Arab American University/ Palestine (AAUP)

The Faculty of Postgraduate Studies

"The Impact of Applying Unfolding Case-Study Learning on Critical Care Nursing Students` Knowledge, Critical Thinking and Self-Efficacy; A Quasi-Experimental Study"

By

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This Thesis is Submitted in Partial Fulfillment of the Requirements for the Doctorate Degree in Philosophy of Nursing, Palestine

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Approval Form

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This thesis was defended successfully on 28 December, 2023 and approved by:

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Declaration

I, the undersigned Maysa Kassabry, authorize the Arab American University/ AAUP to provide copies of my thesis to libraries, institutions, or individuals upon their request, in accordance with the current instructions at the university. I acknowledge that I have complied with the laws, regulations, instructions, and decisions of the AAUP regarding the preparation of doctoral theses when I personally prepared my thesis entitled: " The Impact of Applying Unfolding Case-Study Learning on Critical Care Nursing Students` Knowledge, Critical Thinking and Self-Efficacy; A Quasi-Experimental Study". This is in line with the accepted scientific integrity in writing scientific theses.

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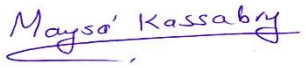
Signature: 

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Dedication

I dedicate my research to the Divine Creator, the source of all knowledge and insight, with humility and appreciation. I thank God for the opportunity and direction during this learning and growing journey. This study should demonstrate His unlimited grace and wisdom.

My beloved children, you have been a constant source of encouragement and support to me. Your unwavering encouragement, support, and love have inspired me to seek knowledge and thrive. I am also grateful for the selflessness, affection, and unwavering belief in my abilities from my late father, cherished mother, and siblings. I honor the confidence you have placed in me and the values you instilled in me from the very beginning. Additionally, this thesis is dedicated to the brave martyrs of Gaza, who fearlessly sacrificed their lives in the pursuit of freedom and justice.

With the illumination of the path towards a more promising future for all, may the knowledge that I have acquired and given serve as a guiding beacon.

Acknowledgment

I am profoundly grateful to God, the source of all wisdom and strength, for guiding me through this arduous yet rewarding journey of completing my thesis.

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“THE IMPACT OF APPLYING UNFOLDING CASE-STUDY LEARNING ON CRITICAL CARE NURSING STUDENTS` KNOWLEDGE, CRITICAL THINKING AND SELF-EFFICACY; A QUASI-EXPERIMENTAL STUDY”

Abstract

BACKGROUND: The growing awareness of utilizing modernized learning strategies in nursing education is emphasized. The unfolding case studies learning approach has a concrete contribution to nursing education. The unfolding case studies can enhance students' acquisition of diverse learning experiences through interactive case scenario discussions. There is a lack of existing research that examined the effects of unfolding case studies on knowledge acquisition, critical thinking, and self-efficacy among undergraduate nursing students.

AIM: To examine the impact of applying unfolding case-study learning on critical care nursing students` knowledge, critical thinking, and self-efficacy in comparison to conventional teaching methods.

METHODS: This posttest-only, quasi-experimental study was conducted at the Arab American University in Jenin, Palestine in the period between February and June 2023. Undergraduate nursing students enrolled in the critical care nursing course were recruited using a single-stage cluster sampling. Students assigned to the intervention group (n= 91) underwent unfolding case-based learning, whereas those in the conventional group (n= 78) were subjected to conventional teaching methods. Unfolding case study learning methods were implemented through interactive group discussions of unfolding case scenarios that were moderated and guided by teachers to ensure exhaustive coverage of the course materials. Study outcomes included the posttests evaluation of students' knowledge, critical thinking, and self-efficacy using validated

instruments. The collected data were analyzed statistically using SPSS software version 27. The Social Constructivist Theoretical Framework which emphasizes social interaction and collaboration in the learning process was integrated into the study.

RESULTS: Participating students were distributed roughly equal across genders, their mean age was 22.3 years, and the mean of their GPA was 2.76. After implementing the study intervention, students in the experimental group showed higher scores in knowledge compared to the conventional group (7.12 vs. 5.49 respectively, t = -12.7, df = 167, p < .001, 95% CI [-1.89 to -1.38]). Similarly, these score differences were also found when assessing students' critical thinking (4.32 vs. 3.63 respectively, t = -17.390, df = 167, p < .001, 95% CI [-0.77 to -0.61]), and self-efficacy (6.12 vs. 4.4 respectively, t = -30.897, df = 167, p < .001, 95% CI [-1.82 to -1.60]). The correlation coefficient indicated a strong positive correlation between critical thinking and self-efficacy in the experimental groups (r = 0.69, p < 0.001).

CONCLUSIONS: The unfolding case-based learning approach was found to be an effective method that enhanced critical care nursing students` knowledge acquisition, critical thinking, and self-efficacy. Nursing instructors should advocate for policies that encourage the incorporation of unfolding case studies as a learning strategy in nursing curricula across various subjects and cohorts.

KEYWORDS: Unfolding case study, Critical thinking, Self-efficacy, Knowledge**,** Nurse, Student, Critical care.

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List of Abbreviations

Abbreviation	Definition
AAUP	Arab American University/ Palestine
ZAD	Zone of Actual Development
ZPD	The Zone of Proximal Development
PPT	PowerPoint Presentation
NCLEX	National Council Licensure Examination
YCTD	Yoon`s Critical Thinking Disposition
MSLQ	Motivated Strategies for Learning Questionnaire
CINAHL	Cumulative Index to Nursing and Allied Health Literature
PICO	The Population, Intervention, Comparison and Outcomes
ECG	Electrocardiogram
PCI	Percutaneous intervention
CHD	Coronary Heart Disease
CTS	Critical Thinking Skills
BSN	Bachelor of Science in Nursing
CBL	Case-based learning
GPA	Grade point average
MCQ	Multiple-choice questions
SPSS	Statistical Package for Social Sciences (SPSS)
IRB	Institutional Review Board
SD	Standard Deviation
P	P value
M	Mean
QSEN	Quality and Safety Education for Nurses
RN	Registered Nurses
HFS	High Fidelity Simulation

CHAPTER ONE

1.1 Introduction and Background

Nursing education is a constantly evolving field, adapting to the changing healthcare landscape and the intricate needs of patients and communities (Cusson et al., 2020; Jager et al., 2020). Given this reality, educational institutions demonstrate a strong dedication to prioritizing the delivery of essential information and expertise to nursing students, enabling them to meet the demanding requirements of the profession (Tanner, 2007). This requires advancing the teaching methodology to integrate both theoretical knowledge along with essential skills and competencies of actual nursing care (National Council of State Boards of Nursing [NCSBN] 2018; Sellars et al., 2018).

Nursing education embarks with encouraging students to actively participate in the learning process (Bean & Melzer, 2021). Adapting an active student involvement approach is essential to reach the utmost educational outcomes (Cooke & Moyle, 2002; Rogal & Snider, 2008). Students engaged in a dynamic and authentic patient scenario can build a robust educational experience with better confidence and efficient management (Greenway et al., 2019). The collaborative learning competencies aim to demonstrate the multidimensional healthcare environment and aid in the development of critical interpersonal communication and collaboration proficiencies (Benner, 2010).

The unfolding case study is an innovative teaching strategy that revolutionizes the traditional learning strategies (Chan, 2013; Miller et al., 2013). It was originally introduced by Glendon and Ulrich in 1997 and has gained popularity in nursing education (Glendon & Ulrich,

1997). This approach involves presenting students with simulated case scenarios that closely mimic real nursing environments, encompassing various aspects such as the patient's illness trajectory, psycho-social concerns, and clinical practice (Kopp et al., 2014).

Unlike traditional learning strategies, unfolding case studies create a dynamic and interactive learning environment (Vogt & Schaffner, 2016). Students are presented with a complex patient scenario that gradually unfolds over time, allowing them to engage in a more immersive and realistic learning experience. This methodology encourages students to think critically, analyze information, and make informed decisions as the case evolves (Costello, 2017; Englund, 2020).

There has been an increase in the recognition of the significance of critical thinking and decision-making abilities in the context of undergraduate nursing education (NCSBN, 2018). As students actively participate in the learning process and navigate the challenges of scenarios, they can upraise their critical thinking, clinical judgment, and decision-making capabilities (Adkins, 2018; Insight Assessment, 2019). In addition, this active engagement accelerates the development of self-efficacy which instills a sense of competence and a feeling of effective handling of case management in the future (Lee & Ko, 2010).

Despite rich evidence of using simulation-based learning in nursing education, (Bogossian et al., 2018; Carter & Welch, 2016; Frost et al., 2017; Mills et al., 2014; Pilcher, 2018), the unfolding case study teaching approach is still unfamiliar in classroom settings in nursing education worldwide (Englund, 2020; Gholami et al., 2021). In the context of Palestine, nursing education is mostly characterized by the use of conventional lecture-style teaching, complemented by some simulated learning tasks, single-episode case studies, group projects, clinical rotations,

and practical hands-on experiences (Affouneh et al., 2021; Ayed et al., 2023; Fahajan et al., 2023; Hodrob et al., 2022; Palkova et al., 2019; Salameh, 2017). However, there has been no concrete implementation of unfolding case studies in classroom settings reported in Palestine. Therefore, this study aimed to examine the impact of applying unfolding case study learning on critical care nursing students` knowledge acquisition, critical thinking, and self-efficacy at Arab American University/ Palestine.

1.2 Problem Statement

One of the fundamental objectives of undergraduate nursing education is to provide students with vital critical thinking skills and knowledge, ensuring that graduates are confidently and proficiently prepared to handle patient needs. The research emphasized the necessity to reform nursing education to meet the changing demands of the healthcare sector, including the replacement of traditional teaching methods with contemporary learning approaches (National League of Nursing [NLN], 2002; Schmidt, 2010).

The traditional lecture approach, which has been employed in various disciplines, including nursing, for decades, has recently faced criticism due to its inherent limitations (Afrasiabifar & Asadolah, 2019; Gholami et al., 2016). One commonly used method in conventional lectures is the incorporation of PowerPoint presentations to educate students. However, research suggests that this instructor-centered strategy, relying heavily on PowerPoint presentations, shows an inability to effectively promote complete student participation and engagement. Instead, it often creates a passive learning environment where students perceive themselves solely as recipients of information (Bronson, 2016; Choi et al., 2014; Ha, 2020; Kantar & Massouh, 2015; Salari et al., 2018). Moreover, traditional lectures have also been criticized for emphasizing memorizing. This

kind of rote learning may impair conceptual comprehension and real-world application. Memorization may provide superficial understanding without critical thought or analysis (French & Kennedy, 2017).

While there is ample evidence suggesting that classroom lectures are effective for knowledge acquisition, they are deemed ineffective for developing “beyond knowledge” such as critical thinking abilities, interdisciplinary collaboration, and self-efficacy in students, which remains a concern for nurse educators (Bristol et al., 2019; Hong & Yu, 2017). This one-way flow of information from the lecturer to the students may not allow students to actively interact with the subject, challenge assumptions, or have meaningful debates. Because of this, students might struggle to acquire critical thinking abilities for understanding complicated situations and considering various perspectives. This lack of critical thinking competency can have detrimental effects on students' preparedness for a constantly evolving global health system, leading to disengagement, poor performance, and negligence (Li et al., 2019; Zhang et al., 2019). One possible reason for this is that instructors are required to deliver a large amount of information to students through lectures, which offer limited opportunities for assistance and contact hours (Hong & Yu, 2017).

Recognizing the importance of theoretical knowledge, many nursing students struggle to see the connection between theory and practice, which can make it difficult for them to engage with the material (Greenway et al., 2019). Literature shows a substantial gap between the competencies possessed by recent nursing graduates and the expectations placed upon them at the entry-level (Akyildiz, 2019; Wolfe, 2001). The gap hinders comprehension of the pros and cons of including unfolding case studies into standard teaching methods (Shoghi et al., 2019), where the lack of practical experience and exposure to real patient care situations can pose challenges for

students in fully understanding the implications and context of using unfolding case studies in nursing education. Moreover, the lack of seamless integration between theory and practice may also limit the deployment of new research and patient care advances (Pitsillidou et al., 2021; Younas & Quennell, 2019). Thus, this constraint could affect healthcare providers' capacity to provide safe and effective patient care in real-world situations. Nursing educators have the responsibility to discover effective ways that promote the integration of theoretical knowledge and practical application. This enables students to get a comprehensive understanding of how theoretical concepts are applied in real-world nursing situations. The objective of this strategy is to augment students' capacities for critical thinking and bolster their self-confidence. This can include using active learning strategies such as unfolding case studies (Meiers & Russell, 2019).

Single-episode case studies are traditionally used by nurse educators in conventional classrooms to foster critical thinking through the examination of realistic client clinical scenarios (Gholami et al., 2021; Herron et al., 2019; Hong & Yu, 2017; Li et al., 2019). However, it is important to acknowledge that this approach also has its limitations. The traditional approach of using a single episode of case studies is characterized to be static and limited in scope. The model's limitations lie in its inability to accurately capture the dynamic nature of real-world situations and may not provide a comprehensive understanding of the problem at hand (Englund, 2020; Hong & Yu, 2017). Additionally, relying solely on a single episode of case studies may result in oversight of significant factors overlooking important variables, and the probable formation of incomplete conclusions (Hong & Yu, 2017). This method restricts educators from analyzing data that promotes students' critical thinking and decision-making processes (Carr, 2015). In contrast to the unfolding case study that progresses gradually in unpredictable ways for the student and offers even more insight into the nursing process and can be a valuable tool in deepening the knowledge,

critical thinking, and self-efficacy of nursing students (Englund, 2020; Hong & Yu, 2017; Reese, 2011).

On the other hand, there are some challenges related to the lack of effective clinical training settings (Jafarian-Amiri et al., 2020; Moghaddam et al., 2020). In Palestine, nursing students encounter restricted training opportunities due to various imposed limitations (Ayed et al., 2021). The combination of political instability and the COVID-19 pandemic has likely exacerbated the challenges faced by nursing students in accessing effective clinical training settings (AlKhaldi et al., 2020; Bsharat, 2023; Shahawy & Diamond, 2017). The absence of territorial, economic, and political sovereignty, has contributed to a highly fragile situation. This fragility can impact the healthcare system and educational institutions, including nursing education. Also, Palestinian nursing students living and studying in the occupied Palestinian territories receive suboptimal training because of ambiguous permit rules, barriers at checkpoints, and the psychological burden of the process (Shahawy & Diamond, 2017). Additionally, the pandemic has led to the implementation of measures and restrictions aimed at preventing the spread of the virus, which may further limit the availability of clinical training settings (AlKhaldi et al., 2020) . Other issues such as limited space, resources, infrastructure, caseloads, faculty expertise, and high student-to-patient ratios hinder the provision of transfer education. This situation is especially concerning because clinical practicums are essential for nurturing analytical and critical thinking skills in nursing students (Abuosi et al., 2022; Fawaz et al., 2018; Younas et al., 2019). This incorporates lots of unfavorable clinical experiences which might affect students' attitude, confidence, and learning abilities (Arkan et al., 2018) and make burden on theoretical part of classroom teaching to take the responsibility of introducing new teaching methodology that compensate lake of competences in clinical settings.

There is a lack of existing research specifically examining the effects of unfolding case studies on knowledge, critical thinking, and self-efficacy within traditional classroom settings accommodating around 30-50 students, as opposed to simulation nursing labs with smaller class sizes ranging from 15-20 students (Baker & Blakely, 2023; Gholami et al., 2021; Hong & Yu, 2017). In light of this gap, the present study was undertaken to evaluate the impact of applying unfolding case studies learning on critical care cursing students` knowledge, critical thinking, and self-efficacy at AAUP.

1.3 Purpose of the Study

This study aims to examine the impact of applying an unfolding case study learning on critical care nursing students` knowledge acquisition, critical thinking, and self-efficacy at Arab American University/Palestine (AAUP).

1.4 Specific Objectives

1- To examine the difference in knowledge acquisition regarding critical care nursing topics between students receiving unfolding case studies and students receiving traditional classroom teaching at AAUP.

2- To examine the difference in critical thinking skills regarding critical care nursing topics between students receiving unfolding case studies and students receiving traditional classroom teaching at AAUP.

3- To examine the difference in self-efficacy regarding critical care nursing topics between students receiving unfolding case studies and students receiving traditional classroom teaching at AAUP.

1.5 Significant of the Study

The importance of this research is emphasized by the fact that it was the first investigation in Palestine to employ unfolding case studies within an educational environment to improve the analytical abilities, knowledge acquisition, and self-efficacy of nursing students. The results of this research possess substantial implications for the formulation of pedagogical approaches that can efficiently enhance nursing students' critical thinking skills and proficiency in patient care. Additionally, the data generated from this study can serve as a valuable resource for health educators and leaders in shaping teaching strategies that better prepare newly graduating nursing students for the challenges of their profession. By filling this research gap and providing evidence-based insights, this study has the capacity to not only advance nursing education in Palestine but also contribute to the broader field of healthcare education and ultimately enhance the quality of patient care.

Unfolding case studies have had a significant positive impact on the quality of nursing care for patients. Unfolding case studies simulate real-life clinical scenarios, enabling students to engage in realistic problem-solving and decision-making processes. By facing complex patient cases that unfold gradually, students are challenged to think critically, analyze information, and make appropriate clinical judgments. This enhances their ability to provide accurate and effective care to patients, ultimately improving patient outcomes (Lloyd, 2020; Moench, 2019). Additionally, the collaborative nature of unfolding case studies fosters teamwork and interdisciplinary collaboration among students. By working together as a team, students learn effective communication skills, build trust and respect for each other's expertise, and develop the ability to work cohesively in delivering safe and coordinated patient care (Upshaw, 2016).

Furthermore, the investigation that went beyond the effects of unfolding case studies on critical care nursing students' knowledge acquisition, critical thinking, and self-efficacy constitutes the study's significance. To address a gap in the current body of knowledge, the current investigation explores the application of unfolding case studies within the realm of critical care nursing education. This specific field has received limited attention in previous research endeavors.

Unfolding case-based learning has been acknowledged as an effective approach for bridging the gap between classroom education and clinical practice (Bonito, 2019; Ma & Zhou, 2022). This methodology necessitates that students use conceptual frameworks in practical situations, facilitating the transformation of theoretical knowledge into practical application. Instead of only depending on conventional lectures, students actively participate in the examination and solutions of issues that closely resemble real-life scenarios experienced in clinical practice. Through engaging with the complexities of these situations, students are stimulated to engage in critical thinking, make well-informed choices, proper clinical reasoning, and cultivate their problem-solving abilities(Choi et al., 2014; Gholami et al., 2021).

Potentially establishing the foundation for evidence-based interventions that contribute to the corpus of knowledge in nursing education, this study possesses the capacity to do so. Through the methodical collection and analysis of data, the purpose of this research is to provide evidence regarding the effectiveness of unfolding case studies as a unique educational intervention. This offers innovative viewpoints that can be implemented by institutions and educators to improve their curriculum development and educational approaches, thus contributing significantly to the continuously evolving field of nursing education.

Moreover, it is positioned to function as a significant reference for other academic institutions and researchers operating within the same discipline. The results of this study are of utmost importance to individuals who are interested in improving their nursing programs. They offer practical advice based on insights into the effects of unfolding case studies on critical thinking abilities, self-efficacy, and knowledge acquisition.

The research contributes to the broader advancement of nursing education by enhancing our understanding of how specific teaching strategies influence nursing students. The study's insightful findings have the potential to guide policymakers and educators in reforming the nursing curriculum and optimizing student learning methodologies. As a result, educational practices can become more informed and tailored to better prepare nursing students for the challenges they will face in their professional careers.

Additionally, the transferability of the study's findings to diverse educational settings and contexts are crucial consideration. If the study design and outcomes are robust and applicable across various contexts, its significance increases, broadening its potential impact. In essence, the study's role extends beyond its specific findings, encompassing its broader implications for the field and its potential to foster collaboration and cumulative knowledge generation.

1.6 Research Questions

1- What is the difference in knowledge acquisition of critical care nursing scores between students receiving unfolding case studies and conventional classroom teaching students?

2- What is the difference in critical thinking skills of critical care nursing scores between students receiving unfolding case studies and conventional classroom teaching students?

3- What is the difference in self-efficacy towards critical care nursing scores between students receiving unfolding case studies and conventional classroom teaching students?

1.7 Research Hypothesis

This study examined the following hypotheses:

H01. There will be no statistically significant difference in post-test knowledge acquisition scores of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$.

H02. There will be no statistically significant difference in post-test critical thinking skills scores of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$.

H03. There will be no statistically significant difference in post-test self-efficacy scores of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$.

1.8 Theoretical Framework

This study adopted the construct of the Social Constructivist Theoretical Framework proposed by Vygotsky (1978) and the constructive theory model by Brandon and All (2010). This theoretical framework emphasizes the learner's active participation in the learning process, focusing on their efforts to acquire knowledge based on their experiences and past knowledge. It underscores a social and communicative approach wherein knowledge is shared, and understandings are constructed within culturally influenced social settings. Learners are expected

to independently and collaboratively construct their knowledge through social groups (Fosnot, 1989b).

The Social Constructivist theoretical framework is the foundation for the constructive Theory Model, as illustrated in Figure 1. It conceptualizes the learning process as a spiral phenomenon and advocates for curricula that are interactive, student-centered, and innovative (Brandon & All, 2010). The student is at the core of the spiral, building relationships with their classmates and interacting with the teacher. As students interact with the subject matter and engage in various learning activities, they revisit and deepen their understanding of concepts over time. Each cycle through the spiral allows for deeper insights and connections to be made. Brandon and All found that students' growing capacity for critical thinking in which students are encouraged to analyze, evaluate, and synthesize information, fosters higher-order thinking skills. Consequently, as students actively participate in their learning and experience success in mastering new concepts and skills, their self-efficacy is enhanced in their abilities coinciding with their progress through the stages. Learners are allowed to potentially construct new knowledge as a result of the instructor's rapid feedback, the students' interactions, and their reflections (Brandon & All, 2010).

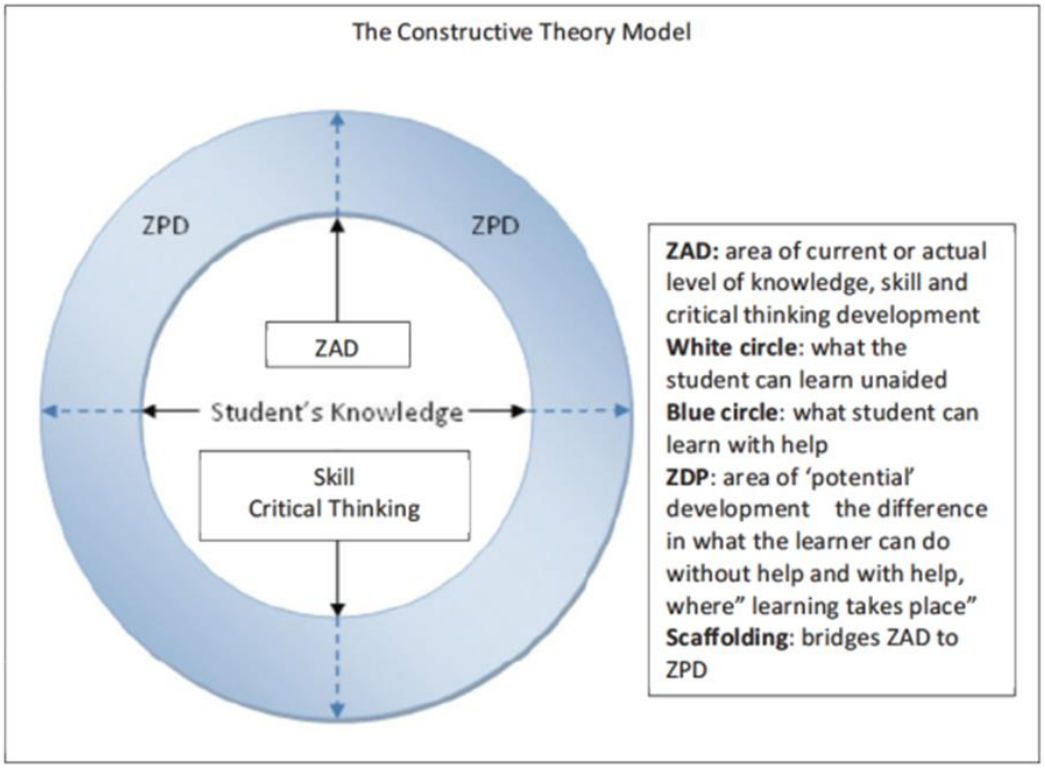

Figure 1: "The constructive Theory Model", adapted from Brandon and All (2010).

Lev Vygotsky's theory within his Social Constructivist Theoretical Framework similarly exemplifies the process of learning through collaboration and encompasses two distinct levels of development. These levels are known as the Zone of Actual Development (ZAD) and the Zone of Proximal Development (ZPD).

The initial level in Vygotsky's theory is referred to as the zone of actual development (ZAD). The ZAD is the level at which the learner is now capable of solving issues on their own without assistance (Shabani et al., 2010). The learner possesses specific knowledge, beliefs, abilities, attitudes, and values prior to commencing the learning process.

The zone of proximal development (ZPD) denotes the second stage of development. The ZPD serves as the benchmark by which all ensuing development is evaluated. It pertains to the spectrum of activities that a novice can execute with the direction of a more experienced individual, including a mentor, instructor, or peer, but has not yet attained the capacity to do so independently (Kozulin, 2004; Shabani et al., 2010). Fundamentally, it signifies the incongruity that exists between the present competencies (ZAD) of the learner and their latent capabilities. By utilizing the ZPD, the student is able to assimilate the material and solve problems at an advanced level.

Scaffolding is another component of the ZPD (Taber, 2018; Verenikina, 2003). Scaffolding is an instructional strategy that utilizes the theoretical framework of the Zone of Proximal Development. According to Kozulin (1986), scaffolding is a process in which an instructor incrementally directs learning activities, in cognitive stages that provide a temporary framework to process new information and integrate it into the student's existing knowledge. It entails offering learners the necessary support to operate within their ZPD, while gradually reducing this support as the learner's proficiency increases. This sort of assistance encompasses several strategies, including modeling, providing feedback, delivering explanations, giving prompts, breaking down complicated activities into smaller pieces, modeling the behavior that is desired, and providing encouragement. The activities that are to be completed are real, take place within contexts that are rich in meaning, and are connected to the actual world. The exercises ought to provide a chance for students to self-evaluate, engage in peer discussion and correction, and get feedback from the teacher. Its purpose is to facilitate the development of learners' skills, enabling them to eventually operate autonomously. Learning via scaffolding creates autonomous critical thinkers who can think critically throughout their lives and bridges the gap between the ZAD and ZPD.

Basically, the Social Constructivist theoretical framework places significance on social interactions and assistance in the learning and developing process, particularly through the concepts of Zone of Actual Development (ZAD), Zone of Proximal Development (ZPD), and scaffolding. It acknowledges the notion that individuals exhibit optimal learning outcomes when they are presented with activities that are within their Zone of Proximal Development (ZPD) and are provided with suitable scaffolding to facilitate their successful completion of those tasks. This approach emphasizes the importance of social environment and teamwork in promoting cognitive growth and development.

Implementing an unfolding case study is recognized as a constructivist approach in the theoretical domain of nursing education. The decision to adopt this framework in the current study is rooted in its incorporation of diverse concepts inherent in unfolding case studies, which have functioned as guiding principles for the research. Utilizing this framework provides a depiction of the unfolding case study, encompassing aspects such as active engagement, student construction through the knowledge acquisition process, critical thinking analysis, and social interactions for sharing, exchanging students' experiences, and the promotion of confidence and self-efficacy. It effectively demonstrates how the unfolding case study, as a learning approach, is constructed using significant real-world events that promote confidence and self-efficacy depicting how the unfolding case study as a learning approach is built using significant real-world events.

Moreover, it illustrates the spiral-like structure of unfolding case study learning, wherein the student assumes a central role in engaging in discussions with the instructor and forming collaborative units with fellow students. Students gradually revisit and enhance their comprehension of concepts as they engage in diverse learning activities and interact with the subject matter. Every iteration of the spiral facilitates the formation of more profound insights and

connections. The research conducted by Brandon and All (2010) suggests that as students progress through the spiral cycles, there is a noticeable improvement in their critical thinking skills, specifically in the areas of information analysis, evaluation, and synthesis. This sequence of events significantly promotes the growth and improvement of critical thinking abilities. In addition, attaining proficiency in new concepts and abilities and actively participating in the learning process both contribute to an enhanced sense of self-efficacy that corresponds with their progression through the cycles. Furthermore, opportunities for learners to potentially develop new knowledge are provided by the instructor on time, through student interactions, and personal reflections (Brandon & All, 2010).

Furthermore, when applying the Social Constructivist theoretical framework to unfolding case studies, the roles of the student and the instructor are emphasized. The students' role is that of an active participant in their learning journey, taking responsibility for acquiring knowledge. They draw upon their prior knowledge, skills, and critical thinking to engage with the learning material, constantly questioning and reassessing their understanding. Through a cyclical process of interpretation, articulation, and re-evaluation, students strive for mastery of the content, refining their comprehension until they achieve a deep and meaningful understanding. On the other hand, the instructor serves as a knowledge facilitator, skill developer, and promoter of critical thinking. Rather than being the "sage on the stage," the instructor adopts a coaching role, guiding learners while allowing them to explore their current understanding. Being non-judgmental, the instructor respects each student's thinking ability and supports them in the learning journey. By creating meaningful opportunities for social interactions and establishing zones of proximal development, the instructor facilitates the learning process, helping students bridge the gap between their current knowledge and new insights in a more relevant context.

The independent variable of the current study is the unfolding case study intervention and the dependent variables are knowledge acquisition, critical thinking, and self-efficacy. Knowledge acquisition, critical thinking, and self-efficacy are the proposed outcomes of the Social Constructivist Theoretical Framework. The framework provides a foundation for exploring various potential variables and their relationships. Figure 2 illustrates the conceptual framework for the study. For this purpose, the current study evaluated the impact of applying an unfolding case study learning method on critical care nursing students` knowledge acquisition, critical thinking, and self-efficacy at Arab American University/Palestine (AAUP).

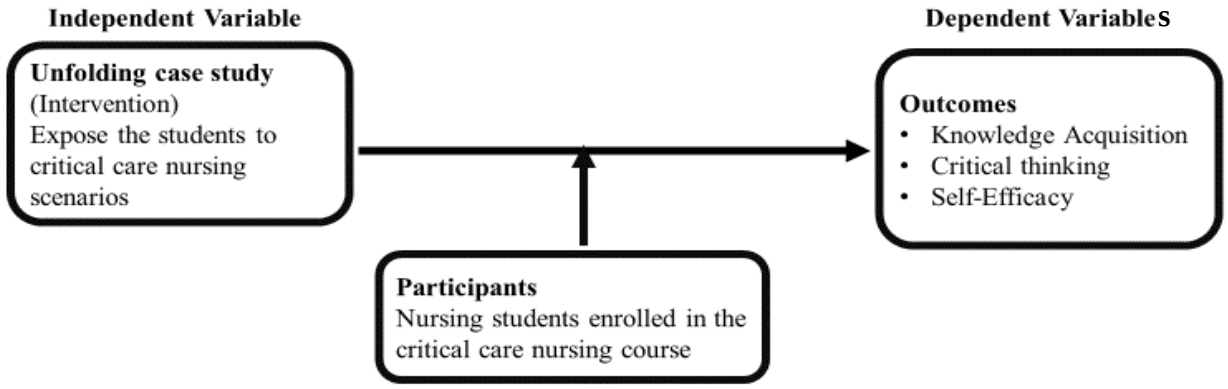

Figure 2: Conceptual framework of the study

1.9 Conceptual and Operational Definitions

The following are the conceptual and operational definitions of the study variables;

Unfolding case study

Conceptual definition: A thorough learning strategy that gives students practice time to address problems both individually and collaboratively in case scenarios that are intended to reflect real-world situations. It combines several cooperative learning techniques with a version and expansion of the widely used case study process, resulting in an individual and group reflective experience (Glendon & Ulrich, 1997). It develops over time in a way that is unpredictable to the student because new aspects of the case are brought to light during multiple encounters with the material (Himes & Ravert, 2012; Reese, 2011).

Operational definition: for this study, an unfolded case study of a cardiovascular chapter of the critical care nursing course was performed by the researcher over six-week classroom sessions with an 18-hour total duration assigned for nursing students.

Traditional classroom lecture

Conceptual definition: A classic teaching method where the student is a passive observer of the lesson taught by the teacher who moderates and regulates the flow of information and knowledge face-to-face for the course content. It creates an instructor-centered classroom (Miller et al., 2013).

Operational definition: The traditional classroom lectures consisted of an eighteen-hour lecture as a total on the critical care topic of the cardiovascular chapter that was selected and delivered over six weeks by the researcher. The students who participated in the teaching sessions

were given instruction through traditional PowerPoint Presentation (PPT) slides. The information reflected the same issues as those discussed in the unfolding case study classroom session but in a different learning style.

Knowledge acquisition

Conceptual definition: Knowledge is the comprehension or awareness of information about a particular subject. It encompasses the facts, truths, or principles that one gains familiarity with through study, investigation, observation, or experience. It is the body of information and understanding that is accumulated over time. It extends to the ability to recall or recognize and apply information, facts, and concepts (Mohajan, 2016; Nasimi et al., 2013). Knowledge is classified as the first level of cognitive learning and is related to verbs such as recognizing and recalling (Bloom et al., 1984; Krathwohl, 2002). Knowledge is built through a combination of student participation, self-reflection, and prompt instructor feedback (Brandon & All, 2010).

Operational definition: A knowledge test was administered to measure the nursing students' understanding of nursing concepts, theories, and practices. The criteria for the test were derived from the NCLEX (National Council Licensure Examination) exams. Nursing students who were enrolled in the theoretical part of the critical care nursing course at AAUP were given pen and paper post-tests by the researcher. Following the course material, the test centered on critical care nursing subjects, particularly the cardiovascular chapter. The test aimed to verify that students had the essential information and abilities required to provide the best possible patient care.

Critical thinking

Conceptual Definition: All or part of the process of questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity (American Nuse Association [ANA], 2018; Mahdi et al., 2020; Paul, 2009).

Operational definitions: Critical thinking was measured using Yoon`s Critical Thinking Disposition Instrument (YCTD) to assess the student's critical thinking (Yoon, 2004)skills (Yoon, 2004). The test was intended for students in undergraduate nursing programs enrolled in critical care nursing courses. The YCTD consists of seven subdomains of critical thinking that can be administered in 25 minutes. The seven domains include Skepticism (4 items), Objectivity (3 items), Systematicity (3 items), Prudence (4 items), Intellectual Eagerness/Curiosity (4 items), Intellectual Fairness (4 items), and Self-Confidence (5 items).

Self-efficacy

Conceptual definition: This is an individual's belief in their own capability to execute tasks, achieve goals, and produce desired outcomes in specific areas of life (Bandura, 1993). It is a personal judgment of how well one can perform the actions required to deal with different situations (Bandura et al., 1999). This belief, which is particular to a task, a body of knowledge, or performance, affects the behaviors and approaches one uses to pursue their goals (Schwarzer & Jerusalem, 1995).

Operational definition: Self-efficacy for Learning and Performance was used to measure the self-efficacy of critical care nursing students. This scale, was taken from the Motivated Strategies for Learning Questionnaire (MSLQ) (McKeachie et al., 1985), consists of eight items,

and takes, on average, 4 minutes to complete, is typically self-administered as part of a longer questionnaire.

1.10 Summary

There is a heightened emphasis on the use of contemporary learning methodologies in nursing education, reflecting an increasing understanding of their importance. By adopting active learning, a pedagogical method that places the student at the center of the educational process, and fostering cooperation, nursing education may enhance its ability to prepare future professionals for the multifaceted challenges of the healthcare environment.

Unfolding case studies in nursing education have emerged as a novel teaching methodology that embraces an interactive learning model. This approach is designed to equip students with the skills needed to navigate the complexities of patient care. The foundation of social constructivism lies in the belief that students actively construct their understanding through shared experiences in the classroom, rather than simply passively receiving information. Students learn from their experiences and reflect as they go about their unfolding case study, adding new information to what they already know.

Currently, there is limited quantitative evidence supporting the effectiveness of unfolding case studies as a learning method in critical care undergraduate nursing education. Therefore, the purpose of this study is to evaluate the impact of unfolding case study experiences as a teaching method on knowledge acquisition, critical thinking, and self-efficacy among critical care nursing students. The research findings would provide valuable insights for Palestinian nurse educators in designing effective teaching methods utilizing unfolding case studies.

CHAPTER TWO

Literature Review

2.1 Introduction

This study examined the impact of using an unfolding case study as a teaching method on knowledge acquisition, critical thinking, and self-efficacy among critical care nursing students at Arab American University/Palestine (AAUP). This chapter provides an overview of the existing literature concerned with using the unfolding case study teaching methods in nursing and health education. Studies included in this review describe the relationship between the independent variable of unfolding case studies and the dependent variables of knowledge acquisition, critical thinking abilities, and self-efficacy. These variables are examined to understand how they may impact the effectiveness of unfolding case studies.

2.2 The Search Strategy

Different databases were used to retrieve published studies as follows**:** HINARY, Medline, CINAHL, ScienceDirect, and PubMed**.** The search strategy evaluated English-language; peer-reviewed studies published from 2012 to 2023. The research centered on the unfolding case studies in the medical domain, more specifically examining nursing curricula across multiple courses. Excluded were studies that were conducted in a language other than English and that examined variables unrelated to knowledge acquisition, critical thinking, and self-efficacy. The keywords used were unfolding case study, critical thinking, self-efficacy, Knowledge acquisition, nursing learning strategies**,** and active learning methods. The Population, Intervention, Comparison, and Outcomes (PICO) model was used to guide the review in this study, which included the following:

P, undergraduate students; I, unfolding case study learning method; C, comparing with traditional teaching methods; O, students` knowledge, critical thinking, and self-efficacy. Figure 3 presents a comprehensive overview of the search methodology and provides a detailed description of the studies that were included and excluded.

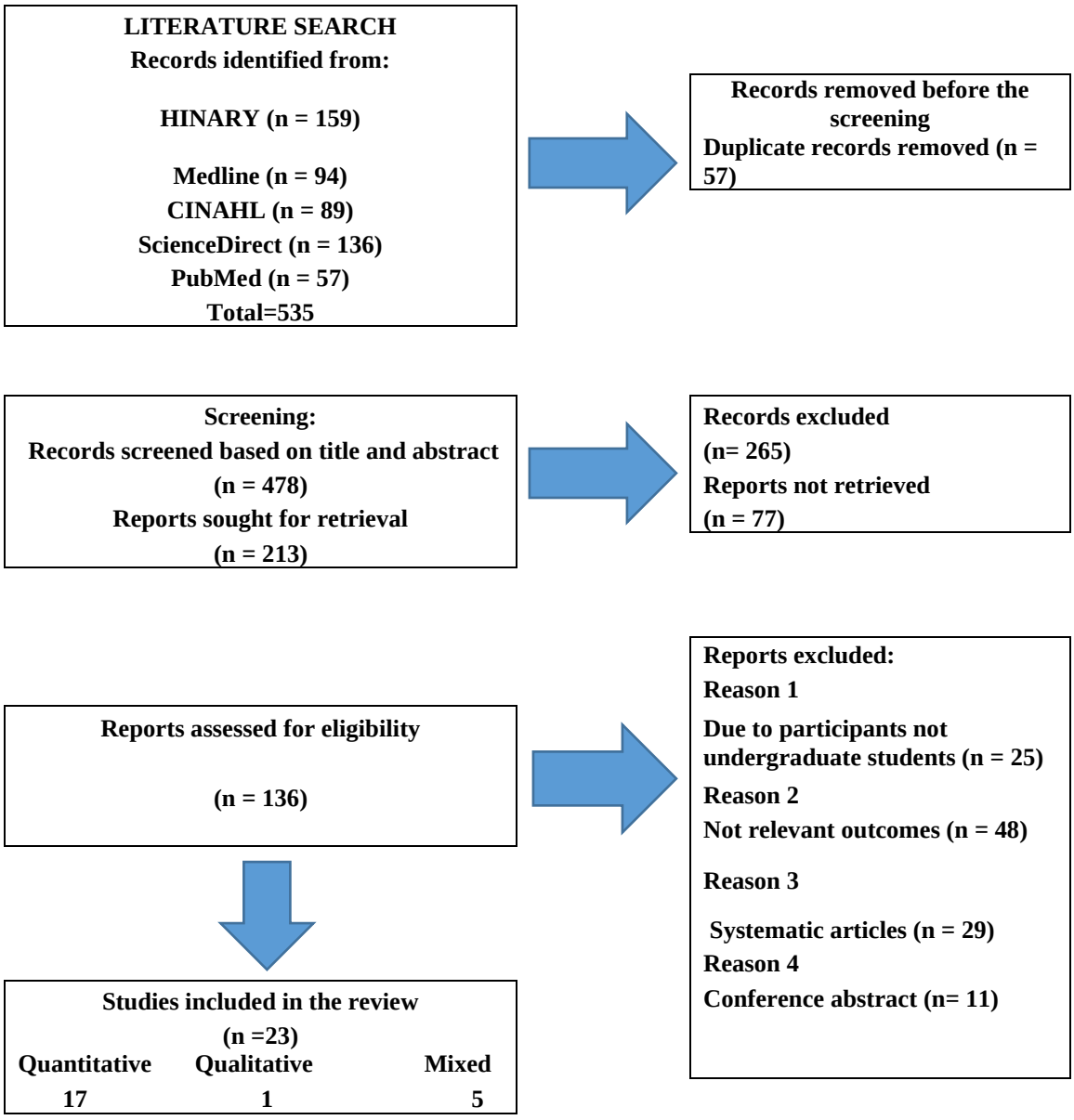

Figure 3: Flow Diagram for a Systematic Review of the Literature

The dataset utilized in the systematic review for this study comprises 17 articles from scholarly journals and six dissertations, encompassing various research methodologies such as quantitative, qualitative, and mixed methods. The screening process involves an initial assessment of titles and abstracts of the identified records. Subsequently, efforts are made to retrieve relevant reports; however, not all sought-after reports are successfully obtained. The retrieved reports undergo a meticulous eligibility assessment, during which some are excluded based on specific criteria. Exclusions include studies that do not involve undergraduate students (Reason 1), studies with outcomes irrelevant to the research objectives (Reason 2), systematic articles (Reason 3), and conference abstracts (Reason 4). Following this rigorous screening process, a subset of studies meeting the specified criteria is included in the systematic review. These studies encompass seventeen articles of diverse research methods, including thirteen quantitative (Al Gharibi et al., 2021; Baker & Blakely, 2023; Carter & Welch, 2016; Englund, 2020; Gholami et al., 2021; Herron et al., 2019; Hobbs & Robinson, 2022; Hong & Yu, 2017; Jensen, 2023; Leynes-Ignacio, 2023; Li et al., 2019; Ma & Zhou, 2022; McCormick et al., 2013), one qualitative (Meiers & Russell, 2019), and three mixed-methods approaches (Mills et al., 2014; Munn et al., 2021; Yousey, 2013). Also, this literature review encompasses six dissertations, consisting of two mixed-methods (Bryant, 2016; Lloyd, 2020) studies and four quantitative studies (Becnel, 2022; Blakeslee, 2019; Peele, 2015; Upshaw, 2016). The final 23 studies were included in this review. The flow diagram visually represents the exhaustive procedures employed to ensure the quality and relevance of the studies incorporated into the systematic review. The review explores three domains and subheadings: Unfolding case studies and knowledge acquisition, unfolding case studies and critical thinking, and unfolding case studies and self-efficacy. In this review, the analyzed studies examined the evidence supporting the positive impact of utilizing unfolding case studies on the three mentioned domains. Additionally, the review also examined studies that presented conflicting outcomes. The

review thoroughly examined and compared the utilization of unfolding case studies with single case studies and compared them with lecture-based methods. Additionally, it offered an overview of studies that integrated unfolding case studies in both traditional didactic classrooms and simulation nursing labs.

2.3 Trends in Nursing Education Strategies

Nursing education is a field that is constantly evolving, with new research and technologies emerging all the time. This requires a commitment to lifelong learning and a willingness to embrace change. Education plays a critical role in preparing students to work properly in real-world situations (Sellars et al., 2018). Nursing programs must provide students with a strong foundation of critical thinking abilities and ample opportunities for hands-on experience that enhances their self-confidence and efficacy so they can better adjust to the challenges of real-life complexities. Yet, several issues with theoretical and clinical training in nursing education must be resolved in order to satisfy the curriculum's objectives.

In the past, nursing education claimed that the faculty's area of expertise was what and how students learned. Recent research suggests that learning outcomes can be enhanced by curriculum and instruction that are student-centered (National League of Nursing [NLN], 2002). As a result of this development, educators are searching for methods to address problems with traditional classroom teaching methods that affect student learning and development options that encourage student engagement. Nursing education is moving away from traditional lecture-based teaching methods and embracing active learning strategies. This includes problem-based learning, single episode case studies, role-playing, and simulation exercises to engage students and enhance their learning experience

Nursing education is a combination of theory and practice that has adapted to the advancements in healthcare technologies and new models of healthcare delivery. This evolution has expanded the scope of practice for registered nurses, allowing them to fulfill their societal obligations and contribute to the well-being of patients and communities (Tanner, 2007). In Palestine, the primary areas for teaching are classrooms and clinical settings, but additional areas include simulation centers, labs, and community-based venues. Flipped classrooms and online instruction are now being included in nursing education in response to the COVID-19 pandemic and to tackle the difficulties caused by political instability. The use of these modalities further promotes learning in an interactive and immersive setting, which enables nursing students to better grasp theoretical ideas and perfect their clinical abilities. However, these modalities have limited capacity and breadth, and they do not cover all material themes comprehensively. Active learning techniques, according to nurse educators, benefit nursing students by encouraging their development of problem-solving, critical thinking skills, and self-efficacy skills. Although there are various teaching methods, classrooms have been the main channel for education for many years. Classrooms offer an opportunity for nursing students to gain insight from experienced educators, learn from case studies and lectures, and engage in meaningful discussions.

Introducing unfolding case studies in classroom settings can provide students with valuable learning opportunities and assist in overcoming the constraints of traditional clinical encounters and the restricted scope of real-world dynamics in traditional lectures. By simulating realistic patient scenarios, these case studies can promote the development of clinical reasoning skills enhance reasoned judgment, and make informed decisions in healthcare settings.

2.4 Unfolding Case Study

The unfolding case study (UCS) model was created by Glendon and Ulrich in 1997 as an expansion and modification of the conventional case study. Students create a single response in accordance with the data presented in a traditional case study at the start of the discussion (Reese, 2011). Unfolding case studies, on the other hand, were initially developed as "an ever-changing case or scenario that students process sequentially," allowing students to read, consider, and respond to one scenario before trying to access the next relevant data (Glendon & Ulrich, 1997, p. 16). This student-centered approach, as Glendon and Ulrich (1997) claim, provides an opportunity for nursing students to apply critical thinking, clinical reasoning, effective communication, self-reflection and decision-making skills by combining the classroom and clinical environment to simulate the real-world of nursing practice, without the risk of harming a real patient.

In 2008, the UCS was recommended as an interactive instructional method by the American Association of Colleges of Nursing (AACN) to weave general education principles into curricula based on the Fundamentals of Baccalaureate Education for Professional Nursing Practice. By the time, unfolding case studies` practices began to become more common in the classroom of nursing schools (Day, 2011) than in online courses (Reese, 2011) and to simulation labs (Johnson & Flagler, 2013; Yousey, 2013).

The unfolding case studies foster an engaging learning environment that simulates "real world" practice and enables students to "think like nurses" (Benner, 2012). In an unfolding case study, the scenario is emulated in stages or chapters, with each chapter revealing new information about the patient's condition or situation. It provides students with the necessary resources to explore the various paths and outcomes of the case study. This could include access to medical

records, patient histories, and other relevant documents. The nursing students are given time to assess the patient and make clinical judgments based on the information provided. The case study may include multiple characters, such as healthcare providers, family members, and other stakeholders. Additionally, a complex patient scenario is presented to students, and as they work through the case, additional information is gradually revealed, which may include changes in the patient's condition, laboratory results, or new symptoms. The purpose of this approach is to mimic the unpredictability and complexity of real-life clinical situations.

Through the unfolding case study, students can practice their critical thinking and reasoning skills in prioritizing patient care, identifying relevant clinical data, and making informed decisions based on evidence-based practice guidelines that achieve their self-efficacy. The method also provides time for reflection and debriefing, by offering them the opportunity to discuss their findings with their peers and, as a result, improves their understanding of the complexity of patient care, risks, and complications. As a result, boosts their communication skills and patient`s nurse relationships.

Some examples of unfolding case studies in nursing education include scenarios involving patients with chronic illnesses, such as diabetes or heart failure, or complex medical conditions, such as sepsis or acute respiratory distress syndrome (ARDS). The cases can be presented in a variety of formats, such as written scenarios, videos, or interactive simulations, depending on the learning objectives and resources available. The NLN-ACE.S (National League for Nursing-Advancing Care Excellence for Seniors) framework actually offers a scripted unfolding case studies to enable faculty integrate geriatric content across the curriculum in simulation (NLN, 2022). The ACE.S – unfolding case studies uses simulation and storytelling to direct the development of nursing actions and critical knowledge domains that will extend the care of elderly people.

The characteristics of an unfolding case study may be succinctly described as follows (Yousey, 2013)**:**

1- Relevance: it must be related to course objectives and suitable for students.
2- Realistic: the case study should be realistic and reveal the tale gradually. For realistic evaluations, it should contain irrelevant and missing information.
3- Engaging: the case study should be intriguing and show diverse viewpoints and ideas. Rich material about chronic disease individuals, locations, challenges, circumstances, and duties is needed. It should also allow students to choose different outcomes.
4- Instructionally: the case study should be tough at levels appropriate for learners. It should have uncommon components to complicate information and need treatment and management analysis. The case study should include chronological and non-chronological facts to complicate clinical decision-making. It should help students develop knowledge and measure their ability to apply it. Teaching tools may also enhance learning.

Overall, unfolding case studies are a valuable tool for nursing educators to help students practice and develop their critical skills, clinical judgment, decision-making skills, and self-efficacy that prepare them for real-life clinical practice.

Unfolding case studies in classroom settings can be a useful teaching tool in nursing education, but they also have some drawbacks. They can be time-consuming to allow for adequate thought or content coverage, expensive for teachers and nursing schools to prepare the content, necessitate experienced instructors to guide discussions, large size classrooms for group round-table discussions, lack of engagement, making it challenging for large students to show interest and enthusiasm in the subject and finally may not provide students with the same level of real-

world experience that they would get from clinical rotations (Joy, 2016). Despite these throwbacks, unfolding case studies in classroom settings can still be a valuable learning experience for nursing education since its benefits outweigh its drawbacks.

2.5 Unfolding Case Study and Knowledge Acquisition

This domain is covered in eleven reviewed studies, including six quantitative studies (Becnel, 2022; Carter & Welch, 2016; Herron et al., 2019; Hobbs & Robinson, 2022; Ma & Zhou, 2022; McCormick et al., 2013), one qualitative (Meiers & Russell, 2019) and four mixed-method studies(Bryant, 2016; Lloyd, 2020; Munn et al., 2021; Yousey, 2013). The acquisition of knowledge is a crucial aspect of nursing education, as it directly impacts the competency and performance of future healthcare professionals (Zook et al., 2018). This part of literature review aims to explore the effectiveness of unfolding case studies in facilitating knowledge acquisition among nursing students.

Conventional teaching methodologies, heavily reliant on lectures, focus predominantly on knowledge acquisition. This approach leaves the application of this knowledge to often unpredictable clinical scenarios to trial and error. In order to stimulate students to seek information, think beyond the facts, utilize their clinical imagination (Carr, 2015), make logical reasoning, and analyze the clinical data to encourage critical thinking skills, unfolding case studies are used as an alternative instructional method. This approach also promotes the development of metacognitive awareness among students, as they engage in risk-taking and receive timely feedback leaving little opportunity for correction and reconstruction. Consequently, students' capacity to make informed clinical decisions is enhanced (Benner, 2010). By critically examining the benefits, challenges, and best practices associated with these teaching strategies, educators can make informed decisions

about incorporating unfolding case studies into nursing curricula. Ultimately, this review seeks to contribute to the ongoing efforts in nursing education to enhance the quality of knowledge acquisition and prepare students for real-world healthcare challenges.

The effect of unfolding case studies on knowledge acquisition among nursing students has been widely explored in the literature. The findings consistently suggest that unfolding case studies have a positive impact on knowledge acquisition in various ways:

a- Active Learning and Engagement

Unfolding case studies promote active learning by immersing students in realistic and complex patient scenarios (Everly, 2013; Yoost & Crawford, 2021). This engagement encourages students to apply their theoretical knowledge, think critically, and make decisions in a clinical context. By actively participating in the unfolding case study, students acquire knowledge through experiential learning, allowing for a deeper understanding of the content. In presenting a complex case study over time, new knowledge is obtained through independent inquiry and exploration. Generally, the constructs for teaching with unfolding case studies are significantly different from traditional teaching methods, with a primary focus on facilitating student-centered learning (Bristol et al., 2019; Ma & Zhou, 2022; Munn et al., 2021).

In a focus group investigation undertaken by Lloyd (2020) to examine the impact of unfolding case studies within classroom environments on critical thinking skills (CTS) and academic performance among pre-licensure Bachelor of Science Nursing students, participant feedback indicated notable observations. Classroom interactions unveiled a heightened level of discourse, with students engaging in more profound discussions when exposed to unfolding case study presentations. Observational evidence further revealed heightened enthusiasm among

students while responding to questions, demonstrating greater engagement compared to instances where the researcher delivered lectures solely via PowerPoint slides.

b- Integration of theory into practice

Unfolding case studies replicate real-life practical situations, in which nurses make decisions based on limited information, as supported by Johnson and Flagler (2013), Reese (2011), and Yousey (2013). These case studies provide a valuable connection between theory and practice by presenting real-life patient scenarios, as mentioned by Day (2011). Nursing students can utilize their theoretical knowledge to address intricate problems, implement suitable nursing interventions, and grasp the practical consequences of their actions (Culyer et al., 2018). This integration enhances their comprehension of the subject matter and equips them for real-world healthcare environments. Numerous studies have been conducted to bridge the gap between theory and practice by employing the unfolding case study approach and assessing its impact on knowledge acquisition among nursing students (Herron et al., 2019; Ma & Zhou, 2022; McCormick et al., 2013; Meiers & Russell, 2019).

c- Enhancing critical thinking abilities

Johnson and Flagler (2013) argue that the utilization of unfolding case studies in nursing education facilitates the cultivation of critical thinking skills among students. Through active participation in the evolving situation, students are afforded the chance to critically examine material, evaluate supporting evidence, deliberate on many perspectives, and ultimately arrive at educated decisions. This approach facilitates the development of critical thinking abilities, promotes the inclination to question assumptions, and empowers individuals to investigate and pursue the most favorable results. In conclusion, these experiences ultimately contribute to the

development of individuals' ability to engage in critical thinking and effectively address complex challenges.

In a study done by Yousey (2013), a mixed-method approach was employed to investigate the implementation of unfolding case studies as a unique strategy for improving students' knowledge, clinical decision-making, critical thinking, and problem-solving abilities in an online nursing program's public health course. Twenty-six students were assigned individually the responsibility of creating a case study over a designated duration, whereby they were required to include principles of chronic disease in the context of public health nursing. Results showed that over four weeks, all students successfully completed the unfolding case study using a rubric for evaluation, demonstrating the integration of knowledge and application in the clinical situation. Participants' feedback verified major themes; an improvement in understanding of public health nursing, innovative problem solving, and the capacity to apply chronic disease ideas using a public health framework implying that they had challenges with incorporating and using knowledge when preparing the case study. Additionally, the study provided faculty with data for formative and summative evaluation of student learning. The author posits that the utilization of the unfolding case study technique is a novel and effective approach to support nurses in the acquisition of essential information, skills, and critical thinking capabilities required for achieving success in the clinical environment.

d- Collaborative learning and communication skills

Unfolding case studies often involve group discussions and collaboration among nursing students (Yoost & Crawford, 2021). Through these interactions, students have the opportunity to articulate their thoughts, listen to their peers' perspectives, and engage in effective communication.

This collaborative learning environment fosters knowledge sharing, teamwork (Benner, 2010; Carson & Harder, 2016; Herron et al., 2019; Himes & Ravert, 2012; Kim & Kim, 2015), and the development of communication skills vital for effective nursing practice (Himes & Ravert, 2012).

A focus group conducted by Bryant (2016) to address the effects of using unfolding case studies within an oxygenation module in a Fundamentals of Nursing Course at a community college in the southeastern United States was examined by comparing differences in understanding and transfer between a classroom that utilized a lecture-based approach (n = 45) and a classroom that utilized unfolding case studies (n = 44). One of the major themes in the qualitative part was the collaboration with peers. Testimonials from the participant group underscored the virtues of collaborative group dynamics and active engagement, as encapsulated by statements such as "Everyone focused on different information and brought it all together.", "It provided us numerous angles about different disease and intervention ideas.", and "Talking through the scenarios as a class."

e- Improving long-term knowledge retention and recall

Furthermore, the unfolding nature of the case study, which presents information gradually, enables participants to explore the subject matter dynamically and interactively. This approach encourages active learning and promotes retention of information by stimulating curiosity and engagement. As participants encounter new information and engage in discussions, they are more likely to internalize and remember the material, leading to improved knowledge acquisition.

In a qualitative study conducted by Meiers and Russell (2019) at North Island College in Canada, faculty and nursing students were surveyed to determine the obstacles nursing students face when attempting to link client conditions with pertinent assessments and the performance of

clinical skills. In order to facilitate students' learning, a case study was created that centered on the management of a patient diagnosed with chronic obstructive pulmonary disease (COPD) and urine retention. The students were provided with assigned texts, mandatory movies, and written learning assignments comprising questions. Six faculty members agreed to lead two focus groups, one for faculty and the other for students. The notes from these focus groups were analyzed, and the effects on nursing lab skill development and student clinical practice were discovered. The study's findings showed that instructors and students alike thought that the unfolding case method of teaching and learning skills promoted skill retention and offered a secure learning environment. The faculty members were eager to contribute to the course's development and valued the evidence that backed up this approach.

The present study incorporates the aforementioned key points by applying them in the traditional classroom setting through the utilization of unfolding case studies. As stated by Billings and Halstead (2012) and Reese (2011), unfolding case studies play a crucial role in facilitating knowledge acquisition. The present study started with a patient who developed unforeseen health issues where students collected evaluation data and created a plan of care that tackled initial patient concerns related to cardiac health changes. This plan of care should include current changes and possible risks. During the case, students review goals, discuss actions and outcomes with instructors, and adjust the plan of treatment as the patient's condition changes. The dialogue will validate proper action and clarify misconceptions before transitioning to the next level of care. Students continue the cycle of assessment, planning, intervention, and evaluation after each feedback session. As patient conditions change, learners plan treatment using decision-making and clinical reasoning abilities in a secure setting of classroom setting (Billings & Halstead, 2012, p.

345). Then students adapt to adjustments and address predicted requirements based on physiological data (Billings & Halstead, 2012; Carr, 2015).

The case study should enhance student comprehension of key ideas for several reasons. Students synthesize new information using their backgrounds and taught subjects, building on their existing understanding as their meta-cognitive processes advance. It focuses on broad concepts (knowledge) to enhance understanding of nursing practices (National Research Council [NRC], 2000). The instructor guides students about the significance of early detection in the context of cardiac health problems. In the absence of timely diagnosis and treatment, cellular and tissue damage can occur, resulting in ischemia, myocardial infarction, cardiogenic shock, and ultimately, death. The attention is redirected towards the clinical representation of a typical electrocardiogram (ECG) in comparison to irregular cardiac rhythms. The discussion may thereafter transition towards the attainment of suitable percutaneous intervention (PCI) or thrombolytic therapy. Each stage elucidates the importance of every piece of information in the context of the overarching objective of restoring optimal cardiac rhythm (Reese, 2011; Treas & Wilkinson, 2013). By organizing the presentation of facts and information in relation to a primary idea or objective, students can get an appreciation for the significance of seemingly minor factors, such as patient chest pain and vital signs in achieving the broader aim of facilitating effective cardiac health intervention. As the ongoing case progresses, it is imperative for students to proactively engage in delivering patient care. In the present research, the unfolding case study of a patient complaining of coronary heart disease (CHD) was developed featuring twelve multi-case scenarios. The multifaceted nature of the multi-case scenarios served as a valuable tool in broadening students' knowledge and fostering a more holistic approach to patient care in the context of cardiac health. The results of this study have the potential to bring nursing education in line with the pedagogical

practices recommended by the Carnegie Report (Benner, 2015; Benner, 2010) and address the challenges identified in the[102] IOM Conference (2010).

Numerous studies have investigated the impact of unfolding case studies on learning outcomes among nursing students in nursing education (Day, 2011; Johnson & Flagler, 2013; Reese, 2011; Yousey, 2013). The utilization of unfolding case studies has been demonstrated to facilitate knowledge acquisition among nursing students, both in the context of high-fidelity simulation and online settings (Bryant, 2016; Dutra, 2013; Herron et al., 2019; Johnson & Flagler, 2013; McCormick et al., 2013; Munn et al., 2021; Yousey, 2013). However, there is a gap in studies that explore the enhancement of knowledge acquisition specifically in traditional didactic classroom environments.

A study at Towson University in the USA conducted by McCormick et al. (2013) compared pedagogical methods by utilizing an unfolding case simulation in the assessment skills laboratory related to Parkinson's disease, contrasting it with a recorded classroom lecture accompanied by YouTube video clips. The study found that the within-group analysis of post-test scores increased for students in both comparison groups ($p = 0.040$). Furthermore, when comparing the posttest scores of both groups, it was found that students who took part in the unfolding case simulation had significantly higher levels of knowledge ($p = 0.031$) compared to students who were taught through traditional classroom lectures (McCormick et al., 2013).

In the aforementioned mixed-method study by Bryant (2016) conducted at a community college in the southeastern United States, the research focused on a cohort of 45 nursing students who were enrolled in a lecture-based instructional setting during the spring semester of 2014. The study incorporated an unfolding case study approach within a group of 44 students from the subsequent spring semester of 2015, employing these unfolding case studies to assess the students'

comprehension and knowledge transfer pertaining to the oxygenation module in a nursing lab utilizing knowledge of 30 multiple choices and short answer questions extracted from course module test bank that is aligned with the material objectives adding to the final exam of 100 items. The findings, as revealed by an analysis of variance, underscore the statistically significant advancement in learning rate and enhanced comprehension among students in the unfolding case study nursing lab, relative to those engaged in a lecture-based instructional setting, particularly in the context of the oxygenation module. Initial comparisons through t-tests revealed no discernible disparities between the two groups at the commencement of their respective course experiences concerning the subject of oxygenation. However, a noteworthy statistical distinction emerged as the unfolding case study group demonstrated a significantly accelerated learning trajectory during instruction, ultimately yielding superior performance at the posttest ($t(1.87) = 2.407$, $p = 0.018$). Within the qualitative facet of the study, two prominent themes surfaced: augmented preparedness or comprehension—both from clinical and theoretical perspectives—and the cultivation of a secure and conducive learning environment. In summary, this article asserts that the integration of constructivist principles through the unfolding case study technique enriches the educational journey of nursing students, ultimately fostering an elevated understanding of intricate subjects, including the challenging issues of the oxygenation module. The preceding insights highlight the transformative influence of this pedagogical approach, rooted in constructivism, on the enhancement of educational outcomes. Consequently, it is strongly advocated that nursing educators and institutions committed to advancing pedagogical excellence delve deeper into the exploration of this constructivist-infused method.

A study by Herron et al. (2019) from the University in the southeastern United States. The effects of traditional written case studies and video simulation unfolding case studies were assessed

in 165 senior nursing students towards their satisfaction, self-confidence, and knowledge. The findings showed that the video simulation group had a higher percentage of correctly answered knowledge questions for all seven questions compared to the traditional written case study group, where the video simulation group outperformed the Case Study Group by 0.19% to 5.09%. Additionally, an analysis of the participant's responses to two open-ended questions at the end of the study revealed four main themes for both groups: better understanding, ability to apply learning to a patient scenario, engagement in learning, and visualization as a helpful tool.

Another mixed-methods investigation, conducted by Munn et al. (2021), delved into the effects of incorporating unfolding case study scenarios into high-fidelity pediatric simulations for one group of undergraduate nursing students. The study aimed to evaluate the effects of utilizing unfolding case study scenarios in simulation on the self-confidence levels of undergraduate nursing students in terms of their knowledge, skills, and clinical judgment/decision-making abilities in the field of pediatric nursing. The study involved 43 nursing students from a public, rural, liberal arts university located in the Southeastern United States. The analysis encompassed both quantitative and qualitative data responses using two scenarios: Sickle-Cell Scenario (Instructor-Led Simulation) and Abdominal Pain Scenario (Student-Led Simulation). The quantitative aspect involved a pre-and post-survey consisting of a 16-item questionnaire adapted from the Perceived Confidence in Pediatric Knowledge and Skills Questionnaire. This questionnaire was structured to assess the four steps/domains of the nursing process (assessment, planning, implementation, and evaluation), with four corresponding evaluative items under each domain. Results from the quantitative analysis, employing Friedman's ANOVA tests, exhibited statistically significant distinctions among the three groups under examination (pre-survey, post-survey for instructor-led simulation, and post-survey for student-led simulation) across all 16

items. The quantitative findings revealed that a significant majority of students provided positive feedback regarding their confidence in pediatric nursing knowledge, skills, and decision-making abilities, highlighting the substantial positive influence of integrating unfolding case study scenarios into simulation exercises. The results in the qualitative part which involved answering the five open-ended questions delivered with each of the post-simulation survey themes identified improvements in four themes: perception of experience, pediatric nursing care, assimilation of knowledge, and critical thinking skills pertinent to their roles as nurses in a pediatric hospital setting. Consequently, the study's results emphasize the beneficial impact of unfolding case study simulation experiences, demonstrating their capacity to improve students' learning, knowledge assimilation, self-confidence, and clinical judgment. This experience can boost decision-making/clinical judgment abilities required for success in future attempts of the Generations NCLEX-RN examination and practice.

Students participating in multi-case scenario-based learning demonstrate enhanced knowledge acquisition and a stronger grasp of the complexities involved in real-world healthcare scenarios. In a quasi-experimental study conducted by Ma and Zhou (2022), one hundred and fifteen undergraduate nursing students from a medical university in southern China were assigned to an intervention group or a control group. The learning outcomes were evaluated by academic achievement, critical thinking, and self-confidence in the health assessment course (44 hours) utilizing unfolding case-based learning compared to a traditional learning method that took place in the nursing laboratory for both. Students in the intervention group were given five unfolding cases with multiple clinical scenarios and asked to analyze them in groups using medium-fidelity mannequins or "real patients" in each scenario. The conventional group was given a simple case with one clinical scenario. The control group had to determine the appropriate health assessment

skills to apply and demonstrate these skills by role-play or on a medium-fidelity mannequin implemented individually. The findings indicate that unfolding case-based learning positively influences academic achievement by enhancing students' comprehension of health assessment knowledge. This is shown by the fact that the average score on the theory test was higher in the intervention group (M=78.72, SD: 12.38) than in the control group (M=76.01, SD: 11.73). This difference was statistically significant (t=2.05, $P < 0.041$), and students' difference scores on the final exam were also statistically significant (M= 88.08, SD= 9.65 vs M= 80.15, SD= 88.3, t =5.03, $P < 0.001$), possibly because the utilization of extensive acquired health assessment knowledge and abilities may have been a contributing factor in their ability to effectively apply unfolding case-based learning.

Additionally, the approach stimulates critical thinking abilities, as students are required to analyze and synthesize information to make informed decisions within the context of the unfolding case scenarios. The interactive nature of this instructional method promotes higher-order thinking skills, such as problem-solving and clinical reasoning.

Moreover, the study demonstrates that unfolding case-based learning contributes to increased self-confidence among undergraduate nursing students. Through active participation in realistic clinical scenarios, students develop a sense of competence and are better prepared to handle similar situations in real clinical settings (Nielsen et al., 2013). This heightened self-confidence can have a positive impact on students' overall professional growth and future practice as nurses.

While the implementation of unfolding case studies appears to have a favorable impact on the acquisition of knowledge among nursing students, it is imperative to undertake a nuanced

examination of potential obstacles and constraints. Factors such as time limitations, adequacy of faculty training, availability of resources, intricacy of the cases, distinctive student attributes, provision of instructional support, and the appropriateness of assessment methodologies warrant careful consideration to optimize the efficacy of unfolding case studies (Culyer et al., 2018; Heitink et al., 2016; Sriratanaviriyakul & El-Den, 2017; Tripathi & Kumar, 2018).

Furthermore, the effectiveness of unfolding case studies in facilitating knowledge acquisition is subject to the interplay of multiple variables. The characteristics of learners, including their prior knowledge, motivation levels, and self-efficacy beliefs, emerge as pivotal elements influencing the contours of the learning journey (Nuutila et al., 2021). It is discerned that students exhibiting heightened engagement and intrinsic motivation tend to manifest more pronounced knowledge acquisition outcomes when immersed in the milieu of unfolding case studies.

The existing body of literature on the subject matter presents a mixed perspective, with some studies demonstrating a clear and significant relationship between the variables under investigation, showcasing consistent patterns and supporting the proposed relationship. However, other studies have conflicting findings, suggesting no substantial association or even presenting opposing conclusions. Additionally, some studies involve mixed results, further adding to the complexity of the topic.

A quasi-experimental study conducted by Carter and Welch (2016) at the School of Nursing at South Georgia State College, examined the impact of unfolding case studies on the knowledge and critical thinking skills of Associate Degree in Nursing (ADN) students in renal and musculoskeletal subjects in traditional classroom settings. The research aimed to assess the

effectiveness of unfolding case studies as an instructional strategy by comparing it to traditional teaching methods in both subject areas. The findings indicated that both groups showed improvement from the pre-test to the post-test. However, there was no significant difference between the two forms of instruction in terms of test score improvement for both Renal (p <0.71) and musculoskeletal (p <0.12) subjects. The research hypotheses were therefore not rejected.

Similar outcomes were observed in a study conducted by Hobbs and Robinson (2022), where they explored the impacts of integrating an unfolding case study into an adult health nursing course on the academic accomplishments of undergraduate nursing students at Capstone College of Nursing, Alabama. The research analyzed the effectiveness of teaching using unfolding case studies against teaching with slide lectures by using pre-tests, post-tests, and transfer tests to evaluate the results, and the questions used for measurement were taken from the course handbook. During the fall semester, 83 students received a slide lecture, while during the spring semester, 98 students received an additional 90 minutes of unfolding case study in the traditional classroom setting. The topic was nursing care for 28-year-old women with burns. Both the slide lecture and unfolding case study groups exhibited an increase in scores from the pretest to the posttest, followed by a subsequent decrease in scores on the transfer test. Also, it was observed that there was no significant difference between the two groups of students in terms of the learning outcomes they achieved. Study outcomes proved that both approaches to teaching produce equivalent results in terms of student learning (Hobbs & Robinson, 2022).

Another study which was previously discussed by Lloyd (2020) as a mixed-methods investigation aimed to assess the impact of integrating unfolding case studies related to adult medical/surgical nursing content within a traditional classroom context. The objectives were not only to foster critical thinking skills but also to gauge academic performance and the student's

perception of engagement. The participants were pre-licensure Bachelor of Science in Nursing students (N=70) from a medium-sized public university in the Midwest. The study focused on various course topics, including cardiovascular disorders and peripheral vascular disease for the initial exam, followed by pulmonary, musculoskeletal, and endocrine disorders for the second exam. The third and final exam, which was noncumulative, encompassed gastrointestinal, neurological, urinary/renal disorders, as well as cancer and palliative care. The study's findings indicated that Independent t-tests were employed to assess the mean scores disparity between the experimental group and the control group across three-course examinations, namely Exams I, II, and the final exam, each consisting of 50 questions. Examining the results, the experimental group attained a mean score of 42.81 for Exam I, whereas the control group achieved a mean score of 41.00. This discrepancy was found to be statistically significant, as indicated by the t-value of -2.169 and p-value < 0.05. However, no statistically significant differences were observed between the experimental and control groups' scores for Exam II or the final exam. Four main themes emerged from qualitative research: Students' cognitive abilities in a traditional classroom, Classroom participation by students, Student-centered traditional classroom instruction, and Traditional classroom reality-based education. The main subject is unfolding case studies and multimodal learning possibilities improving student engagement and thinking, with other supporting themes including colleague cooperation.

Moreover, another study was conducted by Becnel (2022) using a quasi-experimental two-group pretest-posttest design, which focused on nursing students enrolled in the medical-surgical course (54 students in Cohort A and 66 students in Cohort B). Results showed that participants in simulation-based case studies did not score statistically significantly higher on a knowledge pretest than the students who attended a traditional lecture ($t(1, 118) = 1.912$, $p = .058$) (Becnel, 2022). In

the same study, mean gains between the two cohorts in knowledge from the pretest to the posttest were investigated using an independent samples *t*-test. Results showed that Cohort B does have a slightly higher mean increase in knowledge; however, this increase was not statistically significant (t (1, 118) = 0.648, p = 0.519). Moreover, a repeated-measures ANOVA was performed to compare mean pretest and posttest scores in both cohorts to evaluate if either teaching approach affected knowledge acquisition. A significant increase in means scores from pretest (5.7) to posttest (7.3) was seen in Cohort A (F (1, 53) =74.425, p <.001). Also, nursing students taught utilizing simulation-based case studies showed a substantial improvement in mean scores from pretest (6.1) to posttest (7.3) in Cohort B (F(1, 65) = 105.485, p <.001).

This disparity among research outcomes highlights the complexity of the topic and the need for further investigation to better understand the factors influencing the relationship in question. It underscores the importance of critically analyzing and synthesizing the available literature to gain a comprehensive understanding of the subject and identify potential gaps or areas that require additional exploration.

In summary, numerous studies have been conducted to investigate the impact of unfolding case studies on knowledge acquisition within the realms of simulation, online settings, and traditional classroom environments. Interestingly, the positive effects supporting the current study were predominantly observed in simulation or online settings, with limited evidence in traditional classroom settings. This finding highlights the significance of the current study, as it aims to explore the potential effects of unfolding case studies on knowledge acquisition specifically within the context of traditional classroom settings. By filling this research gap, the study aims to shed light on the potential benefits of incorporating unfolding case studies in traditional classrooms and their impact on knowledge acquisition.

2.6 Unfolding Case Study and Critical Thinking

This part of the literature review domain contains a total of eight studies, including seven quantitative studies (Blakeslee, 2019; Carter & Welch, 2016; Englund, 2020; Hong & Yu, 2017; Li et al., 2019; Ma & Zhou, 2022; Upshaw, 2016) and one mixed-method studies (Lloyd, 2020). Historically, nurse educators relied primarily on nursing textbooks as the primary resource of academic material. Long lectures—often lasting three hours—were attended by students with little to no breaks. This strategy placed a lot of emphasis on the instructor-centered approach. Teaching opportunities in the classroom are diminished as a result of the students' passive inactivity, obedient, submissive, and low opportunities to ask questions (Sellars et al., 2018). The problem at hand is that the pedagogies being employed by nurse educators are antiquated and have not been updated to incorporate more modern approaches that are thought to improve their students' cognitive abilities and represent practices in the modern healthcare environment.

The facilitation of higher-level thinking and learning needs to be incorporated into the pedagogies of nurse educators. In adherence to Bloom's taxonomy of cognitive educational achievements, learner-centered learning environments which is highly recommended to inspire educational pursuits that involve analyzing, synthesizing, and evaluating information. Such activities are associated with advanced cognitive thinking and can often lead to better retention of knowledge in the long run. They were acknowledged as educators who endorsed the concept of utilizing unfolding case studies as a methodology for instructing to foster higher-order thinking, or what is commonly known as critical thinking. This acts as a guide for academic staff in the establishment of creative didactic classroom experiences.

Various teaching methods are employed in the classroom, including questioning, modeling, small group work, mind mapping, flipped classroom, problem-based learning, case studies, unfolding case studies, and simulations to further enhance the learning experience (Critz & Knight, 2013; Hendricks & Wangerin, 2017; Jeffries & Clochesy, 2013; Jeppesen et al., 2017; Roshangar et al., 2020; Seibert, 2021). One important aspect of effective teaching is ensuring that the innovative approaches align with the information taught in the classroom. By experiencing scenarios that are consistent with what they have learned, students are better equipped to understand and apply their knowledge in clinical practice. This fact allows for greater concentration on the development of classroom teaching practices and experiential learning. According to the constructivist perspective, deliberate reflection on one's experiences is a critical component of the learning process, and learners must remain actively engaged in order for meaningful learning to take place at any level. As students dedicate the majority of their time to the classroom, there is immense value in incorporating innovative educational learning methods that effectively bridge the gap between theory and practice. One such method, the implementation of unfolding case studies, holds great significance in promoting critical thinking skills as it has been rarely explored in previous research, making it a promising avenue to enhance educational outcomes. A well-designed curriculum can help to foster the development of these skills, while a poorly designed curriculum may hinder their development.

The application of unfolding case studies in nursing pedagogy provides a detailed patient case to engage students and resolve unpredictable situations (Azzarello & Wood, 2006; Day, 2011). Nursing instructors encourage students to examine clients' subjective and objective data to hone and strengthen critical thinking abilities (Carter & Welch, 2016), which might not always be accessible. Pre-licensure nursing students must master identifying patient symptoms and

indicators, evaluating, prioritizing, and providing appropriate care for the client in the case study using high-level thinking (Day, 2011). Unfolding case studies allows undergraduate nursing students to make judgments with incomplete information, simulating real-world situations (Day, 2011). Additionally, an unfolding case study captures context-specific mental models and reveals substantial mistakes in students' problem-solving abilities that would not otherwise be obvious, according to Azzarello and Wood (2006).

Unfolding case studies are an integral component grounded in problem-based learning strategies (Forsgren et al., 2014; Gholami et al., 2021). The utilization of problem-based learning as an instructional technique fosters a student-centric experience that prompts individuals to engage in critical thinking and develop solutions to practical, real-life issues (Hendricson, 2006). Though critical thinking was once synonymous with problem-solving, Sellars et al. (2018) suggest it is better defined as intellectual product evaluation.

Previous quantitative research showed that nursing students utilizing unfolding case studies in PBL groups have higher levels of critical thinking than those attending lectures (Chan, 2013; Choi et al., 2014; Compton et al., 2020). Critical thinking allows individuals to analyze and evaluate information and evidence relevant to the problem, making it essential for effective problem-solving. Engaging in PBL can aid in developing analytical and problem-solving skills and bridge the gap between theory and practice (Cooke & Moyle, 2002; Rogal & Snider, 2008).

Although unfolding case-based learning is a widely adopted approach in nursing education to equip students with the essential nursing skills they require (Gholami et al., 2021; Li et al., 2019; Ma & Zhou, 2022; Mills et al., 2014), the effectiveness of unfolding case studies as a teaching strategy in traditional nursing classroom settings is not well-supported by empirical data, both in

terms of qualitative and quantitative research. There is a lack of empirical research conducted in regular classroom environments that establishes the advantages of unfolding case studies over conventional classroom lectures in terms of evaluating critical thinking skills. Two studies have provided substantiation for the effectiveness of using unfolding case studies, in contrast to the utilization of regular case studies (Englund, 2020; Hong & Yu, 2017).

Two different approaches to case-based learning were examined in a randomized controlled trial (RCT) study that was carried out by Hong and Yu (2017); a multi-episode/ unfolding case study and single episode case study in medical theory nursing across four classes (two for intervention group and two for control group) with 122 undergraduate nursing students and implemented nineteen lectures in nine months over two semesters to study the development of critical thinking for both groups using the instrument of Critical Thinking Disposition Inventory/ Chinese version (CTDI-CV). The findings indicated that the enhancement seen in the trial group was more effective than what was observed in the group serving as the control (with an average total score of 303.7715.24 compared to 288.3413.94, $p < 0.05$). The experimental group also showed improvement that is more substantial in six of the seven dimensions of the CTDI-CV, while the control group only indicated a positive in three of the seven dimensions.

Using Bloom's Taxonomy to measure critical thinking skills involves designing assessments and activities that promote problem-solving and higher-order thinking. By using the taxonomy to assess student learning outcomes, educators can gain a better understanding of their student's abilities and tailor their instruction to promote deeper learning that measures critical thinking indirectly. A pilot study demonstrated the feasibility and effectiveness of incorporating unfolding case studies into nursing curricula conducted by Englund (2020) and assessed the effects of integrating unfolding case studies as a pedagogical method on the development of critical

thinking skills among undergraduate nursing students enrolled in the Adult Health Theory course. The study compared the academic outcomes of students who received regular case studies vs unfolding case studies in traditional classroom settings. Questions on all five exams were prepared at the “applying” level or higher, requiring critical thinking abilities, as per Bloom's revised taxonomy for teaching, learning, and assessment. The study was conducted at a comprehensive university in Wisconsin of moderate size. It utilized a non-experimental correlational approach, with the data collected through course test results. The experimental group was constituted of 160 nursing students, whilst the comparison group consisted of 142 nursing students. Results showed that the experimental group had a mean score of 234.9, whereas the comparison group had a mean score of 228. The study found that the unfolding case study program was more effective in improving the students' critical thinking skills compared to the control group ($t = 299$, $p < .001$). Additionally, the students reported having a favorable experience with the program and found it to be engaging and relevant to their clinical practice. The results of this study provide compelling evidence to support the notion that the utilization of unfolding case studies produces superior outcomes in the development of critical thinking abilities among students, as opposed to the utilization of conventional, static case studies. This statement emphasizes the significance of employing inventive pedagogical approaches, specifically within the discipline of nursing education, in order to augment critical thinking abilities, which are indispensable for proficient healthcare provision. However, they note that further research is needed to validate these findings on a larger scale.

High Fidelity Simulation (HFS) labs commonly use unfolding case studies as a teaching strategy (Jeffries, 2005; Jeffries et al., 2019; Jeffries et al., 2016; Reese, 2011). In light of efforts to overhaul nursing education almost a decade ago, researchers in the field started exploring the

potential of unfolding case studies as an active teaching approach to enhance and evaluate Critical Thinking Skills (CTS) in a Team-based Care Setting (National Council of State Boards of Nursing [NCSBN], 2018). Unfolding case studies have been recognized as an innovative instructional technique that promotes the development of CTS in nursing students, equipping them with the necessary skills to excel as entry-level Registered Nurses (RNs). Notably, two studies have demonstrated the effectiveness of unfolding case studies in enhancing critical thinking skills using HFS labs (Li et al., 2019; Ma & Zhou, 2022).

A study conducted by Li et al. (2019) explored the influence of "nursing case-based learning" of unfolding case studies within a simulation course on the critical thinking skills of nursing students at Huzhou University in China. Out of 80 junior-level students, 40 picked the "nursing case-based learning" course and 40 took the normal teaching course. The critical thinking disposition inventory (CTDI-CV) assessed critical thinking at pre-, mid-, and post-tests. Pre-test thinking abilities were similar among groups ($P > 0.05$). Compared to the control group, the experimental group demonstrated significantly improved critical thinking after nine weeks ($P < 0.05$). Additionally, significant differences were observed between the control and experimental groups at all three time points ($P < 0.05$). These findings imply that "nursing case-based learning “of unfolding case studies increased nursing students' critical thinking.

Research has demonstrated that performing a health assessment is the initial and most crucial step in the nursing procedure, and the quality of assessment data influences all subsequent phases of the nursing process (Weber & Kelley, 2013). A quasi-experimental research was undertaken by Ma and Zhou on 115 Chinese undergraduate nursing students, to assess these students' learning health assessment critical thinking before and after a simulation lab unfolding case-based framework. They assessed critical thinking using the California Critical Thinking

Disposition Inventory (CCTDI). Students showed a considerable increase in critical thinking abilities following the simulation (M = 272.51, SD =18.19 vs. M = 266.47, SD = 19.30, $P < 0.001$). Also, nursing students in the intervention group showed an 8.15 difference in CCTDI scores before and after case-based learning, with a statistically significant difference among groups ($P < 0.001$). No significant changes were seen between control group members before and after conventional learning ($P > 0.05$). Ma and Zhou found that an unfolding case-based simulation laboratory improved undergraduate nursing students' learning of health assessment critical thinking skills (Ma & Zhou, 2022).

Therefore, depending on the results of previous studies, nursing education should be grounded in critical thinking and unfolding case studies, in order to provide students with a chance to improve these skills and to encourage students to explore new or alternative perspectives on a given subject.

Many studies employed a method of critical thinking that is not particularly precise to gauge student nurses' critical thinking skills. A systematic review was conducted by Carter et al. (2015) to evaluate the tools that are employed to measure critical thinking in nursing. They discovered sixty percent of the studies made use of one of the four commercially available tools (the California Critical Thinking (CT) Disposition Inventory, the California Critical Thinking Skills Test, the Watson-Glaser CT Appraisal, and the Health Science Reasoning Test (HSRT)) and was used consistently in the fields of nursing and research. However, due to the fact that the results of the four studies contradicted one another, it became abundantly clear that the tools lacked any sort of reliability in the field of nursing education research (Carter et al., 2015). Because of this, there is a requirement for nursing-specific instruments that is able to evaluate the level of critical thinking possessed by nursing students (Carter et al., 2015). On the contrary,

Yoon's Critical Thinking Disposition Instrument (YCTD) is a reliable and valid instrument for determining critical thinking dispositions in various contexts, such as educational and organizational settings (Elasrag & Elsabagh, 2020; Kim et al., 2020; Shin et al., 2015).

Currently, there is a lack of consistency in nursing education study findings on the utilization of the Health Science Reasoning Test (HSRT) instrument to evaluate one's level of critical thinking (Carter & Welch, 2016; Goodstone et al., 2013; Shinnick & Woo, 2013; Sullivan-Mann et al., 2009). In addition, there is a demand in the nursing education field for the creation of discipline-specific instruments that are trustworthy and valid for assessing students' critical thinking that is accessible and available freely (Carter et al., 2015; Romeo, 2010).

Carter and Welch (2016), as discussed previously, compared in their study the effectiveness of unfolding case studies with traditional lectures in helping AND (Associate Degree in Nursing) pre-licensure second-year nursing students develop critical thinking skills. The study employed a two-group quasi-experimental research design with only post-test evaluation. The intervention group (n=40) received course material on renal and musculoskeletal systems through Unfolding Case Studies, while the control group (n=44) received the material via traditional classroom lectures. HSRT was used as a posttest assessment, which revealed that both groups performed below expectations. However, the control group's scores decreased more significantly than those of the intervention group (M = -4.18, SD = 4.75 Vs. M = -0.52, SD = 3.69). Nonetheless, there was a greater drop in scores in the control group (M = 21.34, SD = 3.61) than in the intervention group (M = 20.8, SD = 3.88; M = 20.32, SD = 3.97). Although results show inconsistent outcomes in terms of the critical thinking tools' assessments, however, it is plausible that a longitudinal study is required since the cultivation of critical thinking calls for a strategy that

is multifaceted over an extended period and makes numerous data-collecting points accessible (Carter et al., 2015).

Furthermore, Upshaw (2016) conducted a quasi-experimental research design to investigate the impact of an intervention called an unfolding case study on the critical thinking abilities of baccalaureate nursing students. The study compared an unfolding case study to a traditional didactic lecture method in a historically black college in southeastern Louisiana. A total of seventy-one (71) nursing students participated in the study and completed pre-and post-test questionnaires using the HSRT. The results of the study showed that there were no statistically significant differences observed in critical thinking from pretest to posttest (t (32) 0.042, p 0.838) in each group and between the groups (F (1,66) 0.414, p-value of 0.522) that received the intervention (unfolding case study) and the control group. Based on the outcomes of the statistical analysis, it can be inferred that the educational intervention conducted by the unfolding case study did not provide statistically significant enhancements in post-test scores pertaining to critical thinking, as assessed by the HSRT.

Similarly, in a quantitative comparative study conducted by Blakeslee (2019) at a private university in the midwestern United States, HSRT was used to quantify mean critical thinking skill scores within and between groups (from pretest to posttest) and between simulation-based learning (36 participants) and written case studies (33 participants) for three weeks of participation in either the written case studies group or the simulation group. Repeated measures mixed analysis of variance showed no statistically significant differences in participants' mean critical thinking scores over time within groups from pretest to posttest ($F(1,67) = .900$, $p = .346$) or between the simulation group and the comparison group using written case studies ($F(1, 67) = .264$, $p = .609$).

Thus, the study did not recommend high-fidelity simulation over printed case studies to improve nursing students' critical thinking.

Moreover, research conducted by Lloyd (2020) **a**t a public university in the South-Central region of the United States, discussed previously, used mixed methods to examine the advantages of unfolding case studies in regular classrooms. The study examined if unfolding case study usage improved critical thinking abilities in the experimental group more than in the control group utilizing traditional classroom lectures, as judged by HSRT. The quantitative element comprised a convenience sample of 70 BSN pre-licensure students and 8 experimental group students who consented to a 1-hour focus group. Statistical analysis showed no significant difference in HSRT scores between experimental and control groups ($p > 0.05$), except for Exam I ($p < .05$). Qualitative comments from participants showed that multimodal learning in unfolding case study in the regular classroom increased classroom engagement and critical thinking abilities through dynamic client situations. This study shows that unfolding case studies can develop critical thinking skills, underlining the necessity for creative nursing education techniques to educate students about modern healthcare.

In summary, numerous studies provide evidence supporting the enhancement of critical thinking skills among nursing students through the use of unfolding case studies. These studies incorporate a range of approaches, including the use of single-case to multi-case episodes, implementation in both classroom and nursing simulation lab settings, and the utilization of various well-established critical thinking skills assessment tools. Despite some inconsistencies in the results obtained from these assessment tools, as well as contradicting findings from other studies regarding the enhancement of critical thinking skills, it is imperative to conduct a comprehensive study that addresses these issues. This study focused on investigating the impact

of unfolding case studies on critical thinking skills among nursing students, considering the various factors and concerns raised in previous studies.

2.7 Unfolding Case Study and Self-Efficacy

This part of literature review demine is comprised of a total of eleven papers, nine of which are quantitative studies (Al Gharibi et al., 2021; Baker & Blakely, 2023; Becnel, 2022; Gholami et al., 2016; Herron et al., 2019; Jensen, 2023; Leynes-Ignacio, 2023; Ma & Zhou, 2022; Peele, 2015), and two of which is a mixed-method study (Mills et al., 2014; Munn et al., 2021). Unfolding case studies employ strategies that enhance self-efficacy. To get the maximum benefit out of how unfolding case studies influence self-efficacy, it is important to make situations that match real-world nursing practice. Include important patient data, different levels of difficulty, and unexpected events to test students' ability to solve problems. Through the use of unfolding case studies, students entering clinical work experience are equipped to navigate cases they have encountered before, ensuring they don't become hindered by unfamiliar realistic scenarios. Also, interactively teach students through unfolding case studies. Promote group conversations, role-playing, and problem-solving. This collaborative method helps students learn from others, obtain novel perspectives, and gain confidence (Day, 2011, p. 449).

Self-efficacy theory is used in the training of healthcare students to develop a sense of self-confidence in their abilities to successfully translate knowledge and skills into practice. In order to build self-efficacy, mastery experiences must be close to the actual experience in which one is seeking to gain self-efficacy. Unfolding case studies may provide a more authentic approximation of the skills healthcare students would need to enact on clinical rotations (Bandura, 1997).

Therefore, nursing educators are challenged to use instructional techniques that would enable nursing students to realize their entire potential as competent future nurses. Presently, numerous studies illustrate that engaging unfolding case studies as a learning approach within simulation-based experiences has an advantageous effect on nursing students' self-efficacy(Riley-Baker et al., 2020); yet, few studies have explored the influence of utilizing classroom unfolding case studies on students' self-efficacy in nursing schools. Through the implementation of unfolding case studies in nursing simulation, the abilities of student nurses to execute nursing interventions and techniques with effectiveness and appropriateness are assessed (NLN, 2019).

The aforementioned mixed method investigation done by Munn et al. (2021) examined the effects of integrating unfolding case study situations into high-fidelity pediatric simulations for a particular cohort of undergraduate nursing students on the self-confidence levels of undergraduate nursing students in relation to their knowledge, skills, and clinical judgment/decision-making abilities in the domain of pediatric nursing. The findings derived from the application of Friedman's analysis of variance (ANOVA) tests indicated the presence of statistically significant variations across the three groups under investigation (pre-survey, both post-test surveys) across all 16 items. One of the major themes that the results of this study revealed was that a substantial proportion of students utilizing unfolding case studies conveyed favorable responses and experiences with regard to their level of confidence in their knowledge, skills, and decision-making abilities in the field of pediatric nursing.

Herron and his coworkers (2019), in their study, which was discussed previously, aimed to compare the impact of traditional written unfolding case studies and video simulation unfolding case studies on nursing students' satisfaction, self-confidence, and knowledge. The study included 165 baccalaureate nursing students from a four-year registered for Clinical Applications and

Reasoning III during the third semester of the nursing degree. The results of the study revealed no statistically significant differences between the two groups, as both the traditional written and the video simulation unfolding case study groups, in relation to satisfaction ($p = 0.32$) and self-confidence ($p = 0.95$). The findings of the study suggest that utilizing unfolding case studies in a traditional classroom, whether in written form or through simulated video, yields similar benefits in the learning process for the participants. This supports the promotion of integrating unfolding case studies in traditional classrooms, as they allow for the exploration of imaginative scenarios. This approach can effectively engage students, promote active learning, and enhance overall learning outcomes.

Similarly, in a previously mentioned study conducted by Ma and Zhou (2022), involving a sample size of 115 undergraduate nursing students, the objective was to evaluate the learning outcomes associated with their academic achievement, critical thinking, and self-confidence in the health assessment course utilizing unfolding case-based learning compared to a traditional learning method. Results indicated that the nursing students who received the intervention displayed higher levels of self-confidence compared to those in the control group, showing a significant difference of 3.88. The distinction between the two groups was statistically significant ($P = 0.036$). Furthermore, participants in the intervention group exhibited consistent improvements in their performance before and after engaging in case-based learning, indicating a difference of 6.16. The participants in the intervention group showed statistically significant differences ($P < 0.001$) compared to the other group. These results suggest that using unfolding case-based learning is more effective than traditional methods in increasing self-confidence among undergraduate nursing students for learning health assessment skills.

In a study conducted by Leynes-Ignacio (2023), the satisfaction and self-confidence levels of nursing students in a medical-surgical learning curriculum were examined using a cross-sectional approach. The study took place at an educational institution in higher education institution (HEI) in Angeles City, Philippines, where online unfolding case studies were utilized. A total of 166 nursing students participated in an online survey, and the results revealed that they expressed high levels of satisfaction (M=22.02; SD=0.29 out of a possible 25) and self-confidence (M=34.60; SD=0.48 out of a possible 40). These findings emphasize the effectiveness of employing unfolding case studies as a strategy to improve students' satisfaction with the learning process and enhance their self-confidence.

Another comparative quantitative study was conducted by Peele (2015). The study aimed to assess the influence of unfolding case studies on the perception of self-efficacy among 17 second-year associate degree nursing students in a complex health concepts course at the College of Community Nursing program in the USA. Collaboration groups of students were formed and assigned classrooms for community practice debates on the breach of care example. The unfolding case study was given in the PowerPoint presentation “Nurses and Social Media: Don’t Create a Breach in Care”. One group pretest-posttest of the General Self-Efficacy Scale (GSF) was given to nursing students to evaluate perceived self-efficacy. The pretest mean was 3.20 (SD = 0.356) while the post-test mean was 3.38 (SD = 0.396). The paired t-test was 0.182 (SD = 0.300) and P = 0.024. This study found that using an unfolding case study as a teaching method might boost nursing students' self-efficacy during their transition to professional nursing.

In contrast to the objective of enhancing self-efficacy, research findings might also uncover an opposing perspective, revealing instances that contradict the anticipated positive outcomes associated with the incorporation of unfolding case studies, or even showcasing outcomes that are

of a mixed nature. Al Gharibi et al. (2021) conducted a quasi-experimental study using a one-group repeated measures design at the College of Nursing and Health Professions in the United States. The study aimed to evaluate the influence of recurrent simulation-based case scenarios accompanied by debriefing sessions on the self-efficacy of 126 nursing undergraduates. The study encompassed topics such as post-partum hemorrhage and acute pneumonia. Across a span of 13 simulation sessions, each comprising 10 students, participants were engaged in the simulations. Throughout the study, students responded to three separate self-efficacy surveys. Notably, students' self-efficacy levels initially declined from the pre-test to the midpoint-test phase. However, these levels exhibited improvement subsequent to the repetition of the simulation scenario, as compared to their self-efficacy ratings prior to engaging in the simulations and after their initial exposure to the simulation exercise. The research findings highlight the efficacy of repeating simulation-based learning in augmenting the self-efficacy of undergraduate nursing students, thereby enhancing their capacity to adeptly handle complex clinical scenarios with heightened clinical competence.

In nursing clinical practice development, self-efficacy is crucial because according to Lee and Ko (2010), strong nursing performance is strongly connected with a high level of self-efficacy in nurses. Many students say they need to improve their self-confidence and satisfaction before they can handle even the simplest of responsibilities, like taking and analyzing vital signs, providing intravenous medications, and keeping track of oxygen provision. By actively participating in unfolding case studies during clinical practice in nursing, students have the opportunity to engage in enrichment activities that can boost their self-efficacy and confidence, ultimately leading to improved performance and the quality of patient care they provide.

Mills and co-researchers (2014) carried out a mixed-method study in Australia with the primary aim of assessing how well a novel teaching approach, involving unfolding case studies, affects the satisfaction of first-year nursing students as they develop their clinical skills. This approach was implemented in a high-fidelity simulated clinical environment within Australia. The distinctive aspect of this method was its utilization of video recording and subsequent discussion of students' interactions with standardized patients who were engaged in role-playing complex scenarios within a simulated hospital ward setup. The methodology integrated unfolding case studies, standardized patients, a simulated hospital ward, video recording, video playback, and post-session discussions. Standardized patients were individuals trained to consistently portray patients with specific medical or mental health conditions. The study outcomes indicated exceptionally positive ratings across all aspects of the student survey, offering quantitative evidence of the students' contentment with this instructional approach. The overall mean score of satisfaction was 4.6 (SD = 0.4), while the overall mean self-confidence score was 4.3 (SD = 0.7. The finding was further supported by the collection of qualitative data from ten interviews (five students, three academics, and two standardized patients), which provides further evidence for the advantages of simulations for both students and academics. The interviews revealed that students expressed a desire to participate in simulations more often, as they believed it would boost their self-satisfaction and confidence (Mills et al., 2014).

Moreover, Numerous disciplines have investigated the effect of unfolding case studies on self-efficacy other than nursing such as psychology, business, training of athletes, occupational therapy, elementary schools, and politics (Bandura, 1997; Shorey & Lopez, 2021), 2021: Jensin, 2023). The utilization of realistic situations that undergo progressive development may be modified to cater to the educational requirements of diverse healthcare students, hence facilitating

the cultivation of problem-solving skills and the enhancement of self-efficacy. A quasi-experimental study was conducted at the University of Minnesota in the USA by Jensen (2023) to examine the effects of an unfolding case study on clinical skill self-efficacy and engagement with course content compared to a static case study. Students from two distinct occupational therapy doctoral student cohorts were recruited and invited to participate via an email containing a link to the survey sent by program staff. The 13-question Physiotherapist Self-Efficacy Questionnaire (PSE) measures clinical skill self-efficacy. It was created for physical therapy students but was suitable for occupational therapy students because the questions were similar. The static case study had an older adult with a main condition where information remained constant. The unfolding case study provided an older adult client with a main diagnosis and the same contextual facts as the static case study. The client's development was followed over six weeks in a rehabilitative institution using a simulated electronic health record. The study discovered a significant difference in clinical competence self-efficacy among a group of 16 occupational therapy students who participated in an unfolding case study vs. a static case study ($M = 3.91$, $SD = 0.51$ vs. $M = 3.65$, $SD = 0.54$ vs., $t(15) = 2.64$, $p < .05$). Furthermore, the study found that occupational therapy students ($n = 47$) engaged more with online instructional content in the unfolding case study than in the static case study ($M = 10.2$, $SD = 3.4$ vs. $M = 5.8$, $SD = 2.0$, $t(46) = 10.1$, $p < .001$). The results of this study demonstrated that utilizing an unfolding case study design may increase self-efficacy in university healthcare students. A static case study design is not realistic and fails to reflect the ever-changing nature of clients throughout a care episode. The utilization of an unfolding case study design can enhance the approximation of real-world scenarios that students are likely to meet in their respective fields, hence fostering the development of self-efficacy.

Unfolding Case studies serve as a vital bridge connecting theoretical ideas with real-world applications. They grant learners a precious chance to put their acquired knowledge into action and witness successful results. Directly facing challenges and achieving solutions nurtures an amplified sense of accomplishment and self-assurance. As a result, their belief in their capabilities grows, instilling them with more confidence, and motivating them to take on future tasks and challenges. According to Bandura (1997) hypothesis, self-efficacy can affect individual motivation and coping mechanisms.

Gholami and colleagues (2021) conducted a study with the main goal of investigating how multi-episode case-based learning (CBL) compares to lecture-based learning using single-group, pretest-posttest intra-group comparisons. The study aimed to assess problem-solving skills and learning motivation in a group of 43 third-year nursing students who were taking an emergency care course at Lorestan University of Medical Sciences in western Iran. The outcomes of the research revealed significant statistical differences both in the overall average score of perceived problem-solving ability ($P < 0.001$) and in the level of learning motivation among the students ($t = 16.91$, $P = 0.000$). As a result of these outcomes, the study proposes that the employment of the multi-episode case-based learning (CBL) approach proves to be an effective method for enhancing problem-solving skills and learning motivation, which in turn can positively impact Bandura's self-efficacy by instilling individuals with the drive and perseverance to overcome challenges and boost their confidence in completing tasks (Gholami et al., 2021).

According to Walsh et al. (2020), it is crucial to study self-efficacy in nursing students as it is an essential characteristic of resilient students and a significant indicator of motivation for education. However, the existing literature fails to differentiate between the different types of self-efficacy present in nursing students. Therefore, the development of a tool that effectively captures

and represents the various nuances of the subject matter will result in more accurate and precise outcomes. For example, Al Gharibi et al. (2021) utilized a modified version of the General Self-Efficacy (GSE) scale to investigate repeated participation in simulation-based evidence on general self-efficacy. The study conducted by Al-Kalaldeh and Al-Olime (2022) utilized the Resuscitation Self-Efficacy Scale (RSES) to investigate the effects of high-fidelity simulation (HFS) teaching on the self-efficacy of nurses in the context of resuscitation. In their study, El Meghawri and Sleem (2021) utilized an adapted iteration of the self-efficacy scale derived from the Motivated Strategies for Learning Questionnaire to assess the efficacy of concept mapping as an instructional approach within an educational setting. Helms and Walker (2018) utilized the general self-efficacy (GSE) scale to assess the effectiveness of a flipped classroom as a learning strategy. Lastly, Goldenberg et al. (2005) used the Baccalaureate Nursing Student Teaching-Learning Self-Efficacy Questionnaire to evaluate the use of role-playing with case study simulation sessions in the classroom. In alignment with this, a pilot study conducted by Baker and Blakely (2023) involved 20 nurse practitioner (NP) students from the University of Alabama at Birmingham and aimed to assess their self-efficacy in caring for community-dwelling older adults. Participants completed a revised version of The Advancing Care Excellence unfolding case study for Seniors, originally created by the National League for Nursing (NLN) for undergraduate nursing simulation experiences (NLN, 2022). The unfolding case study was developed by subject matter experts. Paired t-test analysis indicated that there were improved self-efficacy scores on both the General Self-Efficacy Scale (GSE) and the developed Caring for Community-Dwelling Older Adults Self-Efficacy Scale (CCDOASES) after students completed a mandatory unfolding case study assignment. The statistical significance of the CCDOASES was greater than that of the GSE (P .001 vs. P =.013, respectively). This pilot study supports the addition of a unfolding case study assignment to the curriculum of adult-gerontology primary care students, as it helps both faculty

and students by enhancing self-efficacy among nurse practitioner students transitioning into the position of healthcare provider and allows instructors to construct NP-aligned teaching resources.

Contrary to previous studies, Becnel`s (2022) research employed a Pretest-Posttest Design to compare the efficacy of simulation-based case studies and traditional lectures in self-efficacy among nursing students. The research revealed no significant difference in self-efficacy between 54 students in Cohort A (conventional lecture group) and 66 students in Cohort B (simulation-based case studies group). This implies that simulation-based case studies and conventional lectures both improved nursing students' self-efficacy. The qualitative study confirmed the quantitative findings, demonstrating that both learning techniques improved nursing students' self-efficacy.

Based on published research, demonstrating unfolding case studies in the classroom setting may offer certain advantages over implementing them in simulation nursing laboratories. These advantages include the removal of the requirement to organize student groups in order to attend the simulation laboratory, the elimination of the need to separate active students participating in the simulation from student observers, and an increase in the amount of valuable laboratory space that is made available (Becnel, 2022; Carson & Harder, 2016; Edwards et al., 2018; Kim & Kim, 2015). Consequently, testing self-efficacy in a traditional classroom utilizing unfolding case studies is crucial due to the potential challenges that students in simulation-based learning may face. While simulation offers a valuable learning experience, it can also induce anxiety and stress among students who are unfamiliar with the skills required to perform nursing tasks in a simulated environment. This anxiety and stress can act as obstacles when investigating the impact of unfolding case studies on students' self-efficacy (Becnel, 2022). By administering the self-efficacy assessment within a conventional educational context, when students have a greater sense of ease

and familiarity, it is possible to mitigate the supplementary stresses linked to simulation-based instruction. This enables us to concentrate exclusively on the impact of unfolding case studies on students' self-efficacy, without the disruption of anxiety and stress induced by the simulated environment (Herron et al., 2019). Furthermore, conventional educational settings offer a regulated and uniform atmosphere, therefore guaranteeing equitable access for all students to the unfolding case study materials. This consistency enables more reliable and accurate comparisons of self-efficacy levels among students. Therefore, testing self-efficacy in a traditional classroom utilizing unfolding case studies, can obtain a better comprehension of the true effect of this teaching method on students' self-efficacy, free from the confounding factors introduced by simulation-based learning. This knowledge can then be applied to enhance teaching strategies and improve overall student outcomes.

In conclusion, research has shown that nursing students who take part in unfolding case-study modeling perspectives can encounter positive effects on their learning, self-confidence, self-efficacy as well as clinical decision-making (Munn et al., 2021). In a more precise sense, implementing the unfolding case study in a traditional classroom environment as an educational approach can aid nursing students in elevating their self-efficacy in providing patient care and deepening their involvement with the academic content (Peele, 2015). Therefore, this study investigated the effect of two distinct classroom methods of instruction (unfolding case studies and traditional lectures) on self-efficacy in nursing students who are currently enrolled in a critical case course.

2.8 Summary

The use of unfolding Case Studies in undergraduate nursing education has emerged as a progressively successful learning approach in equipping students with the necessary abilities to navigate the complexities of healthcare. The literature review indicated that integrating unfolding case-based learning into undergraduate nursing education offers substantial advantages in teaching students' essential skills, including knowledge acquisition, critical thinking, and self-efficacy. In comparison to lecture-based learning, involvement in unfolding case studies significantly boosts students' readiness for clinical practice. These studies offer lifelike scenarios mirroring professional situations, effectively bridging the gap between theory and practice. By gradually immersing students in challenging patient scenarios, these case studies foster knowledge acquisition, critical thinking, and problem-solving skills. Through active participation, students learn to apply theoretical knowledge to real-world situations, develop clinical reasoning abilities, and grasp the complexities of nursing practice. These initiatives empower students with the confidence and skills necessary to apply their knowledge effectively in actual healthcare settings, ultimately shaping them into competent and successful healthcare professionals. Conversely, lecture-based learning often stresses rote memorization and fact repetition, is passive, focuses on presenting knowledge rather than encouraging active engagement and collaborative learning, that does not necessarily foster critical thinking abilities. However, despite the positive findings of applying unfolding case studies, there is still limited information available specifically regarding the efficacy of unfolding case studies in classroom settings. While research studies have shown the impact of unfolding case studies, it is still uncertain how effectively they can be implemented in traditional classrooms. This uncertainty arises from inconsistencies in measurement tools, lack of uniformity in the application of unfolding case studies, limited time and resources, and variables

related to student characteristics, faculty attributes, and teaching methodologies. Understanding how unfolding case studies perform in the context of a classroom will provide valuable insights into their practical application and inform educators on how to maximize their effectiveness in teaching nursing students. These limitations underscore the imperative for additional investigations in this area. Further research is required to provide a more comprehensive understanding of the advantages of utilizing unfolding case studies as compared to traditional classroom lectures. Consequently, this study aims to examine the effects of utilizing of unfolding case studies learning method compared to traditional classroom lectures on knowledge acquisition, critical thinking, and self-efficacy among nursing students enrolled in critical care nursing courses.

CHAPTER THREE

Methodology

3.1 Introduction

This chapter provides an overview of the study design, setting, population, sample and sampling method, study instruments and their psychometric properties, and a description of a pilot study is provided. Ethical considerations, data collection procedures, and data management and analysis are also presented.

3.2 Research Design

This post-test-only, quasi-experimental study evaluated the impact of using an unfolding case study as a teaching method on knowledge acquisition, critical thinking, and self-efficacy among critical care nursing students at Arab American University/Palestine (AAUP). This design allows the researcher to compare the outcome of the study intervention of one group against another (Polit & Beck, 2020).

3.3 Setting

The research was conducted at the AAUP in Jenin, which is located in the northern region of Palestine. AAUP is the first private Palestinian university, established in the year 2000 in collaboration with California State University (CSU) in Stanislaus and Utah State University (USU) in Logan. It serves the educational needs of over 11,300 students by providing a dynamic learning environment that inspires innovation and has a main focus on every student`s success. It is comprised of two campuses, the primary one of which is situated in Jenin next to the

municipality of Al Zababdeh, while the second campus is located in the Al Rayhan area of Ramallah (Arab American University [AAUP], 2023). Both campuses are affiliated with the Arab American University. The AAUP operates fourteen distinct faculties, including medicine, pharmacy, sciences, information technology, data and sciences, and digital sciences; nursing, allied medical sciences, arts, dentistry, and engineering; and law and medicine It provides 50 undergraduate programs, 50 master's programs, 14 PhD programs, five academic programs for further specialization, and high diploma programs. Arab American University/Palestine (AAUP) is committed to delivering high-quality education to both Palestinians and international students. To achieve this, AAUP utilizes advanced teaching techniques, which include information technology, virtual technology, and practical training. In addition, AAUP offers internship programs that provide graduates with the necessary skills to excel in any competitive job market. AAUP has also made significant progress in developing educational facilities and laboratories to create a vibrant learning environment (AAUP, 2023).

This study was carried out at the Nursing Faculty, which typically admits an annual cohort of 350-400 students. Within the nursing college, the critical care nursing course comprises various components with different credit hour allocations. The theory component of the course spans three credit hours, the clinical component covers three credit hours, and the simulation component involves one hour of instruction.

To implement the unfolding case study experience, the traditional classroom settings were utilized for undergraduate nursing students enrolled in the critical care course at the nursing college. This approach aimed to provide students with practical and interactive learning opportunities within the classroom environment.

3.4 Population and Sampling

The total population is defined as an entire set of subjects, objects, events, or elements that meet your study's criteria (Ravikiran, 2022). The target population of the current study was all nursing students in Palestine, and the accessible population was all Baccalaureate nursing students who are currently registered in the critical care nursing course of the spring semester of the academic year 2022-2023 at Arab American University/ Palestine (AAUP).

Ravikiran (2022) defines sampling as the process of selecting individuals for a study in such a way that the individuals selected represent the larger group from which they were drawn. According to Majid (2018), proper sampling is crucial in determining the probability of correctly identifying a real difference or rejecting a null hypothesis through inferential statistical tests. In the current study, there was a total of 473 nursing students enrolled in the critical care nursing of nursing program delivered in six classes of critical care theory nursing courses offered during the spring semester of 2022-2023. The study employed a single-stage cluster sampling method. Single-stage cluster sampling involves dividing the target population into clusters or groups, typically based on geographical, organizational, social, or other relevant factors within the research context. Then, in a single step, clusters or groups are randomly selected to form the sample (Rahman et al., 2022; Sedgwick, 2014; Thomas, 2020). When it comes to students, the classes themselves function as clusters. Instead of using a method of selecting people from each cluster, the approach involves the random selection of one or more clusters, whereby all persons included within the selected clusters are included in the sample (Rahman et al., 2022).

Single- stage cluster sampling offers the potential for greater practicality and cost-effectiveness when compared to sampling each individual element within the population. It permits

the collection of data in an efficient manner by sampling groups as opposed to individuals. Nevertheless, the potential for variability within clusters must be taken into account, and the chosen clusters must be representative of the entire population (Sharma, 2017).

The single-stage cluster sampling was conducted as follows: the six classes of critical care nursing students were considered as clusters. In the single-stage of cluster sampling, one class out of six was randomly chosen for the traditional teaching method to be the conventional group. Similarly, one class out of the remaining five classes was randomly chosen for the experimental teaching method, to be the intervention group. Figure 4 illustrates the hierarchy of single-stage cluster sampling.

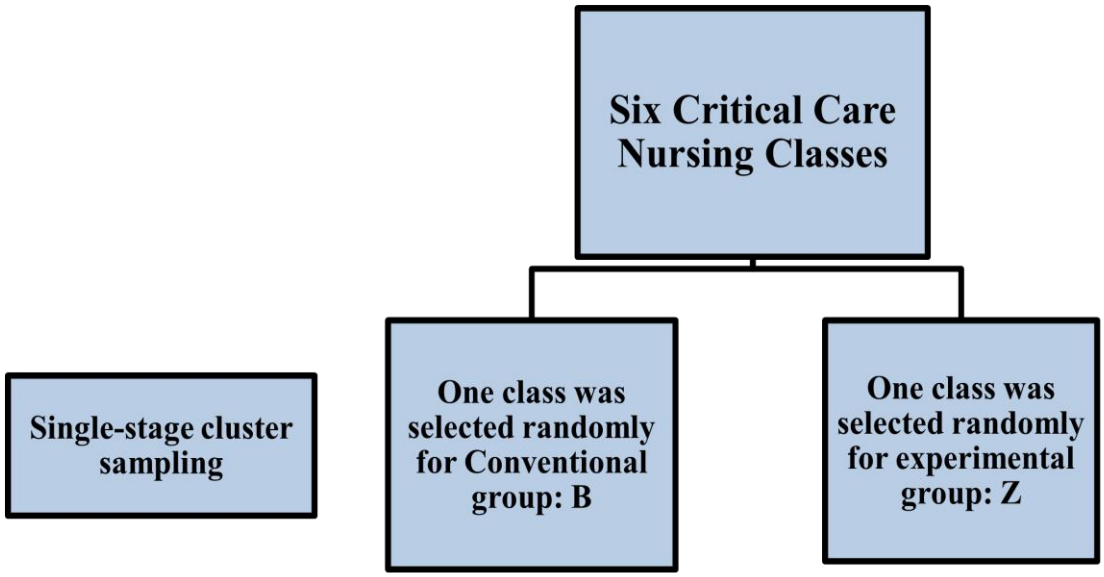

Figure 4: Hierarchy of Single-Stage Cluster Sampling

By employing this single-stage cluster sampling approach, the study successfully selected Class B as the representative class for the conventional teaching method and Class Z as the

representative class for the experimental teaching method. All classes were in the AAUP of the Nursing Faculty which was easily accessible to the researcher.

3.5 Sample Size

The sample for this research was calculated using the G*Power program (Munro, 2005) which allowed for the determination of the sample size necessary to achieve sufficient power to detect differences between groups (Creswell, 2020; Polit & Beck, 2020). The sample size was determined by the power, alpha, level of significance, confidence interval, effect size, and test type which was the two-tail t-test with the difference of the two-independent means (two groups) in the present study.

The high-power values are desirable; a minimum of 80 % is preferred. Power increases proportionally as the study sample size increases. The P-value is defined as "the statistical significance test that compares what we anticipate based on our hypothesis to what we observe" (Munro, 2005, p. 91). While confidence interval is defined as" the degree of confidence expressed by percent, and indicates the likely range of values for the true effect in the population" (Munro, 2005, p. 95). The effect size is the difference between two or more groups due to a specific treatment or intervention (Polit & Beck, 2020).

The G*Power version 3.1.7.9 was used to estimate the necessary sample size to obtain significant results between the two groups (Munro, 2005). Using a calculated medium effect size of 0.5 based on nursing research (Polit & Beck, 2020), for the t-test to determine the differences between the means of the two groups, an alpha of 0.05, and power of 0.80, which is recommended (the higher desired power the more subject required) based on the assumption of an expected difference resulted in assemble of 64 participants per group (Munro, 2005). However, a

consideration of extending the sample size to include all available students would increase the power of the study and overcome possible attritions.

3.6 Inclusion and Exclusion Criteria

The inclusion criteria included students who enrolled in a critical care theory nursing curriculum course (3 credits), and who took the first time the theoretical course of critical care nursing. The selection of students is based on a combination of their fundamental skills, competencies, and the knowledge they have acquired through completing elementary courses (pharmacology 1 &11, anatomy and Physiology, Growth and Development, Therapeutic Communication Skills, adult I and II). These competencies enable students to navigate the complexity of case scenarios with confidence and proficiency. Moreover, critical care nursing students possess basic elementary skills and competencies for critical thinking that are higher than students enrolled in medical surgical 1 & II courses. Also, they were exposed to accumulative cases studied in previous courses in medical surgical 1 & II that prepared them with the necessary knowledge and skills to handle more analytical and complex situations. Adding that implementing unfolding case studies in the theoretical part of the nursing curriculum was due to limitations posed by the clinical part of the curriculum. These limitations can include insufficient space, resources, infrastructure, caseloads, faculty expertise, and high student-to-patient ratio (Jafarian-Amiri et al., 2020). These factors may restrict the opportunities for students to examine the positive effects of unfolding case studies in a clinical setting and falls the responsibility on the theoretical part to compensate to deprived competencies gained in clinical settings.

Nevertheless, the following criteria were utilized to exclude students from consideration: upgrading nursing students who already hold a diploma degree in nursing and are entitled to work

in the clinical field, students repeating the course due to previous failure, and students who were not willing to take a part in the study.

3.7 Research Instruments

Four research instruments were used to collect study data: 1) A Demographic Data Sheet; 2) A Knowledge Competency Test; 3) Yoon`s Critical Thinking Disposition Instrument (YCTD); and 4) Self-Efficacy for Learning and Performance.

3.7.1 Demographic questionnaire

This questionnaire involved background information and attributes. It addressed the students' age, gender, and cumulative GPA. This type of questionnaire is commonly used in research studies to collect demographic data, which provides insights into the characteristics of the study population.

3.7.2 Knowledge test

This tool was used to evaluate the acquisition of knowledge in the field of cardiac health. It gauged students' comprehension through twelve scenarios encompassing six titles addressing cardiac health issues. This evaluation aims to measure students' ability to deliver competent and safe patient care. The examination was administered periodically following the completion of every two titles. It comprises twenty multiple-choice questions (MCQs) designed to assess changes in cognitive knowledge. The mean performance scores of both the conventional and experimental groups were compared side by side. The pen-and-paper competency test, which concentrated on critical care nursing content related to cardiac health, aligned with the course's objectives.

The questions were retrieved from The National Council Licensure Examination (NCLEX), a standardized test widely recognized for its validity and reliability in assessing the competency of nursing students in Canada and the United States (Foreman, 2019; NCSBN, 2011). These questions were specifically retrieved and aggregated by the researcher to reflect the topic aspects covered during the sessions. They have been carefully selected from the analysis, synthesis, and evaluation levels of Bloom's taxonomy.

To ensure the face and content validity of the instructor-selected test questions from NCLEX, the researcher took several steps. First, the researcher requested two critical care nursing instructors with at least five years of experience to conduct a face validity assessment. This involved reviewing the test questions and confirming that they appeared to measure the intended concepts accurately. Secondly, for content validity, the evaluation was conducted by three content experts who are researchers holding PhDs in nursing. These experts have a minimum of five years of experience directly related to the current cardiac content and have demonstrated proficiency in test item development and analysis. Content validity experts meticulously reviewed each question in the test, assessing its relevance, clarity, and appropriateness. They evaluated how effectively the questions captured the content domain and adequately represented the construct being measured.

The comparison of the three independent reviews reached a consensus on the multiple-choice questions (MCQs) included in the tests to measure student nurses' knowledge of cardiovascular assessment skills.

3.7.3 Yoon`s critical thinking disposition (YCTD)

Yoon`s Critical Thinking Disposition Instrument (YCTD) is a tool used to evaluate the higher-thinking processes of nursing students' critical thinking (El Hussein et al., 2022). The

California Critical Thinking Disposition Inventory (CCTDI) served as the foundation for Yoon's (2004) creation of the YCTD instrument, which was designed specifically for use with Korean nursing students. The YCTD (Yoon Critical Thinking Disposition) tool, which was validated in English by Shin (2015), has obtained permission to be utilized in this study (Shin et al., 2015). The YCTD consists of 27 questions and employs answer categories based on a 5-point Likert scale, with one representing a very strong disagreement and five representing a very strong agreement. The following seven subscales are included in the instrument: Skepticism (4 items), Objectivity (3 items), Systematicity (3 items), Prudence (4 items), Intellectual Eagerness/Curiosity (4 items), Intellectual Fairness (4 items), and Self-Confidence (5 items). As a result, the total potential scores varied from 27 up to 135, and the higher the score, the more of an inclination one has toward critical thinking. Twenty-five minutes is all that is needed to administer the YCTD. When examining the findings of the YCTD, the scoring procedure involves calculating the mean and standard deviation for each subscale and the overall score, as reported in previous studies (Kim et al., 2020; Shin et al., 2015).

Yoon (2004) conducted tests to determine the instrument's validity and reliability as part of the process of designing the instrument. By conducting cross-sectional and longitudinal surveys on Korean nursing students and making use of multigroup confirmatory factor analysis, the validity of the YCTD was once again shown to be sound (Shin et al., 2015). Cronbach's alpha estimates of internal consistency reliability were 0.84 for the YCTD total, and Cronbach's alpha values varied from 0.80 to 0.90 for each of the seven subscales, which has been consistently shown to have good reliability in prior research (Elasrag & Elsabagh, 2020; Kim, 2012; Kim et al., 2020; Yang et al., 2009). In the present study, Cronbach's alpha estimates of internal consistency

reliability were 0.86, for the YCTD total, and Cronbach's alpha values varied from 0.82 to 0.90 for each of the seven subscales.

3.7.4 Self-efficacy for learning and performance

This tool was taken from the Motivated Strategies for Learning Questionnaire (MSLQ), which was developed in 1985 by Bill McKeachie, Paul Pintrich, and Lin Yi-Guang. No permission is necessary to utilize the MSLQ, as it is in the public domain and free access (Pintrich et al., 1991). The inquiries posed on this scale were employed to analyze two distinct components of expectations: self-efficacy and success expectations. The term "expectation for success" specifically refers to the belief or anticipation that one will successfully accomplish a task. The notion of self-efficacy is predicated on the capability to execute a given task with proficiency. Self-efficacy refers to an individual's evaluation of their own competence and confidence in their ability to successfully execute a given undertaking (McKeachie et al., 1985). The self-efficacy tool consists of eight questions. Every facet is assessed using a Likert scale that spans from one to seven. A rating of 7 signifies "extremely true of me," while a rating of 1 indicates "absolutely not true of me." A range of 8 to 56 is the possible total score; higher scores are indicative of greater self-efficacy. A range of 8-10 minutes is all that is needed to administer the self-efficacy questionnaire. The assessment was performed utilizing the mean, whereby the scale was populated with the mean of its components. The evaluation was carried out based on the mean, in which a mean of the components that make up the scale is used to fill in that scale. Cronbach's alpha for the instrument is 0.93, indicating that it is a genuine and trustworthy instrument (McKeachie et al., 1985). In our study, the Cronbach`s was 0.91.

3.8 The Content of the Critical Care Nursing Course

The critical care course is designed to equip healthcare professionals with the necessary knowledge and skills to effectively manage critically ill patients. The course covers a variety of critical care subjects across many chapters. The respiratory, cardiovascular, neurological, and endocrine systems have significant importance. Each of these systems is crucial to the health of critical care patients.

The respiratory health component of the critical care nursing curriculum addresses the assessment, management, and intervention of respiratory complications in patients who are in critical condition. The anatomy and physiology of the respiratory system, the complexity of ARDS, pneumonia, and COPD, ventilation techniques, and airway and breathing difficulties are to be covered. Analyses of arterial blood gases and pulmonary function are also be performed. Pharmaceutical and nursing therapies are covered in this chapter.

A critical care nursing course's cardiac chapter covers vital topics for intense cardiovascular care. Cardiovascular anatomy and physiology, assessment techniques for cardiovascular patients, common cardiovascular conditions in critical care, monitoring and hemodynamic support, pharmacological interventions, cardiovascular emergencies like angina pectoris, myocardial infarction, heart block, cardiogenic shock, and pacemaker implantation, and collaborative care are covered.

The course comprehensively covers the nervous system, encompassing topics such as anatomy, physiology, and major neurological illnesses, along with their corresponding therapies in critically ill patients. Students would discover how the brain, spinal cord, and peripheral nerves

influence body processes. They would also learn about traumatic brain injury, stroke, seizures, and neurologic crises and their evaluation and nursing interventions.

The chapter on the endocrine system emphasizes the study of glands and hormones responsible for the maintenance of body homeostasis. Students would be able to understand how the hypothalamus, pituitary gland, thyroid gland, adrenal glands, and pancreas work and interact. They would also learn about diabetes, hyperthyroidism, and Addison's disease and how to treat them using nurse interventions and drugs.

The study content material

The cardiovascular health module from the critical care nursing course comprised the study material for the present investigation. While the neurological, respiratory, and endocrine chapters are important in critical care nursing, the cardiac chapter holds a unique and crucial significance in critical care nursing due to several factors. Firstly, the high prevalence of cardiovascular diseases, which contribute significantly to morbidity and mortality, emphasizes the importance of understanding cardiac care (MOH, 2021). Additionally, the need for immediate interventions during cardiac emergencies, such as heart attacks and arrhythmias, underscores the necessity for nurses to be well-prepared in managing these situations. The complexity of cardiac monitoring and interventions, including interpreting ECGs and assisting with procedures like cardioversion and defibrillation, further highlights the importance of a solid understanding of cardiac care. Moreover, the requirement for interdisciplinary collaboration with cardiologists, cardiac surgeons, and other specialists emphasizes the need for effective communication and collaboration in providing comprehensive care. Lastly, the significance of patient education about cardiac conditions, treatment plans, lifestyle modifications, and the provision of emotional support to help

patients navigate the challenges associated with cardiac care further emphasizes the crucial role of critical care nurses in the cardiac chapter.

The cardiovascular chapter included twelve case scenario applications that helped students apply their knowledge and skills in real-life situations. These case scenarios typically present a patient with a cardiac condition, and students are required to analyze the patient's symptoms, perform appropriate assessments, interpret diagnostic results, and develop a comprehensive care plan.

The adapted unfolding case studies demonstrated Quality and Safety Education for Nurses (QSEN) commitment to safety and patient-centered care (Moench, 2019). The development of clinical reasoning and critical thinking in nursing education has made extensive use of it (Tanner, 2006). There were many sources where the adopted unfolding case scenarios were retrieved. The National League for Nursing's Advancing Care Excellence for Seniors (NLN ACE.S) framework, which was intended to work in conjunction with the Association of Standardized Patient Educators' (ASPE) and Standards Of Best Practice (SOBP) (Lewis et al., 2017; Martin et al., 2020; NLN, 2022; TAGLIARENI et al., 2012). Also, Laerdal Library, the American Association of Critical Care Nurses (AACN) synergy model for patient care (Hardin & Kaplow, 2005), and e-books (Mariann et al., 2013) were other sources for the unfolding case studies. The cardiac unfolding case study was retrieved primarily from Mariann e- book (Mariann et al., 2013). Personal nursing experience, relevance, authenticity, an engaging and challenging nature, and the provision of instructional information were taken into consideration when adopting a case (Kim et al., 2006). To strengthen the interactivity and realism of the cases, images and slides, existing local identities for health centers, and recognizable names for the patients were utilized.

By engaging in case scenario applications, students can enhance their critical thinking and decision-making skills, as well as develop their ability to provide safe and effective care to patients with cardiac conditions. These applications also allow students to integrate theoretical knowledge with practical skills, preparing them for real-world nursing practice.

3.9 Ethical Considerations

Ethical approval was taken from The Faculty of Nursing at the AAUP and the AAUP Institutional Review Board (IRB). After receiving approval (Appendix A), the following ethical concerns regarding data collection were considered.

3.9.1 Informed consent

Through the informed consent, the protection of human rights was ensured. To obtain students' informed consent, it was necessary to provide them with sufficient information about the research study. The students were assured that their participation was voluntary and that they could resign from the program at any time without repercussions. So that the students could comprehend what would be done and what was expected of them, the informed consent was written in straightforward English. The informed consent included comprehensive information about the study's procedure, the reasons for participation, the potential benefits, and a concise explanation of the study's purpose. Before participating in the research, informed consent was obtained from the students. The consent form was signed and dated by every student. Appendix (C) contains the informed consent in English version.

3.9.2 Voluntarily participation

Potential participants were informed that their participation was voluntary and that they could withdraw from the study at any time. They were informed that inability to participate in the study or withdrawal at any time would have no consequences.

3.9.3 Confidentiality and anonymity

During this study, confidentiality and anonymity were maintained. Confidentiality refers to protecting data by not disclosing information gathered without the individual's consent. Anonymity refers to keeping participants' identities concealed and restricting access to information gathered about them (Swedan et al., 2020). In this research, the participants' identities were anonymized using serial numbers. These numbers were sent to the students via email and were exclusively used for the purpose of comparison. Furthermore, participants were explicitly instructed not to disclose their names on the surveys.

The researcher's computer was protected and backed up with data. In addition, the questionnaires were numerically coded to protect participants and ensure the confidentiality of the data, and only the researcher had access to the information. Each questionnaire's accompanying cover letter included a description of the research methodology. Moreover, following the completion of the experimental intervention, the conventional group was subjected to an unfolding case study in order to satisfy ethical requirements.

3.10 Pilot Study

A pilot study consisting of approximately ten percent of the total sample size was carried out immediately following the acquisition of ethical approval from the AAUP and

following making cluster selections for the experimental and conventional classes and before the intervention and collection of data. For the pilot study, a selected class consisting of 17 critical care nursing students from AAUP was chosen. The students were enrolled in the investigation using a simple random selection process. The primary aim of the pilot study was to evaluate the research instrument's viability, the recruiting procedure's feasibility, the effectiveness of the classroom-based intervention delivered through the implementation of the unfolding case study, and the data collection approach. Furthermore, the objective of the research was to determine whether the outcomes derived from the pilot study were feasible and acceptable to the participants. The pilot study specifically addressed the topic of angina pectoris with critical care nursing students, as it was one of the scheduled interventions.

As a result of the pilot study, a change was made to the research implementation of the unfolding case study in regard to the material content that was provided to students initially. This modification was made as a result of the observation that students asked more questions in certain areas of the curriculum. After that, these topics were incorporated into the content that was being lectured in order to keep the students' critical thinking sequence intact and to enable students to have a deeper understanding of the content that was being lectured. The modification that was made to the implementation of the research was essential to ensure that the students received comprehensive information on the topics that were presented, intending to improve the student's ability to think critically. The outcome of the research study was vastly improved as a result of this modification because it made it possible to have a better understanding of the unfolding case study, which consequently provided valuable insights into the efficiency of the instructional approach.

Concerning the study`s tools of self-efficacy and critical thinking, the students who participated in the pilot research were asked to fill out both of the instruments of critical thinking

and self-efficacy and evaluated the feasibility, clarity, application, relevance, readability, ease of understanding, question sequence, and completion time of the questionnaires. The results indicated positive feedback. Firstly, the students reported that the measure completion time was satisfactory, indicating that they were able to complete the questionnaires within a reasonable timeframe. This suggests that the length of the questionnaire was appropriate and did not cause any undue burden or inconvenience for the participants.

Furthermore, the students expressed that the wording of the questionnaire was clear. This implies that the questions were easily understood and that the participants did not encounter any confusion or ambiguity while responding to the questionnaire. Clear wording is essential to ensure that participants can accurately interpret and provide meaningful responses to the questionnaire items. Following experts' recommendations from the pilot research, the questionnaires were verified. Students guaranteed research tool appropriateness. Students who took part in the pilot study were not eligible to take part in the main research project

3.11 Data Collection Procedure

The data collection was conducted during the spring semester, starting in February and continuing until the end of June in the academic year 2023 on critical care nursing students who willingly participated in the study. The data collection process followed a meticulous approach, as outlined below.

A- Preparation phase

1- Meetings with course coordinator

At the beginning of the semester, the researcher met with the course coordinator for the critical care nursing theory course to explain the goals and methods of the research study, set dates for the unfolding case scenarios review, study interventions, student recruitment, data collection, and tools descriptions that were used. In this stage, the researcher, under the supervision of the coordinator, was responsible for reaching out to the students participating in the study, informing them of the study's purpose, content, duration of research, and required tasks, delivering and administering three tests of knowledge acquisition, critical thinking and self-efficacy, and inviting them to participate. The researcher in cooperation with the coordinator also distributed the serial numbers to each student via email to ensure anonymity and privacy. The students were informed that the study's completion is a requisite for the researcher to earn a doctorate in nursing. The students were assured that any positive or negative feedback would not impact their course average grades.

2- Validating the adopted cardiac case study scenarios

The cardiac unfolding scenarios took about one month and a half to be adopted, reviewed, and refined using several useful sources (Lewis et al., 2017; Mariann et al., 2013; Martin et al., 2020; NLN, 2022; TAGLIARENI et al., 2012). A comprehensive literature study laid the groundwork for medical-surgical education best practices and evidence-based knowledge. To validate the developed unfolded case scenarios by a team comprising ten experts, including a cardiologist, critical care nurses, instructors, and PhD academic staff in critical care nursing education, along with the course coordinator, conducted a thorough review of the adopted case

scenarios for the cardiovascular health subject of critical care content to best meet the learning outcomes. Then the face and content validity were established.

Face validity is the degree to which an assessment appears to be a valid method for measuring what it is intended to measure (DeVon et al., 2007). In the context of a critical care nursing case study, face validity was determined by presenting the developed unfolding case study by the researcher in collaboration with the experts in the field to a group of five faculty members from medical-surgical nursing programs and nurses with five years of experience and asking them if they believed the selected case study represented the forms of clinical scenarios that nurses frequently encountered in critical care settings. Although face validity evaluation is subjective and relies on opinions and does not involve rigorous analysis, it helped educators and researchers to gain insight and determine the effectiveness of an unfolding case study in preparing nursing students for practical scenarios (Nevo, 1985).

Content validity is the extent to which a test or evaluation instrument measures what it is intended to measure (Rahardja et al., 2019). In the context of unfolding case studies, content validity refers to the degree to which the case study accurately reflects the situations that nurses may encounter in clinical practice. The content validity of the adopted unfolding case scenarios was assembled by a panel of five nursing education faculty members with PhDs in nursing programs with at least five years of experience in nursing education and critical care nursing, ensuring that it did not include the same members as the previous panel. The experts on this panel were tasked with reviewing and evaluating the case study, assessing whether it accurately depicts the clinical situation that nurses may encounter and whether it evaluates the pertinent core competencies taught in nursing schools. To increase the content validity of the case study, the expert panel members were asked to suggest revisions and improvements. Relevance to nursing

practice, level of complexity, and attention to detail were included in the evaluation. The panel of experts then met to discuss their assessments and identified areas of the case study that required revision or improvement. The decision was made unanimously to incorporate additional details into the adopted cases regarding the necessary laboratory tests, diagnostic procedures, considerations for medications, and follow-up nursing care plans.

3- Recruiting a facilitator

The facilitator, who was recruited for the study by the researcher, received training in the delivery of both conventional and unfolded case studies throughout the didactic classroom session. The individual responsible for facilitating this research has an extensive range of knowledge and skill in the field of medical-surgical material, having served as an academic teacher for more than five years. The intervention's overall effectiveness is significantly bolstered by the facilitator's knowledge, which dramatically boosts credibility and plays a pivotal role in fostering learning and skill development among participants.

4- Setting the intervention timeframe

The intervention was planned to be implemented in six weeks on both groups of the population study, allowing for the collection of valuable data and observations, during which each week consisted of three hours of teaching time. This resulted in a total of 18 hours of intervention for both the experimental and conventional groups separately. The designated timeframe offered a thorough examination of the intervention's material, facilitating students' ability to comprehend and use the information and abilities imparted throughout the program with efficacy.

5- Sending online materials

Before each lesson, students were given reading materials on specific conditions within the selected critical care session areas, which were made available online one week prior to the class. The experimental group received an unfolding case scenario, whereas the conventional group received a PowerPoint presentation.

5.1 Components of study teaching material

The study population consisted of two groups: the experimental group and the conventional group. Both groups were taught the same material content on critical care nursing in the subject of cardiovascular health. However, they differed in their teaching approach. The experimental group received unfolding case studies, while the conventional group received lecture-based learning.

The material content on cardiovascular health which correspond course subject materials covered six topics, which are listed below:

1- Angina Pectoris

2- Atrial Fibrillation

3- Myocardial infarction

4- Cardiogenic shock

5- Complete heart block

6- Pacemaker implantation

The topics are divided into 12 sessions, with each session lasting for 1.5 hours. Two sessions are conducted per week, with two sessions dedicated to a conventional group and two

sessions dedicated to an experimental group. The distribution of the sessions is presented in Table 1.

Table 1: Cardiovascular sessions breakdown in experimental group

Week	Session No.	Title	Time	Unfolding Case Studies Ref.
Week one	Session one	Angina pectoris	1.5 hour	Scenario No.1
	Session two	Nitroglycerin consideration	1.5 hour	Scenario No.2
Week Two	Session three	Atrial fibrillation	1.5 hour	Scenario No.3
	Session four	Myocardial Infarction	1.5 hour	Scenario No.4
Week three	Session five	Reperfusion Therapy	1.5 hour	Scenario No.5
	Session six	Ventricular Tachycardia	1.5 hour	Scenario No.6
Week four	Session seven	Cardiogenic shock	1.5 hour	Scenario No.7
	Session eight	Mechanical intervention for cardiogenic shock: Intra-Aortic Balloon Pump (IABP) and Left ventricular Assist Device (LVAD)	1.5 hour	Scenario No.8
Week Five	Session nine	Cardiogenic Rehabilitation Program	1.5 hour	Scenario No.9
	Session ten	Brady arrhythmia/third-degree heart block	1.5 hour	Scenario No.10
Week six	Session Eleven	Pacemaker implantation: different types and indications	1.5 hour	Scenario No.11
	Session Twelve	Pacemaker misconceptions and important considerations	1.5 hour	Scenario No.12

This series of unfolding case studies was designed to provide nursing students with a logical sequence of progression for the case scenarios related to cardiovascular disease. Table 2 shows the same contentment material that utilized a lecture-based learning approach.

Table 2: Cardiovascular sessions breakdown in conventional group

Week	Session No.	Title	Time
Week one	Session one	Angina pectoris	1.5 hour
	Session two	Nitroglycerin consideration	1.5 hour
Week Two	Session three	Atrial fibrillation	1.5 hour
	Session four	Myocardial Infarction	1.5 hour
Week three	Session five	Reperfusion Therapy	1.5 hour
	Session six	Ventricular Tachycardia	1.5 hour
	Session seven	Cardiogenic shock	1.5 hour

Week	Session No.	Title	Time
Week four	Session eight	Mechanical intervention for cardiogenic shock: Intra-Aortic Balloon Pump (IABP) and Left ventricular Assist Device (LVAD)	1.5 hour
Week Five	Session nine	Cardiogenic Rehabilitation Program	1.5 hour
	Session ten	Brady arrhythmia/third-degree heart block	1.5 hour
Week six	Session Eleven	Pacemaker implantation: different types and indications	1.5 hour
	Session Twelve	Pacemaker misconceptions and important considerations	1.5 hour

5.2 Explanation of the unfolding case study scenarios

In the present study, the researcher delved into the complex medical journey of a 60-year-old male patient who initially presented with angina pectoris and ultimately required pacemaker implantation due to a series of interconnected cardiovascular events.

Stage 1: Angina Pectoris (Initial Presentation):

The unfolding case scenario commences with our patient, Mr. G.P, a 60-year-old male with a history of elevated blood pressure and hyperlipidemia. Mr. G.P had been experiencing intermittent chest pain, which was later determined to be angina pectoris, a condition caused by inadequate blood supply to the heart muscle. His cardiac evaluation revealed coronary artery disease as the underlying cause at this stage.

Stage 2: Progression to Atrial Fibrillation:

Over time, Mr. G.P.'s health deteriorated. Atrial fibrillation is a heart arrhythmia characterized by disorganized and irregular electrical activity originating in the atria. The emergence of the unusual complication was a significant obstacle to the care of his angina pectoris,

requiring specialist intervention and meticulous surveillance to regulate his heart rate and mitigate the risk of further problems.

Stage 3: Myocardial Infarction Occurs:

Unfortunately, Mr. G. P.’s health worsened. He had a heart attack despite excellent treatment. He suffered this serious episode because his coronary artery disease had advanced after his angina diagnosis.

Stage 4: Complications Arise - Tachyarrhythmia and Cardiogenic Shock:

Myocardial Infarction had significant effects. After his heart's electrical circuitry was injured, Mr. G.P. experienced tachyarrhythmia, a potentially deadly heart rate. His cardiac output also declined, causing cardiogenic shock, a potentially lethal disease in which the heart cannot pump enough blood.

Stage 5: Development of Bradycardia and Complete Heart Block:

After working hard to stabilize Mr. G. P., the medical team faced another challenge. His heart's electrical system was disrupted by the myocardial infarction, causing bradycardia. This degeneration caused a full heart block, which prevented the transmission of electrical impulses from the atria to the ventricles, lowering the heart rate and increasing the risk of abrupt cardiac arrest.

Stage 6: Pacemaker Implantation Becomes Necessary:

Due to Mr. G.P.'s increasingly unreliable cardiac rhythm and severely diminished quality of life, the medical team determined that the best course of action was to implant a pacemaker.

This device would serve as a life-saving intervention by delivering consistent electrical signals to modulate his heart rate and ensure synchronized heartbeats.

B- Procedure (Intervention phase)

1. **The conventional group:** the instructor initiated a discussion about the purpose of the study with the students. This class underwent traditional instruction for six weeks, with the material distributed over three hours per week. The instruction included the traditional PowerPoint presentations on cardiovascular health, covering six topics divided into 12 sessions. The lectures encompassed PowerPoint presentations (PPTs) utilizing a conventional approach instead of suggesting case studies. After every two topics, the students completed knowledge post-test questionnaires administered by the researcher.
2. **The experimental group:** The intervention started in parallel with the second group. Within the experimental group, the instructor explained the purpose of the study to the students. They were instructed on how to collaborate effectively in groups and were divided into 10 groups with 7-8 students in each group to discuss the case scenarios. In the unfolding case study, the educational material included specific objectives, a multi-scenario case study, and thought-provoking questions aimed at actively involving the participants (Carter & Welch, 2016; Yoo & Park, 2014). The process was carried out in the following five steps:

Step one: Patient presentation (25 minutes). At that point, the instructor presented the scenario to the students using a paper or on a slide. A brief description of the current illness was given as the first part of the patient introduction. The students were given a patient description and a list of possible diagnoses. During that part of the process, the students observed the patient's

issue or situation, conducted a thorough analysis, and generated imaginative visual representations of it. The challenging question was: what other details and evaluation data were needed to help distinguish between the various possibilities before continuing with the case study? Students obtained faculty feedback on the results of the physical assessment. The students explained what took place in the situation, as well as identified the source of the issue. The facilitator encouraged the students to contemplate deeply the topics at hand, facilitated open discussion on those topics, and assisted the students in comprehending the scenario. If a class was headed in the wrong direction, they were told to do some more research. Students were also questioned about any additional patient or chart information that would be helpful for an accurate diagnosis.

Step two: Case analysis (25 minutes). Hereunder was a student's analysis and evaluation of the case scenarios. At that point, students anticipated labs, diagnostics, and consultations before deciding to call in for orders from the medical provider. The challenging questions that were designed to test the student's knowledge and skills were: (a) What labs, diagnostics, and counsels were the medical professional expected to order? (b) Based on the patient's background, what risk or predisposing factors did the individual have? The instructors reviewed the upcoming labs, diagnostics, and consultations with each group of students. Students in the role of a healthcare provider came up to the instructor for directions using SBAR (situation, background, assessment, and recommendation) communication. Faculty and students worked together during the recommendation stage to discuss possible justifications for orders that would be given. It was expected that the student experienced some level of difficulty at some point. Therefore, each student was provided an in-depth plan for how they would intend to solve the problem. In order for the students to gain experience with a methodical approach to problem-solving, this phase of the lesson consisted of analyzing scenarios that would lead to errors or hypotheses. The students

decided for themselves whether or not to accept the facilitator's assumptions, and the facilitator was there to support and guide them. This ensured that each student group completed the objectives of the exercise successfully.

Step three: Group discussions and interactions (25 minutes). Students were given the results of their tests and went over the orders from the previous section (Step 2). Based on the data collected during the assessment, students were tasked with determining the patient's diagnosis and current state of health. Discussion amongst the group developed a method for dealing with the issue at hand. A leader was appointed for each of the groups and data was discussed within the group before being compiled and summarized by the leader of each of the groups. These discussions were based on the individual plans (solutions) that were presented to the group. Through conversation, the facilitators provided the students with positive encouragement to investigate and compare the causes of the issues that they were facing. Afterward, the facilitators addressed various solutions predicated on the solution that was proposed and debated. The facilitator asked the participants a variety of questions to stimulate discussion and critical thinking: (a) Besides these symptoms, were there any other complications were you looking out for? (b) Would you anticipate the doctor prescribing any special treatments or recommending any specialists? Once again, the students contacted their doctor with test results and followed the doctor's orders (played by the faculty). The faculty and student group discussed the reasoning behind the expected orders during the recommendation stage.

Step four: Finding the right solution (25 minutes). The students reviewed the doctor's prescribed treatments and medicines. In this section, students were tasked with (a) providing the patient with an explanation of the rationale behind each medication, (b) informing the patient of the most significant side effects, and (c) listing interventions and education that should be given

to such a diagnosed patient. Beside this process, the students made suggestions for answers to the problems according to what was discovered and the information that was collected during the previous steps' discussions. The lecturer and the guide gave the students an overview of the factors that made some situations more intricate than they initially appeared.

Step five: Putting it all together; evaluation and reflection (25 minutes). In the final part of the unfolding case study, as it came to a close, students were asked to explain how the patient's situation related to the topic they had been given. After that, each group shared their patient and their findings with the rest of the class. Students gained knowledge of the appointed conditions and made informed comparisons through this process. At this stage, engagement of students in activities such as self-assessment, evaluation by their peers, and reflection on the content they had learned and the methods by which they had acquired it. Each student completed a subset of the case study independently before coming together to discuss their findings on the discussion board. Some students, after perusing the works of their peers, reconsidered their own strategies and/or answers. The facilitator provided the students with assistance as they evaluated the performance of their respective groups for the overall layout and construction of the unfolding case studies. This nursing-related topic was incorporated into the curriculum of the intervention group as a series of unfolding nursing cases presented throughout multiple episodes in the cardiovascular nursing subject. Following the sequence of a patient's malady voyage in response to disease, nursing care, and treatment, these scenarios were progressively displayed. Figure 5 illustrates how the unfolding case-based learning was taught to the intervention group and how it progressed in terms of the number of episodes (Gholami et al., 2021; Hong & Yu, 2017).

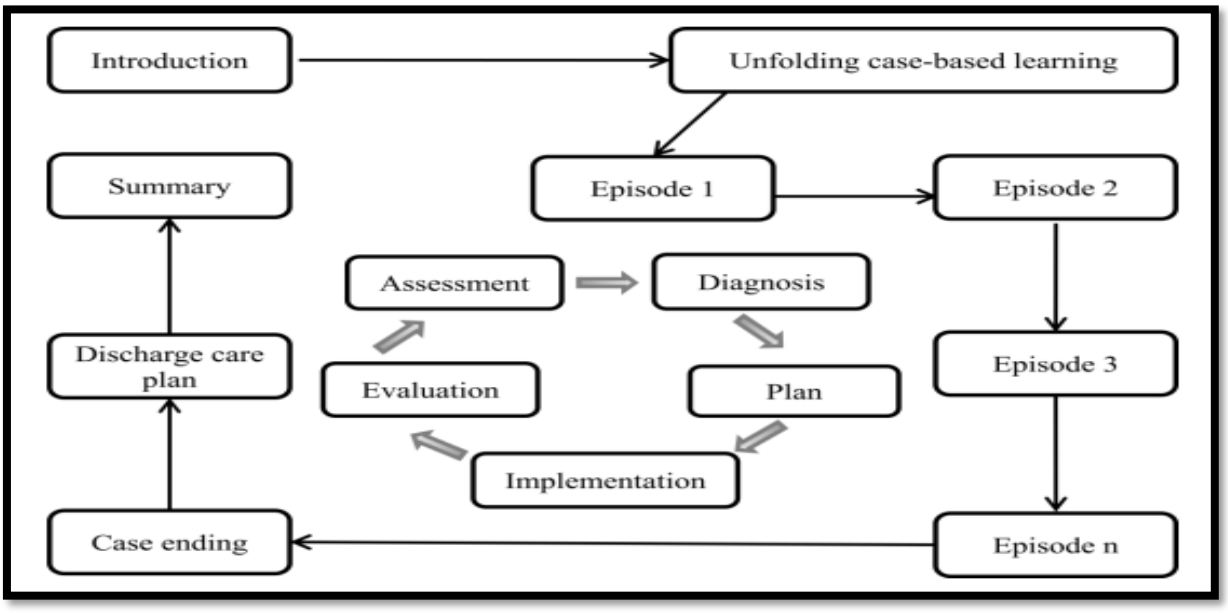

Figure 5: An outline of the case study lecture's content and progression

At the end of each pair of topics covered in the critical care nursing content area, the students were given a knowledge competency test. The test was administered by the researcher and had a time limit of 25 minutes. Before the first knowledge test was introduced, the students filled out demographic data. The multiple-choice questions for the test were formulated based on Bloom's taxonomy, covering a range of critical thinking levels from elementary to advanced. The assessment of knowledge acquisition was conducted through paper examinations as part of the knowledge tests. The total score of the paper exam totaled 10 points, covering 20 multiple-choice questions. At the end of all course sessions, students completed a post-test questionnaire that evaluated their critical thinking skills and self-efficacy. Unfolding case studies and instruments are found in the appendix.

3.12 Data Analysis

The data from the research was entered into and analyzed using the Statistical Package for Social Sciences (SPSS) Version 27. Descriptive statistics, including the mean and standard deviation for continuous variables and numbers and percentages (%) for categorical variables, were utilized to analyze the demographic characteristics of the nursing students who participated in the study. Histograms were used to examine the frequency distribution and perform a descriptive analysis of the variables. The independent t-test was predominantly used for inferential statistics to examine the differences between the groups and verify the hypothesis, as illustrated in Table 3. When discussing statistical significance, α was set at 0.05. Furthermore, Pearson and Point-biserial correlations were utilized to explore the relationships between demographic data and study outcomes for further investigations.

Table 3: The statistical analysis of educational interventions: Traditional classroom lectures vs. Unfolding case studies scenarios

Research Hypothesis	Data analysis	Justification
There will be no statistically significant difference in knowledge of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$.	Independent t-test	1- Independence: The observations in one group are not influenced or affected by the observations in the other group. 2- Normality: The data distribution within each group should closely resemble a normal distribution. 3- Homogeneity of variances: equal variances 4- The independent variables are categorical while the dependent variables are continuous.
There will be no statistically significant difference in critical thinking skills of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$.	Independent t-test	
There will be no statistically significant difference in self-efficacy towards critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$.	Independent t-test	

3.13 Summary

The current study used a posttest only, quasi-experimental design to evaluate the impact of applying unfolding case-study learning on critical care nursing students` knowledge acquisition, critical thinking, and self-efficacy at Arab American University/Palestine (AAUP). A multistage cluster sampling was used to select the study sample. The classes were assigned randomly to the experimental or the conventional group. Both groups filled out the demographic part and were evaluated through the use of knowledge competency tests, and self-administered questionnaires on critical thinking, and self-efficacy.

The study was implemented by the researcher using both conventional and experimental groups. Each group received a total of 18 hours of intervention over six weeks, resulting in three hours of intervention per week for each group. The conventional group engaged in traditional lecture-style instruction, whereas the experimental group used an unfolding case-based learning methodology in the context of cardiovascular health topics. Both groups underwent a knowledge competence exam, which was administered repeatedly upon completion of two out of the six subjects. Upon the conclusion of the research, participants were provided with self-administered questionnaires to assess their critical thinking abilities and self-efficacy. Data were analyzed by SPSS version 27 using independent t-tests to examine mean differences between the conventional and experimental groups and to test the study hypothesis.

CHAPTER FOUR

Results

4.1 Introduction

In this chapter, the results of the study are presented. The purpose of this study was to evaluate the impact of applying unfolding case study learning on knowledge acquisition, critical thinking, and self-efficacy among nursing students enrolled in the critical care health nursing course at Arab American University/Palestine (AAUP). The Statistical Package for Social Science (SPSS, version 27) was used to analyze the data. Descriptive and inferential statistics were used to test the study hypothesis. Descriptive statistics (frequency, percentage, mean, standard deviation) were used to describe the characteristics of the participants. The inferential statistics (independent t-test) was utilized to test the research hypothesis. The study employed an independent t-test to assess the differences in mean scores between the conventional and experimental groups on three variables: Knowledge acquisition, self-efficacy for performance and learning, and Yoon's Critical Thinking Disposition (YCTD).

4.2 Participants` Assignments

One hundred and sixty-nine participants met the eligibility criteria and agreed to participate in the study which exceeded the G*Power estimates, significantly enhancing the study's resilience and statistical power. The students were allocated to two separate classes. By employing a multistage and cluster sampling approach, the study successfully selected one class as the representative for the conventional teaching method and another class as the representative for the experimental teaching method (see Figure 6).

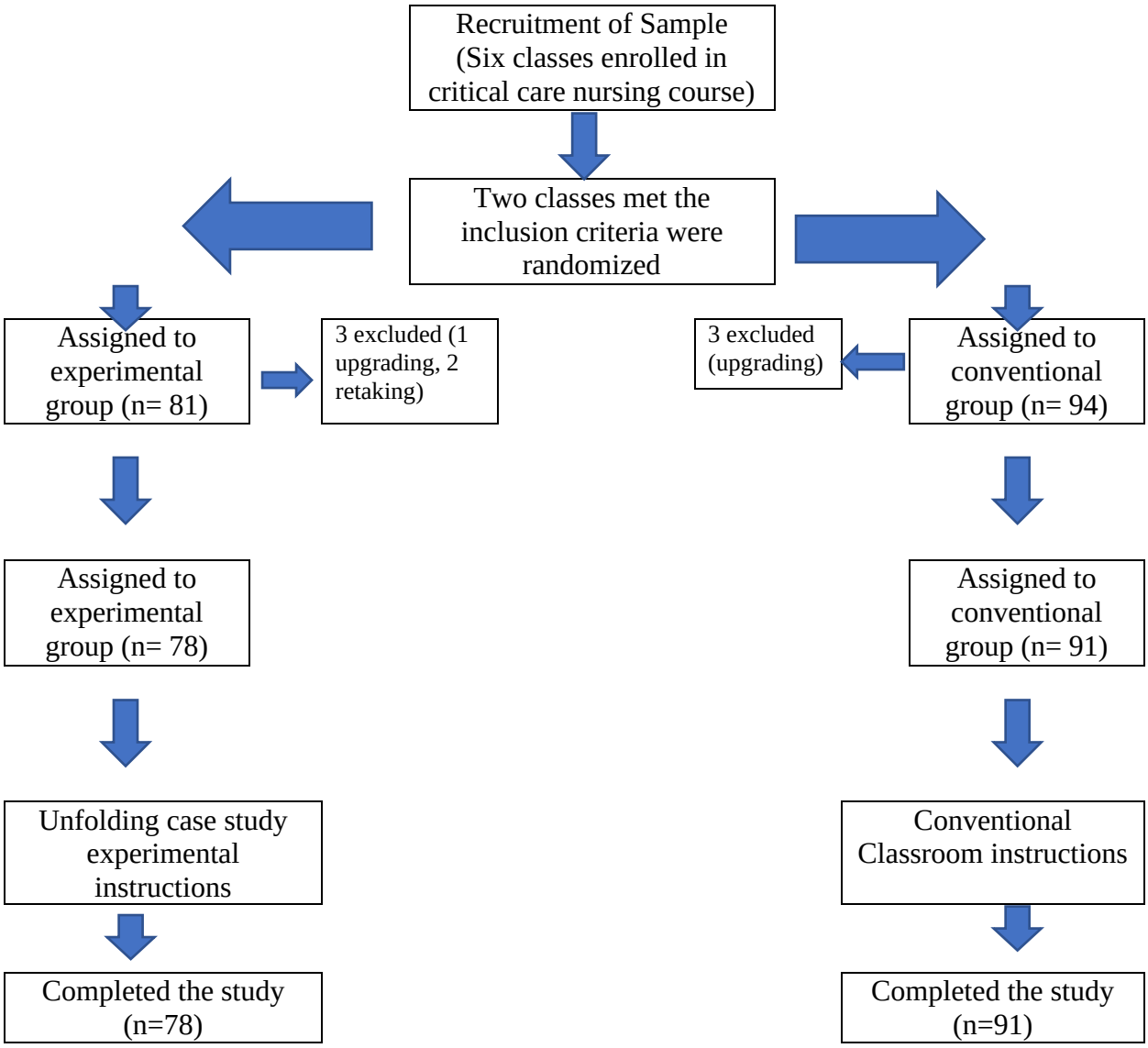

Figure 6: Sampling and flow of subjects through study

4.3 Demographic Characteristics

As shown in Table 4, among the total 169 students, 83 (49.1%) were male, with 40 (44.0%) in the conventional group and 43 (55.1%) in the experimental group. In contrast, the remaining 86 participants (50.9%) were female, with 51 (56.0%) in the conventional group and 35 (44.9%) in the experimental group. The chi-square value (1, N=169) = 2.098, *P* = .148 indicates that the

observed differences in gender by group are not statistically significant at the conventional significance level of 0.05.

Table 4: Participants demographics (N =169)

Variables		Total	Conventional (n= 91)	Experimental (n=78)	Test statistics	*P*-value
Gender, n (%)	Male	83 (49.1)	40 (44.0)	43 (55.1)	$X^2 = 2.098$	0.148
	Female	86 (50.9)	51 (56.0)	35 (44.9)		
Age Mean (SD)		22.32 (0.77)	22.39 (0.68)	22.27 (0.48)	t = -0.977	0.33
GPA Mean (SD)		2.76 (0.56)	2.73 (0.54)	2.80 (0.60)	t = -0.703	0.483

The results are based on two-sided tests assuming equal variances. Categorical variables, such as gender, were analyzed using the chi-square statistical test (X^2), while GPA and age were analyzed using independent t-tests (t).
The p-value is significant at the 0.05 level.
The p-value is highly significant at the 0.001 level

The mean age of nursing students was 22.32 (SD = 0.77) years in both groups. There average age did not differ between the experimental and the conventional groups. The mean age in the conventional group was 22.39 (0.68) years, ranging from 21 to 25, and in the experimental group 22.27 (0.48), ranging from 21.5 to 24.5. The mean difference was 0.12, *t* (167) = -0.977, *P* = 0.322 indicating no statistically significant differences between the groups.

The table also displays that the mean GPA of the nursing students in both groups was 2.76 (SD= 0.56). Their average GPA did not differ between the experimental and the conventional groups. The mean GPA in the conventional group was 2.73(0.54), ranging from 1.78 to 3.85, and in the experimental group the mean was 2.80 (SD = 0.60), ranging from 1.85 to 3.85. The mean difference was 0.07, *t* (167) = -0.70, *P* = 0.48 indicating no statistically significant differences between the groups.

4.4 The Impact of Learning by Unfolding Case-study on Nursing Students` Knowledge

Based on the results obtained in this study, it can be observed that the total scores of the three tests comprising the knowledge acquisition scale for the experimental group demonstrated a normal distribution, as depicted in the histogram in Figure 6 with a normality curve. The distribution displays a skewness value of 0.332, indicating a slightly right-skewed distribution. Additionally, the kurtosis value of 0.005 suggests a near-normal distribution with a relatively flat peak. The standard error, which measures the variability of the scores around the mean, is calculated to be 0.083 indicating that the observed mean is likely a reliable estimate of the true population means. These statistical measures collectively indicate that the knowledge acquisition scores for the experimental group closely adhere to a normal distribution, with a slight right skew and low variability, and support the use of the experimental group's knowledge acquisition scores in future analyses.

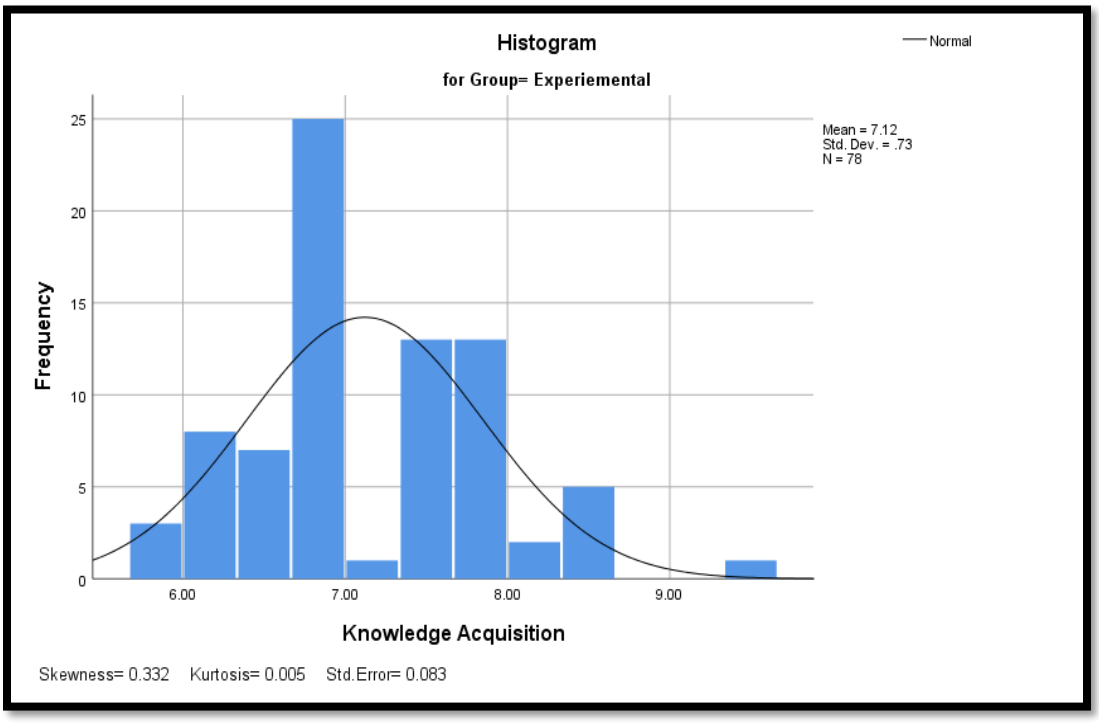

Figure 7: Distribution of knowledge scores among the experimental group

Table 5 represents the results of knowledge scores obtained from both groups across the study phases. The conventional and experimental groups differed in their mean scores on the knowledge acquisition tests. The experimental group had a higher mean score (6.72) compared to the conventional group (4.58) on the knowledge acquisition test one. The mean difference of -2.14 is statistically significant $t(167) = -10.387$, $p < 0.001$, 95% CI (-2.56 to -1.74). Similarly, the experimental group mean (6.80) was higher compared to the conventional group (5.33) on the knowledge acquisition test two. The mean difference of -1.47 between the two groups is statistically significant, t(167) = -7.443, p < .001, 95% CI (-1.85 to -1.07). The experimental group also outperformed the conventional group on the knowledge acquisition test three. The experimental group had a higher mean score (7.84) compared to the conventional group (6.55) on the knowledge acquisition test three. The mean difference of -1.29 between the two groups is statistically significant, t(167) = -6.892, p < .001, 95% CI (-1.66 to -0.92).

Table 5: Comparisons of the means for knowledge acquisition scores between the conventional and experimental groups (N= 169)

Variables	Group	Mean	SD	SE	F	Levene's P-value	t-test	P-value	95% Confidence Interval of the Difference	
									Lower	Upper
Knowledge Acquisition (Test One)	Conventional	4.58	1.37	0.144	0.28	0.597	-10.39	< 0.001	-2.56	-1.74
	Experimental	6.72	1.30	0.147						
Knowledge Acquisition (Test Two)	Conventional	5.33	1.27	0.133	0.08	0.782	-7.443	< 0.001	-1.85	-1.07
	Experimental	6.79	1.27	0.145						
Knowledge Acquisition (test Three)	Conventional	6.55	1.19	0.125	0.74	0.390	-6.892	< 0.001	-1.66	-0.92
	Experimental	7.84	1.24	0.141						
Knowledge Acquisition (Total)	Conventional	5.49	0.91	0.097	3.54	0.062	-12.7	< 0.001	-1.89	-1.38
	Experimental	7.12	0.73	0.083						

The p-value is significant at the 0.05 level.
The p-value is highly significant at the 0.001 level.

Overall, the mean of knowledge acquisition across all tests for the experimental group was 7.12 (SD = 0.73) in contrast to the conventional group 5.49 (SD = 0.91). The statistical analysis reveals a significant mean difference of -1.63 between the two groups, $t(167) = -12.7$, $p < .001$, 95% CI (-1.89 to -1.38).

Figure 7 presents a line chart for the means of the knowledge scores across the study phases. As shown in the figure, the experimental group showed higher means across all three tests compared to the conventional group. Specifically, the scores for the conventional group progressed respectively as 4.58, 5.33 and 6.55 whereas the experimental group showed a greater improvement with scores of 6.72, 6.80, and 7.84 respectively. These findings suggest that the intervention used in the experimental group was effective in increasing knowledge acquisition and should be considered for future interventions.

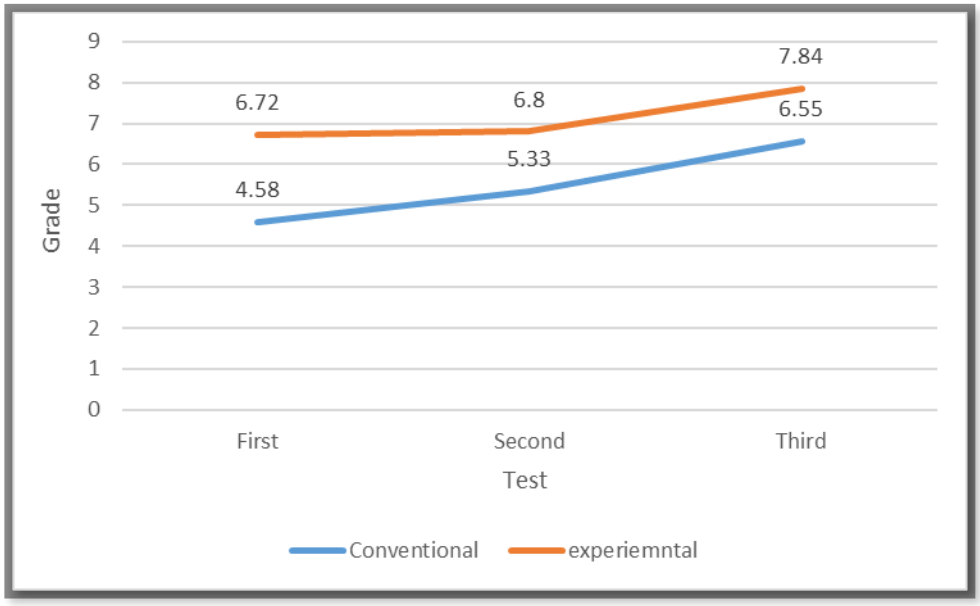

Figure 8: Line chart of knowledge acquisition across the three tests by group

4.5 The Impact of Learning by Unfolding Case-study on Nursing Students` Critical Thinking Skills

Upon analyzing the results of this study, it becomes evident that the mean scores of critical thinking for the experimental group exhibit a normal distribution. This observation is visually represented in Figure 8, where a histogram accompanied by a normality curve portrays the distribution pattern of these scores. The skewness value of 0.198 suggests a minor rightward skew, indicating that the majority of scores tend to cluster towards the higher end of the distribution, albeit without any substantial departure from a normal shape. Furthermore, the kurtosis value of 0.848 indicates a relatively high peak, implying that the distribution is moderately peaked. This suggests that the scores are somewhat concentrated around the mean, displaying a reasonable degree of variability. Additionally, the standard error of 0.032 indicates a high level of precision in estimating the mean scores.

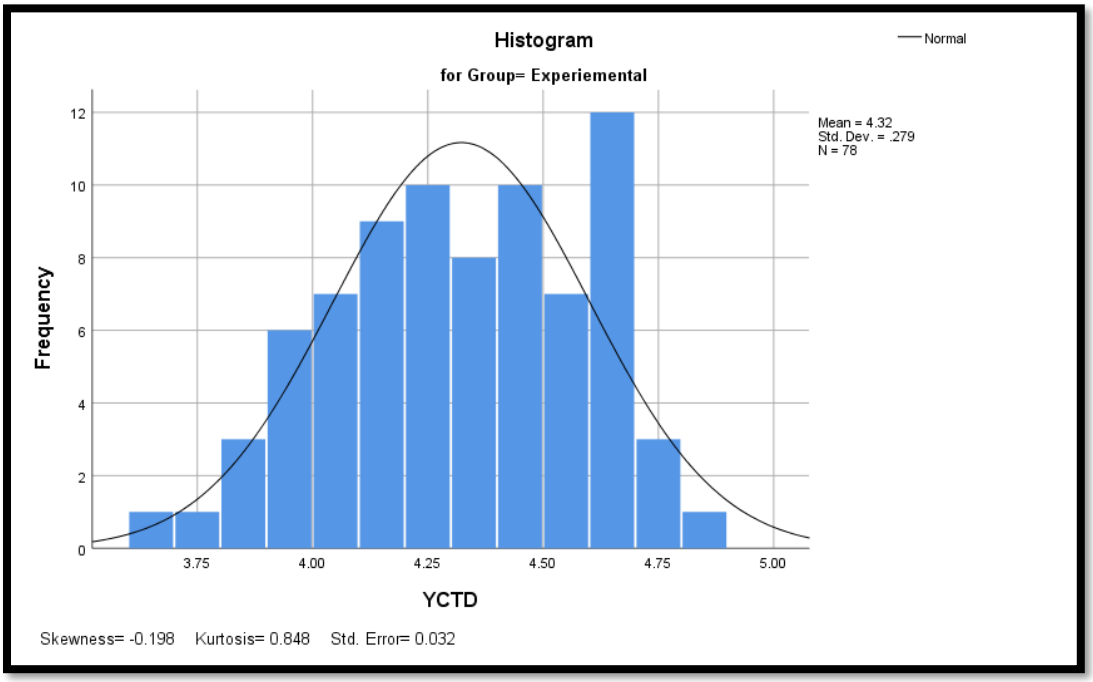

Figure 9: Distribution of critical thinking scores among the experimental group

Table 6 shows that the average of the total critical thinking scale and all of its 7 subdomains in the experimental group are all statistically significantly higher than the corresponding averages in the conventional group. The average critical thinking scale for the conventional group was 3.63 (SD= 0.24) compared to 4.32 (SD= 0.28) for the experimental group. The difference between the two groups -0.69 is statistically significant, $t(167) = -17.390$, $p < .001$, 95% CI (-0.77 to -0.61).

Table 6: Comparisons of the means for Yoon`s critical thinking disposition (YCTD) between the conventional and experimental groups (N=169)

Variables	Group	Mean	SD	SE	F	Levene's P-value	t-test	P-value	95% Confidence Interval of the Difference	
									Lower	Upper
confidence	Conventional	3.57	0.40	0.042	1.62	0.204	-15.064	< 0.001	-0.98688	-0.75818
	Experimental	4.45	0.34	0.039						
Eagerness	Conventional	3.68	0.44	0.046	0.24	0.625	-7.648	< 0.001	-0.66192	-0.39028
	Experimental	4.20	0.45	0.051						
Fairness	Conventional	3.66	0.44	0.046	2.74	0.100	-12.206	< 0.001	-0.87344	-0.63023
	Experimental	4.42	0.35	0.039						
Objectivity	Conventional	3.62	0.44	0.046	0.66	0.417	-10.424	< 0.001	-0.79438	-0.54139
	Experimental	4.29	0.38	0.044						
Prudence	Conventional	3.65	0.43	0.045	1.47	0.227	-8.440	< 0.001	-0.69888	-0.43390
	Experimental	4.21	0.44	0.050						
Skepticism	Conventional	3.60	0.42	0.044	2.35	0.127	-13.470	< 0.001	-0.90928	-0.67680
	Experimental	4.40	0.34	0.038						
Systematicity	Conventional	3.63	0.47	0.049	3.64	0.058	-9.925	< 0.001	-0.79196	-0.52916
	Experimental	4.29	0.38	0.044						
Critical Thinking (Total)	Conventional	3.63	0.24	0.025	3.10	0.080	-17.390	< 0.001	-0.76966	-0.61272
	Experimental	4.32	0.28	0.032						

The p-value is significant at the 0.05 level.
The p-value is highly significant at the 0.001 level.

4.6 The Impact of Learning by Unfolding Case-Study on Nursing Students` Self-Efficacy

The study results show that the mean scores of self-efficacy for learning and performance among the experimental group follow a normal distribution, as evident from the histogram in Figure 9 with a normality curve. The skewness value of 0.480 suggests a slight rightward skew,

indicating that the majority of scores are concentrated towards the higher end of the distribution but without any significant deviation from a normal shape. The kurtosis value of 0.239 indicates a relatively normal peak, suggesting that the distribution is neither too peaked nor too flat.

Additionally, the standard error of 0.042 reflects the precision of the mean scores, indicating that they are estimated with a high degree of accuracy. These results provide important insights into the level of self-efficacy for learning and performance among nursing students, demonstrating the unfolding case study teaching method.

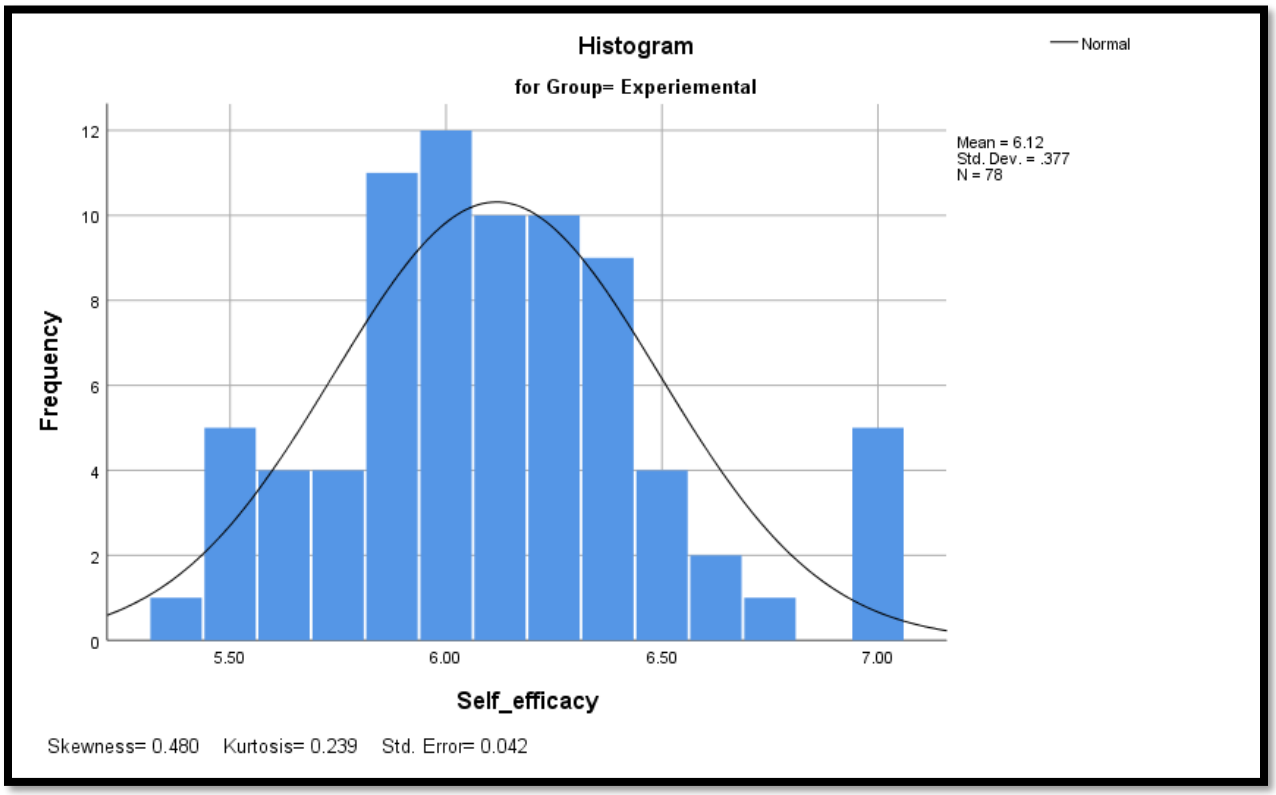

Figure 10: Distribution of self-efficacy scores among the experimental group

According to the findings presented in Table 7, it can be observed that the experimental group exhibited higher scores in terms of self-efficacy for learning and performance when compared to the conventional group. This notable difference was achieved through the implementation of unfolding case study learning among nursing students. The experimental group

had a higher mean score 6.12 (SD = 0.38) compared to the conventional group 4.40 (SD= 0.34) on self-efficacy. The mean difference of -1.72 between the two groups is statistically significant, $t(167) = -30.897$, $p < .001$, 95% CI (-1.82 to -1.60).

Table 7: Comparisons of the means for self-efficacy between the conventional and experimental groups (N=169)

Variables	Group	Mean	SD	SE	F	Levine's P-value	t-test	P-value	95% Confidence Interval of the Difference	
									Lower	Upper
Self-Efficacy	Conventional	4.40	0.34	0.036	0.38	0.540	-30.897	< 0.001	-1.82407	-1.60496
	Experimental	6.12	0.38	0.043						

The p-value is significant at the 0.05 level.
The p-value is highly significant at the 0.001 level.

Table 2, 3, and 4 shows that the observations of the groups are independent and not influenced by each other. Also, the Levene's test for equality of variances for all the comparisons was > 0.05 indicating that the assumption of homoscedasticity was met. This supports the appropriateness of using the independent samples t-tests to compare the mean scores between the conventional and the experimental groups. Additionally, the t-tests were carried out when it was shown that the assumptions about normally distributed data and continuous dependent variables compared to categorical independents variables had been satisfied.

4.7 Relationship Between Variables

The study also aims to find any potential variations between the study outcomes and demographic data including age, gender and accumulative GPA. Examining the correlation between variables holds significant importance in any research endeavor, as it enables investigators to identify patterns, comprehend interdependencies, and establish causal relationships. Consequently, this process yields valuable insights into the fundamental

mechanisms and dynamics of the phenomena being investigated. Table 8 depicts the correlation between GPA and Knowledge Acquisition in the conventional group while Table 9 in the experimental groups. The high correlation coefficients obtained for both groups (0.749 and 0.751 respectively) indicate a significant relationship between the two variables. The statistical significance of the correlations is confirmed by the extremely low p-values of less than 0.001, which implies that the relationships observed are highly unlikely to have occurred by chance. It is noteworthy to mention that the teaching methods employed in the two groups were traditional in the conventional group while demonstrating an unfolding case study was used in the experimental group.

In terms of the correlation between self-efficacy and critical thinking, the conventional group as shown in Table 8 demonstrated a very weak correlation with a coefficient of 0.118 that was not statistically significant. In contrast, the experimental group, where the unfolding case study was used as the teaching method as shown in Table 9, showed a strong correlation coefficient of 0.695 which was highly significant with a p-value of less than 0.001.

Table 8: Intercorrelation matrix (r) between variables by conventional group (N=91)

Variables	Gender	Age	GPA	knowledge Acquisition	Self-efficacy	YCTD
Gender	1					
Age	-.237	1				
GPA	-.040	.067	1			
Acknowledge Acquisition	-.051	.039	.749**	1		
Self-efficacy	.006	-.030	.034	-.051	1	
YCTD	-.131	.148	-.148	-.059	.118	1

****The p-value is highly significant at the 0.001 level.**

Pearson Correlation was used for continuous variables like GPA, self-efficacy, knowledge acquisition, and YCTD. Point biserial correlation was done for dichotomous variables like gender

Table 9: Intercorrelation matrix (r) between variables by experimental groups (N= 78)

Variables	Age	GPA	Gender	Acknowledge Acquisition	Self-efficacy	YCTD
Age	1					
GPA	-.129	1				
Gender	-.119	-.121	1			
Acknowledge Acquisition	-.113	.751**	-.061	1		
Self-efficacy	.090	.090	-.161	-.041	1	
YCTD	.194	.019	-.151	-.100	.695**	1

****The p-value is highly significant at the 0.001 level.**
Pearson Correlation was used for continuous variables like GPA, self-efficacy, knowledge acquisition, and YCTD. Point biserial correlation was done for dichotomous variables like gender

Before testing correlations, it is important to ensure that the underlying assumptions are met. In this study, Pearson and point biserial correlations were used to explore the relationships between variables. To fulfill the assumptions for Pearson correlations, it was necessary to have continuous variables that reasonably follow a normal distribution, equal variances, and avoid the presence of outliers. These assumptions were taken into account when analyzing the relationship between GPA, self-efficacy, critical thinking, and knowledge acquisition with the conventional and experimental groups. The point biserial correlation analysis was conducted to examine the relationship between gender and the outcomes of knowledge acquisition, self-efficacy, and critical thinking within the same groups. However, the results did not yield statistically significant findings.

4.8 Summary

This chapter presented the results of descriptive and inferential statistics conducted for the current study. One hundred and sixty-nine students were recruited to evaluate the impact of applying unfolding case-study learning on critical care nursing students` knowledge acquisition, critical thinking, and self-efficacy at Arab American University/Palestine (AAUP), utilizing

cardiovascular health scenarios. The sample characteristics and the conventional and experimental groups tested by chi-square and independent *t*-test revealed that there were no significant differences between the two groups. The independent *t*-test showed that there was a significant statistical difference in the mean scores of knowledge acquisition, critical thinking, and self-efficacy between the conventional and the interventional groups at the posttest. Mean of the knowledge acquisition, critical thinking, and self-efficacy for the interventional group was higher than the score of the conventional group. There was a high correlation between the GPA and knowledge acquisition in the conventional and experimental groups. The correlation between critical thinking and self-efficacy was higher in the experimental group than in the conventional group. Thus, using unfolding case studies had a significant influence on students` knowledge acquisition, critical thinking, and self-efficacy among nursing students enrolled in critical care nursing courses.

CHAPTER FIVE

Discussion

5.1 Introduction

A quasi-experimental post-test study was conducted to evaluate the impact of applying unfolding case study learning on knowledge acquisition, critical thinking, and self-efficacy among nursing students enrolled in the critical care health nursing course at Arab American University/ Palestine (AAUP). After introducing the topic, reviewing relevant literature, research methodology, and data analysis, this chapter presents a comprehensive overview of the study's findings. The results are analyzed and interpreted concerning the study's purpose and hypothesis. Additionally, the current findings are contextualized within relevant studies and the study's conceptual framework. The implications for nursing practice, education, and administration, as well as the strengths and limitations of the study, are thoroughly addressed based on the research. The study's findings suggest directions for future research. Moreover, this chapter includes both recommendations and conclusions.

A total of one hundred and sixty-nine participants took part in the study, and there were no dropouts during the research. The recruitment surpassed the requirements of the power analysis, ensuring sufficient ability to detect any potential effects.

5.2 Study Findings in the Context of the Conceptual Framework

Based on the conceptual framework, an unfolding case study was proposed as an effective method of teaching that could improve the level of knowledge acquisition, critical, thinking, and self-efficacy among critical care nursing students. The study was integrated and guided by The

Social Constructivist Theoretical Framework and The Constructive Theory Model. Glendon and Ulrich (1997) proposed that an unfolding case study, designed as a dynamic scenario, sequentially guides students through examining, analyzing, and reacting to data within a situation, aligning with Vygotsky (1978) theory of constructivism in learning, where knowledge is constructed through interactions with people and the environment (Mcleod, 2022).

Critical care nursing students in the intervention group were subjected to the unfolding case studies teaching strategies to achieve the outcomes that have been established previously. This group demonstrated an understanding of the case scenario, which centered on critical care disorders within the cardiac system of an adult male. The students pursued further information through health assessments, history inquiries, and continuous updates provided by the evolving case over time. Additionally, the students developed care plans and identified nursing interventions. All these activities are embedded within case scenarios presentations and discussions. On the contrary, the conventional study group had received the traditional teaching strategy using classroom lectures.

Thus, the unfolding case study was organized based on the presumptions of the conceptual framework for the study. Referring to the social constructivist model and its underlying assumptions, students illustrated the process of enhancing their knowledge as they engaged with the instructor-provided case, adeptly monitored their evolving understanding over time, and conducted thorough critical analyses of the information. In this framework, critical thinking is essential as it encourages learners to question, analyze, and evaluate information from various perspectives. By critically examining the unfolding case study, learners are prompted to actively seek and construct knowledge in a spiral manner, fostering a deeper understanding of the subject matter. In addition, using an unfolding case study in a constructivist classroom collaboratively

encouraged students sharing of multiple perspectives, and reflections that supported their growth of self-exploration in mastering skills, inquiry, motivation, problem-solving, confidence, and self-efficacy to ultimately create authentic experiences. Furthermore, the students' increased acquisition of knowledge and heightened critical thinking abilities allowed them to approach future unfolding case situations with greater confidence and competence. The Constructive Theory Model further emphasizes that by engaging in critical thinking during the unfolding case study, learners actively acquire knowledge, construct meaning, and enhance their self-efficacy. As an immediate impact of this, critical care nursing students exhibited greater levels of information acquisition, critical thinking, and self-efficacy as a result of this method of teaching.

5.3 Impact of Unfolding Case Study on Nursing Students` Knowledge Acquisition

The first hypothesis proposed that “There will be no statistically significant difference in knowledge of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students at $P \leq 0.05$”. The findings of the study revealed a significant improvement in the acquisition of knowledge among students in the intervention group who were exposed to unfolding case studies indicated by the increased scores of this group. It can therefore be concluded that unfolding case studies can contribute to increasing knowledge acquisition among critical care nursing students.

The findings of the current study were consistent with Ma and Zhou`s (2022) study, which found that undergraduate nursing students in southern China who were given unfolding case-based learning in simulation improved their academic achievement by improving comprehension and retention of health assessment knowledge. The intervention group demonstrated higher theory test

and final exam scores, indicating that the implementation of unfolding case-based learning may have allowed them to apply newly acquired knowledge of health assessment (Ma & Zhou, 2022).

Similarly, another qualitative study at North Island College that aligns with the findings of the present study conducted by Meiers and Russell (2019). Their research also highlighted three themes regarding the benefits of deploying unfolding case studies in nursing laboratory settings for knowledge synthesis, practice transferability, and clinical competence. Moreover, Meiers and Russell's study emphasized the significance of student focus groups in facilitating the transfer of theoretical knowledge to practical application, hence addressing existing gaps in the literature. In the same research, students' examples demonstrate how the unfolding case method expanded their understanding. The unfolding case process allowed students to build up knowledge, apply it to pathophysiology, nursing fundamentals, and relational practice courses, and apply these skills to practice. Students reported improved retention of theoretical concepts, especially regarding medication administration, and increased ease in dealing with intricate aspects of clinical practice.

Similarly, simulation-based learning was acknowledged by several studies such as McCormick et al. (2013), Miranda et al. (2017), Hooper et al. (2015), Bryant (2016), Yousey (2013), Herron et al. (2019), and Rode et al. (2016). These studies showed that students who participated in unfolding simulation scenarios had higher exam results, improved knowledge, and performed better on final tests compared to those who attended traditional classroom sessions. Simulation-based teaching methodologies can effectively enhance student learning in the classroom.

On the other hand, several other studies demonstrating unfolding case studies either present contradictory findings or exhibit mixed results when compared to the outcomes observed in the present study. The study conducted by Becnel (2022) found no significant differences between

traditional lecture and simulation-based case study teaching strategies in terms of knowledge acquisition. The analysis comparing traditional lecture (cohort A) and simulation teaching (cohort B) found that there was a minor difference in knowledge gains between the two teaching methods, but this difference was not statistically significant. The study examined the mean pre- and post-test scores within each cohort and found a significant increase in mean scores for both cohort A and cohort B. This indicates that both teaching strategies positively contributed to the acquisition of knowledge over time.

Congruently in USA, White et al. (2013) found that conventional lectures resulted in greater knowledge post-test scores than simulation-based learning. Also, Zulkosky (2012) in northeastern of the United States reported that students taught through case studies in the classroom performed as well or better than those taught through simulations. Another study indicated that the incorporation of simulations in an adult health alterations classroom course resulted in mixed outcomes across five assessments (Walters et al., 2017). Furthermore, Carter and Welch (2016) found that the instructional strategy of unfolding case study compared to the traditional teaching method improved the level of knowledge from pre- to post-test, but there was no significant difference in test score improvement between the two teaching methods for Renal and Musculoskeletal participants. Lloyd (2020), in his study, discovered that students of adult medical/surgical nursing exhibited statistically significant mean score differences in Exam I. However, there were no significant differences in the results of Test II and the final test between the experimental and control groups. Similarly, a study conducted by Hobbs and Robinson (2022) found that both unfolding case study and slide lecture group scores increased from the pretest to the posttest, then decreased to the transfer test. The same results were revealed in Upshaw`s (2016) study, where no statistically significant differences were found between the unfolding case study

and conventional instructional lectures in terms of knowledge acquisition (Upshaw, 2016).

Despite the divergence of some previous results with this study's findings, it is emphasized that there is a range of methodological variations between this study and these opposing studies. This includes differences in the topic selected for unfolding/simulation case scenarios. In this study, cases with great complexity and complicated cases with severe consequences were integrated into the scenarios. It is believed that this kind of case enhances student knowledge and critical thinking more than these directional case studies. Another explanation may be due to the timeframe of the study and the duration of exposure to the respective methods might have contributed to the observed outcome as appeared in Becnel's study (2022). Meaningful disparities in knowledge acquisition might require a more extended period of implementation to manifest distinctly. It is plausible that, over time, the unique attributes of unfolding case studies could potentially yield more pronounced effects on knowledge retention and application compared to traditional lectures.

In summation, the absence of significant differences in knowledge acquisition between unfolding case studies and traditional lectures in prior research could arise from a complex interplay of instructional design, student characteristics, timeframe, and assessment tools. Exploring these factors in more depth and conducting further research could provide deeper insights into the dynamics at play and shed light on potential avenues for optimizing pedagogical approaches in the future.

The study's outcomes affirm a robust connection between the implementation of unfolding case studies, grounded on the principles of Social Constructivism, the Constructive Theory Model, and a pronounced elevation in knowledge acquisition among critical care nursing students. According to social constructivism, knowledge is viewed as the result of social interactions and

collaboration. Unfolding case studies provide opportunities for learners to engage in meaningful tasks and collaborate with others, allowing them to actively construct knowledge through their interactions and discussions. As students scrutinize the case study critically, they actively pursue information, analyze different perspectives, and construct their knowledge of the topic. Similarly, the constructive theory model emphasizes that students actively construct their worldview through reflection, exploration, and problem-solving. In unfolding case studies, students gain knowledge through active engagement with the case. reflecting on their experiences, and applying critical thinking skills to solve complex problems. As they navigate through the unfolding case study, learners construct new meanings, integrate new information with their existing knowledge, and develop a deeper understanding of the subject matter, facilitating the synthesis of complex clinical concepts in a manner that is spiral and unparalleled by the passive nature of conventional lectures (Everly, 2013; Lloyd, 2020; Meiers & Russell, 2019; Reese, 2011; Yousey, 2013). This may introduce a sort of superiority of this pedagogical approach over the conventional classroom lecturing method.

5.4 Impact of Unfolding Case Study on Nursing Students` Critical Thinking

The second hypothesis suggested that “There will be no statistically significant difference in critical thinking skills of critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students”. The findings of the study showed that the critical thinking skills of students in the intervention group improved significantly when they were exposed to unfolding case studies. Therefore, it can be concluded that the use of unfolding case studies is an effective learning approach for enhancing the critical thinking abilities of critical care nursing students.

The findings of increased critical thinking of the intervention group at the posttest in the current study were consistent with findings from the previous studies. Two studies were conducted in traditional educational environments (Englund, 2020; Hong & Yu, 2017), while the other two studies were carried out using simulated nursing labs (Li et al., 2019; Ma & Zhou, 2022). All of these studies were grounded in the principles of social constructivism and the Constructive Theory Model. Based on traditional classroom research, Englund (2020) illustrated that the academic outcomes of students who received critical thinking improved more through unfolding case studies in adult health courses (M = 234.9) than regular case studies (M = 228). The study added that the level of critical thinking was measured indirectly by using Bloom's taxonomy for teaching at high levels. Also, in a study of 19 case studies over two semesters, Hong and Yu (2017) found that the unfolding case study in the experimental group had a higher mean total score (303.77±15.24) than the traditional case study in the control group (288.34±13.94). The experimental group showed substantial gains in six of the seven Critical Thinking Disposition Inventory—Chinese version (CTDI-CV) aspects, whereas the control group only improved in three ($p < 0.05$). These results underline the importance of utilizing innovative educational approaches, specifically within the discipline of nursing education, to enhance critical thinking abilities, which are required for a competent healthcare supply.

Several more studies have been conducted to corroborate the conclusions of the present research and have been applied through simulation laboratories. Ma and Zhou (2022) discovered that an unfolding case-based simulation laboratory increased critical thinking in 115 Chinese undergraduate nursing students (272.51 vs. 266.47, P <.001). The researcher used CCTDI to measure critical thinking before and after. Additionally, the Li et al. (2019) research included experimenting with simulated nursing case-based learning courses that showed substantial

improvement in critical thinking at pre-, mid-, and post-tests utilizing CTDI-CV compared to the control group ($P < 0.05$). These results suggest that "nursing case-based learning" improved nursing students' critical thinking.

Despite the rigorous methodologies employed, different studies can yield conflicting outcomes, which can pose challenges to researchers. Two prior studies (Carter & Welch, 2016; Lloyd, 2020) were carried out in a traditional classroom environment, which opposes the results of the present study. Additionally, two other studies (Blakeslee, 2019; Upshaw, 2016) were conducted using simulations. The objective of these studies was to assess the impact of unfolding case studies on the critical thinking abilities of undergraduate nursing students. The measurement instrument employed in these studies was the HSRT tool. The contradictory findings may be attributed to the use of HSRT which raises doubts about its reliability as a tool for evaluating critical thinking skills in nursing students (Carter & Welch, 2016; Goodstone et al., 2013; Shinnick & Woo, 2013). In confirming these doubts, two focus groups in the qualitative portions of these studies (Lloyd, 2020; Upshaw, 2016) did not correlate with the quantitative portions that confirmed the positive effect of using unfolding case studies on students' critical thinking. In qualitative focus groups and interviews analysis, most participants stated unfolding case study in traditional classrooms helped them critically think about client clinical problems and functioned better for critical thinking and active involvement than words in PowerPoint slides.

Moreover, the decrease in HSRT scores in the Carter and Welch (2016) study could be attributed to exam fatigue, as ADN participants took the HSRT exam twice (pretest/posttest), the renal exam twice (pretest/posttest), and the musculoskeletal exam twice (pretest/posttest), for a total of six exams over the semester. Students in the Lloyd (2020) study took the HSRT exam twice (pretest/posttest) and three-course content tests, including cardiovascular disorders and

peripheral vascular illness (Exam I) and pulmonary, musculoskeletal, and endocrine disorders (Exam II). Exam III was a non-cumulative exam that included gastrointestinal, neurological, and urinary/renal illnesses, as well as cancer and palliative care. Exam tiredness may have contributed to this researcher's non-statistical data outcomes for the HSRT overall and subscales posttest scores. In the current study, critical care nursing students took the post-test exam in two comparable groups after completing a 6-week study period of 12 sessions of heart health chapter using traditional lectures and unfolding case studies.

Regarding the conflicting results presented in Blakeslee (2019) study, it was observed that there were no statistically significant disparities in the average critical thinking scores of participants within groups (from pretest to posttest) or between the simulation group (consisting of 36 participants) and the comparison group, which utilized written case studies (comprising 33 participants). An analysis of the potential factors contributing to these findings is necessary. The potential cause of this discrepancy may be attributed to the pre-existing variations between the two groups in terms of demographic factors. The group of participants involved in the written case studies exhibited a comparatively advanced age and possessed a greater level of educational attainment in comparison to the simulation group. This demographic disparity may have introduced a potential bias that could have influenced the outcomes. The current study focused on a cohort of students who shared the same age group and background.

Furthermore, Upshaw (2016) found no improvements in study outcomes in a one-simulation lecture-day intervention on chronic obstructive pulmonary disorders (COPD) and pneumonia. The duration of intervention in this study may be insufficient to adequately assess critical thinking using the HSRT instrument, particularly when compared to the six-week intervention in the current study, which encompassed six cardiac health scenarios. HSRT

instrument takes a long time to assess critical thinking due to its nature. The HSRT (Health Science Reasoning Test) assesses critical thinking and complicated problem analysis. Critical thinking is a complicated cognitive process that cannot be assessed by a single assessment or short observation. Critical thinking is not a static trait that can be measured instantly. Through practice and experience, it improves. Thus, employing the HSRT instrument over time allows for an in-depth assessment of an individual's critical thinking skills, capturing any changes or improvements that may occur over time.

Due to the misalignment between the assessment methods used in unfolding case studies and the desired critical thinking outcomes, it is justified to acknowledge that variations in the quality and effectiveness of these case studies may arise. Additionally, the resource-intensive nature of developing and implementing unfolding case studies, including the need for significant time, faculty expertise, and materials, further justifies the feasibility challenges faced by educational institutions in implementing these approaches to foster critical thinking skills.

Despite the varying results obtained from different studies, the outcomes of both the present study on critical care nursing students and previous studies on critical thinking skills were influenced by the principles of social constructivism and the Constructive Theory Model. In unfolding case studies, students cooperate and exchange insights in a non-linear, interpretative learning process assisted by environmental interaction. Students study complicated patient situations to learn through unfolding case studies(Fosnot, 1989a). Social constructivism promotes critical thinking via collaborative activities, conversations, and problem-solving. Learners are pushed to examine, evaluate, and synthesize material by engaging with others and sharing varied perspectives. This approach develops critical thinking abilities including evidence analysis, assumption testing, and reasoning. This social constructivist method integrates critical thinking

with spiral learning through unfolding case studies (Brandon & All, 2010). Spiral learning improves understanding by encouraging students to explore and solidify information, following constructive theory. This concept stresses that learners actively generate knowledge by integrating new information with their prior knowledge and experiences. Through the Constructive Theory Model, students are taught to question their beliefs, study other views, and link ideas. Critical evaluation and analysis are fostered by this process. This method encourages students to apply their skills to real-world issues. Students must examine complex subjects, analyze many possibilities, and draw informed conclusions, which promotes critical thinking. Constructive Theory encourages self-reflection and self-regulation. Students should evaluate and improve their ideas. Metacognition of ideas and learning helps students' critical thinking. Students are urged to critically analyze these situations to comprehend, apply, and create solutions.

5.5 Impact of Unfolding Case Study on Nursing Students` Self-Efficacy

The third hypothesis suggested that “There will be no statistically significant difference in self-efficacy towards critical care nursing topics between students receiving unfolding case studies and conventional classroom teaching students”. The findings of the study showed that the self-efficacy of students in the intervention group improved significantly when they were exposed to unfolding case studies. Therefore, it can be concluded that the utilization of unfolding case studies can be considered an effective learning methodology for enhancing the Self-Efficacy of critical care nursing students.

Numerous scholarly articles corroborate the findings of this study in enhancing nursing students' self-efficacy through the use of unfolding case studies that involved a range of nursing subjects like medical-surgical, pediatric, geriatric, mental, gastrointestinal disorders, and

fundamental health assessments. Likewise, these scenarios stretched beyond nursing topics to incorporate occupational therapy. Most of these articles emphasize the importance of "hands-on" simulation experiences that incorporate Simulation-Based Case Studies, while only a few incorporate classroom instructions. Among them, two were conducted in nursing simulation labs (Ma & Zhou, 2022; Munn et al., 2021), others used online videos of unfolded simulated scenarios with standardized patients (Mills et al., 2014) or mannequins (Jensen, 2023; Leynes-Ignacio, 2023; Powers, 2020), while only two in didactic classrooms (Baker & Blakely, 2023; Peele, 2015). The comparison was undertaken with the same groups utilizing unfolding case scenarios or with other groups employing comparison with lecture-based, static case studies, or simulation-based learning to unfolding case study internet videos.

Moreover, the current study's findings align with prior research, demonstrating that the utilization of unfolding case studies significantly enhances self-efficacy, which further supports the theoretical framework of social constructivism. In the present study, actively participating in realistic scenarios and problem-solving exercises in the traditional classroom, helped students gain practical experience and develop a strong sense of confidence in their abilities. Additionally, the collaborative nature of group discussions promoted interaction and knowledge-sharing among peers, aligning with the principles of social constructivism. These findings were consistent with other studies implemented in simulations utilizing unfolding case studies, where active engagement, collaboration, and experiential learning are emphasized. In Munn et al. (2021) study, 43 undergraduate pediatric nursing course students demonstrated an improvement in knowledge, skills, and confidence in managing emergencies as measured pre and post-participating in both instructor-led and student-led simulations for unfolding case scenarios of abdominal pain and Sickle Cell Anemia. Other studies have found similar benefits from using simulation unfolding

cases, shown by Lin (2016), Khalaila (2014), and by (Ma & Zhou, 2022), who studied health assessment simulation courses in China and found that they were significantly more effective than traditional methods of instruction (24.92 vs. 18.76, P .001).

Congruently, additional studies further validate the findings of the current study and in the context of video-simulated unfolding scenarios. Leynes-Ignacio (2023) used online unfolding case studies in a medical-surgical learning curriculum where the online survey was completed by 166 nursing students with high satisfaction and confidence. Also, in a separate study conducted by Powers (2020), participants recorded a higher level of satisfaction and self-confidence following a classroom intervention that utilized an unfolding video-simulated patient scenario, as compared to high-fidelity laboratory simulations. This phenomenon could potentially be attributed to the fact that it reduced the psychological burden of stress associated with performing in the presence of one's peers. Online video scenarios allow students to learn at their own pace, creating a more relaxed learning atmosphere than lab-based simulations. Students can explore and understand complex subjects without the burden of lab simulations due to this flexibility. Moreover, online video scenarios offer the opportunity for repeated viewing and review, allowing students to build their confidence by revisiting challenging content as many times as needed. This repetitive exposure fosters a sense of mastery and self-efficacy. The enhancement of satisfaction levels was also evidenced in other studies utilizing video filming of unfolding case studies within a simulated clinical environment utilizing standardized patients in a hospital ward environment as in Mill's (2014) study, or in studies of other allied health disciplines like Jensen (2023) study who examined the effects of an unfolding case study on clinical skill self-efficacy and engagement with online course content compared to a static case study among occupational therapy doctorate students.

Also, in Jensen's study, the unfolding case study format got more page views than the static case study approach in both courses.

Similarly, two other previous studies conducted in traditional classrooms validated the conclusions of this study (Baker & Blakely, 2023; Peele, 2015). Baker and Blakely (2023) did a pilot investigation that examined 20 University of Alabama at Birmingham nurse practitioner (NP) students' self-efficacy in caring for community-dwelling older individuals. Results indicated that after completing an obligatory unfolding case study assignment, students' GSE and CCDOASES self-efficacy levels increased, according to paired t-test analysis. The CCDOASES self-efficacy tool exhibited greater statistical significance than the GSE tool since it was able to accurately capture intricate details of the unfolding case study. These findings demonstrate the effectiveness of the unfolding case study in increasing student self-efficacy. The same conclusion was depicted in Peele's (2015) study with a second-year graduate with 17 associate degrees in nursing in a complex health concepts course. Collaboration groups of students were formed in the classroom using unfolded PowerPoint presentations. The one-group pretest-posttest descriptive design utilizing a paired t-test showed statistically significant differences in self-efficacy levels ($P < .024$).

However, contrary to popular belief, a traditional written case study in a standard classroom setting may have the same effect as a video-simulated unfolding case study when it comes to teaching methods. A study conducted by Herron et al. (2019) aimed to compare the effectiveness of a video-simulated unfolding case study with a traditional written case study in a classroom setting. Although the intervention group exhibited higher levels of overall satisfaction and self-confidence, these differences were not statistically significant ($p = 0.32$, $p = 0.95$, respectively). Moreover, the written comments provided by the intervention group indicated a notable

improvement in their level of engagement with the learning process, namely through the utilization of visualization techniques to comprehend the patient and the corresponding treatment required.

Previous case studies, including written narratives and video simulations, implemented in both traditional classroom and nursing simulation contexts, consistently show their remarkable effectiveness in boosting nursing students' self-efficacy. This congruence in results across multiple locations and modalities supports the present research, which uniquely implements unfolding case studies in a typical classroom. The present research highlights the robust and versatile nature of unfolding case studies as a pedagogical strategy for enhancing self-efficacy in nursing education, validating their potential impact on student learning and confidence.

Furthermore, in contrast to the findings of the current study, a prior study conducted by Becnel (2022) revealed that there was no statistically significant difference in overall self-efficacy between nursing students who actively engaged in simulation-based case studies and those who attended a conventional lecture using PowerPoint slides on patients with gastrointestinal diseases. The research findings showed that simulation-based case studies were linked to marginally lower general self-efficacy scores in comparison to students who participated in conventional lectures. These results could be attributed to the fact that the tool used in this study assessed general self-efficacy and did not specifically assess self-efficacy in demonstrating nursing duties, which was a focus of the simulation intervention unlike the specific assessment tools employed in previous studies conducted by Baker (2002) and Al-Kalaldeh and Al-Olime (2022), which were tailored to nursing interventions. Also, the research participants may have been unfamiliar with classroom simulation-based case studies. Working with groups of students and a new teaching method may have produced stress. This aspect could help explain the lack of a significant difference between the groups.

Additionally, Al Gharibi et al. (2021) conducted a quasi-experimental study using a one-group repeated measures design to assess the impact of repeated simulation case scenarios with debriefing on self-efficacy among nursing undergraduates' topics like post-partum hemorrhage and acute pneumonia. The study results demonstrated a drop in self-efficacy subsequent to the original simulation, followed by a noteworthy enhancement in self-efficacy among students after engaging in a repeated simulation experience. This may be due to the fact that the mid-test occurred shortly after the original simulation experience and before the debriefing session, where the progression and complexity of the scenarios were discussed. On the other hand, the post-test was administered after the second scenario had been completed, where students repeated the same simulation case scenario, thereby adding to their experience and contributing to enhanced learning outcomes.

To conclude, the lack of sufficient unfolding case studies investigating the influence of various teaching methods in the classroom on self-efficacy underscores a research gap within this domain, particularly in didactic classroom settings. Therefore, the results of the present study contribute significantly to nursing education by exploring the impact of unfolding case studies on the self-efficacy of critical care nursing students within traditional classroom environments, potentially offering novel insights into enhancing learning outcomes.

All these conclusions are in accordance with principles drawn from the theoretical framework of social constructivism. Within this framework, the use of unfolding case studies facilitates the creation of an atmosphere that nurtures the growth of self-efficacy among students. These case studies provided students with real-life scenarios that require problem-solving, decision-making, and the application of existing knowledge. The challenges and uncertainties within these cases promote collaborative learning, social interactions, modeling, contextualized

learning, progressive complexity, and feedback. As students experience success, and mastery skills, and achieve milestones within the unfolding case studies, their confidence in their abilities and self-efficacy beliefs are enhanced, which is seen as a fundamental component of the constructivist paradigms. This increased self-efficacy positively impacts their motivation, engagement, and overall learning outcomes, aligning also with the principles of Bandura's theoretical frameworks (Alt, 2015; Bandura, 1977, 1986; Business Bliss Consultants FZE, 2018 ; Gerberry, 2023; Peele, 2015).

5.6 Exploring the Correlations Among Study Variables

Researchers may investigate variable correlations to detect data patterns and trends. The measurement of Grade Point Average (GPA) in the majority of research is often based on academic achievement (Al-Alawi et al., 2020; Bokan et al., 2020). The correlation between the GPA and the post-test knowledge acquisition score in both the traditional lecture and experimental unfolding case study groups indicates a strong relationship (0.749 and 0.751 respectively for both groups, $P < 0.001$). This suggests that students with a strong academic foundation may have an advantage in acquiring and retaining new knowledge, regardless of the instructional method employed. Despite the existence of the correlation, it is essential to recognize that it does not necessarily imply causation.

The consistent findings of no correlation between demographic factors such as age and gender with knowledge acquisition, both in conventional and experimental interventions, along with the higher knowledge acquisition scores observed in the experimental group compared to the conventional group, regardless of age and gender, further support the notion that these results are attributed to the utilization of creative and innovative teaching methods.

Also, this study found no significant relationship between any of the demographic variables such as age and gender and GPA with critical thinking and self-efficacy post-test scores. This finding is consistent with that of Shirazi and Heidari (2019) who found no correlation between age, GPA with critical thinking test scores. Likewise, in a study conducted by Peele (2015), the analysis using Pearson's correlations (r) showed no statistically significant associations between demographic variables and students' self-efficacy scores in health teaching. This suggests that factors such as age and gender did not have a significant impact on students' self-efficacy in this particular context.

Other examined correlations in the study revealed that the conventional group had a weak relationship between self-efficacy and critical thinking ($r = 0.118$) and was not statistically significant ($P > 0.05$). These findings suggest that traditional learning methods often prioritize the memorization of facts and adherence to established procedures. As a result, students may have limited autonomy and independence in their decision-making processes. The absence of chances to actively engage in problem-solving and decision-making can impede the growth of critical thinking. This constraint can result in feelings of uncertainty and self-doubt, ultimately resulting in diminished self-efficacy (Salari et al., 2018). On the other hand, the experimental group that employed the unfolding case study as a teaching approach had a strong correlation coefficient of 0.695 and a p-value of less than 0.001. This result can be explained that critical thinking boosts self-efficacy, particularly in using innovative instructional approaches such as unfolding case studies. It helps nursing students think independently, be fair and insightful, and develop perseverance, curiosity, and confidence. This helps students overcome new problems and make judgments under pressure, building confidence in their capacity to handle complexity (Gholami et al., 2021; Ma & Zhou, 2022; Papathanasiou et al., 2014). These results suggest that the use of the

unfolding case study approach in teaching can enhance student's critical thinking skills and self-efficacy and it could be a useful instructional strategy to incorporate in classroom teaching.

The substantial correlation between critical thinking and self-efficacy in unfolding case studies of the present study corresponds to social constructivism and constructive theory model that may be due to their mutual effect and interaction (Bandura, 1997). Through active participation in critical thinking exercises embedded within unfolding case studies, learners cultivate problem-solving abilities, enhance analytical thinking capacities, and acquire the aptitude to assess and integrate information. The acquisition of these abilities enhances individuals' perception of self-efficacy, as they come to recognize their ability to proficiently address intricate challenges (Nold, 2017). On the other hand, as individuals progress in their learning journey, their self-efficacy tends to strengthen, leading to an increased inclination to participate in critical thinking endeavors with a feeling of assurance and drive. The correlation between critical thinking and self-efficacy is mutually reinforcing, bolstering both conceptions and resulting in improved educational achievements.

5.7 Strengths and Limitations of the Study

5.7.1 Strengths

The study possesses several notable strengths that contribute to its robustness and credibility. Strengths include the following:

1- The present study is set to involve students currently enrolled in critical care nursing theory classes, a choice motivated by their demonstrated proficiency in data interpretation and possession of critical thinking abilities who possess the elementary fundamental knowledge skills (pharmacology 1 &11, anatomy and physiology, growth

and development, therapeutic communication skills, medical-surgical I and 11). These selected participants are expected to bring a high level of expertise to the study. Their competence in interpreting data encompasses the nuanced understanding of patient medical records, laboratory findings, vital signs, and other clinical information, which is of paramount importance in the realm of healthcare, especially within the demanding context of critical care. Additionally, their strong critical thinking skills are anticipated to play a pivotal role in the study, aiding in the assessment of patient needs, identification of potential issues, and the development of well-informed and timely interventions.

2- This study represents the first interventional study conducted in Palestine, which aims to assess the impact of utilizing unfolding case studies on student knowledge acquisition, critical thinking skills, and self-efficacy. Given the advantageous implications of the study's findings, it appears that the study holds potential utility for similar nursing schools situated in the Palestinian context.

3- The support from the nursing faculty and university leadership for my study and its results. The fact that the AAUP places a strong emphasis on evidence-based decisions demonstrates its commitment to providing the best education for nursing students. Moreover, the university's provision of a robust curriculum for nursing students highlights their dedication to excellence in education. By applying evidence-based research, the current study would have the opportunity to enhance outcomes and make a positive impact on the future of nursing.

4- The study's strength lies in its substantial 6-week duration, during which it extensively employed six distinct case scenarios presented as unfolding case studies. This approach generated valuable insights into long-term outcomes and learning experiences. Also,

the study rigorously adhered to a structured methodology of unfolding case studies, utilizing realist case scenarios derived from authentic clinical settings, thus ensuring a high degree of real-world relevance and validity.

5- Using a quasi-experimental design is the chief strength of this study (Nair, 2019). Another strength is the study's multistage cluster assignment of classes to experimental and conventional groups. This practice reduces selection bias by making the groups comparable in observed and unobserved characteristics, improving research internal validity. Multistage sampling reduces the time and resources needed to collect data from the complete population by picking clusters at various phases. Multistage sampling ensures population representation by randomly selecting clusters at each stage. This improves results generalizability (Elfil & Negida, 2017).

6- To maintain the integrity of a research study, measures were taken to minimize potential biases. To eliminate unforeseen temporal effects, the knowledge test was administered to both the experimental and conventional groups on the same day and at the same time in a single venue. This ensured the interventions were administered fairly and consistently.

7- In this study, a researcher who was not the course instructor had to administer the interventions to ensure objectivity and credibility. This approach aimed to minimize unintended bias from skewing the study's results. The study separated researcher and instructor roles to reduce bias and maintain scientific integrity. Participants were also told that the knowledge acquisition exam would not affect their course results. This approach was deliberately designed to encourage voluntary involvement and eliminate academic pressure. This ethical framework ensures informed consent and a transparent, equitable research environment.

8- The study analyzed nursing students' knowledge acquisition using the NCLEX-RN® exam, which emphasizes critical thinking skills aligned with Bloom's Taxonomy high-level domains of applying, analyzing, evaluating, and creating. The NCLEX-RN® exam tests factual knowledge retention, application in complex clinical scenarios, critical analysis of patient data, evaluation of interventions, and innovation. Critical thinking and self-efficacy are also assessed in this study. Two valid and reliable questionnaires measure these variables. The YCTD scale and NCLEX-style quizzes assess critical thinking directly and indirectly. This comprehensive approach ensures that nursing candidates have the knowledge, critical thinking, and self-efficacy to succeed in the dynamic and challenging field of nursing.

5.7.2 Limitations

The current study acknowledged several limitations that impact the generalizability of its findings and warrant further investigation in future research.

1- One potential limitation of this study could be the exclusive utilization of a single educational setting that may potentially constrain the extent to which the findings can be generalized to broader populations.

2- The scope of this study was limited to examining a single chapter about cardiac health within the critical care nursing curriculum. The potential for conducting a comprehensive examination of course chapters to examine the outcomes of student performance throughout the critical care course would have resulted in a more robust approach to data collection, analysis, and interpretation.

3- The availability of authentic unfolding case studies that are both feasible and span across diverse specialties remains notably scarce. This scarcity presents a significant challenge for educators and nursing faculty seeking to enrich their curriculum with dynamic and relevant teaching materials. Academic professionals, specifically faculty members, may face challenges when it comes to developing cases that effectively balance the promotion of students' critical thinking abilities while maintaining authenticity. The task of creating such cases can be difficult, as it necessitates a deep understanding of clinical practice across various healthcare domains and a commitment to maintaining the real-world complexities that students will eventually encounter in their professional careers.

4- Another challenge that arises is the need to ensure the active participation of all learners during group discussions within the unfolding case study. Certain students may tend to be more reserved or passive in their participation, which could potentially impede their ability to acquire knowledge. To effectively tackle these challenges, it is imperative to establish explicit guidelines for engagement, cultivate a nurturing and all-encompassing educational milieu, and provide supplementary materials or exercises that accommodate various learning preferences.

5- Another limitation is the intensive preparation requirements, which necessitate significant effort on the part of instructors, who must conduct research and develop appropriate materials, consult with and receive peer review from experts in order to meet the study objectives and course material.

5.8 Conclusion

Nursing education experts persistently advocate for nurse educators to implement substantial modifications to the current nursing pedagogy to ensure that future nurses are not only knowledgeable but also competent in meeting evolving healthcare challenges. The challenges in healthcare today are more demanding than ever before, with patients requiring higher levels of care, rapidly evolving technology, and nurses carrying greater responsibilities. Nurse educators play a crucial role in providing the best possible education to equip tomorrow's nurses for these challenges. The emphasis on bridging the gap between theoretical learning and clinical practice, by integrating clinical experiences into the classroom, has been a recurring theme. This study represents the first investigation conducted within the specific context of Palestine. Palestine presents a unique situation characterized by political and economic instability, which often hinders nursing students from accessing clinical areas. Furthermore, the presence of injuries and casualties necessitates that nurses be adequately prepared to deliver prompt and exceptional healthcare services. Within this context, the incorporation of unfolding case studies as a teaching strategy emerges as a promising avenue through which nurse educators can respond to this imperative.

This study demonstrated that the use of unfolding case studies is an effective innovative teaching strategy that nurse educators can use to help engage undergraduate nursing students in active learning and critical thinking. The results of this study indicated the use of an unfolding case study enhanced critical care nursing students' knowledge acquisition, critical thinking, and self-efficacy in the Nursing Faculty of AAUP in Palestine. Although positive student outcomes have been achieved, it is important to acknowledge that this is just the initial phase in which nursing education must initiate transformative measures. Nurse educators need to think about the

utilization of unfolding case studies as a pedagogical approach within the context of a conventional classroom setting.

Additional research is required to investigate the effects of implementing unfolding case studies on other outcomes. This study aims to make a valuable contribution to the field by empirically identifying and examining specific strategies that have the potential to improve the learning experiences of students. Moreover, conducting an in-depth analysis of student perspectives to incorporate their input into nursing education would serve as an additional approach to shaping the discipline of nursing education. As ongoing improvements persist, the nursing graduate is ultimately being shaped into a proficient and certified nurse, ready to embark on a career dedicated to providing care for individuals. Every nurse possesses the ability to exert a significant influence on the well-being and experiences of individuals. Through the implementation of improved education and training methods, it is possible to significantly alter the potential impacts on patients' lives, resulting in more advantageous outcomes.

5.9 Implications for Nursing Education, Practice, and Administration

The current study evaluated the impact of applying unfolding case study learning on knowledge acquisition, critical thinking, and self-efficacy among nursing students enrolled in the critical care health nursing course at Arab American University/ Palestine (AAUP).

AAUP has made a significant advancement by exploring the utilization of unfolding case studies as an instructional method in undergraduate nursing curricula. Through their extensive research, AAUP has become the first academic institution to thoroughly examine the impact of this innovative teaching method. This study's findings suggested several implications for nursing education, nursing practice, and nursing administration

5.9.1 Nursing education

The study's conclusions emphasize the importance of using unfolding case studies in nursing education and instruction. Many instructors recognize the practicality of unfolding case studies in preparing nursing students for the real world. Students use unfolding case studies to examine, synthesize, and apply information to complex patient situations. Active learning promotes understanding and knowledge retention.

Students are additionally provided with the chance to explore and unveil original perspectives and explore new information by employing unfolding case studies. During the practice of these scenarios, students might encounter conditions, treatments, or approaches to care that are unfamiliar to them. Students are motivated to seek additional resources and engage in inquiry to enhance their understanding, as this introduction to unique information stimulates curiosity.

Unfolding case studies may provide insights to researchers, academics, and learning institutions. The practical and immersive approach to teaching and learning lets students actively analyze and solve difficult patient problems. This strategy may help instructors to investigate student engagement with difficult patient situations and reveal knowledge gaps and research shortages. Also, Students may meet issues not addressed in current nursing literature or recommendations as they go through these scenarios. This might indicate the need for further nursing practice research and investigation, resulting in new knowledge and evidence-based practices.

The use of unfolding case studies within conventional classroom settings has shown significant value in the context of assessments and evaluations of the nursing process, hence

playing a crucial role in improving the overall quality of nursing education and patient care. By providing true patient scenarios, instructors may assess students' ability to apply theoretical knowledge to real-world situations, discover understanding gaps, and provide suggestions for improvement. This kind of assessment goes beyond exams and quizzes to assess students' problem-solving and healthcare knowledge. Through identifying strengths and weaknesses, educators may modify their teaching methods and give additional help in areas that need development. The insights gained by assessing students' case study progress may help enhance the curriculum, ensuring that the subject content and educational opportunities meet evolving healthcare sector needs.

This research emphasizes the importance of nursing in facilitating a smooth transition from theoretical knowledge to practical application, which benefits students and the nursing field as a whole by bridging the gap between theoretical understanding and real-world implementation. By applying their theoretical knowledge to real-world scenarios, students are motivated to recognize the immediate significance and practicality of what they have learned. Also, the nursing curriculum generally emphasizes theoretical concepts, which might distance students from clinical reality. Unfolding case studies allow students to apply theoretical knowledge to real-life patient problems. This integration, help students develop a more comprehension in understanding of nursing principles enabling them to cultivate a holistic perspective.

Integrating unfolding case studies into normal classrooms creates a safe and interesting learning environment, improving students' knowledge, critical thinking, and self-efficacy. Evidence suggests that critical thinking skills increase the likelihood of passing the NCLEX-RN on the first try (Kaddoura et al., 2017). Evaluation of case studies helps nursing students make decisions. They learn to prioritize patient care, explore treatment alternatives, and make evidence-

based clinical decisions. Students learn how to apply theoretical knowledge to clinical problems by actively participating in actual patient scenarios. This innovative approach helps students grasp healthcare's intricacies and develop the skills and self-efficacy to manage tough circumstances.

Moreover, unfolding case studies' collaborative character encourages communication and teamwork, which are essential for aspiring healthcare professionals. Group conversations teach nursing students how to interact, exchange knowledge, and coordinate patient care, improving collaboration and communication. When working in teams, students get various viewpoints and ideas. This increases their learning by exposing them to different patient care methods, improving their healthcare understanding. Immersive exposure to complicated patient care situations in a controlled context prepares students for future professional difficulties and nursing education contributions.

5.9.2 Nursing practice

Unfolding case studies in traditional classrooms among critical care nursing students provides a deeper level of understanding and preparation for nursing practice. These case studies offer a dynamic and interactive learning experience that goes beyond conventional lectures and textbook knowledge. By engaging with realistic patient scenarios, students are exposed to the complexities and uncertainties of critical care settings, allowing them to develop the necessary skills to think critically and make informed decisions in high-pressure situations.

Furthermore, the use of theoretical knowledge in the context of practical situations through unfolding case studies facilitates the establishment of connections and bridge the gap between academic concepts and their practical implementation. Actively interacting with unfolding case studies helps students comprehend the topic and its practical applications. They learn to critically

analyze, examine many views, and make evidence-based and best-practice judgments. This prepares students for practical problems where they must utilize theoretical knowledge to offer safe and effective patient care.

In a traditional classroom, students see instances that may not be accessible in clinical settings. This lets students experience more situations and learn more about critical care nursing. Student practice without injuring patients is also possible in unfolding case studies. This prevents patients from mistakes and gives students confidence before entering the clinical environment.

In addition, the use of unfolding case studies serves to promote a comprehensive approach among students, fostering their ability to contemplate the many dimensions involved in the practical world of patient-centered care. Healthcare professionals acquire the ability to evaluate not just the physiological condition of individuals, but also their mental, emotional, and social well-being. The comprehensive nature of this approach is indicative of the actualities of nursing practice, as the provision of patient care goes beyond mere medical treatments to embrace the holistic well-being of patients and their families.

Moreover, the use of unfolding case studies serves to enhance the development of effective communication and teamwork skills among the cohort of critical care nursing students. Students acquire the ability to collaborate effectively within an interdisciplinary framework, actively interacting with healthcare practitioners from many fields in order to provide complete healthcare services. The aforementioned collaborative method is in accordance with the prevailing tendency in the healthcare field, whereby significance of cooperation and proficient communication is paramount in delivering secure and efficient patient care.

5.9.3 Nursing administration

Unfolding case studies among critical care nursing students have significant implications for nursing administration. The findings of this study provide great potential for nursing administrators in Palestine, as they present compelling reasons for the adoption of policies that promote the incorporation of unfolding case studies into nursing curricula. The study demonstrates that this educational approach facilitates the acquisition of fundamental nursing skills in a safe, controlled environment. This raises education standards and upholds global healthcare ideals including patient safety and excellent care.

Additionally, by integrating unfolding case studies into the curriculum, nursing administration may effectively enhance the preparedness of future nurses to manage the challenges associated with critical care nursing. Through active participation in realistic patient situations, students can enhance their clinical abilities while also acquiring a more profound comprehension of the intricate and demanding circumstances encountered by nurses in critical care environments. This heightened level of preparedness among graduates can lead to a more competent and confident nursing workforce. Nursing administrators can anticipate improved staff readiness, potentially reducing the orientation and training periods for new hires.

Additionally, the implementation of unfolding case studies is vital in cultivating effective communication and collaboration abilities among students. This is achieved through the frequent participation of students in team-oriented exercises that require them to analyze and develop all-encompassing treatment approaches for simulated patients. Students gain a better understanding of the functions and responsibilities of diverse healthcare professionals and acquire the skills necessary to collaborate efficiently with them through their participation in these case studies. Case

studies of this nature can be utilized by nursing administrators to furnish students with the requisite expertise and competencies to participate in cohesive interprofessional collaboration. This, in turn, empowers students to develop into proficient leaders and administrators.

Moreover, the use of data and insights derived from unfolding case studies by nursing administration may serve as a means to discover potential areas of enhancement within the curriculum, teaching methodologies, and assessment approaches and serves to strengthen the importance attributed to evidence-based practice. The continuous assessment and improvement process aids in maintaining the nursing program's relevance, responsiveness, and alignment with the dynamic requirements of the critical care nursing field. Through a process of impact evaluation, nursing educators are able to make well-informed decisions concerning the curriculum integration of these strategies.

5.10 Recommendations

Baccalaureate nurses play a pivotal role as primary practitioners within healthcare settings, assuming responsibilities that demand a high level of clinical expertise and critical thinking skills. This increased prominence of baccalaureate nurses underscores the importance of nursing education in producing graduates who are not only well-prepared but also equipped to navigate the complexities of contemporary healthcare. In light of the findings from this study, several recommendations come to the forefront

1- Given the demonstrated efficiency in enhancing knowledge acquisition, critical thinking, and self-efficacy through the practice of unfolding case studies in this study, it is imperative to incorporate this innovative methodological approach into the nursing curriculum, extending its application beyond the cardiac chapter within critical care.

This experience should be expanded to include multiple chapters and replicated across other subjects and cohorts within the nursing curriculum, as it is critical in preparing students to pass the Next Generation NCLEX-RN exam

2- The utilization of unfolding case studies in the current study with critical care nursing students, who have already completed courses in adult 1 & 11, pharmacology, microbiology, fundamentals of nursing, and communication skills, not only demonstrated its effectiveness when integrated at this stage but also highlights the potential benefits of introducing it at an earlier stage, such as in the first year of nursing programs, to nurture competency skills progressively. Simpler cases should be used in the beginning to develop fundamental skills, and as students advance, more complex cases should be introduced gradually. This incremental approach would empower students to master essential skills from an early stage, ensuring the delivery of high-quality patient care and the ability to respond effectively to the complexities of healthcare.

3- In order to ensure the successful implementation of unfolding case studies, it is imperative to have an appropriate environment. This includes having larger class sizes are essential to facilitate group discussions, and roundtable sessions, and allocate sufficient lecture time for discussions and reflections to allow for a thorough exploration of unfolding case studies. Unfolding case studies may improve student learning, critical thinking, and nursing education by ensuring these characteristics are in place

4- The integration of unfolding case studies into the nursing education curriculum necessitates comprehensive preparation and strategic planning. Teachers must be trained to create unfolding case studies and relevant situations that support learning objectives. Faculty members who are adequately trained and possess the necessary expertise can effectively maximize learning benefits for students. Conversely, unprepared instructors can negatively impact student learning.

5- The imperative lies in the creation of a nursing-specific instrument that is both valid and reliable, capable of accurately assessing the critical thinking capacities of nursing students. An instrument of this nature would be crucial in capturing the intricate competency skills that are vital for the provision of nursing healthcare.

6- Replicating the current study using a representative sample of universities in Palestine would increase the generalizability of the results. The design of a mixed-methods, qualitative, and quantitative study will examine the benefits and obstacles associated with the development of unfolding case studies.

7- This study solely concentrated on assessing knowledge acquisition, critical thinking, and self-efficacy outcomes. Consequently, future research endeavors should be undertaken to investigate the influence of various variables such as teacher factors, student characteristics, and educational practices, technology integration, resources and facilities, clinical case complexity on a broader range of learning outcomes, including problem-solving abilities, self-regulation, and anxiety, peer interactions, and emotional intelligence. To achieve this, a larger sample size, an increased number of scenarios, and the inclusion of students at all levels of nursing education should be considered.

8- Another area of future research that is worth considering is the investigation of the appropriateness of utilizing unfolding case studies in actual clinical settings. The present study reported an increase in knowledge acquisition, critical thinking skills, and self-efficacy following the unfolding case scenario. However, it remains uncertain whether these outcomes are sustained in actual clinical practice.

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Appendices

Appendix A: Institutional Review Board (IRB)

Arab American University- Palestine
Deanship of Scientific Research
IRB committee
Tef 04-241-8888, ext 1196
E-mail: irb.aaup@aaup.edu

الجامعة العربية الامريكية- فلسطين
عمادة البحث العلمي
لجنة أخلاقيات البحث العلمي
تلفون: 1196 ext 04-241-8888
البريد الالكتروني: irb.aaup@aaup.edu

IRB Approval Letter

Study Title: The Impact of Applying Unfolding Case Study Teaching Methods on Critical Care Nurses Students Knowledge, Critical Thinking and Self-Efficacy; A Quasi- Experimental Study

Submitted by: Maysa Fareed Awad Kassabry

Date received: 6th April 2023

Date reviewed: 1st May 2023

Date approved: 12th May 2023

Your Study titled "**The Impact of Applying Unfolding Case Study Teaching Methods on Critical Care Nurses Students Knowledge, Critical Thinking and Self-Efficacy; A Quasi-Experimental Study**" With archived number 2023/A/103/N was reviewed by the Arab American University IRB committee and was approved on 12th May 2023.

Reham Khalaf-Nazzal, MD, PhD
IRB committee chairman
Arab American University of Palestine

IRB
ARAB AMERICAN UNIVERSITY

General Conditions:

1. Valid for 8 months from date of approval.
2. It is important to inform the committee with any modification of the approved study protocol.
3. The committee appreciates a copy of the research when accomplished.

لجنة اخلاقيات البحث العلمي في الجامعة العربية الامريكية

IRB at Arab American University

Appendix B: Permission letter of the faculty Nursing Dean

Arab American University
Faculty Of Nursing

الجامعـــة العربيـــة الأمريكيـــة
كلية التمريض

Subject: Permission to Commence PHD application.
Date: 12/5/2023

Dear Ms. Maysa Kassabry/ PhD nursing Candidate,

I am pleased to inform you that, as the Dean of the Nursing College, I have granted my approval for you to begin your PhD project which is titled: "The Impact of Applying Unfolding Case-study Learning on Critical Care Nursing Students` Knowledge, Critical Thinking and Self-Efficacy; A Quasi-Experimental Study". After obtaining the necessary approval from our university's IRB, you are now approved to begin your research with the 150 nursing students who are already enrolled in Advanced nursing theory, as outlined in your proposal.
I am confident that your research will contribute greatly to the field of nursing, and I wish you the best of luck in your studies.

Best regards,
Dr. Lobna Harazni

كلية التمريض
FACULTY OF NURSING

Dean, Faculty of Nursing, Arab American University Palestine
Assistant professor
Phone: +972 598930348
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Tel: +970 4 241 8888- Ext.1211
E-mail: lobna.harazni@aaup.edu

Appendix C: Informed consent (English version)

Arab American University
Scientific Research Deanship
Ethical Review Committee

الجامعـــة العربيـــة الأمريكيـــة
عمادة البحث العلمي
لجنة اخلاقيات البحث العلمي

INFORMED CONSENT

AAUP-IRB Code No.: …2023/A/103/N….
AAUP-IRB Date: …12/5/2023…….

I, ……..……..... ***(Name of Participant / optional)*** **hereby agree to take part in the clinical research (clinical study/questionnaire study/drug trial) specified below:**

Title of Study: ..……
"The Impact of Applying Unfolding Case Study Teaching Methods on Critical Care Nursing Students` Knowledge, Critical Thinking and Self-Efficacy; A Quasi-Experimental Study"
Fulfillment of ……PhD ……..…… degree, in ……Philosophy of Nursing…….., in AAUP.
(Name of program)

The nature and purpose of which has been explained to me by ……Maysa Kassabry..…..…., and interpreted by …Maysa Kassabry…….. to the best of his/her ability in English.

I have been told about the nature of the research in terms of methodology, possible adverse effects, and complications (as per the Participant Information Sheet).
After knowing and understanding all the possible advantages and disadvantages of this research, I voluntarily consent of my own free will to participate in the clinical research specified above.
I understand that I can withdraw from this research at any time without assigning any reason whatsoever.

Date: ……..….. **Signature: ……..……**
(Participant)

IN THE PRESENCE OF:

Name: …Maysa Fareed Awad Kassabry…

Designation: the researcher, Maysa…..…… Signature: Maysa Kassabry…

(Witness for Signature of Participant)

I confirm that I have explained to the patient the nature and purpose of the above-mentioned research.

Date: …13/5/2023…. Signature: …Maysa……
(Attending investigator)

For more information:
E-mail: Maysa.kassabry@aaup.edu
Mobile: 0599878675

Appendix D: Yoon`s Critical Thinking Disposition Permission

From: 신현숙(간호학과) <hsshin@khu.ac.kr>

To: Maysa Kassabry <maysa.kassabry@aaup.edu>

Date: Wednesday, March 15, 2023, 11:45:22 PM

Subject: Permission Granted to Use YCTD in Your Research

Hello Maysa Kassabry,

I hope this email finds you well. I wanted to personally thank you for reaching out to me regarding the use of the YCTD (Yoon's Critical Thinking Disposition) scale. I am delighted to hear that you are interested in incorporating this scale into your research.

I am more than happy to grant you permission to use the YCTD scale for your research purposes. Please ensure that proper citation is included when referencing the scale in your work, as it acknowledges its origin and gives credit where it's due.

If you have any questions or require any further assistance, please do not hesitate to reach out at any time. I am here to support and provide any information you may need.

Thank you once again for considering the YCTD scale for your research. I wish you all the best with your study and look forward to hearing about your findings.

Warm regards,

Hyunsook Shin, PhD, RN, CPNP-PC, FAAN

Phone: 82-2-961-9141

E-mail: hsshin@khu.ac.kr

Professor, College of Nursing Science, Kyung Hee University

AI-MUVEs: healthcaresimulation.khu.ac.kr

Global health project: brightkyr.khu.ac.kr

Appendix E: Participant demographic data

Student serial number: ……

Personal information

1. Gender

   a. ☐ Male b. ☐ Female

2. Age: …….

3. Current Grade Point Average (GPA) …….

4. Are you currently enrolled as an upgrading student or a traditional student?

   a. ☐ Upgrading b. ☐ Traditional

5. Are you retaking this course, or is this your first attempt?

   a. ☐ Retaking the course. b. ☐ First time

Appendix F: Knowledge Acquisition Test

THE ARAB AMERICAN UNIVERSITY

Advance Health Nursing
(170114110)

Quiz one

MAY …, 2023

ID: _____
Name: _____
Section: _____

Instructions:

- Turn off your mobile phone
- Time:
- Inquiries are only allowed during the first (15) minutes of exam time
- Use the space provided. In case you need more space, you could use the back of the page.
- Answer all questions.

Total Number of Questions (20)

Best of Luck

Ms. Maysa Kassabry

QUESTION NO. 1 (20 POINTS)

Please select the correct answer from options a, b, c, and d and write it in the answer box on the final page.

1. Which of the following actions is the priority of care for a client exhibiting signs and symptoms of coronary artery disease?

A) Decrease anxiety

B) Enhance myocardial oxygenation

C) Administer sublingual nitroglycerin

D) Educate the client about his symptoms

2. Which information given by a patient admitted with chronic stable angina will help the nurse confirm this diagnosis?

A) The patient states that the pain "wakes me up at night."

B) The patient rates the pain at a level 3 to 5 (0 to 10 scale).

C) The patient states that the pain has increased in frequency over the last week.

D) The patient states that the pain "goes away" with one sublingual nitroglycerin tablet.

3. The client asks the nurse how nitroglycerin should be stored while traveling. What is the nurse's best response?

A) "You can protect it from heat by placing the bottle in an ice chest."

B) "It's best to keep it in its original container away from heat and light."

C) "You can put a few tablets in a resealable bag and carry it in your pocket."

D) "It's best to lock them in the glove compartment to keep them away from heat and light."

4. The patient reports taking medication for hypertension and hyperlipidemia but admits to being noncompliant with the medication regimen. The patient's blood pressure is 150/90

mmHg, and the heart rate is 80 bpm. Which of the following risk factors is most strongly associated with the development of stable angina in this patient?

A) Age.

B) Hypertension.

C) Hyperlipidemia.

D) Type 2 diabetes mellitus.

5. Which statement indicates to the nurse that the client understands sublingual nitroglycerin medication instructions?

A) "I will take up to five doses every 3 minutes for chest pain."

B) "I can chew the tablet for the quickest effect."

C) "I will keep the tablets locked in a safe place until I need them."

D) "I should sit or lie down after I take a nitroglycerin tablet to prevent dizziness."

6. A nurse teaches a patient with a history of angina who has had a total knee replacement. Which statement would the nurse incorporate into this patient's pre-rehabilitation activity teaching?

A) “Use analgesics before and after activity, even if you are not experiencing pain.”

B) “Let me know if you start to experience shortness of breath, chest pain, or fatigue.”

C) “Do not take your prescribed beta blocker until after you exercise with physical therapy.”

D) “If you experience knee pain, ask the physical therapist to reschedule your therapy.

7. After the nurse teaches the patient about the use of carvedilol (Coreg) in preventing anginal episodes, which statement by a patient indicates that the teaching has been effective?

A) “Carvedilol will help my heart muscle work harder.”

B) “It is important not to suddenly stop taking the carvedilol.”

C) “I can expect to feel short of breath when taking carvedilol.”

D) “Carvedilol will increase the blood flow to my heart muscle.”

8. The nurse suspects that the patient with stable angina is experiencing a side effect of the prescribed drug metoprolol (Lopressor) if the

A) the patient is restless and agitated.

B) blood pressure is 90/54 mm Hg.

C) The patient complains about feeling anxious.

D) heart monitor shows normal sinus rhythm.

9. Nadolol (Corgard) is prescribed for a patient with chronic stable angina and left ventricular

dysfunction. To determine whether the drug is effective, the nurse will monitor for

A) decreased blood pressure and heart rate.

B) fewer complaints of having cold hands and feet.

C) improvement in the strength of the distal pulses.

D) participation in daily activities without chest pain.

10. A client with Prinzmetal's (variant) angina is receiving treatment with nitrates and calcium channel blockers. During the assessment, the nurse finds that the client has a history of smoking, hyperlipidemia, and hypertension. Which of the following interventions should be included in the care plan?

A) Administer beta-blockers.

B) Encourage smoking cessation.

C) Modify the diet to include high-fat foods.

D) Encourage a sedentary lifestyle.

11. The patient has a total cholesterol of 190 with a high-density lipid (HDL) of 110 and a low-density lipid (LDL) of 80. The nurse's reaction is one of:

A) Satisfaction. This is good cholesterol control.

B) Determination. This is evidence that more instruction is necessary.

C) Inquiry. This needs to be clarified as to the cause of noncompliance with the drug protocol.

D) Regret. This shows very poor cholesterol control.

12. When a 57-year-old male patient comes to the clinic for a periodic check-up, he receives a diagnosis of angina pectoris, with no subsequent cardiac involvement. His healthcare provider prescribes nitroglycerin. What explanation would the nurse give to this patient about why this medication is given sublingually?

A) Superficial blood vessels promote rapid absorption of the medication.

B) Stomach acids destroy the medication.

C) Saliva helps break down the medication for absorption.

D) The medication is too rapidly absorbed in the stomach

13. **A nurse assesses a patient after administering isosorbide mononitrate (Imdur) to treat angina. The patient reports a headache. What action would the nurse take?**

A) Initiate oxygen therapy.

B) Hold the next dose of Imdur.

C) Instruct the patient to drink water.

D) Administer PRN acetaminophen

14**. A patient is prescribed diltiazem for the treatment of hypertension. Which of the following adverse effects of diltiazem should the nurse monitor for?**

A) Tachycardia

B) Hypertension

C) Bradycardia

D) Hyperglycemia

15**. A patient with angina pectoris is prescribed amlodipine (Norvasc). Which of the following statements by the patient indicates an understanding of the medication's action?**

A) "This medication will help to break up any blood clots in my coronary arteries."

B) "This medication will help to prevent the buildup of plaque in my coronary arteries."

C) "This medication will help to lower my heart rate and blood pressure."

D) "This medication will help to relax the muscles in my coronary arteries."

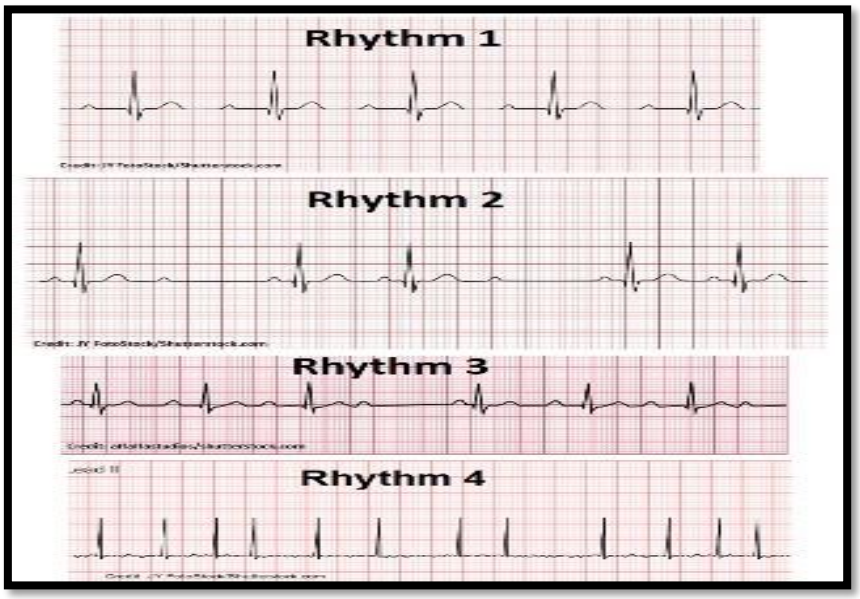
16. Which rhythm above is atrial fibrillation?

A) Rhythm 1

B) Rhythm 2

C) Rhythm 3

D) Rhythm 4



17- A client with atrial fibrillation is experiencing chronic fatigue. What nursing intervention would be appropriate for this client?

A) Encouraging frequent napping throughout the day

B) Limiting caffeine intake

C) Providing stimulating activities to keep the client awake

D) Encouraging the client to exercise vigorously

18- What is the purpose of catheter ablation in treating atrial fibrillation?

A) To remove clots from the heart

B) To destroy small areas of heart tissue that cause abnormal electrical signals

C) To implant a pacemaker to regulate the heart's rhythm

D) To remove built-up plaque from the arteries

19- **The nurse is assessing an ECG strip. Which finding on the ECG strip is NOT a characteristic present** in atrial fibrillation (a-fib)?

A) fibrillary waves

B) unmeasurable atrial rate

C) saw-tooth waves

D) irregular ventricular rat

20. Having atrial fibrillation puts a person at risk for

A) Blindness

B) Diabetes

C) Stroke

D) Gout

Key Answer

1	2	3	4	5	6	7	8	9	10
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**

Total	**Maximum Mark 20**	

مع تمنياتنا لكم بالتوفيق والنجاح

THE ARAB AMERICAN UNIVERSITY

Advance Health Nursing

(**170114110**)

Quiz Two

MAY …, 2023

ID: _____
Name: _____
Section: _____

Instructions:

- Turn off your mobile phone
- Time:
- Inquiries are only allowed during the first (15) minutes of exam time
- Use the space provided. In case you need more space, you could use the back of the page.
- Answer all questions.

Total Number of Questions (14)

Best of Luck

Ms. Maysa Kassabry

QUESTION NO. 1 **(20 POINTS)**

Please select the correct answer from options a, b, c, and d and write it in the answer box on the final page.

1. A nurse reviews laboratory results for a patient who was admitted for a myocardial infarction and cardiogenic shock 2 days ago. Which laboratory test result should the nurse expect to find?

A. Blood urea nitrogen (BUN) of 52 mg/dL (18.6 mmol/L)

B. Creatinine of 2.3 mg/dL (203 mmol/L)

C. BUN of 10 mg/dL (3.6 mmol/L)

D. BUN/creatinine ratio of 8:1

2. A nurse assesses an older adult patient who is experiencing a myocardial infarction. Which clinical manifestation would the nurse expect?

A. Excruciating pain on inspiration

B. Left lateral chest wall pain

C. Disorientation and confusion

D. Numbness and tingling of the arm

3.A nurse cares for a patient who is recovering from a myocardial infarction. The patient states, "I will need to stop eating so much chili to keep that indigestion pain from returning." What is the nurse's best response?

A. "Chili is high in fat and calories; it would be a good idea to stop eating it."

B. "The provider has prescribed an antacid for you to take every morning."

C. "What do you understand about what happened to you?"

D. "When did you start experiencing this indigestion?"

4.A patient has hemodynamic monitoring after a myocardial infarction PCI. What safety precautions does the nurse implement for this patient?

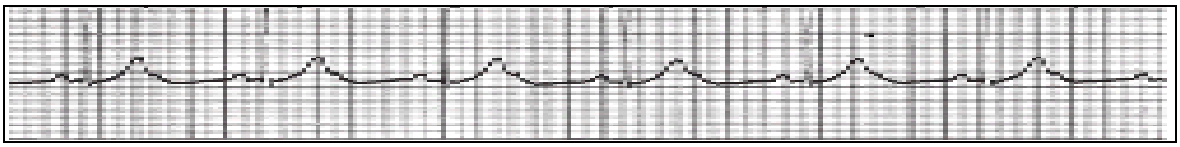
A. Document pulmonary artery wedge pressure (PAWP) readings and assess their trends.

B. Ensure that the balloon does not remain wedged.

C. Keep the patient on strict NPO status.

D. Maintain the patient in a semi-Fowler's position.

5. A patient had an inferior wall myocardial infarction (MI). The nurse notes the patient's cardiac rhythm as shown below:



What action by the nurse is most important?

A. Assess the patient's blood pressure and level of consciousness.

B. Call the healthcare provider or the Rapid Response Team.

C. Obtain a permit for an emergency temporary pacemaker insertion.

D. Prepare to administer antidysrhythmic medication.

6. During the administration of the thrombolytic agent to a patient with an acute myocardial infarction, the nurse should stop the drug infusion if the patient experiences

A. bleeding from the gums.

B. increase in blood pressure.

C. a decrease in the level of consciousness.

D. a no sustained episode of ventricular tachycardia.

7. **How should the nurse advise a patient with an international normalized ratio (INR) of 5.8?**

   A. Make arrangements to go to the emergency room immediately

   B. Increase fluid intake to 2000 mL/day

   C. Stop taking the anticoagulant and notify the healthcare provider

   D. Add more leafy green vegetables to the patient's diet

8. **When a patient is receiving heparin therapy, what would be the nurse's most appropriate action?**

   A. Observe him for cyanosis.

   B. Assess the degree of edema in all extremities.

   C. Give the injection intramuscularly.

   D. Observe emesis, urine, and stools for blood.

9. **When a patient returns to the unit following cardiac catheterization, what nursing activity should immediately follow the taking of vital signs?**

   A. Placing the patient in a warm bed and encouraging sleep

   B. Providing the patient with fluids

   C. Assessing the patient's peripheral pulses

   D. Reapplying the patient's dressing where the dye was injected

10. **Which of the following is a potential treatment option for cardiogenic shock with reduced ejection fraction?**

    A. Fluid replacement to increase preload

    B. Beta-blockers to increase heart rate

    C. Vasodilators to decrease afterload

    D. Oxygen therapy to decrease oxygen demand

11. An emergency room nurse assesses a female patient. Which assessment findings would alert the nurse to request a prescription for an electrocardiogram? *(Select all that apply.)*

A. Hypertension

B. Fatigue despite adequate rest

C. Indigestion

D. Abdominal pain

E. Shortness of breath

12. A nurse assesses a patient who is recovering after a coronary catheterization. Which assessment findings in the first few hours after the procedure require immediate action by the nurse? (Select all that apply.)

A. Blood pressure of 140/88 mm Hg

B. Serum potassium of 2.9 mEq/L (2.9 mmol/L)

C. Warmth and redness at the site

D. Expanding groin hematoma

E. Rhythm changes on the cardiac monitor

13. You're assessing your patient with cardiogenic shock, what signs and symptoms do you expect to find in this condition? Select all that apply:

A. Warm, flushed skin

B. Prolonged capillary refill

C. Urinary output >30 mL/hr

D. Systolic blood pressure 95 mmHg

E. Crackles in lung fields

F. Dyspnea

G. Strong peripheral pulses

H. Chest pain

14. You're precepting a new nurse. You ask the new nurse to list the purpose of why a patient with cardiogenic shock may benefit from an intra-aortic balloon pump.

What responses below indicate the new nurse understands the purpose of an intra-aortic balloon pump? Select all that apply:

A. “This device increases the cardiac afterload, which will increase cardiac output.”

B. “This device will help increase blood flow to the coronary arteries.”

C. “The balloon pump will help remove extra fluid from the heart and lungs.”

D. “The balloon pump will help increase cardiac output.”

Key Answer

1	2	3	4	5	6	7	8	9	10
11	12	13	14						

Total	Maximum Mark 20	

مع تمنياتنا لكم بالتوفيق والنجاح

THE ARAB AMERICAN UNIVERSITY
Advance Health Nursing

(170114110)

Quiz three

June …, 2023

ID: _____

Name: _____

Section: _____

Instructions:

- Turn off your mobile phone
- Time:
- Inquiries are only allowed during the first (15) minutes of exam time
- Use the space provided. In case you need more space, you could use the back of the page.
- Answer all questions.

Total Number of Questions (13)

Best of Luck

Ms. Maysa Kassabry

QUESTION NO. 1: (20 POINTS)

Please select the correct answer from options a, b, c, and d and write it in the answer box on the final page.

1. A nurse cares for a patient who has an 80% blockage of the right coronary artery (RCA) and is scheduled for bypass surgery. Which intervention would the nurse be prepared to implement while this patient waits for surgery?

A. Administration of IV furosemide (Lasix)

B. Initiation of an external pacemaker

C. Assistance with endotracheal intubation

D. Placement of central venous access

2. Which of the following characteristics would make a client eligible for pacemaker implantation, as recognized by the nurse?

A. Bradycardia and multiple episodes of syncope

B. Coronary artery disease (CAD) running normal sinus with occasional PVCs

C. Diagnosis of CHF on telemetry running normal sinus rhythm

D. Diagnosis with asthma exacerbation

3. A nurse cares for a patient who is prescribed magnetic resonance imaging (MRI) of the heart. The patient's health history includes a previous myocardial infarction and pacemaker implantation. What action would the nurse take?

A. Schedule an electrocardiogram just before the MRI.

B. Notify the healthcare provider before scheduling the MRI.

C. Call the physician and request a laboratory draw for cardiac enzymes.

D. Instruct the patient to increase fluid intake the day before the MRI.

4. A nurse cares for a patient with an intravenous temporary pacemaker for bradycardia. The

nurse observes the presence of a pacing spike but no QRS complex on the patient's electrocardiogram. What action would the nurse take next?

A. Administer intravenous diltiazem (Cardizem).

B. Assess vital signs and level of consciousness.

C. Administer sublingual nitroglycerin.

D. Assess capillary refill and temperature

5. A nurse teaches a patient with a new permanent pacemaker. Which instructions would the nurse include in this patient's teaching? (Select only three correct actions.)

A. "Until your incision is healed, do not submerge your pacemaker. Only take showers."

B. "Report any pulse rates lower than your pacemaker settings."

C. "If you feel weak, apply pressure over your generator."

D. "Have your pacemaker turned off before having magnetic resonance imaging (MRI)."

E. "Do not lift your left arm above the level of your shoulder for 8 weeks."

6. A client with a permanent pacemaker has returned to the cardiac unit after an outpatient procedure. Which of the following signs and symptoms might indicate pacemaker malfunction?

A. Dizziness, light-headedness, and syncope

B. Fatigue, confusion, and muscle weakness

C. Numbness and tingling in the lower extremities

D. Difficulty breathing and chest pain.

7. Which of the following is an important nursing consideration when caring for a client with a pacemaker?

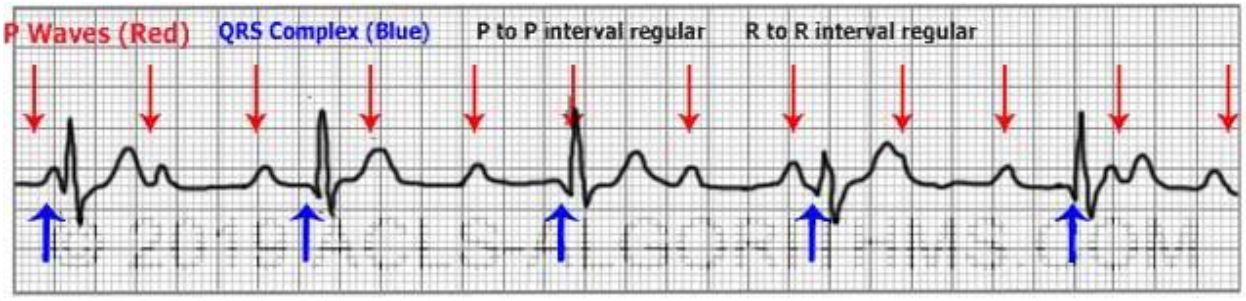
A. Encouraging the client to have an MRI scan

B. Restricting the client's physical activity

C. Teaching the client to use a microwave oven safely

D. Advising the client to avoid large crowds and public events

8. The following rhythm is a complete block. Which definition of the complete block is correct?



A. One or more (but not all) of the atrial impulses fail to conduct to the ventricles due to impaired conduction.

B. The impulse conducting from atria to ventricles through the AV node is delayed and travels slower than normal PR interval is lengthened beyond 0.20 seconds

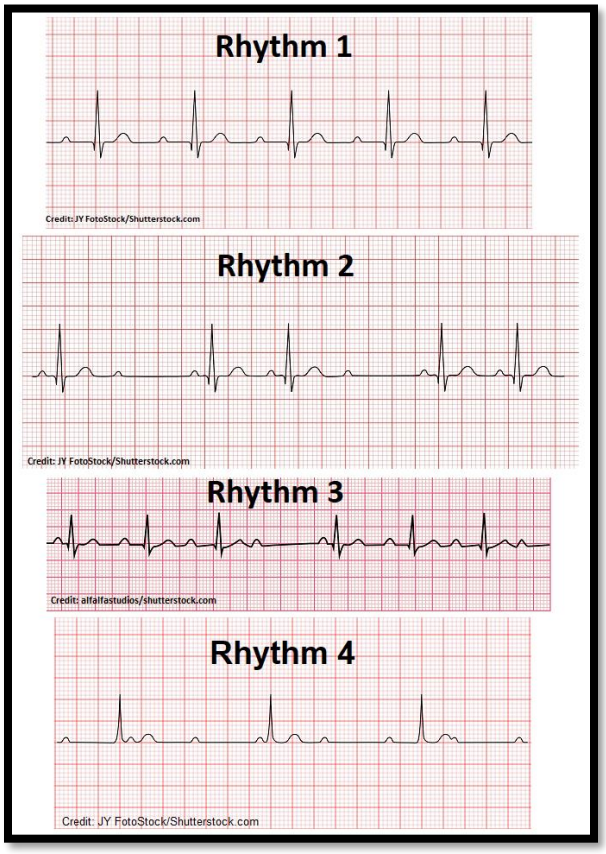
C. The impulse generated in the SA node in the atrium does not propagate to the ventricles and there is no apparent relationship between P waves and QRS complexes.

D. There is no impulse generated from the SA node in the atrium but the ventricles contract from random locations below the AV Node.

9. **The nurse is caring for a client with a dual-chamber pacemaker set to the DDDR mode. Which of the following statements regarding the DDDR pacemaker mode is accurate?**

A. The pacemaker delivers a pacing stimulus to both the atrium and the ventricle.
B. The pacemaker can detect atrial and ventricular arrhythmias and adjust pacing accordingly.
C. The pacemaker only delivers a pacing stimulus to the ventricle.
D. The pacemaker is set to a fixed rate and cannot adjust for changes in heart rate.

10.



Which rhythm above is a Third-Degree Heart Block?

A. Rhythm 1

B. Rhythm 2

C. Rhythm 3

D. Rhythm 4

11. Select below all the causes of a Third-Degree Heart block: (select only three)

A. Congenital heart disease

B. Digoxin Toxicity

C. Blood Glucose 50 mg/dL

D. Potassium 4.2 mEq/L

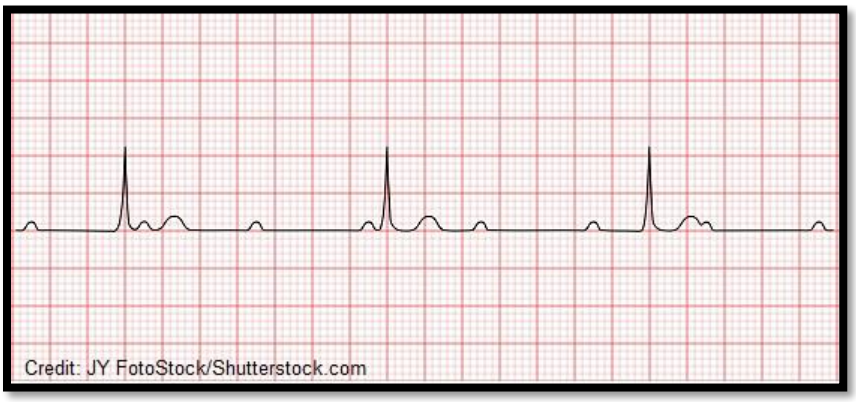
E. Heart valve damage

12. The nurse is caring for a client with a third-degree heart block who is receiving a temporary transvenous pacemaker. The client suddenly develops respiratory distress, is cyanotic, and becomes unresponsive. Which of the following actions should the nurse take first?

A. Administer oxygen
B. Check the pacemaker settings
C. Initiate CPR

D. Notify and wait for the healthcare provider.

13.



Select all the options below that describe the heart rhythm above: (five correct answers)

A. PR Interval progressively prolonged

B. Ventricular rhythm regular

C. Independent P waves and QRS complexes

D. Regular atrial rhythm

E. Slower ventricular rate than atrial rate

F. Atrial rate slower than ventricular rate

G. Equal atrial and ventricular rate

H. Second-Degree type II (Mobitz II)

I. Third-Degree Heart Block (complete)

J. Second Degree type I (Mobitz I or Wenckebach)

Key Answer

1	2	3	4	5	6	7	8	9	10
11	12	13							

Total	Maximum Mark 20	

مع تمنياتنا لكم بالتوفيق والنجاح

Appendix G: Yoon`s Critical Thinking Disposition (YCTD) Instrument

Item	1 Strongly disagree	2 Somewhat disagree	3 Neutral	4 Somewhat agree	5 Strongly agree
Confidence					
1. I think I can get through any complicated problem					
2. I'm handling complicated problems by my criteria					
3. I don't decide depending on others' opinion					
4. I believe my inference to solve the problem					
5. I continually look for pieces of information related to solving a problem					
Eager					
6. I am willing to solve a complicated problem					
7. When I have a question, I try to get the answer					
8. I'm trying to understand how the unknown thing works					
9. When I confront a problem, I try hard to find an answer until I solve it					
Fairness					
10. I turn my mistake into an opportunity to learn					
11. Despite holding a differing viewpoint, I am open to acknowledging and accepting the proven truth.					
12. I am willing to accept criticism of my opinion					

13. I evaluate fairly either my opinion or others					
Objectivity					
14. I have a reasonable proof					
15. I think any opinion needs to have a reliable reason to insist					
16. I explain reasons if I don't agree with others					
Prudence					
17. When I am questioned, I think twice before I give my answer					
18. I tend to make a decision hastily without considering a matter carefully					
19. I tend to act rashly and carelessly when I face a difficulty					
20. I don't judge rush					
Skepticism					
21. I prefer to think differently from others and routines					
22. Although something is already set firmly, I have questions about it.					
23. I continually evaluate whether my thought is right or not					
24. When I see the world, I see it with a questioning mind					
Systematicity					
25. When I judge a matter, I judge objectively					
26. I have a reputation of being a rational person					
27. When I solve or judge a problem, I utilize a collection of data by organizing it systematically					

Appendix H: Self-efficacy Scale for Learning and Performance

Items	1 Not at all true of me	2 Slightly true of me	3 Somewhat true of me	4 Moderately true of me	5 Mostly true of me	6 Very true of me	7 Extremely true of me
1. I believe I will receive an excellent grade in this class							
2. I'm certain I can understand the most difficult material presented in the readings for this course							
3. I'm confident I can understand the basic concepts taught in this course.							
4. I'm confident I can understand the most complex material presented by the instructor in this course							
5. I'm confident I can do an excellent job on the assignments and tests in this course.							
6. I expect to do well in this class							
7. I'm certain I can master the skills being taught in this class.							
8. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class							

Appendix I: Unfolding Case Study Scenarios of Cardiovascular Health

Cardiovascular Health Chapter

Topic: Coronary Artery Disease (CAD). **Class/Group:** Experimental group

Date: …… **Group Members:** A, B, C, D, E, F, G

INSTRUCTIONs

"All questions pertain to this case study. Please keep your responses brief and concise. When asked to provide multiple answers, list them in order of priority or significance. Do not make assumptions about information that has not been provided. Please ensure that your responses are legible. Illegible responses will be marked and you will be required to rewrite them."

Objectives:

1- Understanding the pathophysiology of acute coronary syndrome

2- Demonstrate the appropriate technique for assessing chest pain in a patient, including a thorough history and physical examination and characteristics of associated chest pain.

3- Demonstrate the proper method for assessing angina pectoris and initiating prompt nursing care.

- Evaluate Patient Symptoms: Assess the patient's chest pain description, including location, severity, duration, and radiation.
- Determine whether the pain is the result of physical exertion, emotional tension, or another cause. Examine for symptoms including shortness of breath, diaphoresis, nausea, and vertigo.

- Perform Diagnostic Tests: Collaborate with the healthcare team to order and interpret diagnostic tests, such as electrocardiogram (ECG), stress test, echocardiogram, coronary angiography, or cardiac computed tomography (CT) scan. These tests can help confirm the diagnosis of angina and assess the extent of coronary artery disease.
- Assist with blood tests, including cardiac enzymes (troponin, creatine kinase-MB) to rule out myocardial infarction. Monitor lipid profiles to assess cardiovascular risk factors.

4- Demonstrate the correct technique for administering sublingual nitroglycerin and explain when to seek medical attention for persistent chest pain.

5- Identify the clinical features of atrial fibrillation as a cardiac arrhythmia.

6- Describe the risk factors associated with atrial fibrillation, including hypertension, age, and underlying heart disease.

7- Evaluate the various treatment options for atrial fibrillation

8- Discuss the importance of lifestyle modifications in managing atrial fibrillation and reducing the risk of complications.

9- Identify the potential complications associated with atrial fibrillation.

10- To identify the signs and symptoms of non-ST elevation myocardial infarction (NSTEMI) and cardiogenic shock and compare them to ST-segment elevation myocardial infarction (STEMI) and cardiogenic shock.

- Identify clinical presentations of NSTEMI and STEMI, such as chest pain characteristics, shortness of breath, nausea, and fatigue.

11- Utilize diagnostic tools to confirm the diagnosis and assess the severity of NSTEMI and cardiogenic shock

- Perform an electrocardiogram (ECG) to identify ST-segment changes in NSTEMI and assess for life-threatening arrhythmias in cardiogenic shock.
- Analyze cardiac biomarkers such as troponin, creatine kinase, and myoglobin levels to assess for myocardial damage in NSTEMI.

12- Implement appropriate interventions to stabilize the patient and improve tissue perfusion and oxygenation.

- Administer antiplatelet and anticoagulation therapy to prevent further thrombus formation in NSTEMI.
- Provide oxygen therapy and fluid resuscitation to improve tissue perfusion in cardiogenic shock.
- Consider invasive interventions, such as a coronary angiogram or percutaneous coronary intervention, in patients with ongoing ischemia or hemodynamic instability.

13- Implement appropriate interventions and stabilize patients complaining of tachyarrhythmias

- Conduct an electrocardiogram (ECG) to identify the specific tachyarrhythmia type and its characteristics.
- Evaluate the patient's symptoms including palpitations, vertigo, shortness of breath, and chest pain.
- Assess potential triggers or underlying causes of tachyarrhythmias, such as stress, caffeine, electrolyte imbalances, or medication adverse effects, and assist in determining whether stable or unstable tachyarrhythmias are present.
- Administer antiarrhythmic drugs, such as beta-blockers, calcium channel blockers, and sodium channel blockers, to regulate heart rate and rhythm.

- Consider synchronized cardioversion for hemodynamically compromised tachyarrhythmias, such as ventricular tachycardia.

14- To improve nursing care, outcomes, and patient safety related to cardiogenic shock through the development of evidence-based nursing interventions and care plans.

- To understand the causes and risk factors of cardiogenic shock.
- To identify the signs and symptoms of cardiogenic shock in patients and the importance of early recognition and diagnosis.
- Identify clinical presentations of cardiogenic shock, such as hypotension, cold and clammy skin, altered mental status, and decreased urine output.
- To review the current evidence-based treatment modalities for cardiogenic shock, including medical and surgical interventions.
- To develop and implement individualized nursing care plans for patients with cardiogenic shock in the acute care setting, including targeted assessments, interventions, and evaluation of outcomes.

15- Identify heart block and its types. Identify heart block and types

16- Discuss the indications for pacemaker therapy and identify common complications related to pacemaker use.

17- Identify the different types of pacemakers.

18- Patient Education for an impending pacemaker discharge

19- Addressing Misconceptions About Pacemakers; microwave Ovens/Cell Phones, theft/Security Sensors, fictional Portrayals

Unfolding Case Scenario

It is midmorning in the cardiac unit where you work, and you are getting a new patient. G.P. is a 60-year-old retired businessman, who is married and has three grown children. As you take his health history, he tells you that he began feeling changes in his chest about 10 days ago. He has hypertension (HTN) and a 5-year history of angina pectoris. During the past week, he has had frequent episodes of mid-chest discomfort in rest. The chest pain responds to nitroglycerin (NTG), which he has taken sublingually (SL) about 8 to 10 times over the past week. During the week, he has also experienced increased fatigue at rest. He states, "I just feel crappy all the time." A cardiac catheterization done several years ago revealed 50% stenosis of the right coronary artery (RCA) and 50% stenosis of the left anterior descending (LAD) coronary artery. He tells you that both his mother and father had coronary artery disease (CAD). He is currently taking amlodipine (Norvasc), metoprolol (Lopressor), atorvastatin (Lipitor), and aspirin 81 mg/day.

1. Can you explain the pathophysiology of acute coronary syndrome? ***(Step one, 10 minutes)***

2. Concerning the case above, what other information are you going to ask about his chest pain characteristics? ***(Step one, 10 minutes)***

3. What are common sites for radiation of ischemic cardiac pain? ***(Step one, 10 minutes)***

4. You know that G.P. has atherosclerosis of the coronary arteries. You need to know his risk factors for CAD to plan teaching for lifestyle modifications. What will you ask him about? ***(Step one, 10 minutes)***

ANGINA PICTORIS

CASE STUDY PROGRESS NO. ONE

5. Mr. G.P. is continuing to experience chest pain at rest. Based on this information, can you identify the type of angina he is experiencing? Additionally, could you please mention any other types of angina? ***(Step one, 10 minutes)***

6. What are the differences between stable, unstable, and variant angina in plaque formation? ***(Step one, 10 minutes)***

Nitroglycerin Considerations

7. Mr. G.P. had Nitroglycerin, can you explain nitroglycerin considerations concerning:

a) Generic and brand name

b) Action.

c) Dosage, route, and frequency

d) Indication.

e) Contraindication.

f) Side effects.

g) Precautions

h) Interactions

i) Administration

j) Nursing consideration ***(Step four, 10 minutes)***

8. Although he has been taking sublingual nitroglycerin (SL NTG) for a long time, you want to be certain he is using it correctly. Which actions are correct when taking SL NTG for chest pain? (Select all that apply.) ***(Step four, 10 minutes)***

- ***Stop the activity and lie or sit down.***
- ***Call 911 immediately.***

- ***Call 911 if the pain is not relieved after taking one SL tablet.***
- ***Call 911 if the pain is not relieved after taking three SL tablets, 5 minutes apart.***
- ***Chew the tablet slowly then swallow.***
- ***Place the NTG tablet under the tongue.***

9. What other information would you need to make certain he understands the side effects and storage of SL NTG? ***(Step four, 10 minutes)***

10. The nurse reviews the use and storage of SL NTG with G.P. Which statement by G.P. indicates a need for further education? Explain your answer next to your answer selection. ***(Step four, 10 minutes)***

- ***"I carry the tablets with me at all times."***
- ***"I will keep the pills in their original brown bottle."***
- ***"I will not store other pills in the nitroglycerin bottle."***
- ***"I will discard any open bottle of nitroglycerin after a year."***

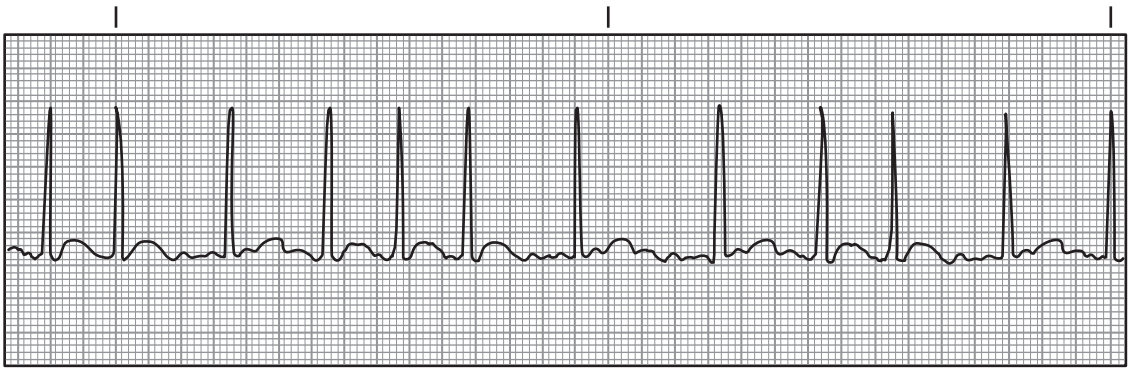
ATRIAL FIBRILLATION

CASE STUDY PROGRESS NO. TWO

Mr. G.P. was admitted with complaints of cardiac arrhythmia. On further inquiry, it was revealed that he had been consuming alcohol in large amounts, which could have contributed to the arrhythmia. As part of the initial treatment plan, he was placed on telemetry to monitor his cardiac rhythm. Telemetry monitoring would provide continuous monitoring of his heart rhythm and alert the healthcare team of any changes or abnormalities that may require further attention. This would help ensure that his condition is managed effectively and reduce the risk of any adverse outcomes. The

healthcare team would continue to closely monitor Mr. G.P.'s condition and work on addressing the underlying causes of his arrhythmia to prevent further episodes.

11. Identify the rhythm. ***(Step three, 5 minutes)***



12. What are the nurse's top 3 responses once the rhythm is confirmed? (Medication)and what is the medical intervention for atrial fibrillation? ***(Step three, 10 minutes)***

13. Explain the primary complication that could occur if this heart rhythm were not treated. ***(Step four, 10 minutes)***

14. Review G.P.'s history. What conditions may have contributed to the development of this dysrhythmia? (Step four, 10 minutes)

15. As the patient is diagnosed with Angina pectoris, the doctor sets the intervention plan and prescribes medications. In this section, students will be tasked with providing the patient with an explanation of the rationale behind each medication. What is the Complete Medication template for each of the following medications: (1) Amlodipine, (2) diltiazem IV (3) Digoxin, (4) Propafenone, Rhythmal (5) Amiodarone. ***(Step four, 10 minutes)***

Answer guidelines: **Generic name, Brand Name, indication, work of action, dosage, route, frequency, common side effects, contraindication, nursing consideration.**

MYOCARDIAL INFARCTION

CASE STUDY PROGRESS NO. THREE

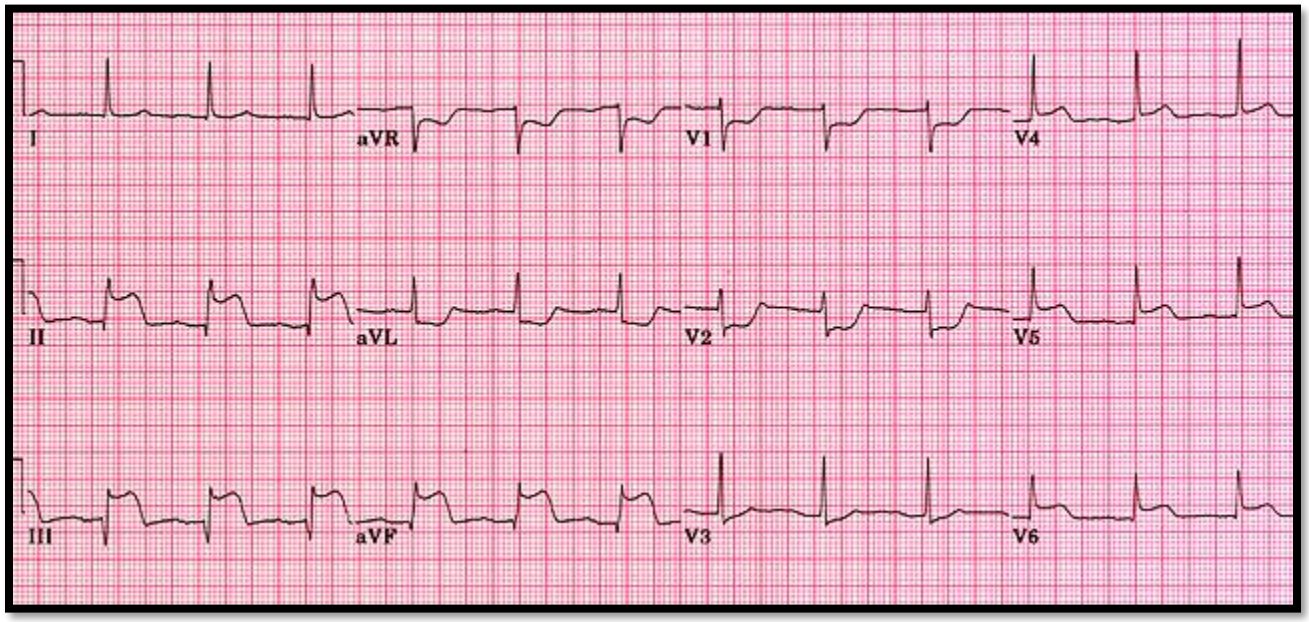
While Mr. G.P. was planting some flowers in his garden, he suddenly experienced a severe crushing chest pain that radiated to his left arm and jaw. These symptoms are consistent with angina, a type of chest pain that occurs when there is reduced blood flow to the heart muscle. Mr. G.P.'s wife was monitoring him from her kitchen window and was quick to respond, giving him a sublingual nitroglycerin tablet. However, the chest pain did not subside, and they immediately called 911 and transferred him to the hospital. It is important to seek prompt medical attention for symptoms of angina, as it can be a sign of underlying heart disease that requires urgent intervention. The healthcare team will work to evaluate Mr. G.P.'s condition in emergency room and provide appropriate treatment to alleviate his symptoms and prevent further complications.

16. What should the nurse do first in the case G.P of a severe MI? Why? ***(step four, 10 minutes)***

CASE STUDY PROGRESS

The nurse promptly conducts an ECG, which shows ST-elevation in leads 11, 111, and aVF. Cardiac biomarkers and ABGs will be sent to the lab for analysis to confirm diagnosis.

17. Identify the rhythm. ***(Step three, 5 minutes)***



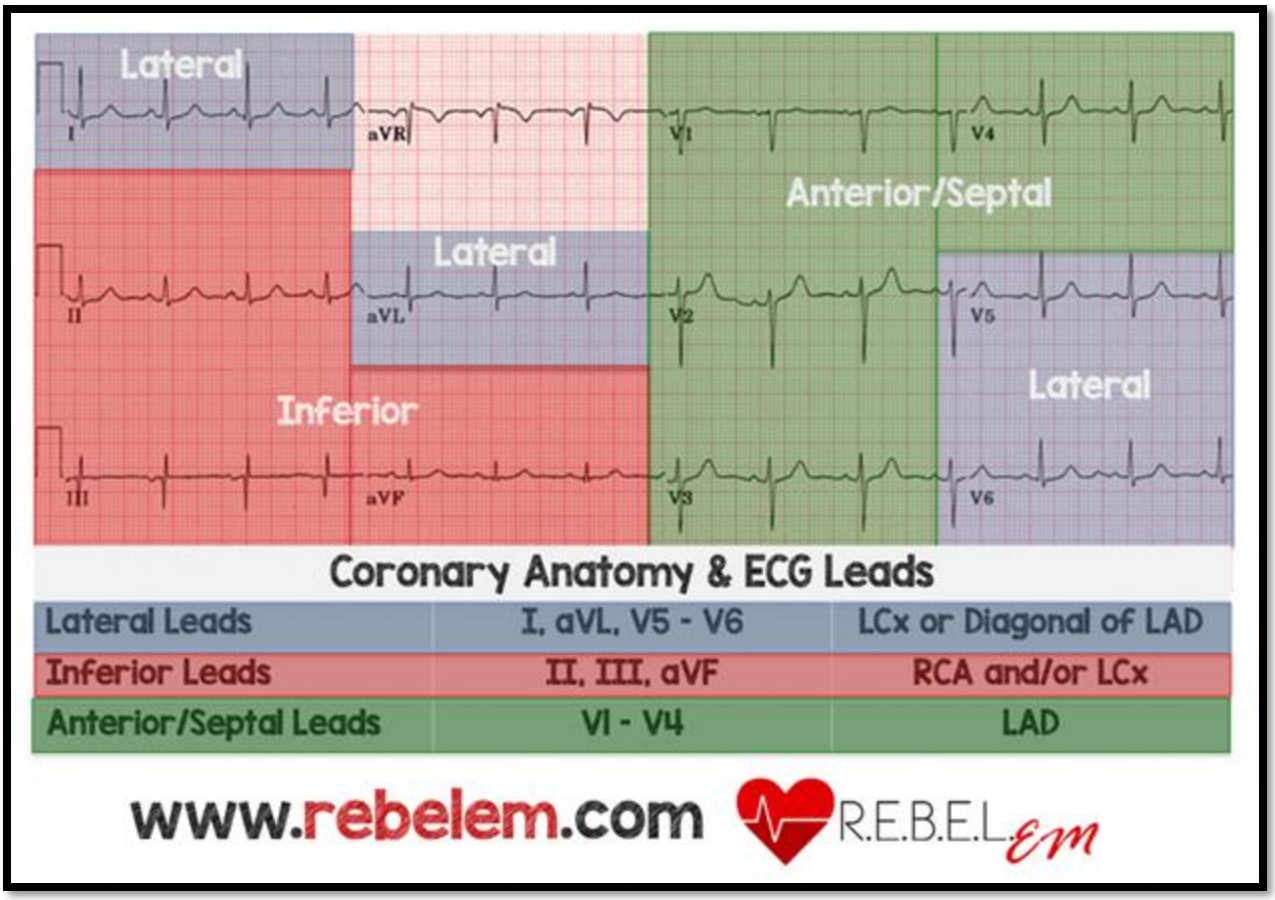
18. How can nursing students differentiate between ST-elevation myocardial infarction (STEMI) and non-ST-elevation myocardial infarction (NSTEMI)? What are the key differences in symptoms, electrocardiogram (ECG) findings, and treatment approaches for each condition? (Step four, 10 minutes)

CASE STUDY PROGRESS

Shortly after, the patient starts to experience shortness of breath, and hypotension with signs of cardiogenic shock like cold and clammy skin and altered mental status.

19. How can nursing students differentiate between non-ST-elevation myocardial infarction (NSTEMI) and angina? What are the key differences in symptoms and electrocardiogram (ECG) findings, and how do these differences impact the treatment plan for each condition? ***(step four, 10 minutes)***

20. What are other types of AMI other than inferior MI? ***(Step three, 10 minutes)***



21. **Lab tests of Mr. G.P. indicated a high level of troponin. what are the normal ranges of Troponin I and troponin T, and how does it differ with cardiac muscle damage?** ***(Step three, 10 minutes)***
22. **What emergency intervention should be implemented in the G.P. case of acute MI as a management intervention?** ***(Step four, 10 minutes)***
23. **What does the word reperfusion mean?** ***(Step four, 5 minutes)***
24. **In relation to Mr. G.P.'s case, what is the process for implementing reperfusion therapy in patients with acute myocardial infarction (MI)?** ***(Step four, 10 minutes)***

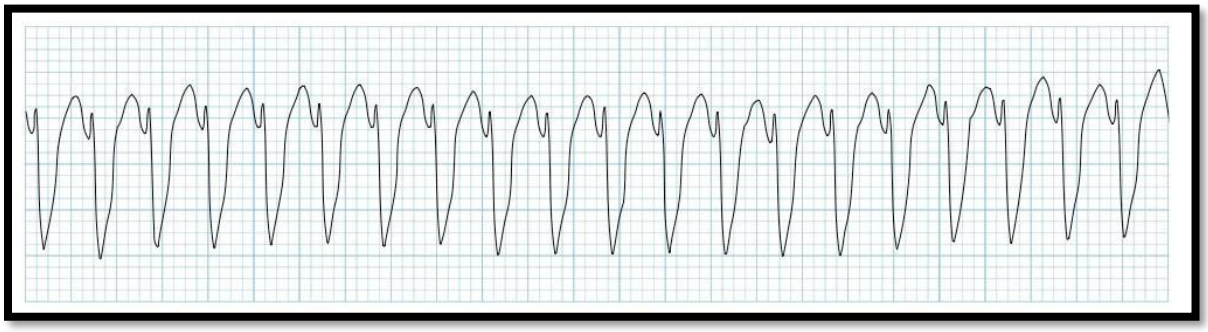
25. **What is the difference between PTCA (percutaneous transluminal coronary angioplasty) and PCI (percutaneous coronary intervention) as procedures used in treating acute myocardial infarction (AMI)?** ***(step three, 10 minutes)***
26. **What nursing care should done prior to starting reteplase?** ***(step one, 10 minutes)***
27. **What is the nursing care associated with a patient receiving reteplase? (Step one, 10 minutes)**
28. **What complications must be assessed during and after administration of the medication?** ***(Step four, 10 minutes)***
29. **Why is CABG scheduled and not PCI in some cases?** ***(Step four, 10 minutes)***
30. **What is CABG (coronary artery bypass grafting) and under what circumstances is the procedure typically performed?** ***(Step 4, 10 minutes)***

TACHYARRHYTHMIA

CASE STUDY PROGRESS NO. FOUR

Vital signs as follows prior to the patient being taken to the cath lab: BP 80/50 mmHg SpO2 91% on 2 L NC, HR: 170 bpm with frequent PVCs on monitor, RR 32 bpm at rest, Temp 37°C. Mr. G.P. also complains of "having trouble breathing" and has a look because of fear and worry on his face. He is placed on the portable monitor to go to the cath lab and the nurse notices that the cardiac rhythm is very fast, approx. 180 bpm. There appear to be no P waves anymore and the QRS is very wide. The monitor alarms loudly and G.P`s eyes are now closed.

31. **How does the nurse interpret this rhythm? What should the nurse do first?** ***(step one, 10 minutes).***



32. How do you define cardiogenic shock? ***(step one, 10 minutes)***

33. What signs of shock is Mr. G.P. exhibiting? What other clues does the nurse have indicating this could be cardiogenic shock? ***(Step one, 10 minutes)***

34. What is the main cause of cardiogenic shock in relation to Mr. G.P.'s condition? Are there other causes for cardiogenic shock? ***(Step two, 10 minutes)***

35. Another staff member interrupts the nurse during her discussion with the family to say that G.P.`s MAP is only 50 and the ejection fraction is 35. How does the nurse interpret this number? How is it calculated? ***(Step three, 10 minutes)***

36. What specific tests will a nurse use to diagnose cardiogenic shock in a patient? ***(Step two, 10 minutes)***

37. What type of medication might the nurse request from the provider or ask about starting? ***(Step three, 10 minutes)***

38. How is cardiogenic shock treated? ***(Step four, 10 minutes)***

39. Can you explain the work of the two devices of IABP and LVAD? ***(Step one, 10 minutes)***

40. What are the nursing interventions for caring for a patient with an intra-aortic balloon pump (IABP)? ***(Step four, 10 minutes)***

41. What are the common nursing interventions for caring for a patient with a Ventricular Assist Device (VAD)? ***(Step four, 10 minutes)***

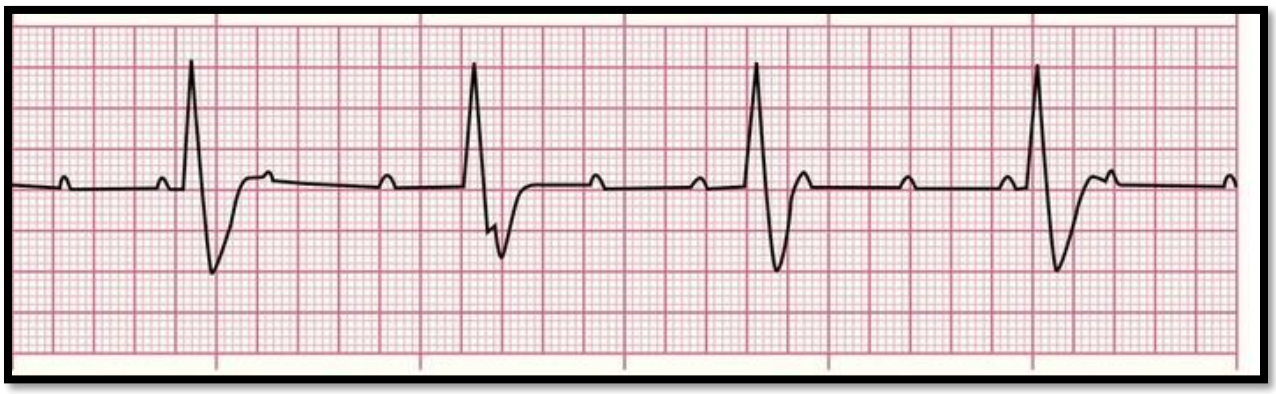
42. **What are the nursing care plans for a patient with cardiogenic shock?** ***(Step four, ten minutes)***
43. **What are some key points to consider when discussing a cardiac rehabilitation program, and how can it improve the cardiovascular health of someone who has experienced a heart attack or heart surgery?**
44. **What outcomes demonstrate interventions are working with Mr. G.P? (Reflecting)**

(Step five, 10 minutes)

COMPLETE HEART BLOCK

CASE STUDY PROGRESS NO. FIVE

After experiencing cardiogenic shock, Mr. G.P. developed severe bradycardia with symptoms and signs of reduced heart rate. He presented with complaints of symptoms such as dizziness, shortness of breath, fainting, fatigue, and irregular heartbeats, hypotension with medication. He was immediately taken to the emergency department for further assessment and management. Upon arrival, a nurse took his vital signs, including his heart rate, blood pressure, and respiratory rate, and obtained a comprehensive medical history, including any relevant past medical issues or medications, and the healthcare team observed physical signs such as a slow pulse and decreased blood pressure upon examination. To obtain a more accurate assessment of Mr. G.P.'s heart rhythm, he was placed on ECG monitoring. This allowed the healthcare team to monitor his heart rate and rhythm continuously and identify any changes or abnormalities that may require intervention. The healthcare team would work closely together to address the underlying causes of his bradycardia, manage his symptoms, and prevent further complications.



45. Identify the rhythm. ***(Step three, 5 minutes)***

46. What assessments indicate that Mr. G.P. is not tolerating the low heart rate? ***(Step two, 10 minutes)***

47. Regarding G.P., what risks does the new rhythm entail? Provide justifications for your response. ***(Step two, 5 minutes)***

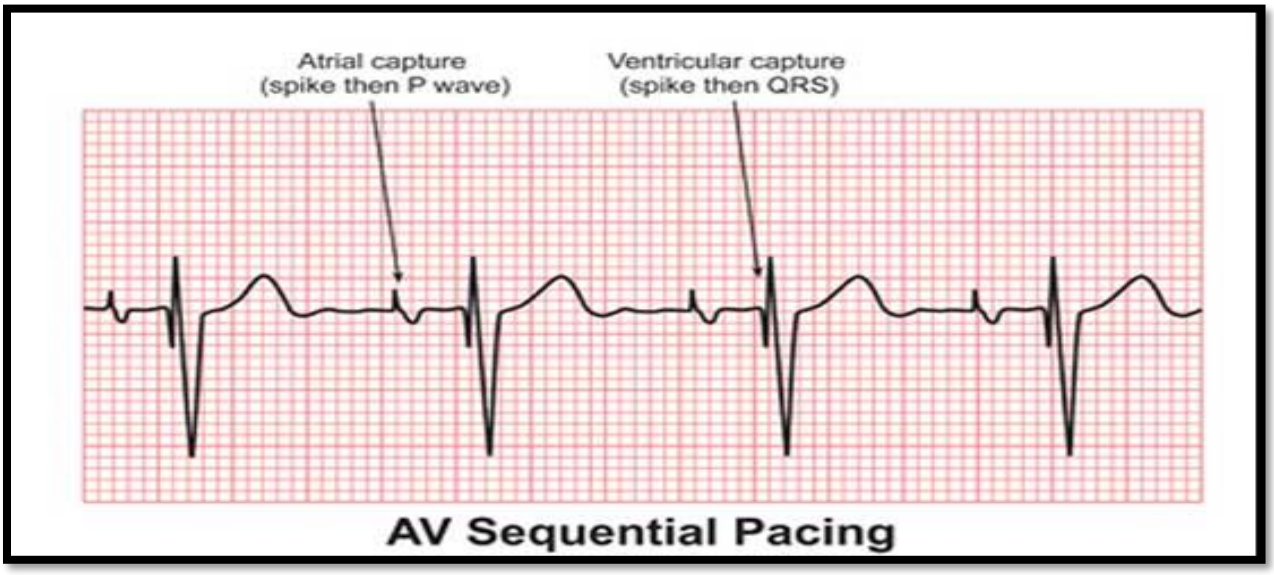
PACE MAKER IMPLANTATION

CASE STUDY PROGRESS NO. SIX

Because G.P.'s dysrhythmia is causing unacceptable symptoms, he is taken to surgery and a permanent DDDR pacemaker is placed and set at a rate of 70 beats per minute (BPM).

48. What does the code DDDR mean? What is used for? ***(Step three, 5 minutes)***

49. What ECG findings may indicate the presence of a pacemaker in a patient's heart?



50. What are the most common medical conditions that indicate the need for pacemaker implantation?

51. What are the different types of pacemakers available to patients? ***(step two, 10 minutes)***

52. Can you discuss the different points of pacemaker malfunction and how these abnormalities appear on an electrocardiogram (ECG)? ***(step three, 10 minutes)***

53. The pacemaker insertion surgery places Mr. G.P. at risk for several serious complications. List three potential problems that you will monitor for as you care for him. ***(step three, 10 minutes)***

CASE STUDY PROGRESS

One day, he suddenly developed palpitations and noticed that his heart was beating irregularly. She also experienced shortness of breath, especially during physical activities, and started feeling lightheaded and dizzy. As he sat down to rest, she began to experience intense chest pain and discomfort, accompanied by nausea. She then fainted and was rushed to the hospital.

54. **What complication Mr. G.P developed?** ***(Step four, two minutes)***
55. **How can the nurse investigate the dislodging of the pacemaker?** ***(Step two, 10 minutes)***
56. **What are some possible causes the nurse should investigate for a pacemaker becoming dislodged from its intended position?** ***(Step two, 10 minutes)***
57. **Complete a concept map that identifies 3 priority problems and collaborative/ nursing care. (*Step three, 10 minutes)***
58. **Mr. G.P. will need some education regarding his new pacemaker. What information will you give him before he leaves the hospital?** ***(Step Four, 10 minutes*)**
59. **Describe the teach-back process and the top 3 priorities for living with a pacemaker.** ***(Step four, 10 minutes)***
60. **Mr. G.P.'s wife approaches you and anxiously inquires, "My neighbor saw this science fiction movie about this guy who got a pacemaker and then he couldn't die. Is that for real?" How are you going to respond to her?** ***(Step four, 10 minutes)***
61. **G.P. and his wife tell you they have heard that people with pacemakers can have their hearts stopped because of microwave ovens and cell phones. Where can you help them find more information?** ***(Step Four, 10 minutes*)**
62. **G.P. and his wife tell you they have heard that people with pacemakers can have their hearts stopped because of theft and security sensors in stores and airports. Where can you help them find more information?** ***(Step four, 10 minutes)***
63. **Question to students for evaluation and reflection:** ***(Step five, 15 minutes)***

How does this unfolding case study that uses group-based learning contribute to the improvement of the participants' material knowledge acquisition, their critical thinking, and their self-efficacy in mastering problem-solving skills? ***(Step five, 10 minutes)***

Appendix J:Traditional PowerPoint presentation lectures of Cardiovascular health

Coronary Artery Diseases (CAD); *Angina & Atrial fibrillation*

Prepared by
Maysa Kassabry

1

Objectives

1-Understanding the pathophysiology of acute coronary syndrome

2-Demonstrate the appropriate technique for assessing chest pain in a patient, including a thorough history and physical examination and characteristics of associated chest pain.

3-Demonstrate the correct technique for administering sublingual nitroglycerin and explain when to seek medical attention for persistent chest pain.

2

Cont.

5-Identify the priority intervention for the treatment of angina pectoris, based on the patient's symptoms and vital signs.

6-Identify the clinical features of atrial fibrillation as a cardiac arrhythmia.

7-Describe the risk factors associated with atrial fibrillation

8- Evaluate the various treatment options for atrial fibrillation

9- Identify the potential complications associated with atrial fibrillation.

3

Definition

- Acute coronary syndrome (ACS) refers to a group of conditions associated with sudden , reduced blood flow to the heart . This can occur due to the buildup of plaque in the coronary arteries, leading to a partial or complete blockage

4

Pathophysiology

1. Injury to epithelial cells in the intima.
2. Platelet aggregation:
3. Migration of monocytes:
4. Lipoproteins enter intima
5. Fatty streak.
6. Monocytes develop into macrophages
8. Atheroma
9. Fibrous cap forms
10. Fibrous cap often ruptures
11. Thrombus
12. Clotting cascade initiated
13. Activation of Platelets change shape and activate receptors:
14. Release: Thromboxane A_2 and serotonin
15. Activate glycoprotein IIb/IIIa receptors
16. Aggregation

5

Chest pain characteristics

PQRST

- **P: Provokes**. What are the triggers or causes of the patient's chest pain? Does it occur when they are exerting themselves (such as during exercise) or when they are at rest? What makes the pain worse or better?
- **Q: Quality.** How would the patient describe the pain? Is it sharp, dull, stabbing, burning, crushing, or pressure-like?
- **R: Radiates.** Does the pain travel to other areas of the body, such as the arms, jaw, or back?
- **S: Severity.** How severe is the pain on a scale of 0 to 10, with 10 being the worst pain imaginable?
- **T: Time.** When did the pain start? Has it been constant or intermittent? How long does it last?

6

Common sites for radiation of ischemic cardiac pain

a) Left arm
b) Left shoulder
c) Neck
d) Jaw
e) Back or between the shoulder blades
f) Epigastric region

7

Risk factors for CAD

Non-modifiable risk factors:

1. **Age:** The risk of heart disease increases with age. Men aged 45 years or older and women aged 55 years or older are at increased risk.
2. **Gender:** Men are at higher risk of developing heart disease than women. However, after menopause, women's risk increases and becomes similar to that of men.
3. **Family history:** If there is a history of heart disease in your immediate family (parent, sibling), your risk of developing heart disease is increased.
4. **Race:** Certain ethnic groups, such as African Americans, Hispanics, and Native Americans, are at increased risk of developing heart disease.

8

Modifiable risk factors

1.**High blood pressure:** High blood pressure can damage the arteries and increase the risk of heart disease.
2. **High cholesterol:** High levels of LDL (bad) cholesterol and low levels of HDL (good) cholesterol in the blood increase the risk of heart disease.
3. **Smoking:** Smoking damages the blood vessels and increases the risk of atherosclerosis (hardening and narrowing of the arteries), which can lead to heart disease.
4.**Obesity:** Being overweight or obese increases the risk of heart disease.
5.**Physical inactivity:** Lack of physical activity increases the risk of heart disease.
6.**Diabetes:** People with diabetes are at higher risk of developing heart disease.
7.**Stress:** Chronic stress can increase the risk of heart disease.

9

The different types of angina

A-Stable Angina

- Also known as chronic or exertional angina
- Caused by physical exertion or stress, so pain is predictable
- Classic symptoms include a typical pattern of chest pain or discomfort, shortness of breath, and sweating
- ST segment depression and Ischemic T-wave inversion may be seen on an ECG during exercise or stress testing, but without changes in QRS.
- Treatment typically involves lifestyle modifications, such as regular exercise, healthy diet, and quitting smoking
- Medications like nitroglycerin, beta-blockers, calcium channel blockers, and aspirin may be prescribed to relieve symptoms and prevent complications
- Revascularization procedures like angioplasty or coronary artery bypass surgery may be considered for patients with obstructive coronary artery disease

10

B- Unstable Angina

- Also known as crescendo angina, while in rest or with minimal exertion.
- More severe and occurs more frequently compared to stable angina and can last longer, with less relief with medication.
- ECG typically shows transient or persistent ST-segment depression, T-wave inversion, or both, indicating myocardial ischemia
- Considered a medical emergency and requires prompt evaluation and treatment to prevent progression to myocardial infarction
- Medications like nitroglycerin, heparin, glycoprotein IIb/IIIa inhibitors, aspirin, Beta-blockers, Calcium channel blockers, Ranolazine.
- Additional interventions like angiography and percutaneous coronary intervention (PCI) may be considered for patients who have obstructive coronary artery disease

11

C- Variant Angina

- Also known as Prinzmetal's angina
- Caused by vasospasms in the coronary arteries and can occur at any time, even at rest
- Chest pain or discomfort is often severe
- This type of angina is usually not related to physical activity or emotional stress and often occurs at rest, especially in the middle of the night.
- May see ST elevation during pain episodes on an ECG

12

Medications

- Medications: Calcium channel blockers, nitrates, and aspirin. These medications help to relax the coronary artery, relieve spasm and improve blood flow to the heart.
- Beta-blockers are generally not recommended for patients with variant (or Prinzmetal's) angina, as they can exacerbate the condition by increasing coronary artery spasm and causing chest pain.

13

Nitroglycerin

- **Generic name:** Nitroglycerin
- **Brand name:** Nitrostat, Nitrolingual, Nitrogard
- **Nitroglycerin Action:** relaxes smooth => venous dilation, reduces preload/afterload, dilates coronary arteries => increased perfusion to heart.
- **Nitroglycerin Indications**

a) chest pain (cardiac origin) acute pulmonary edema
b) Given for myocardial ischemia
c) Treatment and prevention of angina pectoris and acute angina attacks

14

Cont.

- **Nitroglycerin contraindications**

Systolic BP < 90, pts who have taken erectile dysfunction medications (phosphor-diesterase inhibitors) in last 48 hrs, S/S of head trauma (increased intracranial pressure), cerebral hemorrhage, & poor systemic perfusion, RT ventricular infarction/ Inferior MI, brady/ tachy cardia, hypersensitivity to nitroglycerin or nitrates, severe anemia, hypotension, or pericardial tamponade.

- **Nitroglycerin side effects**

headache, hypotension, bradycardia, rebound HTN/tachycardia, palpitations, facial flushing, sublingual burning, dizziness, weakness, faintness, nasal congestion, GI bleeding, edema

15

Cont.

- **Nitroglycerin Interactions**

caution w/pts who use vasodilators, alcohol, Ca2+ blockers, beta blockers, & phenothiazines (antipsychotics= end-zine). Don't give with Viagra or cardiogenic shock

• **Dosage:** 0.3-0.6 mg every 5-10 minutes as needed, up to three doses. Max dose: 3 doses in 15 minutes.

16

Cont.

- **Route:** Sublingual

- **Precautions:** Use caution in patients with hypotension, hypovolemia, hepatic or renal impairment, glaucoma, or history of head trauma. Nitroglycerin may interact with other medications, such as beta-blockers, calcium channel blockers, or diuretics.

- **Nursing considerations:** Monitor blood pressure and heart rate before and after administration. Instruct the patient to place the tablet under the tongue and not to swallow or chew it. Teach the patient to store the medication in its original container at room temperature and to discard any unused medication after the expiration date.

17

The correct actions when taking SL NTG for chest pain include:

- Stop the activity and lie or sit down: When activity stop will allow the chest to relax and reduce the pain or discomfort of heaviness, tightness in the heart.
- Call 911 immediately: He can be transported to the hospital for further evaluation
- Place the NTG tablet under the tongue: place under tongue and work faster when is absorbed through the lining of the mouth. Nitro should not be chewed, crushed, or swallowed
- Allow the tablet to dissolve slowly.

18

Cont.

- Call 911 immediately if the pain is not relieved after taking one SL tablet: This indicate that it may not work to treat chest pain further evaluation is needed
- Call 911 if the pain is not relieved after taking three SL tablets, 5 minutes apart: For the Doc to further evaluate and probably unstable angina is pending which can lead to heart attack.

19

Other information about the side effects and storage of SL NTG

1. Having **any allergies or previous** adverse reactions to nitroglycerin or other medications?
2. **Taking any other medications**, supplements, or over-the-counter products that may interact with nitroglycerin?
3. The potential **side effects of nitroglycerin**, such as headaches, dizziness, flushing, and low blood pressure? It's important to know what to do if these side effects occur.
4. **How to properly store nitroglycerin**, such as keeping it in its original container and **away from heat and moisture**? Nitroglycerin tablets should be **stored in a cool, dry place and kept in their original container**. The tablets should **not be exposed to heat, moisture, or light.**

20

Cont.

5- How long is SL NTG effective? Nitroglycerin tablets have a relatively **short half-life**, so it's important to replace them periodically to ensure they remain effective.

6- How to **dispose of expired or unused** nitroglycerin properly?

7- Has the patient been instructed on how often and **when to check the expiration date** of his nitroglycerin tablets?

21

Atrial Fibrillation

22

Atrial fibrillation characteristics

- Atrial fibrillation can be classified into two types - paroxysmal atrial fibrillation (PAF) and persistent atrial fibrillation (PeAF). PAF refers to episodes that terminate spontaneously within seven days, whereas PeAF is defined as episodes lasting more than seven days or requiring termination by cardioversion.
- Atrial fibrillation is characterized by an irregularly irregular rhythm on the ECG.
- There is no discernible P wave on the ECG, and it can be replaced by fibrillatory waves instead.

23

Cont.

- Absence of an isoelectric baseline, with **a wavy baseline** instead.
- The **ventricular rate on the ECG can vary from normal to very fast due** to the atrial activity being irregular and uncoordinated.
- Atrial fibrillation can also be identified on the ECG by **a narrow QRS** complex, indicating that the ventricular depolarization is still normal despite the atrial fibrillation.
- The diagnosis of atrial fibrillation should always be made after a detailed clinical evaluation by a healthcare professional

24

Treatment of Atrial Fib.

A- Medications that:

1. **Rate control:** The first priority for patients with atrial fibrillation is to achieve rate control, which can be accomplished through medication that slows down the heart rate. Medications such as beta-blockers, calcium channel blockers, and digoxin may be used to achieve this.
2. **Anticoagulation:** Patients with atrial fibrillation are at an increased risk of blood clots and stroke due to the irregular and inefficient blood flow in the atria. Therefore, anticoagulants are often prescribed to prevent the formation of blood clots in the heart. Common anticoagulants include warfarin, dabigatran, rivaroxaban, and apixaban.

25

Cont.

3. Rhythm control: For patients who are symptomatic or whose atrial fibrillation is not controlled by rate control and anticoagulation, rhythm control may be an option. This can be achieved through medications that help restore and maintain normal sinus rhythm, such as amiodarone, dofetilide, sotalol, and flecainide.

B- Lifestyle changes: such as reducing alcohol and caffeine intake

26

C- In some cases, surgical or other invasive procedures:

- **Maze procedure:** A surgical procedure where a series of incisions are made in the atria to create a pattern of scar tissue, which directs the electrical signals in the heart and prevents irregular heart rhythms like AFib.
- **Catheter ablation:** A minimally invasive procedure where a catheter is inserted into a blood vessel in the groin and guided to the heart. Radiofrequency energy or cryoablation is then used to create scar tissue in the heart, blocking the signals that cause AFib.
- **Electrical cardioversion:** A brief electric shock is delivered to the heart through paddles or patches on the chest to restore a normal heart rhythm.
- **Pulmonary vein isolation**: A catheter is used to block the electrical signals coming from the pulmonary veins, which are often the source of AFib.
- **Hybrid ablation:** A combination of surgical and catheter ablation techniques are used together to treat AFib.

27

The primary complication that could occur if this heart rhythm is not treated

1- stroke,
2- pulmonary embolism
3- heart failure.

28

Conditions may have contributed to the development of this dysrhythmia

- **Risk factors and comorbidities:**

1) **Age:** Atrial fibrillation is more common in older adults, especially those over the age of 65.
2) **Hypertension:** High blood pressure can damage the heart and increase the risk of developing atrial fibrillation.
3) **Coronary artery disease:** Narrowing of the coronary arteries that supply blood to the heart muscle can cause damage to the heart and increase the risk of atrial fibrillation.
4) **Heart failure:** This condition can weaken the heart muscle and cause an enlarged heart, both of which increase the risk of atrial fibrillation.
5) **Valvular heart disease:** Damage to the heart valves, such as mitral valve prolapses or stenosis, can cause changes in the heart's electrical system and lead to atrial fibrillation.

29

Cont.

6) Diabetes: Uncontrolled diabetes can damage the blood vessels and nerves that control the heart's electrical system, increasing the risk of atrial fibrillation.

7) Sleep apnea: This condition, in which breathing is interrupted during sleep, can cause changes in the heart's electrical system and increase the risk of atrial fibrillation.

8) Structural changes in the heart due to heart disease

9) Abnormal heart rhythms

10) Heart block

11) Sick sinus syndrome

12) Angina pectoris

30

Triggers

1) **Age** - afib is more common in people above the age of 60.
2) **Heart disease** - such as coronary artery disease or valve problems
3) **High blood pressure**
4) **Obesity**
5) **Diabetes**
6) **Sleep apnea**
7) **Certain medications**
8) **Thyroid problems**
9) **Alcohol consumption**
10) **Caffeine**
11) **Stress or anxiety**

31

What is the Complete Medication template for each of the following medications: (1) Amlodipine, and (2) diltiazem IV (3) Digoxin, (4) Propafenone, Rythmol. (5) Amiderone?

1- Amlodipine Medication Template:

- **Generic name:** Amlodipine besylate
- **Brand name:** Norvasc
- **Indication:** Treatment of **hypertension, angina pectoris**, and vasospastic angina.
- **Work of action:** relaxing the blood vessels, which lowers blood pressure and allows more blood and oxygen to reach the heart muscle. When given as an intravenous (IV) medication, diltiazem is typically used to treat rapid heart rates such as atrial fibrillation or atrial flutter. It can also be used to treat high blood pressure when oral medications are not effective/ calcium channel blocker medication.
- **Dosage:** 5-10 mg once daily, maximum dose: 10 mg/day.
- **Route:** Oral
- **Frequency:** Once daily
- **Common side effects:** Headache, edema, flushing, dizziness, fatigue, nausea, abdominal pain, hypotension, palpitations.
- **Contraindications:** Hypersensitivity to amlodipine or dihydropyridine **calcium channel blockers, severe hypotension, cardiogenic shock, or aortic stenosis.**
- **Precautions:** Use caution in patients with hepatic or renal impairment, heart failure, or sick sinus syndrome. Amlodipine may interact with other medications, such as beta-blockers, digoxin, or simvastatin.
- **Nursing considerations:** Monitor blood pressure and heart rate regularly. Instruct the patient to take the medication at the same time every day and not to stop taking it abruptly. Teach the patient to report any symptoms of hypotension or edema.

32

2- Diltiazem IV Medication Template:

- **Generic name:** Diltiazem hydrochloride
- **Brand name:** Cardizem, Tiazac
- **Indication:** Treatment **of hypertension, angina pectoris**, and atrial fibrillation/flutter. (calcium channel blocker medication)
- **Work of action:** It works by **blocking calcium channels** in the muscles of the heart and blood vessels, which causes the muscles to relax and widen (dilate). This allows blood to flow more easily through the blood vessels, which can lower blood pressure and reduce the workload on the heart.
- **Dosage:** 0.25 mg/kg over 2 minutes, followed by an infusion of 5-15 mg/hour. Maximum dose: 360 mg/day.
- **Route:** Intravenous
- **Frequency:** Continuous infusion
- **Common side effects:** Headache, dizziness, flushing, hypotension, bradycardia, peripheral edema, nausea, constipation.
- **Contraindications:** Hypersensitivity to diltiazem, severe hypotension, sick sinus syndrome, **second or third degree AV block without a pacemaker**, or Wolff-Parkinson-White syndrome.
- **Precautions:** Use caution in patients with hepatic or renal impairment

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3- Digoxin medication template

- **Generic name:** Digoxin
- **Brand name:** Lanoxin
- **Indication:** Digoxin is used to treat heart failure, atrial fibrillation, and other heart rhythm disorders.
- **Work of action:** Digoxin works by increasing the strength and efficiency of the heart muscle, which can improve blood flow and reduce symptoms of heart failure.
- **Dosage:** The usual maintenance dose of digoxin is 0.125-0.25 mg once daily.
- **Maximum dose:** The maximum daily dose of digoxin should not exceed 0.5 mg/day.
- **Route:** Digoxin is usually given orally, but it may also be given by injection in certain situations.
- **Frequency**: The frequency of dosing may vary depending on the individual patient's medical history and other factors, but it is typically once daily.
- **Common side effects:** Common side effects of digoxin may include nausea, vomiting, loss of appetite, diarrhea, headache, and dizziness.
- **Contraindications:** Digoxin is contraindicated in patients with a known hypersensitivity to the medication, those with certain types of heart rhythm disorders, and those with **severe heart block.**
- **Precautions:** Use caution in patients with hepatic or renal impairment, as well as those with electrolyte imbalances or thyroid disorders.

Note that the specific content and format of a digoxin template may vary depending on the source and intended audience. It's important to always consult with a healthcare professional for personalized recommendations regarding medication use.

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4- Amiodaron

- **Generic name:** Amiodarone
- **Brand name:** Cordarone, Pacerone
- **Indication:** treatment of irregular heart rhythms, including atrial fibrillation, ventricular arrhythmias, and supraventricular arrhythmias.
- **Work of action:** Amiodarone works by blocking potassium channels in the heart, which slows the rate of electrical impulses and helps to stabilize the heart rhythm.
- **Dosage:** Amiodarone is usually given in an oral tablet form, with the dosage and duration of treatment varying depending on the individual patient's medical history and condition. Treatment may start with a loading dose of up to 800-1600 milligrams a day for one to three weeks, followed by a maintenance dose of 200-400 milligrams a day.

35

Cont.

- **Common side effects:** nausea, constipation, loss of appetite, fatigue, and tremors. Other more serious side effects include pulmonary toxicity, liver damage, and thyroid dysfunction.
- **Contraindication:** Amiodarone should not be used in patients with a known hypersensitivity to the medication, certain types of heart block, or severe asthma or lung disease. It should also be used with caution in patients with liver or thyroid disease, as it can exacerbate these conditions.
- **Nursing considerations:** Nurses should monitor patients receiving Amiodarone closely for any signs of potential side effects, such as respiratory distress, hypotension, or abnormal liver or thyroid function. Any changes in the patient's heart rhythm or other vital signs should also be closely monitored. Patients should be advised to avoid grapefruit or grapefruit juice while taking Amiodarone, as this can increase the risk of side effects.

36

Appendix K: Literature Review Matrix

No.	Author (Year)	Place	Participants	Aim	Study Design	Findings
1.	Lloyd (2020), Dissertation	Medium-sized public university in the Midwest	Pre-licensure Bachelor of Science in Nursing students (N=70), 8 involved in the focus group.	To examine the impact of unfolding case studies in adult medical/surgical nursing content within classroom environments on critical thinking skills (CTS) and academic performance among pre-licensure Bachelor of Science Nursing students	Mixed method, quasi-experimental study, semi-structured Focus Group	The experimental group scored higher in academic success than the control group but no difference between both groups regarding critical thinking. **In the qualitative study, four primary themes emerged:** **1.** Cognitive skills in typical classrooms. 2. Student engagement in class. 3. Student-centered conventional teaching. 4. Classroom reality-based teaching
2.	Yousey (2013)	University of Northern Colorado, USA	Nursing students (n=26)	To investigate the implementation of unfolding case studies as a unique strategy for	Mixed-method approach, scoring rubric, and feedback	Students showed an understanding of public health nursing better,

				improving students' knowledge, clinical decision-making, critical thinking, and problem-solving abilities in an online nursing program's public health course	survey questions.	improved their inventive problem-solving and public health interpretation of chronic illness concepts. **Faculty assessment**: the research contributed to improving formative and summative student assessment.
3.	Bryant (2016), Dissertation	Community college in the southeastern United States	Students in a Fundamentals of Nursing Course, lecture group 45 students, unfolding case study group 44.	To examine the effects of using unfolding case studies within an oxygenation module in a Fundamentals of Nursing Course by comparing differences in understanding and transfer between a lecture-based approach and an unfolding case studies approach	Mixed-methods investigation, quasi-experimental, pre-posttest, a qualitative survey	1. Results showed unfolding case study students understood more than lecture-based students in the oxygenation module 2. Qualitative findings indicated two main themes: first; increasing preparedness and knowledge. Secondly: emphasized safe learning

						and peer interaction.
4.	Meiers and Russell (2019)	North Island College, Canada	Faculty and nursing students	To determine the obstacles nursing students encounter when linking client conditions with assessments and performing clinical skills	Qualitative study, two focus groups; one for students and the other for faculty.	Teacher-student focus groups identified three themes regarding the benefits of unfolding case studies for students: knowledge synthesis, practice transferability, and clinical competence.
5.	McCormick et al. (2013)	Towson University, Towson, USA	Students in assessment skills laboratory and classroom.	To compare the effectiveness of unfolding case simulation and classroom lecture in teaching about Parkinson's disease of nursing students` level of knowledge.	Quantitative study, comparative experimental design	1.The within-group analysis demonstrated a significant increase for students in both groups ($p = 0.040$). 2.Compared to classroom lectures, unfolding case simulation students exhibited considerably superior knowledge ($p = 0.031$).
6.	Herron et al. (2019)	University in southeastern US	165 baccalaureat	Compare the effects of traditional	Quantitative study, a quasi-	1.The video simulation group

			e nursing students	written case studies and video simulation unfolding case studies on nursing students' satisfaction, self-confidence, and knowledge	experimental design of two groups, content analysis to 2 open-ended questions on the post-test	consistently had greater accuracy on knowledge questions than the written case study group. 2.The traditional written case study and video simulation groups exhibited equal satisfaction and self-confidence. 3. Introducing Case Studies Student Learning: Written or simulated video case studies improved learning, knowledge, application, and visualization.
7.	Munn et al. (2021)	Southeastern United States Public, rural, liberal arts university	43 nursing students	To evaluate how undergraduate nursing students' self-confidence in their clinical judgment/decision-making skills and knowledge of	Mixed-methods investigation, one group pre- and post-survey design, directed content analysis of the five	1.Students' pediatric nursing knowledge, skills, and decision-making confidence improve via case studies through

				pediatric nursing is affected by simulation utilizing unfolding case-study situations.	open-ended survey questions	instructor-led simulation and student-led simulation. 2.Themes of experience perception, pediatric nursing care, knowledge absorption, and critical thinking improved.
8.	Ma and Zhou (2022)	School of Nursing, Guangzhou Medical University, Guangzhou, Guangdong, Southern China	115 undergraduate nursing students from a medical university, Intervention group (n = 54) and a control group (n = 61)	To evaluate the effects of unfolding case-based learning on enhancing academic achievement, critical thinking, and self-confidence, in comparison to traditional learning methods in the health assessment course	Quasi-experimental study	- Unfolding case-based learning enhanced health assessment academic performance, critical thinking, and self-confidence between and within groups analysis.
9.	Carter and Welch (2016)	School of Nursing at South Georgia State College, USA	Intervention group: 40 Control group: 44 Associate Degree in Nursing (ADN) students	To assess the effectiveness of unfolding case studies as an instructional strategy in renal and musculoskeletal subjects with traditional lectures in	Quasi-experimental study with post-test evaluation	-Both groups' knowledge improved from pre- to post-test, but no significant difference in test score improvement

				nursing students' level of knowledge and critical thinking skills.		between the two teaching methods for both renal (p <0.71) and musculoskel etal (p <0.12) patients. - Both groups' HSRT scores were disappointin g. - The control group's scores dropped more than the intervention group's
10.	Hobbs and Robinson (2022)	Capstone College of Nursing, Alabama	Undergradu ate nursing students(n= 86)	To explore the impacts of integrating unfolding case studies into an adult health nursing course on the academic accomplishmen ts of students	Quasi-experimenta l study	-Both slide lecture and UCS groups improved from the pretest to the posttest. - Both groups' transfer test results dropped. - Learning results were similar for both groups.
11.	Becnel (2022) Dissertati on	A public university in the South-Central region of the	Nursing students in medical-surgical course (54 students in	To compare the effectiveness of simulation-based case studies and traditional	Quasi-Experiment al Two-Group Pretest-	-Cohort B nursing students who completed simulation-based case

		United States	Cohort A, 66 students in Cohort B)	lectures in knowledge acquisition, clinical judgment, and self-efficacy among nursing students.	Posttest Design	studies and cohort A who attended lectures had similar knowledge, clinical judgment, and self-efficacy. -ANOVA revealed substantial mean score gains from pretest to posttest in Cohorts A and B suggesting enhanced knowledge acquisition.
12.	Hong and Yu (2017)	the Nursing School of Qianjiang College of Hangzhou Normal University in China, Medical Theory nursing classes	122 undergraduate nursing students	To examine two approaches to case-based learning: multi-episode/unfolding case study and single episode case study on critical thinking ability.	Randomized Controlled Trial (RCT)	-The multi-episode case study group enhanced critical thinking more than the single-episode case study - The single-episode case study improved in three of seven CTDI-CV characteristics, whereas the experimental group

						improved in six.
13.	Englund (2020)	Comprehensive university in Wisconsin Oshkosh, College of Nursing, United States of America	Experimental group: 160 nursing students, Comparison group: 142 nursing students enrolled in the Adult Health Theory course.	To assess the feasibility and effectiveness of incorporating unfolding case studies into nursing curricula and compare their impact on critical thinking skills development.	Quantitative Non-experimental correlational study	-The experimental group did better on course tests than the comparison group. -The research found that unfolding case studies boosted students' critical thinking.
14.	Li et al. (2019)	Huzhou University, Zhejiang Province in China	80 junior-level nursing students (40 in the experimental group, 40 in the control group)	To explore the influence of "nursing case-based learning" of unfolding case studies on the critical thinking skills of nursing students	Quantitative Comparative study	-The experimental group utilizing unfolding case studies showed significant improvement in critical thinking after nine weeks compared to the control group utilizing lecture-based learning.
15	Upshaw (2016) Dissertation	Historically black college in southeastern Louisiana	71 baccalaureate nursing students	To investigate the impact of the Unfolding Case Studies (UCS) intervention about COPD and pneumonia	Quasi-experimental Study, Solomon research design.	-HESI scores from pre-test to post-test demonstrated no significant difference in knowledge

				on the knowledge acquisition and critical thinking abilities of baccalaureate nursing students, comparing it to the traditional didactic lecture method.		acquisition between experimental and control groups. - The pretest and post-test critical thinking scores, as measured by the HSRT, were comparable both within and between the groups.
16.	Blakeslee (2019), Dissertation	A private university in the midwestern United States.	Baccalaureate junior nursing students (n= 69), Simulation group: 36 participants, Comparison written case studies group: 33 participants	To compare critical thinking skill scores between simulation-based learning and written case studies.	A quantitative causal-comparative methodology with a pretest/posttest design	-The mean critical thinking scores of participants in each group did not change significantly from the pretest to the post-test - No statistically significant changes in critical thinking skills utilizing HSRT were found between the high-fidelity simulation and written case studies.

17.	Leynes-Ignacio (2023)	Higher education institution (HEI) in Angeles City, Philippines	166 nursing students	Examine satisfaction and self-confidence levels in a medical-surgical learning curriculum utilizing unfolding case studies	Cross-sectional approach, an online survey	-Nursing students expressed great satisfaction (M=22.02; SD=0.29 out of 25) and self-confidence (M=34.60; SD=0.48 out of 40) using unfolding case studies.
18.	Peele (2015), Dissertation	College of Community Nursing, USA	17 second-year associate degree nursing students	Assess the influence of unfolding case studies on self-efficacy in community complex health concepts course	Quantitative method, one group pretest-posttest comparison design	- Classroom debates using the unfolding case study "Nurses and Social Media: Don't Create a Breach in Care" increased nursing students' self-efficacy ($p = 0.024$).
19.	Al Gharibi et al. (2021)	College of Nursing and Health Professions, Midwest USA	126 nursing undergraduates	Evaluate the influence of recurrent simulation-based case scenarios with debriefing on self-efficacy	Quasi-experimental (one-group repeated measures design)	-Repeating simulations increased self-efficacy in nursing student's clinical competence. - From the pre-test to mid-test, self-efficacy decreased. -After repeated simulations,

						self-efficacy improved.
20.	Mills et al. (2014)	Australia	First-year nursing students (n= 47)	Assess the impact of a teaching approach using unfolding case studies on the satisfaction of nursing students	Mixed methods study, one group self-administered survey, 10 semi-structured interviews (five students, three academics, and two standardized patients)	-The average student satisfaction score was 4.6 (SD = 0.4), while the average student self-confidence score was 4.3 (SD = 0.7). - Video recording, playback, post-session conversations, and qualitative interview data verified students' high satisfaction with the educational strategy.
21.	Jensen (2023)	University of Minnesota, USA	16 occupational therapy students practice unfolding case studies, 47 occupational therapy students in online page reviews	Examine effects of unfolding case study on clinical skill self-efficacy and engagement with course content compared to a static case study	The quasi-experimental study, one group retrospective data analysis on online page views.	-Student self-efficacy ratings were higher in unfolding case studies and differed significantly with the static case study curricular designs. - Occupational therapy students used online

						educational resources more in the unfolding case study than in the static case study. - The unfolding case study had a better mean engagement score than the static case study.
22.	Gholami et al. (2021)	Lorestan University of Medical Sciences, Iran	43 third-year nursing students enrolled in an emergency care course	Investigate multi-episode case-based learning (CBL) vs. lecture-based learning on problem-solving abilities and motivation	Quasi-experimental, single-group, pretest-posttest Comparative Study	-Multi-episode case-based learning (CBL) showed substantial variations in perceived problem-solving abilities ($p < 0.001$) and learning motivations ($p < 0.001$).
23.	Baker and Blakely (2023)	University of Alabama at Birmingham, USA	20 nurse practitioner (NP) students	Assess the self-efficacy of students utilizing unfolding case studies in caring for community-dwelling older adults	Quasi-experiment, pilot Study	-NP students' self-efficacy increased after completing an obligatory unfolding case study using two assessment tools: the General Self-Efficacy

						Scale (GSE) and the Caring for Community-Dwelling Older Adults Self-Efficacy Scale (CCDOASES). - The UCS assignment helps instructors create NP-focused teaching materials.

الملخص

"أثر تطبيق التعلم القائم على الاستكشاف التدريجي للحالات المرضية على المعرفة والتفكير الناقد والكفاءة الذاتية لطلبة مساق تمريض العناية الحثيثة: دراسة شبه تطبيقية"

المقدمة: هناك زيادة بالوعي في استخدام استراتيجيات التعليم الحديث في علم التمريض. إن منهج التعلم القائم على الاستكشاف التدريجي للحالات المرضية، له مساهمة ملموسة في تعليم لتمريض. إن دراسة الحالات المرضية المبنية على الاستكشاف التدريجي يمكن ان تحسن من اكتساب الطلبة لخبرات تعلم متنوعة من خلال التفاعل في مناقشة السيناريوهات العلاجية. هناك نقص في الأبحاث الموجودة التي تدرس تأثير دراسات الحالات المتكشفة على اكتساب المعرفة والتفكير النقدي والثقة بالنفس بين طلاب التمريض.

هدف البحث: تهدف هذه الدراسة إلى تقييم أثر تطبيق التعلم القائم على الاستكشاف التدريجي للحالات المرضية لطلبة مساق تمريض العناية الحثيثة من حيث المعرفة والتفكير الناقد والكفاءة الذاتية بالمقارنة مع طرق التدريس التقليدية.

منهجية الدراسة: استخدمت منهجية البحث شبه التطبيقي في الجامعة العربية الأمريكية في جنين، فلسطين، خلال الفترة من فبراير إلى يونيو 2023. تم اختيار عينه الدراسة من طلبة التمريض المسجلين في مساق تمريض العناية الحثيثة باستخدام استراتيجية أخذ العينات بالمجموعات ذات المرحلة الواحدة. خضع الطلبة المشاركين في مجموعة التطبيق (n= 91) الى التعلم القائم على الاستكشاف التدريجي للحالات المرضية، في حين خضع طلبة المجموعة الضابطة التقليدية (n= 78)لأساليب التدريس التقليدية. تم تنفيذ أساليب التعلم القائم على الاستكشاف التدريجي للحالات المرضية من خلال مناقشات جماعية تفاعلية لسيناريوهات الحالات المرضية المستخلصة من مراجع معتمدة، والتي قام مدرسي المادة بالإشراف عليها وتوجيهها لضمان تغطية شاملة لمحتوى المساق. شملت نتائج الدراسة تقييم أداء الطلبة البعدية من حيث المعرفة، والتفكير النقدي، ومستوى الكفاءة الذاتية تم قياسها باستخدام أدوات تم التأكد من ثباتها ومصداقيتها. تم تحليل البيانات إحصائيا باستخدام برنامج SPSS إصدار 27 ومن الناحية النظرية تم استخدام الى مفاهيم نظريه البناء الاجتماعي التي تستند الى التفاعل الاجتماعي في عملية التعلم خلال مراحل الدراسة.

النتائج: كانت العينة موزعة بشكل متساوي تقريبي بين الجنسين، وكان متوسط أعمار الطلبة المشاركين 22.3 سنة، وكان المعدل التراكمي لديهم 2.76. بعد تنفيذ برنامج الدراسة، أظهر الطلبة في

المجموعة التطبيقية تحسنا في المعرفة مقارنة بالمجموعة الضابطة، حيث كانت الدرجات أعلى بشكل معنوي (7.12 مقابل 5.49 على التوالي، t = -12.7، df = 167، p <.001، 95٪ CI [-1.89 إلى - 1.38]). بالإضافة إلى ذلك، تم العثور على فروقات مماثلة في درجات التفكير النقدي للطلبة (4.32 مقابل 3.63 على التوالي، t = -17.390، df = 167، p <.001، 95% CI [-0.77 إلى -0.61])، وكذلك في مستوى الكفاءة الذاتية (6.12 مقابل 4.4 على التوالي، t = -30.897، df = 167، p <.001، 95% CI [-1.82 إلى - 1.60]). وأشار معامل الارتباط إلى وجود علاقة إيجابية قوية بين التفكير الناقد والكفاءة الذاتية في المجموعات التطبيقية (r = 0.69، p<0.001).

الاستنتاج: اثبتت الدراسة ان منهجية التعلم القائم على الاستكشاف التدريجي للحالات المرضية يعتبر أسلوبًا فعّالًا في تعزيز اكتساب طلبة التمريض لمساق الرعاية الحثيثة لكل من المعرفة، والتفكير النقدي، والكفاءة الذاتية. يجب على مدرسي التمريض أن يدعوا لسياسات تشجع على إدماج دراسات الحالات المتكشفة كاستراتيجية تعليمية في مناهج التمريض في مواضيع مختلفة ومجموعات متنوعة.

الكلمات الدالة: دراسة الحالة، التفكير النقدي، الكفاءة الذاتية، المعرفة، الممرض، الطالب، الرعاية الحثيثة.