REPUBLIC OF TURKEY
ANKARA YILDIRIM BEYAZIT UNIVERSITY
THE INSTITUTE OF HEALTH SCIENCES

THE EFFECT OF TWO DIFFERENT SIMULATION MODALITIES IN PALLIATIVE CARE TEACHING ON NURSING STUDENTS' KNOWLEDGE, SATISFACTION, SELF-CONFIDENCE, AND SKILLS

DOCTORAL THESIS

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04/03/2022

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I certify that this thesis meets all the requirements for a PhD degree.

DECLARATION

I hereby declare that all information in this thesis has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work; otherwise, I accept all legal responsibility. 04/03/2022.

Abdallah ALWAWI

DEDICATION

To all health science students and educators around the world

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ÖZET

Palyatif Bakım Öğretiminde İki Farklı Simülasyon Yönteminin Hemşirelik Öğrencilerinin Bilgi, Memnuniyet, Özgüven ve Becerilerine Etkisi

Gelişmekte olan ülkelerde hemşirelik öğrencilerinin palyatif bakımı (PB) deneyimlemek için fırsatları sınırlıdır, bu da öğrencilerin klinik deneyim kazanmalarını zorlaştırır. Standart hasta simülasyon uygulamaları ve düşük gerçeklikli simülasyon uygulamaları, hemşirelik öğrencileri için gerçekçi palyatif bakım deneyimleri sağlayabilir. Filistin'de hemşirelikte simülasyona dayalı eğitim konusunda araştırma oldukça sınırlıdır. Gelişmekte olan ülkelerden biri olan Filistindeki hemşirelik öğrencileri üzerinde simülasyon uygulamalarının etkili olacağı düşünüldüğünden bu çalışma yapılmıştır. Bu araştırma ile palyatif bakım öğretiminde iki farklı simülasyon uygulamasının hemşirelik öğrencilerinin bilgi, memnuniyet, özgüven ve becerilerine etkisini incelemek amaçlanmıştır.

Çalışma Kudüs Üniversitesi'nde Palyatif Bakım Hemşireliği dersine kayıtlı ikinci sınıftaki 70 hemşirelik öğrencisi ile yapılmış randomize kontrollü bir çalışmadır. Öğrenciler her grupta 35 öğrenci olacak şekilde rastgele düşük gerçeklikli simülasyon veya standart hasta grubuna atanmıştır. Öğrencilere teorik eğitim verilmiştir. İki grup için teorik eğitime paralel olarak simülasyon uygulamaları yapılmıştır. Öğrencilerin bilgileri Palyatif Bakım Bilgi Testi ile, özgüven ve memnuniyeti Öğrenci Memnuniyeti ve Öğrenmede Kendine Güven Ölçeği ile, beceriler ise ayrı form ve senaryolarla değerlendirilmiştir. Bilginin değerlendirilmesi, her grupta uygulamalardan önce ve sonra yapılmıştır.

Araştırmanın sonunda, öğrencilerin bilgileri, her iki grup arasında anlamlı bir fark olmaksızın, ön teste göre son testte önemli ölçüde arttı. Bulgular düşük gerçeklikli ya da standard kullanımının, klinik eğitimlerde her senaryo için öğrenciler arasında öz memnuniyet ve özgüven üzerinde aynı etkiye sahip olduğunu göstermiştir. Beceri performansı, gruplar arasında karşılaştırıldığında standart hasta grubunun becerilerinin, (hastanın ailesine kötü haberlerin nasıl iletileceğine ilişkin ilk senaryoda) düşük gerçeklikli uygulama grubuna göre önemli ölçüde geliştiği görülmüştür. Kronik hastalar için palyatif bakım planlaması eğitimini içeren ikinci senaryo ve palyatif

bakım ileri planlamasını içeren üçüncü senaryonun sonuçları, her iki grupta beceri düzeyi ortalama puanları arasında anlamlı bir fark olmadığını göstermiştir.

Sonuç olarak bu çalışma her iki simülasyon uygulamasının palyatif bakım hemşireliği öğrencilerine güvenli bir öğrenme ortamı sağlamada etkili olduğunu, dolayısıyla bilgi, memnuniyet, güven ve becerilerini artırdığını ortaya koymuştur.

Anahtar Kelimeler: Beceriler, bilgi, hemşirelik öğrencileri, memnuniyet, özgüven, palyatif bakım öğretimi, simülasyon.

ABSTRACT

The Effect of Two Different Simulation Modalities in Palliative Care Teaching on Nursing Students' Knowledge, Satisfaction, Self-confidence, and Skills

Nursing students from developing countries have limited opportunities to experience palliative care, making it difficult for them to learn how to deliver it clinically. Limited research is available on simulation-based education in nursing in Palestine. Testing and employing standardized patient simulation (SPS) and low fidelity simulation (LFS) applications may be the best solution for developing countries that lack adequate resources and can impact nursing students in Palestine as a model for developing countries. This study aimed to test the effects of two different simulation modalities in palliative care teaching on nursing students' knowledge, satisfaction, self-confidence, and skills.

The study was randomized controlled trial of 70 nursing students in their sophomore year who were already registered in the Palliative Care Nursing course during the spring semester of the academic year 2020-2021 at AQU. Students were randomly assigned to the (LFS) group or to the (SPS) group. 35 in each group. Students were given a three-credit-hour theoretical education. Simulation exercises were conducted in parallel with the theoretical education, for the two groups. Students' knowledge was assessed with the Palliative Care Quiz for Nursing; satisfaction and confidence with the Learner Satisfaction and Self-Confidence with the Learning; and the skills were evaluated with separate forms, scenarios, and rated by three researchers. Assessment of knowledge was carried out before and after the intervention in each group. Other tools were carried out after the intervention in each group for each scenario.

Students' knowledge improved significantly on the post-test compared to the pre-test, without significant differences between both groups. Unexpectedly, the findings showed that the utilization of the LFS or SPS in students' clinical training for each scenarios has the same effect on the self-satisfaction and self-confidence among students. Skill performance was comparable between groups. Expectedly, the skills of the SPS group improved significantly more than the LFS group on the first scenario which was on how to deliver bad news to the patient's family about the progression of

the disease. Unexpectedly, the results of the second scenario which included training on palliative care planning for chronic patients, and third scenario which was training on continuation of the palliative care advance planning, showed no significant difference between the mean scores of the skill level of both groups.

The current study revealed that both simulation modalities are effective in providing a safe learning environment for palliative care nursing students, hence boosting their knowledge, satisfaction, confidence, and skills. Moreover, In preclinical palliative care nursing education, simulation-based practice using low fidelity and standardized patient simulations can be recommended.

Keywords: Skills, knowledge, nursing students, satisfaction, self-confidence, palliative care teaching, simulation.

LIST OF ABBREVIATIONS

AQU	: Al-Quds University
BSN	: Bachelor of Science in Nursing
ELNEC	: End-of-Life Nursing Education Consortium
EOL	: End-of-life
HCPs	: Health care professionals
LFS	: Low Fidelity Simulation
LSSCL	: Learner Satisfaction and Self-Confidence in Learning
Max	: Maximum
Min	: Minimum
PC	: Palliative Care
PCQN	: Palliative Care Quiz for Nursing
SD	: Standard deviation
SMOTS	: Scotia Medical Observation and Training System
SPS	: Standardized Patient Simulation
SPSS	: Statistical Package for the Social Sciences
WHO	: World Health Organization
$\bar{x}$	: Mean

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1. INTRODUCTION

1.1. Statement of the Problem and Significance

Over the past few decades, palliative care (PC) has experienced dramatic growth from the formal categorization of Hospice and Palliative Medicine by Local Board Authorities in many countries, to creating new models for supplies and payment and growing patient understanding of the need for such care (1-4). However, in large sections of the Middle East, PC is not yet understood by healthcare workers, health professionals students, patients, and the general public (5). An explanation for this is that PC does not reflect the purpose of the clinical discipline, which is to improve the quality of life when battling a critical condition. Moreover, tradition and culture have contributed to misgiving and uncertainty, especially in the critical stages (5).

Palliative nursing care requires extensive knowledge, critical thinking, heightened mental functioning, and the use of nuanced palliative nursing skills. Patients and families with severe End-of-life (EOL) diseases and death are challenged regularly by need of palliative care nurses (6). This condition is compounded further by complex social circumstances, difficult conditions, difficulty managing symptoms, and challenging communication surrounding death and grief in patients, which requires self-confidence. As such, knowing oneself is crucial to match one's work with the hospice care philosophy (7). Given the association and crucial role played by various attributes, including knowledge, self-satisfaction, self-confidence, critical thinking, and skills, it is crucial to investigate the variables together to determine how they influence the efficiency and quality of PC education (8). Contemporary, research reveal that PC education and experience are essential to deliver high-quality palliative nursing care by nursing students (9-11).

Globally, nursing education ensures that students are empowered, safe, and capable (12-15). Today’s nursing students face varying challenges, with those from developing countries facing more tough ones, unlike those from developed countries.

Currently, the number of patients with life-limiting and serious illnesses has increased, and all of them require PC. However, there are widespread shortage of PC specialists, with their number reported by some scholars as low as 1% of all medical specialists 20 years from now (12). Hence, there is a local and global need for teaching nursing students about PC. Given the high demand for clinical placements and a decrease in the number of clinical instructors, there has been an evident decline in nursing students' involvement in clinical procedures, which may affect the quality of education and services (21).

One of the most significant issues in PC nursing education is a lack of coherence between theory and practice (75). Clinical training data revealed that PC nursing teaching is primarily theoretical, with little integration of theory and practice (75). The emphasis of nursing education must shift from conventional teacher-centered teaching systems to student-centered active approaches. Moreover, the combination of the two learning strategies would improve the success of educational programs (16). There are several approaches and methods used in nursing education to bridge the gap between theory and practice (12, 14, 15). Simulation is one of those educational methods that seek to reduce this gap (12). Prior to providing services to patients, nursing students are now expected to show proficiency and competency, all of this is achieved through specialized education, training and meeting the past challenges.

Simulation is the safest solution to resolve the lack of knowledge and skills of PC among nursing students (17-19). Nursing students may be trained about it using simulations to lower the gap between nursing theory and practice regarding PC (12-15). Simulation may enhance nursing students' knowledge and skills in PC by replacing real experiences with guided ones that are a replica of the real world (12). Research reveal that simulations enhance the preparedness of students in acute care to provide safe PC (20, 21). The result of a study conducted to determine the relationship among previous PC nursing experience, performance, self-awareness, and knowledge among nursing students after an end to end simulation revealed that there was an increase in the study variables after the simulations (9). Meanwhile, Research also reveal that there is a limited data on simulation-based education used in nursing (22).

Simulation education is perceived to enhance satisfaction, knowledge, confidence, and skills among nursing students. Simulation methods are acknowledged

as effective interactive learning strategies in nursing education that allow the students to feel satisfied with the care, they deliver during their clinical placement (20, 23-29). Therefore, this study is conducted to add to the existing body of literature regarding the effectiveness of simulation in improving learning experiences among student nurses. This study are expected to provide supporting evidence to back up the assumption below. The assumption is that various simulation modalities interventions could be used as the appropriate interactive teaching and learning methods that may provide the necessary learning opportunities for nursing students to acquire clinical skills and competencies that may help them improve quality of care during their placement in PC.

The simulation approaches provide the nursing students with enough opportunities to practice their clinical skills through different real-life situational scenarios (30-36). Therefore, the study findings add to the benefit of the nursing education and nursing practice considering that implementation of these approaches will have a significant role among nursing students during their placement. The greater demand for well-qualified nurses in the modern clinical environment with enough clinical background justifies the need for more effective and life-changing teaching methods.

There is a growing body of literature that reveal the educational value of various simulation modalities such as using standard patient simulation (SPS) and low-fidelity simulation (LFS) which are vital in enhancing nursing students' skills (37, 38). However, the above simulation methods exist in various forms and numbers, each having its advantages and disadvantages. Testing and employing these two types of simulation methods may be the best solution for developing countries that lack adequate resources, and can impact nursing students in Palestine as a model for developing countries. From the body of knowledge regarding low fidelity and standardized patient simulation interventions, these simulation-based nursing interventions are the most popular pedagogical approaches used to teach nursing students (37, 38).

Clinical evidence shows that simulation-based strategy is an innovative teaching method that may help prepare nursing students to acquire the necessary skills and provide quality PC or EOL care (14). LFS is one of the learning interventions used in

nursing education to teach nursing students about PC. Different simulation modalities have been proven to be effective in improving nursing students learning experiences that enable them to learn from clinical complexities or real-life case scenarios. Existing literature that has examined the application of clinical fidelity simulation strategy in clinical settings, including PC, showed that implementation of this learning intervention plays a crucial role in improving nursing students learning experiences in various clinical scenarios (12, 13, 39). However, the studies lacked detailed evidence on the simulation modalities in PC teaching among student nurses.

Clinical evidence establishes that maximizing the effectiveness of simulation training in developing countries is imperative to promote access to safe and essential clinical care (39-42). The innovative training methods are needed in such countries to improve the efficiency of nurses' training in various clinical practices (41, 42). Simulation training is one of the innovative methods that may have a crucial contribution to upscaling and improving the proficiency of nurses' training and delivery of care in clinical settings. These simulation interventions are imperative to improve nurses' teaching and learning experiences to improve patient and clinical outcomes (43-45).

Kirkpatrick, Cantrell (9) argue that although research has been done in the field of PC to compare impact of simulation between experienced and inexperienced students, the results were not sufficient due to a small number of participants (n=5) with no prior experienced. Therefore, the researcher recommended to more effectively evaluate and control previous experience in PC as a variable that influences the students' outcome before and after implementing the simulation. The current research seeks to address this research gap using a sample with low variability and enough sample to give room for generalization. Researchers also add that although a brief PC nursing education improved nurses' knowledge in PC in study, it was recommended that palliative nursing education should be included as part of a continuing education program for nurses (46). This would improve and optimize their knowledge in PC which, in turn, can improve clinical practice. More research is needed to clarify the findings that a brief palliative nursing education can improve nurses' knowledge in PC (46).

The main problem in this research is that there was a lack of relevant studies on the impact of simulations on nursing students' in Palestine including simulations in palliative care (22). Furthermore, it is not known whether, or not, a LFS and SPS improves Palestinian nursing. The studies lacked detailed evidence on the simulation modalities in PC teaching among student nurses in Palestine (22). Thus, nursing schools that will apply the recommended simulation approaches derived from the findings of this study will have the capacity to adequately train or educate their nursing students. The study was also conducted to benefit the nursing students during their clinical placement in PC. The study's findings are expected to help them realize whether the skills and knowledge they developed from the simulation approaches would be helpful to them in their future careers as they work with patients in their EOL care. Further, the study's findings are expected to provide important information that encourages nursing students to appreciate and pursue their clinical profession with a focus on delivering safe and quality care to their patients in PC or at EOL care. Additional, the current study's findings are expected to provide additional information on how LFS and SPS interventions provide nursing students with a higher learning experience where psychomotor, cognitive, and emotional learning are acquired and integrated into clinical practice. The findings are expected to uncover what is not known and elaborate on what is known regarding the effectiveness of LFS and SPS in PC education. Since the present study focused on the effects of LFS and SPS among nursing students in Palestine, a developing country, the findings may be generalized to other developing countries to improve the learning experiences of nursing students. Therefore, the findings of this study may provide the foundation for some developing countries to implement simulation-based interventions to train nursing students.

The current research, therefore, seeks to fill this research gap by examining how two different simulation modalities in PC teaching impact nursing students' qualities, which in turn, can improve the quality of care provided to patients with chronic, serious illness receiving PC in the hospital setting. This study aimed to test the effect of two different simulation modalities in palliative care teaching on nursing students' knowledge, satisfaction, self-confidence, and skills.

1.2. Hypotheses

H1-0: There is no difference in the Knowledge level among nursing students at the palliative care course before and after receiving clinical training using low-fidelity simulation.

H2-0: There is no difference in the Knowledge level among nursing students at the palliative care course before and after receiving clinical training using Standardized Patient simulation.

H3-0: There is no difference in the Knowledge level between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.

H4-0: There is no difference in self-satisfaction between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.

H5-0: There is no difference in self-confidence between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.

H6-0: There is no difference in skill level between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.

2. REVIEW OF LITERATURE

2.1. Palliative Care Definition

Palliative care is defined in a variety of ways, both brief and comprehensive. Institute of Medicine (2015) defines PC as a type of care that focuses on patients with advanced illnesses and their families, providing relief from pain and other symptoms while also promoting quality of life (47, 48). PC may start early in the course of treatment of a serious disease and may be provided in a variety of locations across the health care continuum, including homes, nursing homes, long-term acute care facilities, acute care hospitals, and outpatient clinics. Hospice and specialty PC, as well as basic PC, are all part of PC (49).

Palliative care is defined by the Centers for Medicare & Medicaid Services, Department of Health and Human Services (2014) as patient and family-centered care that improves quality of life by predicting, preventing, and relieving suffering. PC includes managing physical, intellectual, emotional, social, and spiritual needs as well as promoting patient autonomy, access to information, and choice along the disease continuum (49). World Health Organization (WHO) defined PC as a process of improving the quality of life of patients and their families who are dealing with a life-threatening illness by preventing and alleviating suffering through early detection, accurate assessment, and treatment of pain and other physical, psychosocial, and spiritual issues (50) .

Palliative care nursing includes assessing, diagnosing, and treating human responses to real or potentially life-limiting conditions, and it demands a dynamic, caring interaction with the patient and family in order to alleviate suffering. As a result, palliative nursing is a specialization of nursing that is evolving in tandem with the art and science of nursing and PC (51). A nurse who specializes in PC may have a wide range of education, training, and clinical experience.

2.2. Palliative Care Education in Nursing

Palliative care nursing education at the undergraduate level is either given as an elective course or mandatory course in the curriculum or PC is incorporated throughout the curriculum in other nursing specialty courses (52). Clinical training data revealed that PC nursing teaching is primarily theoretical, with little integration of theory and practice (53).

In Palestine, PC is not a requirement in medical and nursing curricula and training programs. Recently, however, Bethlehem University started a master's program in oncology and PC nursing, Birzeit University started a master's program in oncology nursing, and some universities such as AQU started a recent program to integrate PC content in the undergraduate nursing curriculum.

Nurses who have received palliative nursing education are more competent to comprehend the EOL experience, suffering and symptoms management, care goals, and advance care planning (46). A person's ability to comprehend EOL situations can be influenced by cultural factors, personal values, and beliefs (46). Through critical thinking and self-reflection, education will aid in maintaining of a balance of emotion and understanding in making reasonable decisions. Nursing students will learn to understand, and reflect on their experiences, as well as share their feelings to build a sense of respect and empathy that fosters a positive learning experience (46).

Recent global healthcare innovations necessitate higher nursing competence-based levels for nurses to adapt effectively to challenging clinical situations (54). Nursing education and practice in the twenty-first century face a variety of demands and challenges, both locally and internationally, including; the growing number of patients with life-threatening diseases and critically ill patients, and the growing shortage of nurse educators (55), lack of Integrative learning strategies that help students develop and reinforce their skills and knowledge (56), and the need to expand an educational environment that supports and prepares nursing students for practice in a diverse and dynamic environment (57). Nurse educators' pedagogues are needed to periodically properly assess teaching and learning approaches, strategies, and nursing programs adopted to train and prepare nursing students, in addition to displaying various aspects of reformation (55, 56). A reform in nursing education is required to

prepare practitioners to deliver care in an ever-changing health-care setting. The Institutes of Medicine, Quality and Safety Education for Nurses, and nursing education research all state that new nursing education alternatives must be applied to meet current nursing care requirements (58). The emphasis of nursing education must shift from conventional teacher-centered teaching systems to student-centered active approaches. Moreover, the combination of the two learning strategies would improve the success of educational programs (16). Prior to providing services to patients, nursing students are now expected to show proficiency and competency, all of this is achieved through specialized education, training and meeting the past challenges.

Nurses who devote the major time to patients are the cornerstone of the PC group and are responsible for providing high-quality care. Nevertheless, the major barriers to PC nursing progress are lack of specialized PC nursing education (59-61), knowledge deficiencies, misunderstandings among healthcare professionals regarding PC; insufficient number of qualified nurses (60, 62), scarcity of PC nurse professionals who may work as instructors, lack of specialized PC units/institutions for experiential learning, need for funds to develop and implement holistic simulations and unavailability of PC teaching materials (63), huge class densities with students have limited time and access to clinical locations, and also they are not allowed to practice caring for dying patients for fear of exacerbating difficult situations, resulting in uneven experiences across students (64). Zimmermann et al. mentioned PC training is scarce in nursing programs, and new nurses are not fully prepared to offer high-quality PC (65). Therefore, incorporating adequate PC nursing education and training into nursing programs are the foundation for increasing nursing students' knowledge and skill (1, 61, 66). With a growing lack of faculty members and clinical sites, simulation offers the possibility of exposing large numbers of students to PC situations, relieving the burden on clinical instructors and clinical agencies that see a significant volume of nursing students each semester (67).

Nursing education is combination of theoretical and practical learning opportunities that seeks to provide nursing students with the knowledge, and skills needed for future clinical practice as experienced nurses. Clinical nursing education is an essential part of nursing programs (68). Clinical education is regarded as a dynamic process that involves the integration of perceptual, affective, and psychomotor abilities

(69, 70). Clinical training allows students to integrate analytical, theoretical knowledge, and skills necessary to address health-related challenges, think logically, respond critically and professionally (71, 72). Nursing clinical instructors play an important role in training students to meet their career goals and clinical learning outcomes by providing ongoing guidance and resources (73).

The future access to quality care and nursing education will be determined by an increase in the number of BSN-prepared nurses. Buzieh (74) emphasized that the advancement and improvement of the Palestinian healthcare sector necessitate the development of its relevant parties. The advancement of the Palestinian health care system must begin with the development of nursing education and nursing curriculum, the creativity of effective teaching approaches, and an emphasis on competencies.

2.3. A Brief History of Simulation in Education

Simulation is becoming a widespread and effective teaching method in university education and continued education, Simulation-based learning provides many possibilities for challenging competence practice in university education, as well as the implementation of various forms of support to promote successful learning (26). Jeffries (75) defined simulation as "activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision making, and critical thinking through techniques such as role-playing and the use of devices such as interactive videos or mannequins". Simulation is an activity in which students participate individually or in groups and are observed by educators. Student activities are recorded. An analysis session is organized after the scenario implementation. During this session, the case is reviewed and analyzed from the beginning, and feedback is obtained from other students and educator. Simulation is often used to contribute to clinical education for patient care environments (76). A simulation is a tool for transferring classroom experience into a comfortable and safe educational environment (77). As a result, various nursing skills may be learned without putting actual patients in danger or pain.

Many nursing core competencies can be acquired by simulation, including problem-solving, teamwork, shared knowledge and skills, client-centered practice, and the ability to work collaboratively, and clinical procedures (78). Nursing students

should work in an atmosphere that is as similar to a real situation as possible, giving them the ability to "think on their feet, not in their seat."(79). Simulation can put the learner in scenarios that are similar to real-life situations, but without the risk-taking implications of a real-life scenario. The advantages of teaching nurses professional skills in a virtual environment were recognized early on until they were used on a real human for the first time (80).

In the 16th century, "phantom" versions were the first medical simulators, these activities stand out as nonsystematic approaches to training and evaluating obstetric competence to reduce maternal-infant mortality. (81, 82). Mme Coudray's delivery mannequin, made as early as the 18th century, is a part of the collection at the Flaubert Museum of the History of Medicine and shows the need for practitioners to provide a model for training in this particular field (83). The Anatomy Act 1832 is an Act of the Parliament of the United Kingdom that offered a free license to teachers of anatomy and students to dissect donated bodies (84). Mrs. Chase, the first human-sized low-reality simulator, was created in 1911 (76).

Improvements were made to the mannequin over time, baby and male models were created as well (85). Since the 1940s, simulation had been used in the military, nuclear energy, and aviation fields. Like aviation, health care is conditioned on safety, especially patient safety. For certain essential practices, the simulation would be the preferred teaching tool, as the link between simulation and patient safety becomes increasingly apparent (86).

In the contemporary sense, the first resuscitation manikin was used in clinical education in 1960 with "Ressusi-Anni," a joint product of anesthesiologists and industry. Laerdal produced this to teach ventilation (81).

Barrows defined the standard patient as a "programmed patient" in 1964, and it was first used to teach medical students during a third-year neurology internship (87). Standardized Patients are role-played patients for training, simulating assessment of history taking, physical examination, communication, and different therapeutic interventions. Standardized Patients may take several different forms: standardized patient (trained actors), learner/learner, educator/learner, patients playing the role of patient, female and male human models for pelvic and prostate exams, unfolding case

studies (88). These simulation tools have many advantages such as higher realism in the interpersonal and emotional responses, good for communication skills and interpersonal relationships training, and good for evaluation (89), and provide a relatively consistent experience for all students (90). On the other hand, there are some limitations such as moderate to high cost with each use, limited learners (90), and signs that do not match symptoms (89).

Abrahamson and Denson created the first computer-controlled human simulator, "Sim One," in 1967. This simulator is a mannequin with several features that resembles a human. This simulator has many practical features, including being shaped and moving while breathing, having a heartbeat and peripheral pulse, blinking, and measuring blood pressure (91).

Gordon developed the "Harvey" cardiac simulator in 1968. Harvey is a life-size model that mimics a variety of heart disorders (92). In the 1980s, Norman, Tugwell (93) introduced the definition of "standardized patient" as an expression that defined the high standardization of simulation, born out of the need to provide student groups with an unchanging experience and evaluate their performance. In 1987, "Gainsville Anesthesia Simulator" (GAS) was developed by an independent group in the University of Florida, and "Comprehensive Anesthesia Simulation Environment" (CASE) was developed by Gaba and DeAnde over the same time, (GAS) and (CASE) were very successful in the 1990s by developing additional clinical features and educational practices (94).

The innovation of Virtual Simulation in the 1990s was the breakthrough with the most potential for extending the area of surgical simulation. Digital tendon reconstruction, cholecystectomy, wound debridement, and suturing were among the first virtual simulators (95).

High-reality simulators were used in many disciplines besides anesthesia in the late 1990s, including nursing, trauma care, emergency care, and dentistry (96). The use of SPS continues today with much more structured roles such as "Patient Instructor" developed by Stillman and his colleagues (97).

Simulation has been more developed into the education of nurses over the last 20 years, but it is still not completely integrated into the curriculum of the health

professions (98). The Human Patient Simulator, created by Medical Education Technologies Incorporated (METI) and SimMan by Laerdal, are two of the most recent developments in technology models for clinical practice. The devices are computerized whole-body manikins of various ages that are designed to fulfill the learning requirements of students at all stages. The SimMan from Laerdal is managed by software. On the monitor screen, it shows the patient's physiologic parameters. The manikin allows for the practice of various procedures. High Technology Manikins such as 3G Simulators are very appealing to educators because they can provide high degrees of realism (fidelity) to scenarios (99).

2.4. Types of Simulation and Related Technologies

Simulation in health care education can take many forms, ranging from basic to highly complex (100). According to Sanford (101), simulation in nursing education has been around for a long time in the form of static manikins, group activities, role-playing , and CPR manikins; however, a high-fidelity simulation is a relatively recent field of nursing education that makes use of high-tech simulation screens and computers. Simulation-based learning experiences are characterized as a means of achieving learning objectives through engaging with people, simulators, computers, or tasks trainers that mirror or simulate real-world experiences and activities in some way, derived from the definition of the Agency for Healthcare Research and Quality (102).

Simulation can be considered as a continuum extending from LFS to high-fidelity simulation. Fidelity is the extent to which a simulated training program resembles reality; as fidelity increases, realism increases (103, 104). Simulation Fidelity is the physical, contextual, and emotional realism that allows persons to experience a simulation as if they were operating as in an actual healthcare activity (89, 105). Fidelity can take many forms, including environmental fidelity, conceptual fidelity, and psychological fidelity (13). In-situ simulation refers to bringing the simulation (and simulator) to the site where the learner is practicing such as in ER or Surgical unit (106).

Simulated learning environments (SLEs) are classified into 3 levels of complexity: low, medium, and high fidelity (107-109).

Low Fidelity Simulation has been identified as simulations that use role play, non-computerized manikins or task or skill trainers to help students practice a specific psychomotor skill. Task or Skill Trainers Equipment are simulators that are used to practice a skill such as an IV arm that is used to practice IV insertions skills, injection, pad, heart sound simulator which may mimic, or a model abdomen which is employed to practice a wound dressing change. A device that does not respond to interventions or create a response (91, 110). Also, Case studies and role-plays that are relevant to a certain circumstance (65).

Mid-Fidelity Simulations has been identified as simulations that utilize standardized patients, computer programs or video games. A more technologically sophisticated device which more closely resembles a real human but may not have complete ability to interact and allow multiple skills to be performed. An example of a moderate-fidelity device would be a lung and heart chest torso that is able to generate both normal and adventitious heart and lung sounds upon auscultation with a special stethoscope, also, a full body training manikin, such as VitalSim, manikin used for CPR training (111). Computer-aided simulators such as multimedia programs, interactive systems, virtual reality and haptic systems(91).

High-Fidelity Simulations have been identified as simulations that utilize computerized manikins, or standardized patients. They considered the most advanced simulation. A manikin which is realistic in multiple aspects and procedural realism. Patient simulator such as Sim Man 3G, 4G. Interactive mannequins are capable of realistic physiologic responses, including respiration, pulses, heart sounds, breath sounds, urinary output, and pupil reaction, voice, and have the capability of administering intravenous fluids and medications. The scenarios offer students a chance to practice inter-professional teamwork principles which are widely encouraged to improve patient care and safety (111). The use of this technology increased rapidly after faculty members realized that simulation could enhance students' skills, critical thinking, and clinical decision-making in a safe environment; its use in nursing programs has also become widespread (107). Standardized Patients may take several different forms: trained actors, educator/learner, patients playing the role of patient (88). These simulation tools have many advantages such as higher realism in the interpersonal and emotional responses, good for communication skills

and interpersonal relationships training, and good for evaluation (89), and provide a relatively consistent experience for all students (90).

There are some principles for selecting a type of simulation to use, for example, simulation should be driven by the educational objectives, match the educational level of the student, and the higher the degree of the realism is, the more effective in engaging the student. Different simulation approaches can be modified to meet specific learning goals and educational levels (112).

There are several subforms of simulations, including screen-based/PC-based simulation; virtual patients; partial task trainers; human patient simulators; standardized patients, and hybrid simulation (113).

Screen-based computer simulators are computer programs to train and assess clinical knowledge and decision-making (88, 113). Screen-based computer simulators are intended to simulate many elements of human physiology, as well as specific tasks or situations such as computer-assisted instruction (CAI), virtual reality excursions (VRE), web-based programs. Learners utilize information to make clinical judgments and examine the consequences in action using a range of computer applications. During and after the interaction, there is regular feedback. Screen-based computer simulators are relatively low cost, reusable, can be used individually or in groups, easy, flexible, unlimited access, useful for knowledge acquisition and critical thinking, accommodating to the individual pace of learning, good for lower entry-level students. On the other hand, there are some limitations such as no physical interactivity, low fidelity, no experiential learning (89, 113).

The virtual patient simulation is used to describe interactive computer simulations of clinical scenarios used in health care education (114). Virtual patients may take several different forms: Case Presentation, Interactive Patient Scenario, Virtual Patient Game, Virtual Reality Scenarios, High Fidelity Software Simulation, High Fidelity Manikin, and Virtual Standardized Patient (115). Virtual patient simulation is easy to access, economic for teaching multidisciplinary care, accommodating to the individual pace of learning, good for the students of lower education levels. On the other hand, there are some limitations such as no physical interactivity, low fidelity, no experiential learning (89, 116).

Partial task trainers are the simulator of choice when props, models, or mannequins are used to practice psychomotor skills and procedures in isolation. They typically don't incorporate much "patient" feedback, such as pain caused by the procedure or changes in vital signs (88). Task trainers may take several different forms: food items such as oranges for injections and chicken breast for biopsy, pig's feet for suturing, inject pads, adult/child/infant mannequins, breast and GYN/prostate models, eye/ear models, IV arms, CPR mannequins, and case studies. These simulation tools are relatively low cost, and multiple models are often available for use within the same institution, allowing for larger numbers of learners to practice simultaneously, good for procedural practice. On the other hand, there are some limitations such as low realism (89, 113).

Human Patient Simulators are full-length human mannequins with different patient ages (adult, infant, and pediatric models) that replicate elements of human physiology and are fully computer-controlled to meet the educational needs of the learners at all levels in nursing education. These interactive mannequins are capable of realistic physiologic responses. Additionally, the more advanced models can communicate with the student and react like a live human (88). Human patient simulators, therefore, are generally categorized as: a) low fidelity systems, for example, Noelle birthing mannequin which uses a compressor to birth newborn every 7 minutes that simulates anatomy and physiology, b) intermediate fidelity systems, for example, Laerdal^{TM} SimMan^{TM} which is simulated by computer-driven scenarios that respond as programmed, or c) high fidelity systems, for example, METI Human Patient Simulator^{R} which is simulated by computer-driven physiologically based that respond in real-time to interventions (88, 117). These simulation tools have many advantages such as different levels of fidelity manikins, interactive experience, animating theoretical knowledge within the context of clinical reality, using emotional and sensory components of learning, good for critical thinking, decision-making, and delegation, good for knowledge integration, and good for students of higher educational levels. On the other hand, there are some limitations such as high cost, limited access, dependent on availability of human instructors/operators, and limited realistic human interactions (89).

Standardized Patients are role-played patients for training, simulating assessment of history taking, physical examination, communication, and different therapeutic interventions. Barrows defined the standard patient as a "programmed patient" in 1964, and it was first used to teach medical students during a third-year neurology internship (87).

Standardized Patients may take several different forms: standardized patient (trained actors), learner/learner, educator/learner, patients playing the role of patient, female and male human models for pelvic and prostate exams, unfolding case studies (88). These simulation tools have many advantages such as higher realism in the interpersonal and emotional responses, good for communication skills and interpersonal relationships training, and good for evaluation (89), and provide a relatively consistent experience for all students (90). On the other hand, there are some limitations such as moderate to high cost with each use, limited learners (90), and signs that do not match symptoms (89).

Hybrid simulation involves a task trainer or partial simulator being realistically affixed to a standardized patient. This allows for the proper teaching and assessment of clinical treatment and communication skills in an integrated fashion (118, 119). Le Lous, Simon (120) defined hybrid simulation as utilizes at least two different simulation modalities, whereby combining them will enable one type of simulation modality to enhance the other, with the proper alignment, coordination, and interfacing between the modalities (121) .

Hybrid model using wearable technology integrated with human actors (standardized patients) may present a cost-effective alternative to high fidelity simulation training scenarios (119). Hybrid simulators enable the educator to create a learning scenario that can incorporate human interactions, reactions, and body language as well as clinical data such as blood pressure, and stomach sounds which may be controlled by the educator. Hybrid simulation allows both procedural and communication skills training, bringing a sense of realism to the training that may not be attained by using human actors or simulators alone. The use of hybrid simulation can be a cost-effective training option compared to exclusively high fidelity simulators, as these simulators can cost to tens of thousands of dollars (122).

2.5. Integrating Simulations into the Palliative Nursing Student's Clinical Practice

There is little training in PC in bachelor nursing schools, leaving students unqualified to care for patients with life-limiting illnesses, dying patients, and their relatives (42). Large cohorts of nursing students may not be able to have direct experience in PC due to time restrictions, limited availability of clinical settings in nursing education and few opportunities to develop these skills in the clinical context, because exposure to patients and families receiving palliative and EOL care is generally restricted. As a result, most new nurses must learn PC skills on the job, which is inefficient and can be stressful (13, 123). Nursing students and professionals are acquiring palliative and EOL skills through simulation-based learning experiences (9, 13, 124). Simulation-based learning experiences provide a chance for students to improve their competencies (42, 104).

Simulation often entails simulating real-world circumstances in order to offer learners with relevant experiences under controlled settings (125). To create realistic surroundings indicative of the learner's professional responsibilities, simulation-based learning experiences use a variety of simulated learning methods, such as manikin-based, standardized/simulated patients or computer-based programs, virtual reality, or hybrid simulation (126). The simulation is critical for assisting students in reflecting on their feelings, ideas, and responses following the EOL care simulation, as well as enhancing the learning process and assisting students in coping with psychosocial reactions and processing of feelings(42) . Furthermore, EOL simulation is regarded as an effective and long-term training tool for increasing self-efficacy while dealing with EOL occurrences (127). Student competency in providing high-quality palliative nursing care requires PC education and experience. A manikin, when regarded as a patient, may provide students with a genuine sense of what it is like to behave like a nurse. As a result, this realism allows students to practice and learn various nursing techniques. Using a simulation can help students create their professional identities (128).

2.6. Nursing Education Using Simulation in Palestine

There is a scarcity of data on the influence of various simulation modalities on nursing students' knowledge, satisfaction, self-confidence, and skills in Palestine. Furthermore, no research has been conducted on the use of simulations in the teaching of PC for nursing students. In a study conducted by Jawabreh, Ayed (22), revealed that simulation is significantly effective in helping to improve nursing students' knowledge, and there was statistical difference between pre-post course responses regarding the effect of simulation on enhancing their knowledge of adult nursing course.

In another study, findings showed that high-fidelity simulation improves nursing students' self-confidence and satisfaction among undergraduate nursing students (129). Another study found that after applying the high-fidelity simulation intervention, there was a significant difference in clinical decision-making methods between the groups (130). As a result, the study concluded that the high fidelity simulation intervention is beneficial, and it may assist nursing students through improving their clinical decision-making (130).

As a result of simulation, the researchers noted a statistically significant improvement in self-awareness, empathy, and patient-centered care (131). Another study revealed significant differences in knowledge and overall clinical judgment levels between the groups after HFS (132). In a study conducted by Ayed, the results showed that there were no significant differences of clinical judgment between both groups' scores regarding of clinical judgment at pretest, while the results of the posttest after high fidelity simulation showed significant differences between both groups' scores relating to clinical judgment, self-satisfaction, and self-confidence (133).

Despite the fact that earlier studies focused on different aspects than the current study, they all agree on the relevance of simulation to students' academic performance and learning achievements. In Palestine, where clinical settings are few and limited, simulation can serve as an effective teaching tool and an innovative educational method (22).

2.7. Nursing Students' Knowledge Level, LFS and SPS at the Palliative Care Education

This subsection reviewed existing literature regarding the impact of LFS use in PC. Recent studies on the knowledge level among nursing students regarding the use of LFS in PC education were reviewed. Regarding nursing students' knowledge relating to LFS in PC education, three studies (134-136) investigated the impacts of low clinical simulation strategy on students' knowledge found significant improvement in knowledge levels. Lancaster and his colleagues conducted a descriptive pilot study to investigate and describe nursing students' attitudes towards knowledge level, through which they explored scenario-based LFS when caring for patients at EOL care (134). The study established that the use of LFS increased levels of knowledge of the majority of student nurses ($p<0.05$). The study concluded that LFS is thus an effective teaching method to improve student nurses' knowledge of EOL care (134). Another qualitative explorative design study that involved bachelor's nursing students examined the effects of a LFS on knowledge and attitudes towards caring for a dying patient (136). The study revealed that learning as a result of LFS improves student nurses' knowledge and enables positive attitudes towards caring for a dying patient (136). Similarly, a qualitative explorative design study that involved second-year bachelor nursing students showed that SPS is beneficial. It helped improve their knowledge of PC principles, enhanced communication skills, courage, self-confidence, and positive attitudes towards PC (135). The strength of these studies is that they all provided valuable information from the perspective of nursing students regarding the use of LFS in PC and how the intervention impacts their knowledge levels when providing care at EOL care. The studies presented unique data that helped add to the existing body of knowledge. However, the weakness is that there might have been selection bias of nursing students, which might have influenced the validity of study findings.

This literature review also focused on available studies regarding the effect of standard patient simulation intervention on the knowledge level among nursing students. Regarding the impact of standardized simulation on nursing students' knowledge level on PC, two quasi-experimental studies involving nursing students supported the efficacy of the intervention in improving students' knowledge of

palliative nursing care (8, 9). A quasi-experimental study by Kirkpatrick et al. (9) investigated the relationship of PC nursing experience, knowledge, self-awareness, and performance among nursing students during EOL simulation. The study revealed a significant increase in EOL care knowledge among the students concerning palliative nursing care knowledge (9). The study showed that the use of SPS effectively improved palliative nursing care knowledge (M=80.5%; ±2.6) in enhancing nursing students' critical thinking and assessment skills (9). This showed that the intervention could be used as an innovative teaching modality to improve undergraduate nursing students' knowledge on how to deliver PC to dying patients. Similar findings were found in a quasi-experimental design study of bachelor's nursing students that examined the effects of an EOL simulation-based experience on active and observer nursing students' PC knowledge and self-awareness (8). The study revealed a significant increase ($p<0.001$) in knowledge levels among all the students. This study thus suggested that EOL simulation-based experience with standardized patients is an effective method to improve student PC competence (8). The study revealed overwhelming clinical evidence regarding the effectiveness of this SPS in increasing nursing students' knowledge scores; however, its findings only focused on high-fidelity simulation and SPS and nursing students' knowledge levels. Moreover, this revealed a gap in the literature about the effect of the LFS and SPS at the PC education on the knowledge level. Therefore, the present review lays a foundation for further research on knowledge level outcomes specific to LFS and SPS and nursing education in PC. The strengths of the quasi-experimental studies were that they supported the study's purpose by revealing that simulations enhance nursing students' knowledge of PC. However, they also had their weakness whereby the articles failed to highlight the role that simulations have on palliative-care-related confidence, skills, or satisfaction.

The reviewed studies show that both low-fidelity and standardized patient simulations significantly affect nursing students' knowledge of PC. These simulation-based interventions improve or increase knowledge level on PC, allowing them to apply the knowledge in providing care to dying patients during their clinical placement.

2.8. Nursing Students' Self-Satisfaction, Self-Confidence, LFS and SPS at the Palliative Care Education

Concerning the literature review on LFS and self-satisfaction among nursing students, students can feel satisfied with the learning experiences they acquire with simulation. A quasi-experimental design study on second-year nursing students examined the effects of LFS on self-satisfaction (137). The study indicated that the nursing students felt that the use of simulation was satisfying (137). The study stated that the students thought that the experiential simulator sessions with LFS were satisfactory in learning how to provide care to critically ill patients (137). Of the reviewed studies, only one study was found to solely describe the effects of LFS nursing students' self-satisfaction in PC. This indicates that limited studies have been conducted on the topic, hence further investigation is needed. The strength of the article was that it contributed to this study's purpose by revealing the role of LFS on nursing student's self-satisfaction in PC. However, the study has some weakness as if failed to prove the role of simulations in PC-associated aspects being investigated in this research. The mentioned studies also faced the risk of bias due to the selective selection of the participants.

This literature review focused also on nursing students' self-satisfaction and SPS. One qualitative study investigated the interprofessional health care team communication simulation focused on simulated patient and geriatric PC and determined its effects on various outcomes, including trainees' satisfaction. The study included nursing students as part of health professionals that took part in the study. The study revealed that nursing students felt the use of simulated patients was satisfying in improving interprofessional health care team communication (138). The study showed that most nursing students reported high satisfaction with simulation training with a simulated patient. The nursing students showed that the simulation training was very satisfying in deconstructing the skills and experiences they learned (138). The study presented high-quality findings based on the perspective of nursing students that improved the quality of study findings. One observational study assessed the possible relationship between emotional intelligence, coping styles, and satisfaction with individual self-learning using simulated patient scenarios (139). Concerning nursing students' self-satisfaction, the study established that most nursing

students reported high satisfaction with individual learning with simulated patient scenarios (139). The study revealed that with the use of patient simulation intervention, nursing students find the learning experience satisfying, especially when learning complicated patient medical cases or real-life scenarios (139). However, even if the study supports the effects of SPS on self-satisfaction among nursing students in geriatric PC, the study was limited to college nursing students in their 2015/2016 academic year. This indicates the need for the current study to validate the findings.

One article used a mixed-methods study to investigate the use of simulation-based learning experiences to teach nursing students communication skills while delivering PC to patients and their families (140). The study used Kirkpatrick's level of evaluation to assess nursing students' responses or reactions to regarding simulation satisfaction with a simulated patient as one of the simulation-based techniques. The review reported a high satisfaction among nursing students regarding the use of simulated patients. It improved their level of confidence in providing PC to patients and their families (140). Regardless of the valuable information presented in this review, the data can give low-quality evidence since only secondary data were used.

An experimental study also explored the use of simulated patient scenarios to teach nursing students about PC. It showed high satisfaction with the simulation modality because the intervention improved their ability to communicate with their patients at EOL (141). Based on the study findings, it was observed that nursing students showed higher levels of satisfaction because the simulation modality enhanced their motivation to work with patients at the end of life (141). While these studies showed the effects of standardized simulation in improving self-satisfaction among nursing students, they also revealed a literature gap on the perspective of nursing students in PC, indicating the need for primary data to validate the findings. The studies' strength is that the authors' conclusions emphasized the objectives of this research by proving that simulations may enhance nursing students' satisfaction. However, they had a weakness whereby none of the studies highlighted the role of simulations on nursing students' knowledge, skills, or confidence when providing patients with PC.

This literature review investigated the effect of LFS on self-confidence among nursing students. From the reviewed studies, one quasi-experimental study that

compared the impact of mid-level versus LFS on self-confidence as one of the clinical outcomes among Bachelor of Science nursing students indicated the efficacy of the interventions. The study revealed that students in the LFS group had a higher level of self-confidence than the students in mid-level simulation (t=2.213, df.=71, p=0.03) (142). Similar findings were found in a randomized controlled trial that compared the effects of low and high-fidelity simulations on self-confidence among medical students (143). The study's findings revealed that most students showed overconfidence with high-fidelity simulation than LFS intervention (143). Despite improved self-confidence, LFS was more superior or effective than a high-fidelity simulation that induces undesirable overconfidence among students (143). The studies' strength relating to this research purpose was that they provided in-depth insights into the impact of LFS on students' self-confidence. Based on the studies' findings, it was evident that nursing students benefit more from a LFS than a high-fidelity one because of their practical capabilities as students, unlike if professionals were involved. However, the findings of the studies may lack generalizability because of the focus on nursing students at specific academic years as the participants.

Contradicting findings were found in one descriptive study and one quasi-experimental study of nursing students that supported the clinical efficacy of both low and high-fidelity simulations (144, 145). The studies revealed that low-fidelity and high-fidelity simulation interventions improved nursing students' self-confidence to conduct necessary tasks in their clinical practices. The studies revealed that self-confidence improved among all students who were satisfied with the simulations, which made them confident to apply their skills while conducting nursing practices (144). Also, a two-group quasi-experimental study provided contradicting findings, the said study aimed to determined whether, or not, video simulation versus traditional written case studies improves self-confidence, knowledge, and satisfaction among nursing students (146). The study disclosed that the use of both simulation interventions led to a high level of self-confidence in transferring classroom content into their practice to improve patient safety and deliver high-quality care (146).

The reviewed studies did not focus on the effects of LFS from the perspective of PC education. There were no clinical studies or research on LFS and self-confidence among nursing students. This reflects the existing literature gap that needs to be filled

by conducting further research. The three studies postulated the overall benefit of using simulation during nursing students' education. The findings provided valuable insights into how simulations may enhance nursing student's knowledge, self-confidence, and satisfaction. However, the authors are not predicting regarding how the nursing students may apply what they learned via the simulations during PC. Additionally, there exists a lack of generalizability of the findings because the cohort being studied was extracted from one facility.

This literature review also focused on the effects of SPS on the self-confidence level among nursing students. From the review conducted, simulation has been found to improve self-confidence among nursing students (147-150). However, no studies have been conducted on SPS and its effects on nursing students' self-confidence in PC. A standardized patent simulation is more effective than other interventions in improving self-confidence. This is supported by a qualitative study that compared the effectiveness of using video and SPS on communication performance (151). The study showed that SPS was more effective than video simulation in improving communication skills, which, in turn, improved self-confidence among students in delivering care (151). This study lacked detailed information from the perspective of nursing students in PC education. Additionally, some studies supported the effectiveness of SPS in improving the self-confidence of undergraduate nursing students, enabling them to act appropriately during their clinical placement (152-156). Two studies showed that SPS increased student confidence resulting in helping them to create a positive self-image in their clinical experiences (152, 153). The strengths are evident in how their findings prove that patient simulation impact positively on nursing students' self-confidence. Besides, the authors' use of primary data enhanced the reliability of the findings. However, the articles were not short of limitations. There was a risk of bias because some studies were not blinded, lacked randomization, and involved a small sample size. The generalizability of the studies' findings was also questionable because almost all of them used participants from a single facility and certain academic learning levels, which limited the results' generalizability. Thus, the articles' weakness was the implied risk of bias and a lack of generalizability of the studies' findings to nursing students from different academic learning levels or facilities.

2.9. Nursing Students' Skill Level, LFS and SPS at the Palliative Care Education

This literature review focused on the effect of LFS on the skill level among nursing students. Studies supported that LFS helps students to gain or develop new skills in their nursing education experience (14, 157-159). A mixed-methods research investigated the impacts of a low-fidelity clinical simulation intervention on undergraduate nursing students' skill in PC. The study showed that the intervention improved nursing students' acquisition of skill that help them to connect theory with clinical practice during PC (14). The study indicated that LFS helped students acquire communication skills on family management and provision of a safe environment for patients during their PC (14).

Descriptive research that explored student nurses' perceptions regarding the LFS method showed that the simulation led to skill acquisition and skill development. The study showed that student nurses perceived that LFS was an effective educational method that provided effective learning and improved clinical skills (157). Similar findings were supported in a quasi-experimental study of graduate prelicensure nursing students that showed that LFS improved students' skills on medication safety and safe medication administration (158). Another descriptive study of medical students investigated the effects of LFS in influencing students' ability to acquire basic clinical skills and elderly medicine (159). The study revealed that LFS enables the student to develop procedural and technical skills (159). A quasi-experimental study by Bowling et al. demonstrated that LFS is more effective than mid-level fidelity simulation in improving skill performance (142). The study found a significant increase in the levels of students' skills performance, with most students acquiring new skills in clinical practice (142). Further, a prospective descriptive design investigated the effects of LFS on skill levels regarding transferring the practice of peripheral blood sampling among novice medical students(160). The study found that an educational intervention with LFS increases students' skills levels on peripheral blood sampling (160). The study found that with LFS, medical students were able to acquire and transfer higher levels of procedural skills on peripheral blood sampling (160).

Contradicting results were found in a systematic review that determined the effectiveness of high-fidelity simulation versus LFS on clinical and practical skills

development among pre-registration physiotherapy students. The review found that high fidelity simulation is more effective in developing motor skill with regards patient safety (13.5% safety fails) than LFS (8.1% safety fails) (161). However, in terms of clinical skill reasoning, the review demonstrated that high fidelity simulation is not as effective as a LFS in influencing students' clinical reasoning ability to apply their skills and knowledge acquired (161). Also, contradicting findings were found in a quasi-experimental study that compared impact of high and a LFS on perceived skill development and self-efficacy among maritime training nurse students (162). Concerning perceived skill development, the study disclosed that students preferred training with high-fidelity simulation to LFS. This was because high-fidelity simulation had significant effects in improving motivation using immersion training simulators than traditional training involving the use of competent seafarers (162). Another quasi-experimental study examined the impact of LFS on student nurses' skill levels or competence in the active management of third-stage labor (37). It was established that despite the effectiveness of LFS in impacting nurses' skills and knowledge on active management of third stage labor, contradicting findings concerning obstetric management and emergency skills were reported (37). The study revealed that despite the promising results of improving nurses' skills in active labor management, the use of LFS does not improve nurses' obstetric emergency skills. Such skills are needed to ensure the proper delivery of quality care and management of obstetric conditions during labor (37).

Only one study was found to describe the effects of LFS on the skill level among nursing students in PC education (14). This indicates limited studies on the chosen topic that needs further research to validate the findings. Generally, all the studies had several strengths that proved the benefit of using simulations during nursing students' education because they enhance their confidence, knowledge, skills, and satisfaction. The studies demonstrated that nursing students from different academic years benefit from the stimulations. In addition, most of the studies used primary data, which makes their findings reliable and of excellent quality because scholars may validate the reported results. Despite the studies' strengths, all of them had weaknesses that might influence the reliability of the articles. Some of the articles lacked randomization and blinding and used a small sample size. Thus, there was a risk of bias based on the above limitations. Additionally, the articles' findings regarding the influence of

simulation on nursing students' confidence might have been biased because students are mostly over-confident when in such situations, unlike if they were in front of an educator.

Furthermore, most participants involved were either from a single facility, a single geographical location, or a certain academic learning year. The studies' findings might lack generalizability as they will be limited to only the selected facility, area, or academic year. Moreover, most of the studies proved that LFS and not high-fidelity ones might effectively enhance nursing students' skills, knowledge, confidence, and satisfaction. Thus, further research into the impact of high-fidelity simulations was inadequate to warrant a conclusion that they effectively enhance the above nursing students' qualities.

This literature review also focused on the effects of SPS on the skill level among nursing students in PC. Three studies provide information on how simulated or standardized patients influence skill's levels among student nurses (13, 163, 164). Smith and colleagues conducted a systematic review on the use of simulation-based learning methods, including standardized or simulated patients and their effects on communication skills among nursing students who provide palliative and EOL care to patients and their families(13). The review showed that with the use of simulated patient, nursing students acquire communication skills on palliative and EOL care that help them communicate and deliver the needed care to patients(13). Similar findings were found in a mixed method study that investigated the impacts of using standardized patients on palliative communication skills (163). The study revealed a significant increase in student nurses' skill set that enabled them to deliver the needed palliative or EOL care. Valen, Simonsen (164) found that the PC simulation expanded participants' self-reported skills and competence. The studies have strength in that they provide valuable and detailed information on the topics. Also, the studies used appropriate study designs that yielded high level of evidence on SPS and its effects of student nurses' skills. In terms of weakness, Smith and colleagues used secondary data, which might have influenced the quality of the findings. Using secondary data only supported the topic from the perspectives of other scholars(13). Spear et al. and Valen et al. focused on selected nurse students from one hospital, which might have impacted the generalizability of the findings(163, 164).

Also, reviewed studies presented general information with contradicting results. To conclude, the literature showed a lack of literature about the effect of the LFS and SPS at the PC course on self-satisfaction, self-confidence, and skill level. This review lays a foundation for further research on clinical outcomes specific to low-fidelity and standardized patient simulations and relevance to nursing education.

3. METHODOLOGY

3.1. Research Design

This a randomized controlled trial using pre-, and post-tests has evaluated the effect of two different simulation modalities in PC teaching on knowledge, satisfaction, self-confidence, and skills for sophomore nursing students who were attending the ‘palliative care course’. Students who were interested in participating in this study were randomly allocated to one of the two simulation groups: LFS group or SPS group. The researcher compared before-and-after findings for each group, within-group comparisons, and across groups using this design. Both groups followed the usual nursing curriculum of palliative care (one class on PC and four classes involving case study discussion of patients at the EOL stage). Then both groups completed two different simulation modalities in PC teaching simulation as an additional training course. This study strictly adhered to the CONSORT guidelines (165). The flow chart of this research is presented in figure 1.

3.2. Setting

This study was conducted in the nursing simulation center of AQU. The Simulation Laboratory was established in 2017. The nursing department uses contemporary technology in the classrooms and laboratories, and they have a simulation laboratory that simulates a mini hospital, providing students with a safe training setting and allowing them to practice under a variety of circumstances. The simulation lab, which contains three classrooms, two control rooms, and three debriefing rooms, is equipped with the highest-quality patients-dolls and equipment. These sophisticated and high-efficiency mannequins enable students to practice almost all main nursing skills, as they are using a wireless system and control devices (tablets) to operate and program them in any potential scenario and setting a student could encounter in a hospital, and to apply it safely before working there. The simulator lab rooms have a complete camera system (SMOTS) to observe students’ work with patients in the rooms, transfer the image and sound to other students in the debriefing room, and discuss students' work with patients.

The Nursing Simulation center was used to simulate the current study's experience. The Nursing Simulation center is designed to provide students hands-on experience at the center. It is fully equipped with dolls, materials, static manikins, and simulators of high- fidelity. High-fidelity manikins and a standardized Patient are part of the HFS laboratory experience. Students took part in different situations that were chosen to help them to meet the course goals. A master's student specialized in the field of oncology nursing was hired to play the role of the standard patient after carrying out the necessary training and was informed, of the purpose of research and training on the required scenarios, in detail. Several training sessions were held before participating in the real scenarios in front of the students. The researcher has placed protective measures to reduce the possibility of spread of the Coronavirus/COVID-19. Measures for COVID-19 control were implemented.

3.3. Population, Sample, and Sampling

The target population of this study was all sophomore's nursing students, and the accessible population was all sophomore's nursing students (n=140) who were already registered in the Palliative Care Nursing course during the spring semester of the academic year 2020-2021 at the nursing department of the Faculty of Health Professions at AQU.

In this study, a simple random sample of PC nursing students at AQU who met the Study criteria enrolled in the Study. SPSS was used for random assignment to ensure that each participant has an equal probability of being allocated to any of the groups (LFS group or SPS group). The researcher prepared a list of university identity numbers of the participant students, and assigned each, randomly, by SPSS either to LFS group or to SPS group.

Inclusion criteria included 1) sophomore nursing students enrolled in Palliative Care Nursing course, 2) signed a consent form after being given a thorough description of the Study, and 3) attending all lectures.

Exclusion criteria included 1) upgraded nursing students (bridging), and 2) nursing students who did not complete answering the research tools.

3.4. Sample Size

All of AQU's palliative care nursing course students were eligible to participate in this study. A total of 140 students were enrolled in the palliative care nursing course, and they were divided into two sections. The study sample was estimated using G*Power, which allowed researchers to determine the sample size necessary to detect differences between groups with sufficient power. Sample size depends on power, alpha, and P level of significance, confident interval, and effect size determinations. The sample size which is required to produce significant findings between the two groups is estimated using power (166).

The high-power values are desirable; at least 80% is preferable. Power proportionately increases as the sample size for the study increases (167). The effect size is the difference between two groups or more, based on some treatment or intervention (166).

The G*power version 3.1.9.4 was used to calculate the sample size required to get statistically significant findings between the two groups (167). Using a calculated large effect size of 0.8 for t-test to determine the differences between means of the two independent groups, an alpha of 0.05, and power of 0.90. The total sample was 70 participants. 35 participants in each group (Appendix 1, 2). Also, the sample size was estimated to be 35 in each group based on the previous studies (9, 154, 168-171). Participants were selected on a voluntary basis, and the number of participants who could participate was limited due to the outbreak of COVID-19.

3.5. The instruments/Tools

Four different instruments were used to obtain the data. Each student has completed the following:

3.5.1. Demographic Data Form

Demographic Data Form covered participant’s demographic and academic backgrounds which include gender, age, grade point average (GPA), previous experience in PC, simulation experience, any information about simulation, number of

clinical nursing courses attended, any personal or professional experience with PC, being attending the PC course offered at university, experience outside of nursing courses in direct patient care in the PC field, and experience in EOL care (Appendix 3).

3.5.2. Palliative Care Quiz for Nursing (PCQN)

Palliative Care Quiz for Nursing is a 20-item test for understanding PC principles, it was used to measure the PC nursing knowledge, and symptoms management. Students select ‘true’, ’false’, or ’don't know’ for each statement that relates to a common misunderstandings regarding PC (172). Demographic Data Form (Appendix 3) was used in addition to the PCQN via incorporating a file into the Google Forms®. Pre-test and post-test which have the same content have been prepared to measure the participant’s knowledge levels on PC. The PCQN, created by M Ross, McDonald (172), was used as the tool to assess the PC knowledge level among the two groups of students (Appendix 4). Permission to use the PCQN was obtained before data collection from Fothergill-Bourbonnais who has taken care of Dr. Ross correspondence for many years, via email (Appendix 9).

The PCQN's developers used a sample of 200 nursing students and 196 registered nurses to establish baseline reliability and validity. According to the authors, the sample had a 61% success rate (172). The Kuder Richardson formula KR-20 was 0.78 indicating a high level of internal consistency for the quiz (172). The test-retest reliability correlation coefficient was conducted with a three-week lag period between taking the two PCQNs. The correlation coefficient of 0.56 has been reported by M Ross and McDonald (172). When compared to the first test, the results of the second trial were comparable. Content experts confirmed the validity of the PCQN during its development and significant item-to-total correlation indicated accuracy in reflecting nursing knowledge of PC principles (172). The tool's validity was confirmed by a large sample of nursing students and nurses. Acceptable reliability and validity were reported in previous studies (173). Researchers reported the findings, which showed that the students scored 50% or higher on 8 of the 20 items, whereas the RNs scored 50% or higher on 18 of the 20 (174).

In the current study, Cronbach's alpha coefficient for The PCQN (=0.72) was found to be acceptable. The PCQN is a twenty-question quiz with the choices of true, false, and don't know, as answers. M Ross, McDonald (172) scored each participant one point for a correct answer and zero points for incorrect or unknowing replies, of a total score of 20. The authors used total mean percentages across all samples to grade the test (172). The researcher of this study has examined the PC knowledge levels of LFS group and SPS group using the percentage of each group. The total score of both groups was expressed as a percentage and was used to describe the general PC knowledge level of the BSN students. Total scores are determined by calculating the percent of correct responses (correct=1; incorrect/ "don't know" =0), with total scores ranging from 0% to 100%. The knowledge scores were classified into Poor knowledge (≤60%), (less than 12 points), and (≥60%), (more than 12 points) considered good knowledge.

3.5.3. Learner Satisfaction and Self-Confidence in Learning (LSSCL)

The National League for Nursing has developed the LSSCL, a 13-item, 5-point Likert scale (75). The scale is divided into two subscales, one for measuring student satisfaction (five questions) and the other for measuring self-confidence (eight questions) in learning. The satisfaction subscale has a range of 5 to 25 points, while the self-confidence subscale has a range of 8 to 40 points, with higher scores indicating more satisfaction and confidence. Both of subscales are composed of a five-item Likert scale, namely: 1= I strongly disagree with the statement; 2= I disagree with the statement; 3= undecided - I neither agree nor disagree with the statement; 4= I agree with the statement; 5= I strongly agree with the statement. The validity of this tool was confirmed by clinical experts (175). This research tool was developed to evaluate student's learning satisfaction and self-confidence in simulations utilized by the National League for Nursing (NLN). Cronbach's alpha was used to test the tool's reliability: satisfaction = 0.94; self-confidence = 0.87 (176). The Author's permission to use the tool was obtained (Appendix 10).

This instrument was modified according to the purpose of the Study (Appendix 5), and the experts consulted made no comments. The reliability of the scale was tested by alpha Cronbach through the pilot study on 31 participants. Cronbach's alpha

coefficient of satisfaction = 0.79 and self-confidence = 0.83, which is strongly reliable, and the scale was passed to be applied in the Study.

In the current study, Cronbach's alpha coefficient for the modified LSSCL scale (self-satisfaction = 0.81 and self-confidence = 0.85) was found to be acceptable. According to Polit and Beck (166) coefficients of 0.80 or greater are highly recommended.

3.5.4. Skill Assessment Forms

The skill assessment form for each scenario was prepared by using the relevant literature to evaluate the skill levels of the students in the LFS group and SPS group through different scenarios (13, 99, 177-184). The skill assessment forms have been designed in such a way. So that they can be scored and score whether the student performs the implementation steps in the correct order and appropriately. In order to evaluate the skill assessment form in terms of expression, intelligibility, accuracy, coverage of the subject and whether they contain scientific errors, written opinions on the scope and validity were obtained from a total of 5 experts, three academic nurses, and two PC nurse specialists. They were asked to examine content validity by evaluating and rating each of the items with regards its relevance to measuring students' competency. According to expert feedbacks, the contents of the forms were arranged and finalized.

Skill assessment forms included three parts: 1) Breaking bad news communication skill assessment form. 2) Palliative care needs of patients with chronic illness skill assessment form, and 3) Advanced care planning skill assessment form. Breaking bad news communication skill assessment form consists of 28 items (Appendix 6), the palliative care needs of patients with chronic illness skill assessment form consists of 23 items (Appendix 7), and the advanced care planning skill assessment form consists of 12 items (Appendix 8). In the skill assessment forms, options that can be marked as "Not Observed", "Incomplete/Incorrect" and "Correct/Complete" were included for each item and these categories were scored as 0, 1, and 2, respectively.

The complete score for all items of Breaking bad news communication skill assessment form totaled 56 points, for Palliative care needs of patients with chronic illness skill assessment form was 46 points, and for Advanced care planning skill assessment form totaled to 24 points. The skill scores were classified into Poor skill (≤50%), Fair skill (51- 75%), and (≥76%) considered as good skill.

3.6. Implementation of the Research

The research was conducted in two phases: preparation and implementation. The research preparation included preparing all necessary permissions, course content and material, scenarios, learning guidelines, and data collecting forms. While the research implementation phase included online meetings with students, theoretical education of students, simulation training sessions, and assessments implementation.

3.6.1. Preparation Phase

In the research preparation phase of the PC content, which is primarily included in the palliative care course (3 credit hours), it was identified as the primary teaching content in this research. The (ELNEC)-Core curriculum was used to develop the course materials relevant to the test subject of knowledge. The course content on this topic was the basis for choosing the appropriate forms and skills that were used to collect data in this research. Lecture content included PC definitions and models, the current situation of PC in Palestine, comprehensive assessment, pain assessment and management, symptoms assessment and management, the dying process, loss, grief and bereavement, communication issues (communicating effectively, sharing bad news), spiritual, ethical and cultural issues, and burn out for HCPs. Later, the course contents were delivered using a PowerPoint presentation. Lectures were given by the course coordinator, and the researcher attended all these lectures, the lectures were conducted twice a week. (Appendix 18). Prior to the implementation of the research, the researcher had obtained specialized training in PC, simulation, and simulated patient methodology (Appendix 17). In addition, five training sessions were conducted for the oncology nursing master's student who played the standard patient role during the three training scenarios in the research.

A learning guide was designed to assist the learner to master the three separate skill steps before evaluating skills in all of the three scenarios. The learning guide includes: first, implementation steps related to communicating bad news to the patient and his family, consisting of 28 practical steps, second, learning guide to know the palliative care needs of patients with chronic illness, consisting of 23 practical steps, and last, learning guide for advanced patient planning, consisting of 12 practical steps (Appendix 6,7,8). In order to evaluate the learning guide in terms of expression, intelligibility, accuracy, coverage of the subject and whether they contain scientific errors, written opinions on the scope and validity were obtained from a total of 5 experts, three academic nurses, and two PC nurse specialists. According to expert feedbacks, the contents of the learning guide were arranged and finalized.

Three different application scenarios were applied in the simulation exercises, which were done using a low-fidelity simulator (static mannequin) and a SPS (Appendix 16). Each of the three scenarios contains a detailed medical history of the patient and his condition (Appendix 13,14,15). The same three scenarios were used through both simulations (LFS and SPS). The standardized patient was trained on the three scenarios. He is a 28-year-old master student in oncology nursing and has practical experience in oncology and palliative care departments and worked at the Center for Education and Evaluation of the College of Nursing at AQU, the standardized patient was informed of the purpose, method, and scenarios of the research in detail.

3.6.2. Implementation Phase

The researcher made face-to-face contact with the coordinator of PC nursing course to present the research idea before meeting with the course students. It was suggested to use the American Curriculum (the (ELNEC)-Core curriculum) in the teaching of the course. After the course coordinator reviewed the content of the curriculum, it was found that it is the same curriculum used in teaching this course for undergraduate students. The coordinator role was limited to teaching the theoretical part of PC nursing, explaining the Study and its purposes to the students, and inviting them to participate in the Study. Moreover, announcements were published on social

media for nursing students in the PC course to encourage them to participate in the research after getting the approval of the Nursing Department Director.

A meeting was held with all students of the course (140 students), who were divided into two sections, through the Zoom application, due to the outbreak of the Corona pandemic and the imposed protective measurements, at the time. The idea, aim, objectives, content, duration of the Research, what participants are required to do, and an informed consent form were presented. The students were informed that the conduction of this study is a part of an academic requirement for the researcher to obtain a doctoral degree in medical nursing.

Another online meeting was held with the students who expressed desire to participate in the research and met the inclusion criteria through Zoom, and then an informed consent form was sent to them by e-mail to obtain their documented consent. After that, 70 nursing students gave their consent and signed the form. Students received printed information about dates and time schedule of the study's activities. The researcher prepared a list for the students' university ID numbers and assigned them randomly by SPSS to LFS group and SPS group. SPSS was used for random assignment to confirm that each participant has an equal probability of being assigned to any group ((LFS), (n=35)) or((SPS), (n=35)).

Before the start of the first lecture of the Course and during the first week of the spring semester of 2020-2021, a pre-test of the PCQN and the demographic part was sent to be filled out. The Google platform was used to create and send a link for the questionnaire to the 70 students of the Course who agreed to participate in the research. Students were asked to fill out a questionnaire before taking the Course lectures.

The completed pre-test of the PCQN was received from the students within 2-4 days from the date it was sent to them. A week after filling out the previous pre-test questionnaire, teaching began in the Course.

Theoretical education: In the spring semester of the academic year 2020-2021, 140 students in the second-year undergraduate students who studied at the Nursing Department at the Faculty of Health Professions at AQU received the "Palliative Care Nursing" course, since it is obligatory course for nursing students. The content was conveyed by the course lecturer via narration and demonstration method during the

Course. The content of the Course plan, which depends on the (ELNEC)-Core curriculum is attached (Appendix 12,18). Theoretical teaching was delivered through the Zoom system due to the Corona pandemic and the imposed closure. Due to the COVID-19 pandemic's social distancing requirements, the PC course (3 credit hours) content was delivered through the Zoom video conferencing program (https://zoom.us/) to match with our lecture meetings, which had been relocated to the virtual domain and held equivalent to 3 credit hours. The course started with a slide-based presentation to give resources and educational contents, and then proceeded in small groups utilizing Zoom's breakout room option, which divides learners into smaller groups for further discussing every lecture. The intervention and data collection occurred over a period of three months during the spring 2021 semester.

During the second week of the start of giving theoretical lectures, the students were randomly divided into two groups using the SPSS statistical analysis program. A list of the university ID numbers for the 70 students was entered in the SPSS file. Then, random sample of 50% for the LFS group (n=35) and 50% for the SPS group (n=35) were chosen. The 35 students, in the LFS group were divided into five groups, each group consisting of seven students. And the same applied for the SPS group. After that, the participants were provided with a timetable of training schedules in the simulation lab of AQU.

Diffusion of intervention, which occurs when students in one educational group receive information intended for students in another educational group, is one of the most serious challenges to internal validity (185). To avoid this challenge, pre-existing clinical groups were randomly assigned to the learning methods and requested not to talk about their learning experience outside of their group until the end of the training period.

3.7. First Scenario (teaching Bad News Communication)

LFS and SPS groups (n=70)

Briefing session: A meeting was held through the Zoom application with all members of the LFS and SPS groups (LFS, n=35, and SPS, n=35). The patient's condition, under the First Scenario, was explained to the students and they were

provided with the required information about the condition. This briefing session meeting was held a day before the actual training. The First training Scenario was on how to deliver bad news to the patient's family about the progression of the disease. (Appendix 13.) The steps for communicating bad news were explained to the students of the two groups.

An educational guide had been prepared earlier to help students to learn the steps to deliver bad news. The learning guide includes application steps related to communicating bad news. The guide to learning bad news communication consists of 28 steps for implementation (Appendix 6). The guide was explained to the students during the briefing session. A complete video demonstration of the steps was shown to them. At the end of the meeting, the LFS Group (n=35) was divided into five subgroups so that each subgroup consisted of seven students. Likewise, for the SPS Group (n=35), and then they were provided with training dates sequentially in the simulation lab of AQU.

Simulation Implementation and Evaluation for the LFS group (n=35): The First Simulation Scenario was implemented with the first subgroup, which consisted of seven students. The training was through LFS, using a Static Manikin representing a family member. Each student applied the steps of communicating and reporting bad news to a static manikin, representing a member of the patient's family, with the bad news relating to the patient's deteriorating condition. The rest of the students of the subgroup were watching the student through a room with a screen transmitting everything that was happening in the simulation room. Each student in the subgroup in turns applied the required skill while the rest of his/her classmates watched in the simulation observation room. The skill (how to deliver bad news to the patient's family) was assessed through the Skill Assessment Form, which was prepared based on the literature (186-190). The assessment was made for each student by the Researcher, the Course Instructor, and an assistant master's student, immediately after the training. In case of different evaluations on one of the items, the average evaluation was considered for that point. It is worthwhile mentioning that variations in evaluation occurred only in evaluating skills of one student in the first subgroup, and another in the fourth subgroup. The participating students in each subgroup were asked not to share what was being trained with students of the other subgroups.

Debriefing Session: After the simulation training for the entire subgroup, a 40-minute debriefing session was conducted immediately with all the students in the subgroup. the students were given feedback on their deficiencies in practice and their performance, and they were given the opportunity to evaluate themselves. This form was used to receive feedback from students and give feedback to the student after applying the simulation scenario through the debriefing session (Appendix 21). Then, each student was asked to fill out the (LSSCL) Form.

The same previous steps were repeated for each of the LFS subgroups (5 subgroups). All subgroups of the LFS Group were trained during the first week through the same scenario and same training method. The exercises were conducted on the LFS with the First Scenario according to the scheduled program between March 23 and 25, 2021.

Simulation Implementation and Evaluation for the SPS group (n = 35): Almost all implementation steps carried out under Simulation and Evaluation for the LFS Group (n=35) were applied under Simulation and Evaluation for the SPS Group (also n=35). The core difference in the Second exercise was that the Static Manikin representing the patient's family member in the First, was replaced by a Standardized Patient (the role of a patient's family member was played this time by a 28-year-old master student in oncology nursing and has practical experience in PC departments and worked at the Center for Education and Evaluation of the College of Nursing at AQU), in the Second exercise.

The following lists, in brief, carried out activities, for illustration:

- The first subgroup (7 students) of the SPS Group carried out simulation training, with the Standardized Patient playing the role of a patient's family member.
- Each student, in the subgroup, exercised communicating and reporting bad news regarding deteriorating condition, to the patient's family member (the Standardized Patient).
- The other subgroup students watched through a screen in the observation room.

- All subgroup students, in turn, practiced the bad news communicator exercise.
- A 40-minute debriefing session was conducted with all the students in the subgroup.
- Each student filled out the (LSSCL) Form.
- Same procedure was followed with the other 4 subgroups of the SPS Group.
- The Researcher, the Course Instructor, and an assistant master's student, each carried out an evaluation of all participants' skill, using the Skill Assessment Form.
- Where there were differences in evaluating some items relating to a student skill, average evaluation was considered, and that occurred only in evaluating one student in the fourth subgroup.
- The exercises on Standard Patient Simulation with the First Scenario were carried out, during the second week, according to the scheduled program between March 31, and April 7, 2021.

3.8. Second Scenario: (Assessing the Palliative Care Needs of Patients with Chronic Illness)

All implementation steps carried out under the first scenario were applied under the second scenario too. The Second training Scenario was on palliative care planning for chronic patients. (Appendix 14). The guide to learning of palliative needs assessment for patients with chronic illness consists of 23 steps for implementation (Appendix 7).

The skill (assessment of palliative care needs for patients with chronic disease) was assessed through the Skill Assessment Form, which was prepared based on the literature (99, 191-194).

The exercises were conducted on the LFS with the Second Scenario according to the scheduled program between April 13 and 15, 2021. The exercises on Standard

Patient Simulation with the Second Scenario were carried out, during the fourth week, according to the scheduled program between April 20 and 22, 2021.

3.9. Third Scenario: (Providing Updated Information about the Patient in the Previous Scenario)

All implementation steps carried out under the first scenario were applied under the third scenario too. The Third training Scenario was on providing updated information about the patient in the previous Scenario, hence it was a continuation of the palliative care planning for chronic patients (advanced care planning). (Appendix 15). The objective of the Third Scenario was to provide an opportunity for the participant to increase his/ her level of comfort in interviewing the patient about his understanding of his illness, and to identify more palliative care needs (advanced care planning). The guide to learning of advanced care planning of palliative needs assessment for patients with chronic illness consists of 12 steps for implementation (Appendix 8).

The skill (assessment of palliative care needs for patients with chronic disease, an advanced care planning) was assessed through the Skill Assessment Form, which was prepared based on the literature (99, 191-194).

The exercises were conducted on the LFS with the Third Scenario according to the scheduled program between April 27 and 29, 2021. The exercises on Standard Patient Simulation with the Third Scenario were carried out, during the sixth week, according to the scheduled program between May 4 and 6, 2021.

3.10. Final Theoretical Evaluation

All students participating in the study were given a post-test on June 06, 2021, and their knowledge levels were evaluated by the Palliative Care Quiz for Nursing (post-test PCQN). The PCQN was used via the Google Forms®. Pre-test and post-test which have the same content have been prepared to measure the participant's knowledge levels on PC.

3.11. After The Study

After the study was completed, the groups and students who wanted to apply with standard patients and low-fidelity simulators were switched only for two training, to allow both groups to work equally and gain experience.

3.12. Ethical Considerations

Ethical considerations at each step of the study process were insured. To evaluate the ethical suitability of the study, before data collection, the research protocol was submitted to the approval of AQU Research Ethics Committee and ethics committee approval was obtained on February 13, 2021 (Number: 169/REC/2021) (Appendix 19). Written permission was obtained from AQU/Health Professions Faculty/Nursing Department, which is the institution where the research was conducted.

An informed consent form was signed by all of the interested students who volunteered to participate in the study. The informed consent form included extensive information on the research process, reasons for involvement, possible advantages and hazards, as well as a clear description of the study goals and the significance of the study. Before participating in the study, the students were given the opportunity to offer their informed permission. Confidentiality and anonymity were assured during all phases of this study (Appendix 20).

3.13. Data Analysis

The Statistical Package for Social Sciences (IBM SPSS Statistics, Version 24), (IBM Inc., Armonk, NY, USA) was used to analyze quantitative data. Descriptive statistics were used to identify the demographic characteristics of the nursing students. By looking at the frequency distribution was utilized to do a descriptive analysis of the variables. The normal distribution was examined with the Kolmogorov-Smirnov test and the Shapiro Wilk test. All assumptions were met for all four sets of data: knowledge, self-satisfaction, self-confidence, and skill performance. A chi-square test was used to assess if there was a significant difference in demographic characteristics across groups at the beginning. The inferential statistics were mainly independent sample t-test, paired t-test used to test the hypotheses**.**

Table 3.1. Data analysis

	Research hypothesis	**Data analysis**
1	There is no difference in the Knowledge level among nursing students at the palliative care course before and after receiving clinical training using low-fidelity simulation.	Paired t-test
2	There is no difference in the Knowledge level among nursing students at the palliative care course before and after receiving clinical training using Standardized Patient simulation.	Paired t-test
3	There is no difference in the Knowledge level between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.	Independent sample t-test
4	There is no difference in self-satisfaction between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.	Independent sample t-test
5	There is no difference in self-confidence between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.	Independent sample t-test
6	There is no difference in skill level between students at the palliative care course trained by using low-fidelity simulation and those trained by Standardized Patient simulation.	Independent sample t-test

3.14. Flow Chart of the Research

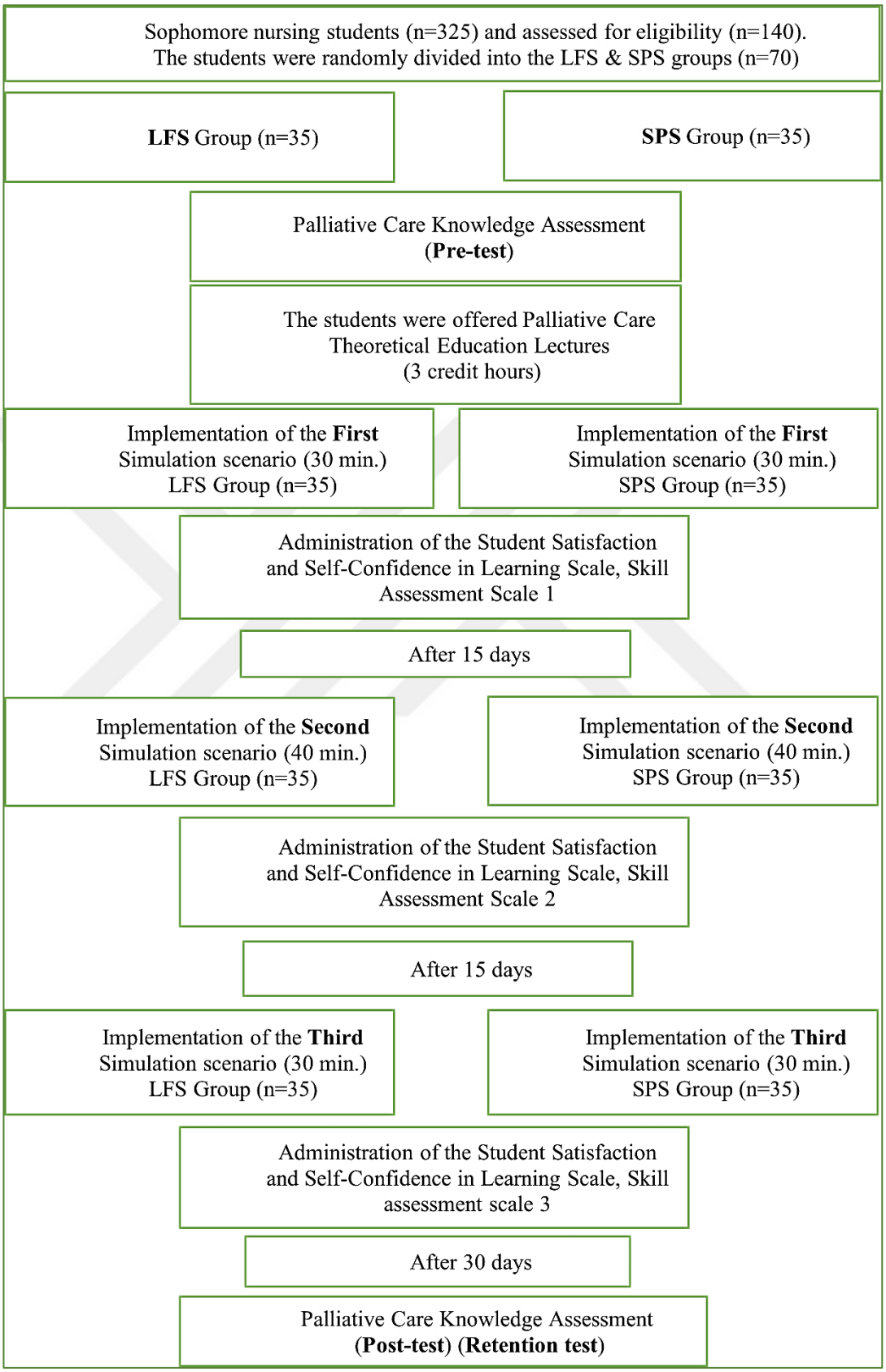


Figure 3.1. Flow chart of the research

4. RESULTS

In this chapter, the results of the study are presented. The purpose of this study was to evaluate the effects of two different simulation modalities in palliative care teaching on nursing students' knowledge, satisfaction, self-confidence, and skills at AQU.

4.1. Participants' Characteristics

Seventy nursing students in their sophomore year met the eligibility criteria and agreed to participate in the study. Students were randomly assigned to the LFS group or to the SPS group. Thirty-five students in each group, (Table 4.1). A total of 560 forms were collected from seventy participants: 140 forms of the PCQN (pre and post-test), 210 forms of the LSSCL (for three scenarios), 210 forms of the skill assessment form (for three scenarios).

The sample consisted of 43(61.4%) females and 27(38.6%) males. The age of the students ranged from 20 to 21 years. The mean age was 20.34 years (SD=0.48). The mean GPA was 83.09 (SD=4.49). The GPA of the students ranged from 73.12 to 94.40. The majority of the students 67(95.7%) had neither previous experience in PC nor experience outside of nursing courses in direct patient care of PC field 66(94.3%). More than half of the students 37(52.9 %) had no previous simulation experience. Half of the students 36(51.4%) had no information about simulation. More than two-thirds of the students 54(77.1%) had trained in four clinical nursing courses. The majority of students had neither personal nor professional experience with PC or hospice 66(94.3%), and had no experience in EOL care 65(92.9%). Also, the majority of students 68(97.1%) did not attend the PC course offered at the university (Table 4.1).

Table 4.1. Comparison of the sample characteristics between the two groups according to background characteristics at baseline (n=70)

Variable		Total n (%)	LFS group n (%)	SPS group n (%)	Test statistic [a] P-value [a]
Gender	Male	27(38.6)	12(34.3)	15(42.9)	0.543 p=0.461
	Female	43(61.4)	23(65.7)	20(57.1)	
Age	20≥ years	46(65.7)	26(74.3)	20(57.1)	2.283 p=0.131
	20< years	24(34.3)	9(25.7)	15(62.5)	
GPA	90-100	3(4.3)	0(0.00)	3(8.6)	4.551 p=0.103
	80-89.9	50(71.4)	24(68.6)	26(74.3)	
	70-79.9	17 (24.3)	11(31.4)	6(17.1)	
Previous experience in Palliative care	Yes	3(4.3)	3(8.6)	0(0.00)	3.134 p=0.077
	No	67(95.7)	32(91.4)	35(100)	
Previous simulation experience	Yes	33(47.1)	14(40)	19(54.3)	1.433 p=0.231
	No	37(52.9)	21(60)	16(45.7)	
Information about simulation	Yes	36(51.4)	17(48.6)	19(54.3)	0.229 p=0.632
	No	34(48.6)	18(51.4)	16(45.7)	
Nursing courses you have had in which clinical experiences were included	One	2(2.9)	2(5.7)	0(0.0)	3.810 p=0.149
	Three	14(20)	9(25.7)	5(14.3)	
	Four	54(77.1)	24(68.6)	30(85.7)	
Any personal or professional experience with palliative care or hospice	Yes	4(5.7)	2(5.7)	2(5.7)	0.000 p=1.000
	No	66(94.3)	33(94.3)	33(94.3)	
Have you taken or are you taking the palliative care course offered at your university?	Yes	2(2.9)	1(2.9)	1(2.9)	0.000 p=1.000
	No	68(97.1)	34(97.1)	34(97.1)	
Do you have experience outside of your nursing courses in direct patient care in palliative care field? (Experience with palliative care).	Yes	4(5.7)	1(2.9)	3(8.6)	1.061 p=0.303
	No	66(94.3)	34(97.1)	32(91.4)	
Experience in end-of-life care	Yes	5(7.1)	2(5.7)	3(8.6)	0.215 p=0.643
	No	65(92.9)	33(94.3)	32(91.4)	

[a] Chi-square, LFS: Low Fidelity Simulation, SPS: Standardized Patient Simulation

4.2. Characteristics of the Study Participants in Each of the Two Groups

Table 4.1 shows that the majority of the sample in the LFS group was females 23(65.7%) while male students formed 12(34.3%). The mean age for the sample was 20(SD=0.99) years. The age of the students ranged from 20 to 21 years. The mean GPA was 82.11(SD=4.01). The GPA of the students ranged from 73.12 to 88.60. Most students 32(91.4%) had no previous experience in PC. Results indicated that 21 students (60.0 %) had no experience in simulation. Also, most of the students 24(68.6 %) had trained in four clinical nursing courses. The majority of the students had neither personal nor professional experience with PC or hospice 33(94.3 %), and had no experience in EOL care 33(94.3 %). Also, the majority of students 34(97.1%) did not attend the PC course offered at the University.

On the other hand, there were 20(57.1%) female students and 15(42.9%) male students in the SPS group. The mean age was 20 (SD=1.00) year. The age of the students ranged from 20 to 21 years. The mean GPA was 84.08(SD=4.79). The GPA of the students ranged from 73.70 to 94.40. All students 35(100.0%) have no practical experiences in PC. More than half of students 19(54.3%) had previous experience in simulation. Also, most of the students 30(85.7%) had trained in four clinical nursing courses. The majority of the students had neither personal nor professional experience with PC or hospice 33(94.3%), and had no experience in EOL care 32(91.4%). Also, the majority of students 34(97.1%) did not attend the PC course offered at the University.

Chi-square tests were performed to assess if there were significant differences between the LFS group and the SPS group regarding age, gender, GPA, previous experience in PC, previous simulation experience, nursing courses in which clinical experiences were included, any personal or professional experience with PC or hospice, taking the PC course offered at the university, experience outside nursing courses in direct patient care in PC field, and experience in EOL care. The results revealed no significant differences between the two groups at baseline in terms of demographics and all other variables, as displayed in (Table 4.1).

4.3. Distribution of the Knowledge Level Among The Participants At Pre-Test and Post Test

This section presents the differences of the Knowledge level of the LFS group and the SPS group at pretest and posttest.

Table 4.2. Distribution of the Knowledge level between both groups (n=70)

Items	LFS Group				SPS Group			
	Before		After		Before		After	
	n	%	n	%	n	%	n	%
Poor Knowledge (Less than 12 point) Total score 20 point	35	100.0	14	40.0	34	97.1	12	34.3%
Good Knowledge (More than 12 point) Total score 20 point	0	00.0	21	60.0	1	2.9	23	65.7%
Total	35	100%	35	100%	35	100%	35	100%

LFS: Low Fidelity Simulation, SPS: Standardized Patient Simulation

The findings from analyzing the distribution of knowledge levels among the participants in the two groups at pretest showed that the majority of the participants in the LFS group and the SPS group had poor knowledge 35(100.0%) and 34(97.1%), respectively. On the other hand, the findings of the knowledge level among the participants in the two groups at posttest showed that the majority of the participants in the LFS group and the SPS group were of good knowledge 21(60.0%) and 23(65.7%), respectively (Table 4.2).

The findings of the knowledge level showed that the majority of the LFS group before LFS was of poor knowledge level 35(100.0%). While the majority of the LFS group after LFS was mainly of good knowledge 21(60.0%). On the other hand, the findings of the knowledge level showed that the majority of the SPS group before SPS

was of poor knowledge level 34(97.1%). While the majority of the LFS group after SPS was mainly of good knowledge 23(65.7%) (Table 4.2).

4.4. Impact of LFS and SPS on the Knowledge Level

This section presents the results related to the differences in the knowledge level between the LFS group and SPS group at pre and posttest, these differences in the knowledge level were examined by paired t-test and independent sample t-test.

Table 4.3. Differences between pre-test and post-test knowledge scores according to simulation method

	LFS group * (n=35)		**SPS group ** (n=35)**		**Test statistic [a] P [a]**
	Min-Max (0-20)	x̄±SD	Min-Max (0-20)	x̄±SD	
Pre-test	2-11	5.68±2.47	2-13	6.37±2.78	-1.089 p=0.280
Post-test	7-19	11.74±2.26	6-20	13.08±4.08	-1.701 p=0.095
Test statistic [b] P [b]	11.50 p<0.001		10.265 p<0.001		
Post-Pre	6.06±3.11		6.71±3.87		0.78 p=0.437

a: Independent T-Test, b: Paired T-Test, *Low-Fidelity Simulation, ** Standardized Patient Simulation, Min: Minimum, Max: Maximum, x̄: Mean, SD: Standard Deviation,

To compare between the two groups on the knowledge level at the posttest, it is necessary to assess the normality of distributions and the homogeneity of variances of both groups at the pretest. Therefore, an independent sample t-test was performed to compare the mean scores of the knowledge level between the LFS group and the SPS group at the pretest (Table 4.3). The first assumption of the t-test was that the distribution of the knowledge level scores, which were assessed by a histogram that indicated the scores on the Knowledge level, was approximately normal distribution within the two groups. The second assumption was based on the Levene's test that was conducted to examine the homogeneity of variances of the two groups. The Levene's

test was not significant (F=0.197, p=0.658); thus, the assumption was met, and the group variances were not significantly different of the knowledge level for the LFS group and the SPS group. This indicated a no violation of the equal variance assumption. The third assumption with the existence of two mutually exclusive groups, the LFS group and the SPS group, while no significant difference of means of the knowledge level, t=-1.089, p<0.280. The mean scores of the knowledge level in the LFS group and SPS group were (M=5.69, SD=2.47) and (M=6.37, SD=2.79), respectively. Thus, as the LFS group and the SPS group were similar without differences according to the knowledge level at pretest, that makes it applicable to make a comparison between both groups at the posttest.

The inferential statistics were performed using the independent sample t-test to compare means of the Knowledge level between the LFS group and the SPS group at the posttest, and the results of this analysis are in (Table 4.3). The first assumption of the t test was that the distribution of the knowledge level scores, which were assessed by histogram that indicated the scores on the knowledge level, was approximately normal distribution within the two groups. The second assumption was based on the Levene's test that was conducted to examine the homogeneity of variances of the two groups. Levene's test indicated unequal variances (F=12.55, p<0.001), so degrees of freedom were adjusted from 68 to 53. Thus, the assumption was not met, and the group variances were significantly different between the LFS group and the SPS group. This indicated a significant violation of the equal variance assumption, and equal variances not assumed was chosen. The third assumption with the existence of two mutually exclusive groups, the LFS group and the SPS group, an independent sample t-test was conducted to determine if there were significant differences between the SPS group and the LFS group at the posttest. The results showed no significant difference between the mean scores of the knowledge level of both groups (t=-1.701, df=68, p=0.095). The mean scores of the knowledge level for the LFS group and SPS group were (M=11.74, SD=2.26) and (M=13.08, SD=4.08), respectively. These results indicated that the participants' knowledge levels after LFS utilization were not different from the participants' knowledge levels after utilization of the SPS (Table 4.3).

When the difference between the post-test/ pre-test scores between the groups was evaluated, the results showed no significant difference between the mean scores of the knowledge level of both groups ($t=0.78$, $p=0.437$).

Paired t-test was performed to compare means of the knowledge level of the LFS group before and after receiving clinical training using LFS. Because the students took the PCQN by using a secret three-digit code on both the pretest and posttest, tests were matched up at the end of the study in order to better analyze the data through a paired t-test. The mean scores of the knowledge level differed significantly ($t=11.50$, $p<0.001$). The mean scores of the knowledge level among the LFS group after receiving clinical training using LFS ($M=11.74$, $SD=2.26$) were higher than mean scores before ($M=5.68$, $SD=2.47$). Thus, the LFS group experienced a higher Knowledge score after receiving clinical training using LFS than before receiving the training (Table 4.3).

Paired t-test was performed to compare means of the knowledge level of the SPS group before and after receiving clinical training SPS. Because the students took the PCQN by using a secret three-digit code on both the pretest and posttest, tests were matched up at the end of the study in order to better analyze the data through a paired t-test. The mean scores of the knowledge level differed significantly ($t=10.265$, $p<0.001$). The mean scores of the knowledge level among the SPS group after receiving clinical training SPS ($M=13.08$, $SD=4.08$) were higher than mean scores before ($M=6.37$, $SD=2.78$). Thus, the SPS group experienced slightly higher knowledge score after the clinical training using SPS than before receiving the SPS training and the difference between pre- and post-training among this group is higher than among the LFS group, but without significant intergroup differences (Table 4.3).

4.5. Impact of LFS and SPS on self-satisfaction and self-confidence

This section covers the differences in the self-satisfaction and self-confidence between the LFS group and SPS group at posttest for Scenario 1,2 and 3. These differences were examined by an independent sample t-test.

Table 4.4. Differences between self-satisfaction and self-confidence scores according to simulation method through different scenarios

	LFS group* (n=35)	**SPS group** (n=35)**	**Test statistic[a] P[a]**
Self-satisfaction	$\bar{x}$±SD	$\bar{x}$±SD	
Scenario 1	21.94±1.79	22.05±1.76	-0.27 p=0.789
Scenario 2	21.8±2.50	21.48±1.75	0.60 p=0.546
Scenario 3	21.77±2.14	21.51±3.10	0.404 p=0.688
Self-confidence			
Scenario 1	33.60±2.83	35.05±5.50	-1.392 p=0.169
Scenario 2	33.17±3.88	32.25±3.22	1.07 p=0.288
Scenario 3	32.91±3.37	33.57±3.68	-0.779 p=0.439

a: Independent T-Test, *Low-Fidelity Simulation, **Standardized Patient Simulation, $\bar{x}$: Mean, SD: Standard Deviation.

Independent sample t-tests were performed to compare the mean scores of self-satisfaction and self-confidence between the LFS group and SPS group at Post-Tests for Scenarios 1,2 and 3. The results of the independent sample t-tests are shown in (Table 4.4).

Three assumptions were considered regarding the distribution of scores on self-satisfaction. The first assumption of normal distribution, which was assessed by histogram, that indicated the scores on self-satisfaction were approximately normal distribution within the two groups. The second assumption is homogeneity of variance, assessed by the Levene test (F=0.05, p=0.821); thus, the assumption was met, and the group variances were not significantly different between the LFS group and SPS group. This indicated no violation of the equal variance assumption.

As for the third assumption, and with existence of two mutually exclusive groups, the LFS group and SPS group, it turned out that for scenario 1, the mean scores of self-satisfaction did not differ significantly between both groups (t=-0.11, p=0.789).

The mean scores of self-satisfaction in the LFS group and SPS group were (M=21.94, SD=1.79) and (M=22.05, SD=1.76), respectively. Also, for scenario 2, no significant difference between mean scores of self-satisfaction of both groups (t=0.60, p=0.546). The mean scores of self-satisfaction in the LFS group and SPS group were (M=21.8, SD=2.50), (M=21.48, SD=1.75), respectively. The same applies for scenario 3, with no significant difference between mean scores of self-satisfaction in both groups (t=0404, p=0.688). The mean scores of self-satisfaction in the LFS group and SPS group were (M=21.77, SD=2.14), (M=21.51, SD=3.10), respectively (Table 4.4).

Three assumptions were considered regarding the distribution of scores on self-confidence. The first assumption of normal distribution, which was assessed by histogram, that indicated the scores on self-confidence were approximately normally distributed within the two groups. The second assumption is homogeneity of variance, assessed by Levene test (F=1.07, p<0.304); thus, the assumption was met, and the group variances were not significantly different between the LFS group and SPS group. This indicated a no violation of the equal variance assumption.

As for the third assumption, and with existence of two mutually exclusive groups, the LFS group and SPS group, it turned out that for scenario 1, the mean scores of self-confidence did not differ significantly between both groups (t=-1.392, p=0,169). The mean scores of self-confidence in the LFS group and SPS group were (M=33.60, SD=2.83) and (M=35.05, SD=5.50), respectively. Also for scenario 2, no significant difference between mean scores of self-confidence of both groups, (t=1.07, p=0.288). The mean scores of self-confidence in the LFS group and SPS group were (M=33.17, SD=3.88) and (M=32.25, SD=3.22), respectively. The same applies for scenario 3, with no significant difference between mean scores of self-confidence in both groups (t=-0.779, p=0.439). The mean scores of self-confidence in the LFS group and SPS group were (M=32.91, SD=3.37), and (M=33.57, SD=3.68), respectively (Table 4.4).

These findings suggest that the utilization of the LFS or SPS in students' clinical training for each scenario has the same effect on the self-satisfaction and self-confidence among nursing students.

4.6. Impact of LFS and SPS on the Skill Level

The inferential statistics were performed using the independent t-test to compare means of the skill level between the LFS group and SPS group for scenario 1, 2 and 3. The results of this analysis are presented in (Table 4.5). The first assumption of the t test was related to distribution of the skill level scores, which were assessed by histogram, that indicated the scores on the skill level were approximately normally distributed within the two groups for all scenarios. For the second assumption, the Levene's test was conducted to test the homogeneity of variances of the two groups. Levene's test for scenario 1 indicated unequal variances ($F=9.056$, $p<0.004$), so degrees of freedom were adjusted from 68 to 53. Thus, the assumption was not met, and the group variances were significantly different between the LFS group and the SPS group. This indicated a significant violation of the equal variance assumption, and equal variances not assumed was chosen. The Levene's test for scenario 2 and 3 was not significant ($F=0.133$, $p=0.716$) and ($F=0.856$, $p=0.358$), respectively; thus, the assumption was met, and the group variances were not significantly different of the skill level for the LFS group and the SPS group. This indicated a no violation of the equal variance assumption.

As for the third assumption, and with existence of two mutually exclusive groups, the LFS group and SPS group, an independent t-test was run to determine if there were significant differences between LFS group and SPS group. The results of the first scenario showed a significant difference between the mean scores of the skill level of both groups ($t=-3.11$, $df=68$, $p=0.003$). The mean scores of the skill level for the SPS group ($M=26.88$, $SD=6.13$) were higher than the mean scores of the skill level among the LFS group ($M=23.20$, $SD=3.28$). This result indicated that the SPS increases the skill level among nursing students of the first scenario. Meanwhile, the results were different in the second and third scenarios. The results of the second scenario showed no significant difference between the mean scores of the skill level of both groups ($t=0.525$, $df=68$, $p=0.602$). The mean scores of the skill level in the LFS group and SPS group were ($M=40.76$, $SD=4.63$) and ($M=41.42$, $SD=5.30$), respectively. The results of the third scenario showed no significant difference between the mean scores of the skill level of both groups ($t=-0.527$, $df=68$, $p=0.600$). The mean

scores of the skill level in the LFS group and SPS group were (M=22.53, SD=1.94) and (M=22.22, SD=2.82), respectively (Table 4.5).

These findings suggest that the SPS increases the skill level among nursing students of the first scenario under which the training was on how to deliver bad news to the patient's family about the progression of the disease. On the other hand, the results of the second scenario which included training on palliative care planning for chronic patients, and third scenario which was training on continuation of the palliative care planning for chronic patients, showed no significant difference between the mean scores of the skill level of both groups.

Table 4.5. Skill level scores according to simulation method through different scenarios

	LFS group* (n=35)		**SPS group** (n=35)**		**Test statistic[a] P[a]**
	Min-Max	$\bar{x}$±SD	Min-Max	$\bar{x}$±SD	
Post Simulation Evaluation Scenario 1 (Total score =56)	17-29	23.20±3.28	19-41	26.88±6.13	-3.11 p=0. 003
Post Simulation Evaluation Scenario 2 (Total score =46)	24-46	41.42±5.30	26-46	40.76±4.63	0.525 p=0.602
Post Simulation Evaluation Scenario 3 (Total score =24)	12-24	22.22±2.82	12-24	22.53±1.94	-0.527 p=0.600

a: Independent T-Test, *Low-Fidelity Simulation, **Standardized Patient Simulation, Min: Minimum, Max: Maximum, $\bar{x}$: Mean, SD: Standard Deviation.

5. DISCUSSION

Simulation is a teaching strategy that enables experimentation with the representation of an actual event to practice, learn, evaluate, or understand such situations. It is a teaching tool based on active methodology, which can be defined as a methodology that reproduces real conditions, enabling the student to acquire concepts necessary for understanding and solving the problem actively (139). At the same time, the teacher adopts the role of conductor or facilitator. This study focused on evaluating how low fidelity and standardized patient simulations affect nursing students' knowledge, self-satisfaction, self-confidence, and skills.

The findings of this research are discussed under three headings.

- Discussion of findings on the impact of LFS and SPS on the Knowledge Level
- Discussion of findings the impact of LFS and SPS on self-satisfaction and self-confidence
- Discussion of findings on the impact of LFS and SPS on the Skill Level

5.1. Impact of LFS and SPS on the Knowledge Level

The findings of significantly improved knowledge in the LFS group at the posttest indicate accepted of the first alternative hypothesis. This finding is consistent with findings from the previous studies as in Brauneis, Badowski (158) study who conducted a quasi-experimental comparison group research study, and found the experimental group had a statistically significant difference in pharmacology knowledge at posttest than pretest after using low-fidelity simulation. Moreover, another quasi-experimental study using low fidelity simulation training supported the results of the current study conducted by Angelina, Stephen (195) that aimed to assess the effectiveness of a low fidelity simulation-based training intervention in enhancing knowledge of nurses on management of labor. Results showed overall knowledge were significantly improved after low fidelity simulation training. Lancaster and his colleagues conducted a descriptive pilot study to investigate and describe nursing students' knowledge level explored scenario-based LFS when caring for patients at

EOL care (134). The study established that the use of LFS increased levels of knowledge of the majority of student nurses. The study concluded that LFS is an effective teaching method to improve student nurses' knowledge of EOL care (134). Another qualitative explorative study that involved nursing students examined the effects of a LFS on knowledge towards caring for a dying patient (136). The above studies revealed that learning as a result of LFS improves student nurses' knowledge towards caring for a dying patient. This proved that the intervention may be utilized as a teaching tool to increase nursing students' understanding of how to give PC.

The findings of high Knowledge level of the SPS group at the posttest indicate accepted of the second alternative hypothesis. This finding is consistent with findings from previous studies as in a quasi-experimental study by Kirkpatrick et al. (10) which investigated the relationship of PC nursing experience, knowledge, self-awareness, and performance among nursing students during EOL simulation. The study showed that the use of SPS effectively improved palliative nursing care knowledge (M=80.5%; ±2.6) in enhancing nursing students' critical thinking and assessment skills (10). This showed that the intervention could be used as an innovative teaching modality to improve nursing students' knowledge on how to deliver PC to dying patients. Similar findings were found in a quasi-experimental design study of nursing students that examined the effects of an EOL simulation-based experience on active and observer nursing students' PC knowledge and self-awareness (15). The study revealed a significant increase ($p<0.001$) in knowledge levels among all the students. Similarly, a qualitative explorative design study that involved second-year nursing students showed that SPS is beneficial. It helped improve their knowledge of PC principles, enhanced communication skills, courage, confidence, and positive attitudes towards PC (135). This confirms that EOL simulation-based experience with standardized patients is an effective method to improve student PC competence. These findings revealed overwhelming clinical evidence regarding the effectiveness of this SPS in increasing nursing students' knowledge scores; however, its findings only focused on high-fidelity simulation and SPS and nursing students' knowledge levels.

The results revealed that the utilization of the LFS and SPS has the same effect on the Knowledge level among nursing students at the posttest, we therefore accept the third null hypothesis. In the independent sample t-test used to test the change in

the nursing students' knowledge, both types of simulation indicated that the simulation plays a vital role in boosting the participants knowledge on how to handle PC patients and family members. Advantages of simulation, include: safe, realistic, and ethical environment, better performance at work individual and group, development of autonomy and confidence, ability to evaluate and generate information; debriefing, development of knowledge (196). According to Burrell, Ross (197), simulation is an effective strategy for teaching nursing professionals contributing to the advancement of scientific knowledge. Cant and Cooper (198) complement by highlighting that the realistic simulation enables the training and practice in a safe environment. In a simulated environment, nurses can make mistakes without causing damage or harm to actual patients and developing the control of their feelings, exposed through the debriefing available at the end of the action of each group. For Carrero, Pol (199), teaching in nursing education constitutes a search process, scientific construction, and successive criticisms and reflections of the knowledge produced. Therefore, clinical simulation becomes an essential tool in the teaching-learning process, intending to make observation emerge and make students confident in their ability to maintain interprofessional dialogues and with the family, implying in professional practice concerning decision-making and the communication of bad news.

According to D'Souza, Arjunan (200), early training and team care encourage clinical reasoning, integration, and communication, essential aspects concerning chaotic situations. In this sense, Doğru and Aydın (201) emphasize that younger students are more likely to acquire cognitive and practical knowledge after implementing a realistic simulation strategy (202). The SPS group performed the same as the LFS group. Therefore, even though both types of simulation effectively boost student knowledge, both suitable for ensuring that the students grasp all the essential information. The use of low-fidelity simulation led to equal growth in knowledge as compared to Standardized Patient Simulation.

According to the literature, all simulation modalities enhance students' knowledge. Although Tüzer's study (169), and Karadag's study (203) indicated that the standard patient was more efficient in enhancing knowledge. Smithburger's study (204). On the other hand, showed that using high fidelity simulation was more beneficial. The authors illustrate how a PC scenarios applying LFS was used to enrich

the curriculum on PC offered to nursing students (14). It has been demonstrated in the literature, as in this study, that there is no significant difference between different simulation modalities and students' ability to obtain and enhance knowledge (205-207). All of the study findings show that there is no difference in the impact of different simulation modalities on nursing students' knowledge levels. It can be explained that the rising expenses of simulation approaches are not directly proportional to the rising learning benefits. The crucial aspect for nurse educators here is that when any simulation appropriate for the learning aim is applied and the scenario stages are properly completed, the students' level of knowledge grows. Both groups got theoretical lectures on different palliative care topics and reviewed the information throughout their interventions, thus these results were predicted. These findings remain consistent with previous studies because any educational intervention should expand students' knowledge base. Moreover, the use of simulation in PC could be promotes the quality of the health services offered, improving, and encouraging user satisfaction, especially when considering the weaknesses of health policies which relate for palliative care as in Palestine.

5.2. Impact of LFS and SPS on Self-Satisfaction

The results revealed that the utilization of the LFS or SPS in students clinical training for all scenarios has the same effect on the self-satisfaction among nursing students, we therefore accept the fourth null hypothesis.

Concerning the literature review on LFS and satisfaction among nursing students, students can feel satisfied with the learning experiences they acquire with simulation. A quasi-experimental design study on second-year nursing students examined the effects of LFS on self-satisfaction (137). The study indicated that the nursing students felt that the use of simulation was satisfying (137). The study stated that the students thought that the experiential simulator sessions with LFS were satisfactory in learning how to provide care to critically ill patients (137). Of the reviewed studies, only one study was found to solely describe the effects of LFS nursing students’ satisfaction in PC. Moreover, One qualitative study investigated the interprofessional health care team communication simulation focused on simulated patient and geriatric PC and determined its effects on various outcomes, including

trainees' satisfaction. The study included nursing students as part of health professionals that took part in the study. The study revealed that nursing students felt the use of simulated patients was satisfying in improving interprofessional health care team communication (138). The study showed that most nursing students reported high satisfaction with simulation training with a simulated patient. The nursing students showed that the simulation training was very satisfying in deconstructing the skills and experiences they learned (138). One observational study assessed the possible relationship between emotional intelligence, coping styles, and satisfaction with individual self-learning using simulated patient scenarios (139). Concerning nursing students' self-satisfaction, the study established that most nursing students reported high satisfaction with individual learning with simulated patient scenarios (139). The study revealed that with the use of patient simulation intervention, nursing students find the learning experience satisfying, especially when learning complicated patient medical cases or real-life scenarios (139).

A mixed-methods study investigated the use of simulation-based learning experiences to teach nursing students communication skills while delivering PC to patients and their families (140). The study used Kirkpatrick's level of evaluation to assess nursing students' responses or reactions to regarding simulation satisfaction with a simulated patient as one of the simulation-based techniques. The study reported a high satisfaction among nursing students regarding the use of simulated patients. It improved their level of satisfaction in providing PC to patients and their families (140).

An experimental study also explored the use of simulated patient scenarios to teach nursing students about PC. It showed high satisfaction with the simulation modality because the intervention group improved their ability to communicate with their patients at EOL more than the control group (141). Based on the study findings, it was observed that nursing students showed higher levels of satisfaction because the simulation modality enhanced their motivation to work with patients at the end of life. While the study findings showed the effects of simulation in improving satisfaction among nursing students, they also revealed a literature gap on the perspective of nursing students in PC, indicating the need for primary data to validate the findings. Concerning the studies on simulation and satisfaction among nursing students,

students can feel satisfied with the learning experiences they acquire with different types of simulation.

5.3. Impact of LFS and SPS on Self-Confidence

The results revealed that the utilization of the LFS or SPS in students clinical training for all scenarios has the same effect on the self-confidence among nursing students, we therefore accept the fifth null hypothesis. From the reviewed studies, one quasi-experimental study that compared the impact of mid-level versus LFS on self-confidence as one of the clinical outcomes among nursing students indicated the efficacy of the interventions. The study revealed that students in the LFS group had a higher level of self-confidence than the students in mid-level simulation ($t=2.213$, $df.=71$, $p=0.03$) (142). Similar findings were found in a randomized controlled trial that compared the effects of low and high-fidelity simulations on confidence among medical students (143). The study's findings revealed that most students showed overconfidence with high-fidelity simulation than LFS intervention (143). Despite improved confidence, LFS was superior or more effective than a high-fidelity simulation that induces undesirable overconfidence among students (143). Based on the studies' findings, it was evident that nursing students benefit more from a LFS than a high-fidelity one because of their practical capabilities as students, unlike if professionals were involved. However, the findings of the studies may lack generalizability because of the focus on nursing students at specific academic years as the participants.

Contradicting findings were found in one descriptive study and one semi-experimental study of nursing students that supported the clinical efficacy of both low and high-fidelity simulations (144, 145). The studies revealed that low-fidelity and high-fidelity simulation interventions improved nursing students' confidence to conduct necessary tasks in their clinical practices. The studies revealed that confidence improved among all students who were satisfied with the simulations, which made them confident to apply their skills while conducting nursing practices (144). Also, a two-group quasi-experimental study provided contradicting findings, the said study aimed to determine whether, or not, video simulation versus traditional written case studies improves confidence, knowledge, and satisfaction among nursing students

(146). The study disclosed that the use of both simulation interventions led to a high level of confidence in transferring classroom content into their practice to improve patient safety and deliver high-quality care (146).

The reviewed studies did not focus on the effects of LFS from the perspective of PC education. There were no clinical studies or research on LFS and confidence among nursing students. The three studies postulated the overall benefit of using simulation during nursing students' education. The findings provided valuable insights into how simulations may enhance nursing student's knowledge, confidence, and satisfaction. However, the authors are not predicting regarding how the nursing students may apply what they learned via the simulations during PC. Additionally, there exists a lack of generalizability of the findings because the cohort being studied was extracted from one facility.

This study also focused on the effects of SPS on the confidence level among nursing students. From the review conducted, simulation has been found to improve confidence among nursing students (147-150). However, no studies have been conducted on SPS and its effects on nursing students' confidence in PC. A standardized patent simulation is more effective than other interventions in improving self-confidence. This is supported by a qualitative study that compared the effectiveness of using video and SPS on communication performance (151). The study showed that SPS was more effective than video simulation in improving communication skills, which, in turn, improved confidence among students in delivering care (151). This study lacked detailed information from the perspective of nursing students in PC education. Additionally, some studies supported the effectiveness of SPS in improving the confidence of nursing students, enabling them to act appropriately during their clinical placement (152-156). Two studies showed that SPS increased student confidence resulting in helping them to create a positive self-image in their clinical experiences (152, 153).

Through the simulation, the students showed high confidence in approaching the patient and the family members. They learn the feelings of the other parties and become more assertive in their interactions. Further, they are more confident with their work. Both forms of simulation have a similar effect on the confidence among nursing students. The study reported a high satisfaction among nursing students regarding the

simulation trainings. It enhanced their level of confidence in providing PC to patients and their families. It is clear that confidence among all students who were satisfied with the simulations, which made them confident to apply their skills while conducting nursing practices.

5.4. Impact of LFS and SPS on the Skill Level

The results revealed that the SPS increases the skill level among nursing students of the first scenario which the first training scenario was on how to deliver bad news to the patient's family about the progression of the disease, we therefore accept the sixth alternative hypothesis. On the other hand, the results of the second scenario which the second training scenario was on palliative care planning for chronic patients, and third scenarios which the third training scenario was continuation of the palliative care planning for chronic patients, showed no significant difference between the mean scores of the skill level of both groups, we therefore accept the sixth null hypothesis.

A comparison between the performance from the LFS and SPS indicated that the standardized simulation was more effective at boosting the nursing students' communication skills. The LFS outperformed the standardized patient care on the test about the skills on handling patients in PC. On average, the two simulation methods generate similar results in boosting the skills of the nursing students. However, the results from the SPS group indicate that the approach has better performance than the LFS group (208). The LFS could not properly teach how the nursing students should introduce themselves and how to minimize distractions and appear calm and composed. The SPS approach excels on these two skills.

It was found that the simulation trainings with standard patients are helpful for the progress of communication skills (209). Applying scenario simulation teaching in nurse-patient communication generally selects links more prone to conflicts and disputes in nurse-patient interactions. They allow nurses to play different roles, experience the psychological feelings of each role, and learn to change thinking positions, acquire nurse-patient communication skills from it, and improve communication skills (210). The problems that arise in the nurse-patient relationship are often repetitive (211). Through scenario simulation nurse-patient communication training, nurses can gain nurse-patient communication experience and improve their

ability to analyze and solve problems (212). Training can be organized for standard clinical communication links, such as receiving new patients, pre-operation communication, post-operative rehabilitation guidance, and pre-discharge communication (213).

In this study, the skill scores of the students were significantly higher in the application performed with the standard patient compared with the low fidelity simulation in how to deliver bad news to the patient's family about the progression of the disease. In the literature, there are studies supporting the use of SPS that increase students' skills (163, 209, 214, 215), as well as studies showing that there is no difference (169, 214, 216).

The application of scenario simulation teaching in communication training makes learners more immersive and effectively improves nurses' empathy and communication skills in response to various situations (217). In addition, scenario simulation can allow nurses to complete nurse-patient communication tasks following specific work requirements by setting up realistic work scenarios (212). Studies indicated that use of SPs is an efficient strategy in teaching students about communication skills of students from medicine, and nursing in difficult situations (216). When the communication task is not completed satisfactorily, they can go back to the previous link, change the communication method, and try again to exercise the nurse's communication skills repeatedly until the scenario simulation task is completed.

Concerning the effect of LFS on the skill level among nursing students. Studies supported that LFS helps students to gain or develop new skills in their nursing education experience (14, 157-159). A mixed-methods research investigated the impacts of a low-fidelity clinical simulation intervention on nursing students' skill in PC. The article showed that the intervention improved nursing students' acquisition of skill that help them to connect theory with clinical practice during PC (14). The study indicated that LFS helped students acquire skills on palliative care planning for chronic patients, and advanced palliative care planning for chronic patients.

Descriptive research that explored student nurses' perceptions regarding the LFS method showed that the simulation led to skill acquisition and skill development. The

study showed that student nurses perceived that LFS was an effective educational method that provided effective learning and improved clinical skills (157). Similar findings were supported in a quasi-experimental study of graduate prelicensure nursing students that showed that LFS improved students' skills on safe medication administration (158). Another descriptive study of medical students investigated the effects of LFS in influencing students' ability to acquire basic clinical skills and elderly medicine (159). The study revealed that LFS enables the student to develop procedural and technical skills (159). A quasi-experimental study by Bowling et al. demonstrated that LFS is more effective than mid-level fidelity simulation in improving skill performance (142). The study found a significant increase in the levels of students' skills performance, with most students acquiring new skills in clinical practice (142). Further, a prospective descriptive design investigated the effects of LFS on skill levels regarding transferring the practice of peripheral blood sampling among novice medical students(160). The study found that an educational intervention with LFS increases students' skills levels on peripheral blood sampling (160). The study found that with LFS, medical students were able to acquire and transfer higher levels of procedural skills on peripheral blood sampling (160).

Contradicting results were found in a systematic review that determined the effectiveness of high-fidelity simulation versus LFS on clinical and practical skills development among physiotherapy students. The review found that high fidelity simulation is more effective in developing motor skill with regards patient safety (13.5% safety fails) than LFS (8.1% safety fails) (161). However, in terms of clinical skill reasoning, the review demonstrated that high fidelity simulation is not as effective as a LFS in influencing students' clinical reasoning ability to apply their skills and knowledge acquired (161). Also, contradicting findings were found in a quasi-experimental study that compared impact of high and a LFS on perceived skill development and self-efficacy among maritime training nurse students (162). Concerning perceived skill development, the study disclosed that students preferred training with high-fidelity simulation to LFS. This was because high-fidelity simulation had significant effects in improving motivation using immersion training simulators than traditional training involving the use of competent seafarers (162). Another quasi-experimental study examined the impact of LFS on student nurses' skill levels or competence in the active management of third-stage labor (37). It was

established that despite the effectiveness of LFS in impacting nurses' skills and knowledge on active management of third stage labor, contradicting findings concerning obstetric management and emergency skills were reported (37). The study revealed that despite the promising results of improving nurses' skills in active labor management, the use of LFS does not improve nurses' obstetric emergency skills. Such skills are needed to ensure the proper delivery of quality care and management of obstetric conditions during labor (37). Only one study was found to describe the effects of LFS on the skill level among nursing students in PC education (14).

Regarding the effects of SPS on the skill level among nursing students in PC. Three studies provide information on how standardized patients influence skill's levels among student nurses (13, 163, 164). Smith and colleagues conducted a systematic review on the use of simulation-based learning methods, including standardized patients and their effects on communication skills among nursing students who provide palliative and EOL care to patients and their families (13). The studies showed that with the use of simulated patient, nursing students acquire communication skills on palliative care that help them communicate and deliver the needed care to patients(13). Similar findings were found in a mixed method study that investigated the impacts of using standardized patients on palliative communication skills (163). The study revealed a significant increase in student nurses' skill set that enabled them to deliver the needed palliative. Valen, Simonsen (164) found that the PC simulation expanded participants' self-reported skills and competence. This study indicated that SPS helped students acquire skills on how to deliver bad news to the patient's family about the progression of the disease.

5.5. Conclousion and Recommendation

5.5.1. Conclusion

Today's nursing students face varying challenges, with those from developing countries facing tougher challenges than in developed countries. Currently, the number of patients with life-limiting and serious illnesses has increased, and all of them require PC. However, there are widespread shortages of PC specialists (12). Hence, there is a local and global need for teaching nursing students about PC. Contemporary,

researchers reveal that PC education are essential to deliver high-quality palliative nursing care from nursing students (9-11). Nursing education ensures that students are empowered, safe, and capable (12-15). Nurse educators are responsible for providing the best possible education method to prepare tomorrow's nurses to deliver high-quality palliative nursing care.

The current study is the first to be performed within the Palestinian context in the field of palliative care education. Palestine is a unique case and had witnessed political and economic instability that students can't go to clinical areas in various conditions. Moreover, the fact that there is often no appropriate environment for palliative care education in the clinical field.

The results of this study are summarized below:

- The current study revealed that both simulation modalities (LFS and SPS) are efficient in providing an effective learning situation for palliative care nursing students, hence boosting their knowledge, skills, satisfaction, and confidence.

- There were no statistical significance differences in the knowledge, satisfaction, and self-confidence between both groups. However, in the study, the SPS group presented higher mean values in knowledge. Because both simulation modalities generate knowledge, satisfaction, and self-confidence, they can be mutually used in palliative care education.

- The findings revealed that the SPS increases the skill level among nursing students of on how to deliver bad news to the patient's family about the progression of the disease. On the other hand, the results of the scenario which included training on palliative care planning for chronic patients, and on continuation of the palliative care planning, showed no significant difference between the mean scores of the skill level of both groups.

- Simulation-based learning experiences provide a chance for students to improve their competencies. Large cohorts of nursing students may not be able to have direct experience in PC due to time restrictions, limited availability of clinical settings in nursing education and few opportunities to develop these skills in the

clinical context, because exposure to patients and families receiving palliative care is generally restricted.

5.5.2. Recommendations

In large sections of Palestine, PC is not yet understood by the healthcare workers, health professions students, patients, and the public. Hence, there is a local and global need for teaching nursing students about PC. PC requires extensive knowledge, heightened mental functioning, and the use of nuanced palliative nursing skills. Patients and families with severe EOL diseases and death are challenged regularly by need of palliative nurses. Registered nurses are the major practitioners in most health care settings, with raised emphasis on nursing education to prepare nurses who are ready to practice in an empowered, safe, and capable way.

Based on the results from this study, the following recommendations are suggested:

- It is recommended that teaching staff consider giving more time in their course to integrate different simulation modalities as an adjunct to teaching methods especially in field of palliative care nursing.

- Integrating different simulation modalities as innovative teaching methods for palliative care nursing curriculums such as scenarios for how to deliver bad news, palliative care planning, palliative care advance planning, to enable nursing students to start gaining knowledge, confidence, and skills at earlier time.

- It is recommended that educators utilize standardized patients especially when teaching communication skills such as scenarios for how to deliver bad news to the patient's family about the progression of the disease.

- The generalizability of the current study might be improved by replicating it with a representative random sample from other Palestinian universities. Moreover, exploring the facilitators and obstacles factors related with various simulation modalities would be aided using mixed-method study approaches.

- This study focused only on the effects of two different simulation modalities in palliative care teaching on nursing students' knowledge, satisfaction, self-confidence, and skills. Therefore, future studies are needed to examine impact of other variables as levels of nursing students, student factors, teacher factors, debriefing techniques, simulation and scenario design characteristics, personal learning style, more scenarios on other learning outcomes such as self-awareness, self-efficacy, critical thinking, clinical judgement, knowledge retention, attitudes towards palliative care.

- Another future study that is suggested is to investigate the durability, sustainability, and reflections of the aforementioned type of simulation and to assess if there a relationship between type of simulation and whether or not the influence translates to actual clinical practice.

- In preclinical palliative care nursing training, simulation-based practice using low fidelity and standardized patient simulations can be recommended.

- As an educational resource, the nursing laboratory must be made available to the student to practice the procedures in a transition between theory and clinical practice. This environment, however, is not restricted to techniques but provides a relationship between teacher and student, generating knowledge and reflection.

- An instructor should accompany the students to guide them through the process and assist them with technical support. The teacher must encourage academics to search for technical and human knowledge, becoming the link between personal relationships and performance to facilitate nursing.

- The simulation labs should be offered before interacting with the first patient. Preexposure to the simulation environment ensures that the students are exposed to a similar situation and have already learned about their shortcomings and worked towards improving them.

- The study confirms the use of simulation in nursing student preparation, nursing students may be trained about PC using simulations to lower the gap between nursing theory and practice regarding PC.

- The study suggests that including various types of simulation into the PC nursing course can reduce the need for clinical settings for clinical practice in the PC nursing course.

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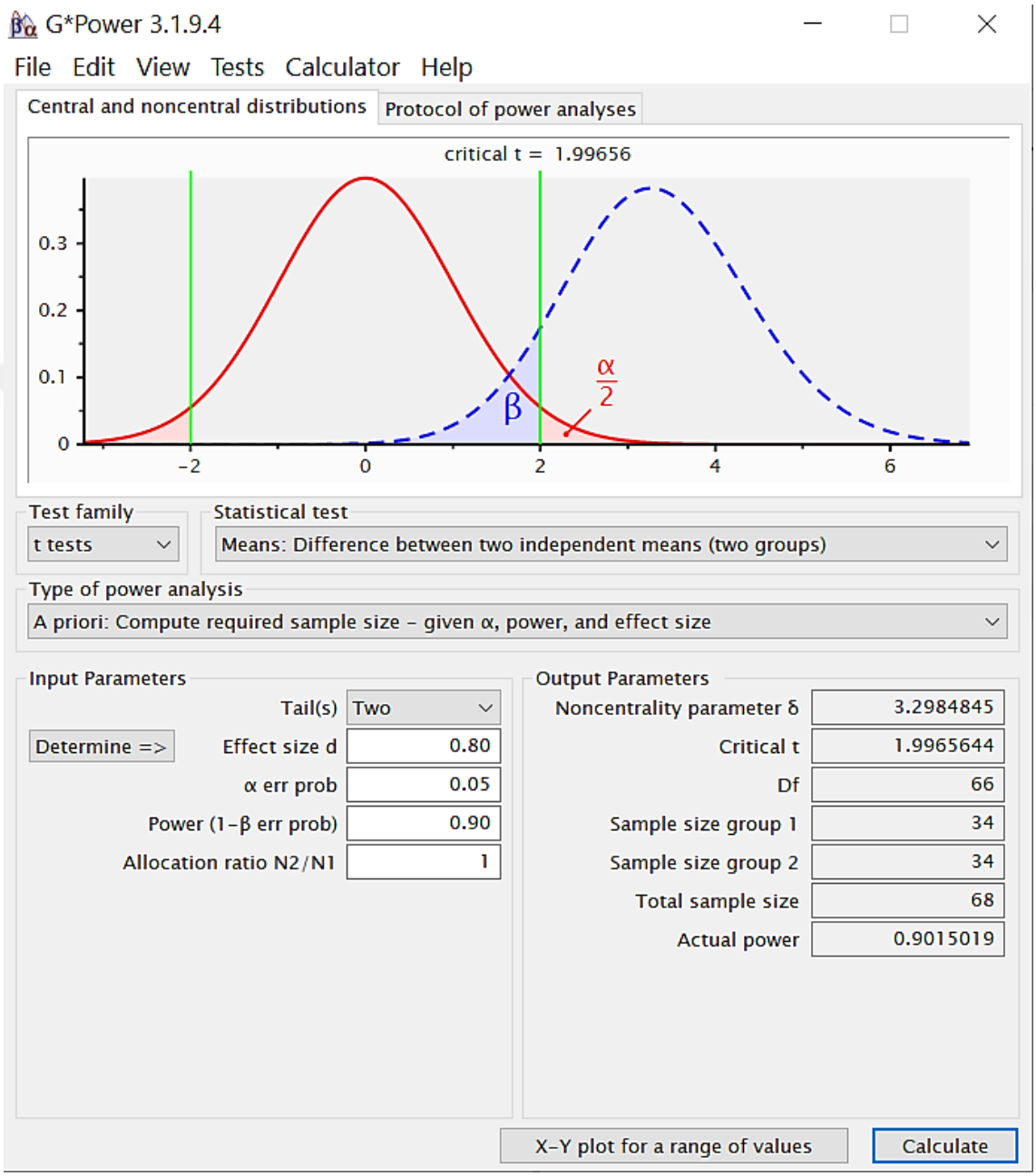
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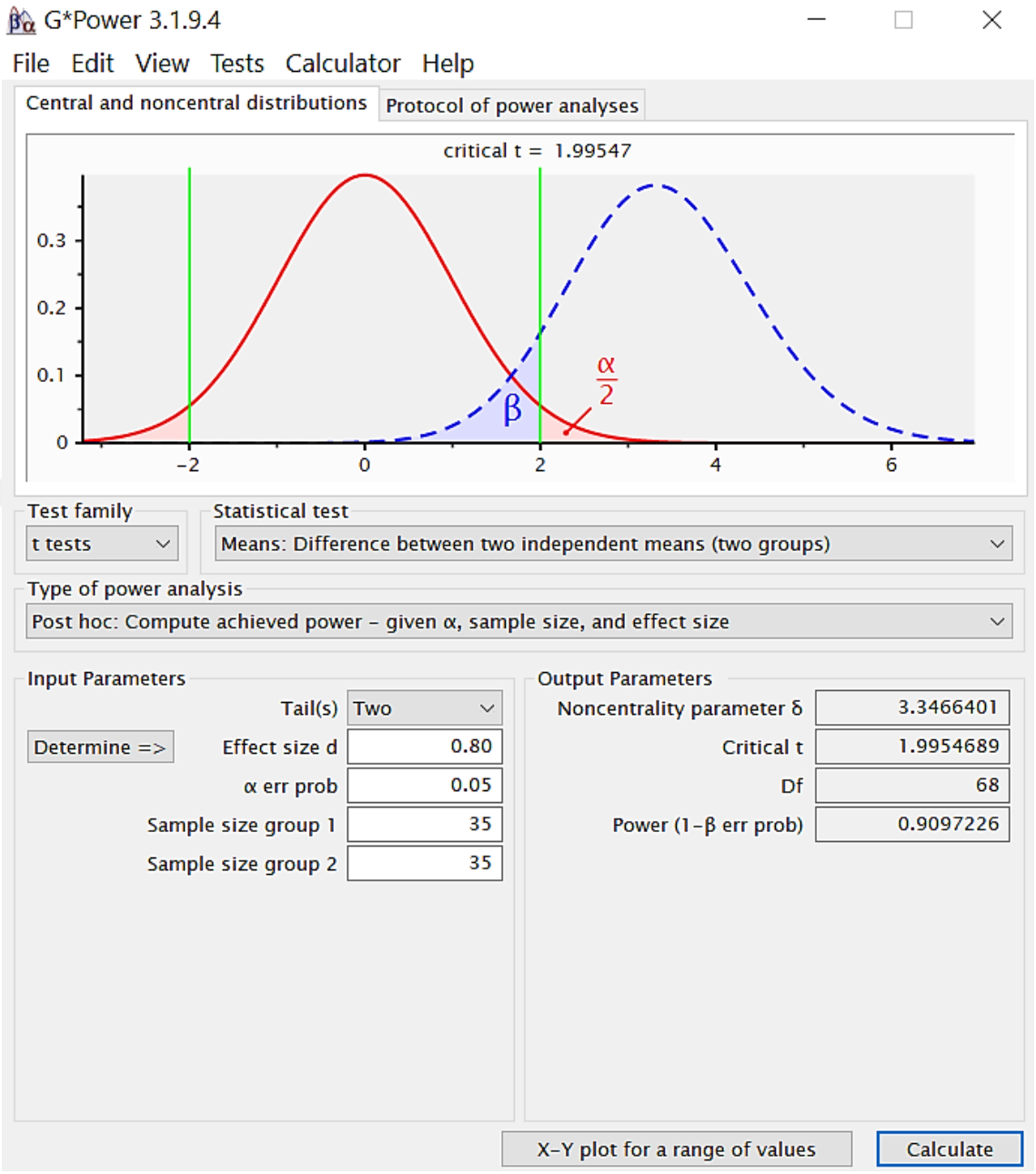
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7. APPENDIX

APPENDIX-1. Power Analysis Result for Sample Size



APPENDIX-2. Posthoc Power Analysis Result



APPENDIX-3. Participant Demographic Data Form

Please complete that following informational items by circling the data that most describes you.

1. Student code …….
2. Age ……
3. Gender

   Male Female
4. Current Grade Point Average (GPA)…….
5. Previous experience in palliative care

   Yes No
6. Have you participated in any practice where simulation method is used? (Previous simulation experience).

   Yes No
7. Do you have any information about simulation?

   Yes No
8. Number of nursing courses you have had in which clinical experiences were included

- One
- Two
- Three
- Four
- More than four

9. Do you have any personal or professional experience with palliative care or hospice?

   Yes No
10. Have you taken or are you taking the palliative care course offered at your university?

    Yes No
11. Do you have experience outside of your nursing courses in direct patient care in palliative care field? (Experience with palliative care.)

    Yes No
12. Experience in end-of-life care

    Yes No

APPENDIX-4. Palliative Care Quiz for Nursing (pretest / post test)

Created by Margaret M. Ross, Beth McDonald, and Joan McGuinness.

Right Answer: √

	Items	True	False	Don't Know
1	Palliative care is appropriate only in situations where there is evidence of adownhill trajectory or deterioration.		√	
2	Morphine is the standard used to compare the analgesic effect of other opioids.	√		
3	The extent of the disease determines the method of pain treatment.		√	
4	Adjuvant therapies are important in managing pain.	√		
5	It is crucial for family members to remain at the bedside until death occurs.		√	
6	During the last days of life, the drowsiness associated with electrolyte imbalancemay decrease the need for sedation.	√		
7	Drug addiction is a major problem when morphine is used on a long-term basisfor the management of pain.		√	
8	Individuals who are taking opioids should also follow a bowel regime (laxative treatment).	√		
9	The provision of palliative care requires emotional detachment.		√	
10	During the terminal stages of an illness, drugs that can cause respiratorydepression are appropriate for the treatment for severe dyspnea.	√		
11	Men generally reconcile their grief more quickly than women.		√	
12	The philosophy of palliative care is compatible with that of aggressive treatment.	√		
13	The use of placebos is appropriate in the treatment of some types of pain.		√	
14	In high doses, codeine causes more nausea and vomiting than morphine.	√		
15	Suffering and physical pain are synonymous.		√	
16	Demerol (Pethidine) is not an effective analgesic in the control of chronic pain.	√		
17	The accumulation of losses renders burnout inevitable for those who seek work inpalliative care.		√	
18	Manifestations of chronic pain are different from those of acute pain.	√		
19	The loss of a distant or contentious relationship is easier to resolve than the loss ofone that is close or intimate.		√	
20	The pain threshold is lowered by anxiety or fatigue.	√		

APPENDIX-5. Student Satisfaction and Self-Confidence in Learning

Instructions: This questionnaire is a series of statements about your personal attitudes about the instruction you receive during your training activity. Each item represents a statement about your attitude toward your satisfaction with learning and self-confidence in obtaining the instruction you need. There is no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the numbers that best describe your attitude or beliefs. Please be truthful and describe your attitude as it really is, not what you would like for it to be. This is anonymous with the results being compiled as a group, not individually.

Mark:

1 = STRONGLY DISAGREE with the statement

2 = DISAGREE with the statement

3 = UNDECIDED - you neither agree or disagree with the statement

4 = AGREE with the statement

5 = STRONGLY AGREE with the statement

APPENDIX-5 (continue). Student Satisfaction and Self-Confidence in Learning

Satisfaction with Current Learning	SD	D	UN	A	SA
1. The teaching methods used in this training were helpful and effective.	1	2	3	4	5
2. The training provided me with a variety of learning materials and activities to promote my learning the palliative care nursing curriculum.	1	2	3	4	5
3. I enjoyed how my instructor taught the training.	1	2	3	4	5
4. The teaching materials used in this training were motivating and helped me to learn.	1	2	3	4	5
5. The way my instructor(s) taught the training was suitable to the way I learn.	1	2	3	4	5
Self-confidence in Learning	**SD**	**D**	**UN**	**A**	**SA**
6. I am confident that I am mastering the content of the training activity that my instructors presented to me.	1	2	3	4	5
7. I am confident that this training covered critical content necessary for the mastery of palliative care nursing curriculum.	1	2	3	4	5
8. I am confident that I am developing the skills and obtaining the required knowledge from this training to perform necessary tasks in a clinical setting	1	2	3	4	5
9. My instructors used helpful resources to teach the training.	1	2	3	4	5
10. It is my responsibility as the student to learn what I need to know from this training activity.	1	2	3	4	5
11. I know how to get help when I do not understand the concepts covered in the training.	1	2	3	4	5
12. I know how to use training activities to learn critical aspects of these skills.	1	2	3	4	5
13. It is the instructor's responsibility to tell me what I need to learn of the training activity content during class time.	1	2	3	4	5

APPENDIX-6. Skill Assessment Form 1

A BREAKING BAD NEWS COMMUNICATION EVALUATION GUIDE

Below is a form to evaluate the skills of a breaking bad news communication. 2 points will be given for full psychomotor behavior and 1 point will be given for under-performed behavior. If the behavior is not observed, the not observed option will be selected 0.

		Observed		**Not observed**
		Complete 2	**In Complete 1**	**0**
1.	Find a private location			
2.	Sit down, remove barriers (telephone….)			
3.	Sitting at the same level as the family with full eye contact			
4.	Introduce yourself... I am a nurse... I care for ...			
5.	Appear calm, attentive, and minimize interruption			
6.	The question about their situation and their conditions in general as an entry point to the conversation			
7.	Was the patient's permission taken to explain his condition and inform his family about his health condition?			
8.	Attention to the use of non-verbal means of communication …-Make connection with the patient – eye contact, appropriate comforting touch.			
9.	Explore what the patient's family already knows			
10.	What did you first think when you noticed your patient			
11.	What do you think is causing the patient's symptoms?			
12.	What do the family like to know about their patient's illness			
13.	Find out how much detail the family and patient prefer			
14.	How much detail would you like to know about the patient's treatment plan?			
15.	Inform them if they would like to know about the prognosis of the disease			
16.	Warn patient's family that bad news is coming.: (I wish I had better news…..)			

APPENDIX-6 (continue). Skill Assessment Form 1

		Observed		Not observed
		Complete 2	In Complete 1	0
17.	Has the family been informed about the disease gradually and smoothly?			
18.	Deliver information in small pieces with non-technical terms and avoid jargon.			
19.	Was a period of complete silence given after notifying the family?			
20.	Not many details were given after the family was informed of the initial bad news			
21.	Was attention paid to the emotional and physical reactions of family members and the patient? (…anger, fear, shock……)			
22.	Did the nurse interact with the patient or his family and their feelings?			
23.	Was the family asked about their thoughts and feelings after reporting the bad news?			
24.	Make sure to ask if the patient's family are ready to discuss the treatment plan			
25.	Was the patient or his family given an opportunity to ask, and their questions answered and confirm understanding?			
26.	Identify resources for support (support groups, etc.…)			
27.	Were realistic hope (symptomatic control, minimizing pain, research….) and encouragement given to the patient and the family?			
28.	Were the most important points that were discussed in the dialogue summarized?			

APPENDIX-7. Skill Assessment Form 2

The palliative care needs of patients with chronic illness.

Below is a form to evaluate the skills of the palliative care needs of patients with chronic illness. 2 points will be given for full psychomotor behavior and 1 point will be given for under-performed behavior. If the behavior is not observed, the not observed option will be selected.

		Observed		**Not observed**
		Complete 2	**In Complete 1**	**0**
1.	Hand washing			
2.	Checked the identity of the patient			
3.	Introduce yourself... I am a nurse... I care for ...			
4.	Reviewing the patient profile			
5.	Assess physical symptoms related to the patient's disease and treatment plan.			
6.	Assess psychological symptoms related to the patient's disease and treatment plan.			
7.	Preform nursing functional health pattern assessment for the patient			
8.	Identify issues of concern			
9.	Identify the problem/intervention sheet based on assessment.			
10.	Anticipate physical needs of the patient.			
11.	plan for physical needs of the patient.			
12.	Anticipate psychological needs of the patient.			
13.	plan for psychological needs of the patient.			
14.	Anticipate social needs of the patient.			
15.	plan for social needs of the patient.			
16.	Anticipate spiritual needs of the patient.			
17.	plan for spiritual needs of the patient.			
18.	Demonstrate sensitivity to personal and cultural influences on the individuals' reactions to the illness experience and end of life.			
19.	Discuss the importance of interdisciplinary teamwork in the care of patients with palliative care needs.			

APPENDIX-7 (continue). Skill Assessment Form 2

		Observed		Not observed
		Complete 2	In Complete 1	0
20.	Describe communication techniques that facilitate discussions regarding palliative care needs.			
21.	Utilizing communication techniques to facilitate discussions regarding palliative care needs.			
22.	Hand washing			
23.	Documentation			

APPENDIX-8. Skill Assessment Form 3

The palliative care needs of patients with chronic illness (follow up-advanced care planning**).**

Below is a form to evaluate the skills of the palliative care needs of patients with chronic illness (follow up). 2 points will be given for full psychomotor behavior and 1 point will be given for under-performed behavior. If the behavior is not observed, the not observed option will be selected.

Mr. Ali has been in the hospital for three days and his condition has improved enough to be discharged to home tomorrow.

		Observed		**Not observed**
		Complete 2	**In Complete 1**	**0**
1.	Hand washing			
2.	Checked the identity of the patient			
3.	Introduce yourself... I am a nurse... I care for ...			
4.	Reviewing the Update patient profile			
5.	Assess current understanding of patient's illness.			
6.	Assess understanding of the discussion at the family meeting.			
7.	Assess understanding of the plans for his discharge			
8.	Assess plans for advanced care planning			
9.	Assess symptoms related to the patient's disease.			
10.	Utilizing communication techniques to facilitate discussions regarding palliative care needs.			
11.	Hand washing			
12.	Documentation			

APPENDIX-9. Palliative Care Quiz for Nursing Permission

APPENDIX-10. Student Satisfaction and Self-Confidence in Learning Permission

APPENDIX-10 (continue). Student Satisfaction and Self-Confidence in Learning Permission

APPENDIX-11. The Palliative Care for Chronically Ill Scenario Permission

Appendix-11 (continue). The Palliative Care for Chronically Ill Scenario Permission

APPENDIX-12. Scenarios about each model of palliative care Permission

APPENDIX-13. Case scenario of a breaking bad news communication

Case Scenario #1

Mr. Ali: Breaking Bad News

You have received a hospice referral for Mr. Ali, age 54, who has Amyotrophic lateral sclerosis. He and his family, who are confused and anxious, listen to you as you describe what they should expect from the hospice experience. The family does not seem to understand why you are discussing end-of-life issues with them. You call Mr. Ali's family physician who tells you that the patient assured him that he talked to his family about his prognosis. You determine that Mr. Ali has, in fact, not told his family. You talk with Mr. Ali who admits that he has told his family he is very stable and expected to have many years of life remaining. He asks you to help him break the reality of his poor prognosis to his family.

By the end of the simulation, the student will:

Understand the physical setting where a discussion of bad news should be conducted.

Demonstrate knowledge of the key steps for delivering bad news.

Recognize essential principles of breaking bad news.

Assessing what the patient' family perceive.

Demonstrate ability to assess patient/family understand and respond to their needs.

Addressing the family's emotions.

Demonstrate ability to respond appropriately to strong patient emotions (sadness, fear, anger, etc.).

Employ therapeutic communication techniques with patient' family

Providing support to the patient

Apply skills of breaking bad news in a simulated situation.

Demonstrate how to open a discussion when bad news will be presented.

Demonstrate the ability to deliver bad news with honesty and compassion.

Demonstrate how to conclude a discussion of bad news.

APPENDIX-14. Case scenario of the palliative care needs of patients with chronic illness

Case Scenario #2

Ali Abdallah is a 65 yr. old, Arabic speaking, Palestinian male admitted yesterday with heart failure. he has a PMH of uncontrolled hypertension (BP 180/110), type 2 diabetes, and heart failure, which were diagnosed when he presented to the emergency department three years ago with progressive weakness, dizziness, shortness of breath and headache. Prior to this he had limited contact with health care providers due to inadequate health insurance. he was started on an ACE inhibitor, beta blocker, diuretic, and a glucose-lowering agent. Despite being more closely managed by her PCP, he has worsening heart failure and has developed pulmonary hypertension and mitral regurgitation. Yesterday, he sought care in the emergency department because of severe shortness of breath and fatigue. he was started on oxygen via nasal cannula, diuresis with IV furosemide and admitted. His admission ECHO shows he has moderate mitral regurgitation with an ejection fraction of 24 %. he is in sinus rhythm at a rate of 62 beats per minute via ECG. Her CXR shows an enlarged right ventricle and bilateral perihilar alveolar edema. He has no known drug or food allergies. He can get out of bed with assistance. Current medications include: Lisinopril 20 mg po QD, Metoprolol Succinate 100 mg po QD, Glyburide 5 mg po BID, Furosemide 20 mg BID.

Mr. Ali's wife of 36 years passed away five years ago. he had worked as a cook for many years. he currently lives alone and has a fixed income. he has two adult children. His son lives in Ramallah with his wife and four children; he works as a manager of a large chain department store. he also has an unmarried daughter in Hebron who is a librarian. Mr. Ali is deeply religious and believes that God has a plan for his. Cardiology and pulmonary consults were obtained to further evaluate her status. Based on the trajectory of her disease to date and his immediate clinical picture, the physicians have determined that he is not a candidate for a heart transplant or ventricular assist device. The focus of her plan of care will be on managing his symptoms and maintaining physical functioning so he can be discharged to home.

APPENDIX-14 (continue). Case scenario of the palliative care needs of patients with chronic illness

By the end of the simulation, the student will:

Assess physical and psychological symptoms related to the patient's disease and treatment plan.

Anticipate and plan for physical, psychological, social, and spiritual needs of the patient.

Demonstrate sensitivity to personal and cultural influences on the individuals' reactions to the illness experience and end of life.

Discuss the importance of interdisciplinary teamwork in the care of patients with palliative care needs.

Describe communication techniques that facilitate discussions regarding palliative care needs.

Improve comfort with utilizing communication techniques to facilitate discussions regarding palliative care needs.

APPENDIX-15. Case scenario of the palliative care needs of patients with chronic illness (follow up)

Case Scenario #3

Mr. Ali has been in the hospital for three days and her condition has improved enough to be discharged to home tomorrow. During this admission, a team meeting (medical, nursing, social services, and chaplaincy staff) was held to discuss Mr. Ali's care. Subsequent to the team meeting, a family meeting that included Mr. Ali, her minister and both her son and daughter via conference call was held. During the family meeting, the clinicians reviewed both the current status of Mr. Ali's symptoms, as well as the expected future progression of her heart failure. The discharge plan with her medication regimen, home care services (VNA, physical therapy, home health aide, Meals on Wheels), and the need to begin advanced care planning was addressed.

During this interaction with Mr. Ali, you must assess his:
Current understanding of her illness.
Understanding of the discussion at the family meeting.
Understanding of the plans for her discharge.
Plans for advanced care planning.

Use any knowledge you have gained from the previous scenario to complete this assessment.
After the debriefing session, participants will be given a handout which provides an update on Mr. Ali and his care as well as directions for their role in the scenario.

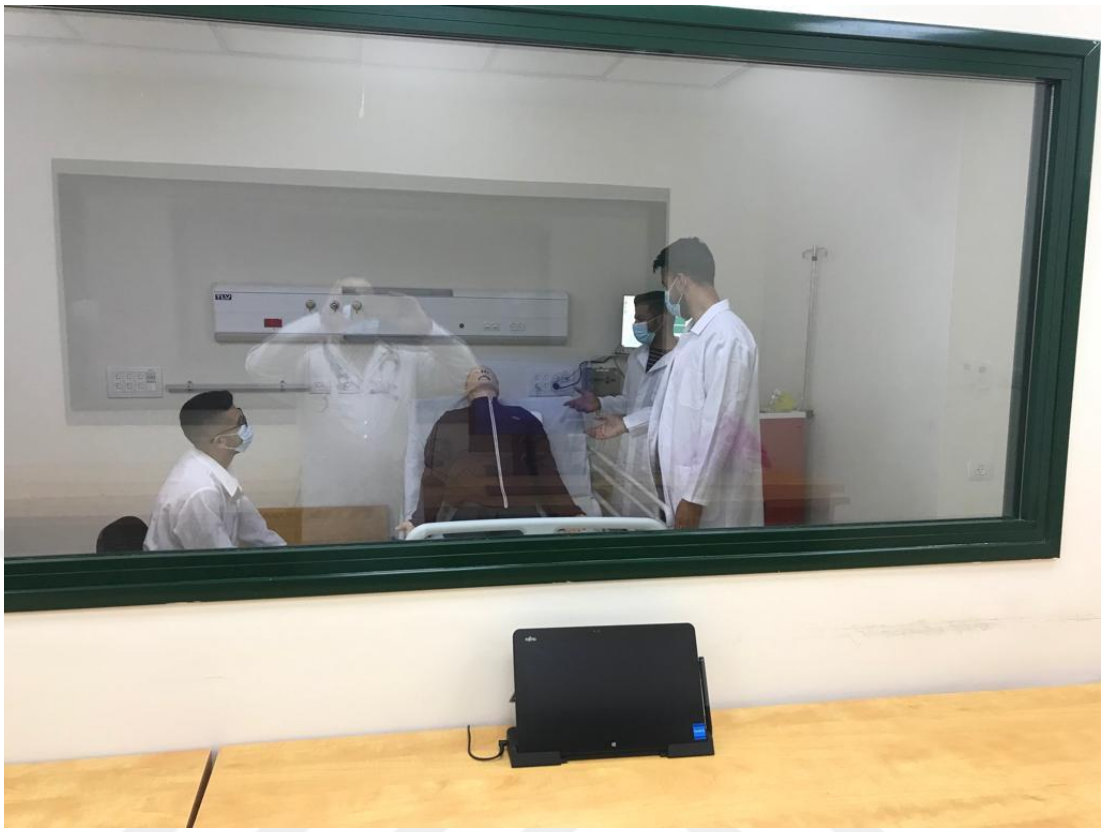
The goal of this scenario is to provide an opportunity for the participant increase their level of comfort interviewing the patient about their understanding of their illness and further identify palliative care needs.

APPENDIX-16. Pictures from the Research Study





APPENDIX-16 (continue). Pictures from the Research Study





APPENDIX-16 (continue). Pictures from the Research Study





APPENDIX-16 (continue). Pictures from the Research Study





APPENDIX-16 (continue). Pictures from the Research Study





APPENDIX-16 (continue). Pictures from the Research Study



APPENDIX-17. Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-17 (continue). Researcher training certificates

APPENDIX-18. Course Outline for the Palliative Nursing Care Course

Module One	Current Situation of Cancer Patients in Palestine
	Quality of Life of Palestinian Cancer Patients
	Gaps In Cancer Care
Module Two	What Is Palliative Care
Module Three	Comprehensive Assessment
Module Four	Communication Issues
	Communicate Effectively
	Sharing bad news
Module Five	Pain
	Pain Assessment
	Pain Management
Module Six	Symptoms Management
	General Introduction
	Nausea and Vomiting
	Anorexia and Cachexia
	Constipation and Diarrhea
	Fatigue
	Bone Marrow Suppression
	Mucositis
	Dyspnea
	Ascites
	Anxiety
	Delirium
	Depression
	Skin Care (malignant wound)
Module Seven	Dying Process
Module Eight	Loss, Grief And Bereavement
Module Nine	Spiritual, Ethical And Cultural Issues
Module Ten	Burn Out

APPENDIX-19. Ethics Committee Approval Form

APPENDIX-20. Informed Consent

Informed Consent

Title of the study: The Effect of Two Different Simulation Modalities in Palliative Care Teaching on Nursing Students' Knowledge, Satisfaction, Self-confidence, and Skills
Principal Investigator: Abdallah Ahmad Alwawi, PhD student, Ankara Yildirim Beyazit University.

Why is this research being done? This research aims to evaluate the effect of two different simulation modalities in palliative care teaching on nursing students' knowledge, satisfaction, self-confidence, and skills. This study will be conducted in partial fulfillment of the requirements for a doctoral degree in nursing.

Who is being asked to take part in this research study? Why am I selected? All students enrolled in the palliative care nursing course at Al-Quds University will represent thesample for this study. I'm selected as a possible participant in this study because I'm currently enrolled in a nursing program at Al-Quds university, Faculty of Nursing.

What procedure will be performed for research purpose? The researcher will assign randomly the students to the intervention groups. Both groups will fill the demographic part and will be evaluated through palliative care simulation scenarios using different scales.

What are the benefits of being in the study? Participation in this study may or may not benefit you personally. You may find it helpful to practice care of patients with palliative care scenarios. Overall, we hope to gain information about palliative care so that nurse educators can better teach students in preparation for their new role as registered nurses. This preparation will possibly benefit all patients through the care provided by nurses.

What are the possible risks, side effects, and discomfort of this research study? There are minimal risks from being in this study. You may become tired or uncomfortable while you answer the survey questions. You may feel stress while you participate in the simulations and when your performance will be evaluated during the simulation activity. Your decision to take part or not to take part will not affect your course grade.

If I agreed to take part in this research study, will I be told of any new risks thatmay be found during the study? If you agreed to take part in this research study, you will be informed of any new risksthat may be found during the study.

Will my insurance provider or I be charged for the cost of any proceduresperformed as part of this research study? You will not be charged for the cost of any procedures performed as part of thisresearch study.

Who will know about my participation in this research study? We will keep your records private to the extent allowed by law. We will use a number code rather than your name on study records. Results will be reported only by code. The code key will be stored separately from the data and destroyed at the same time asthe video recorded data, five years after analysis of the results. Questionnaire data willbe stored on a password- and firewall-protected computer. Questionnaire data will be kept in a locked filing cabinet in the researcher's office. Members of the research teamwill have access to the information you provide.

APPENDIX-20 (continue). Informed Consent

Is my participation in this research study voluntary? Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions on questionnaires or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

How can I access the results of the study? You can access the results of the study from the researcher upon completion of thestudy.

VOLUNTARY CONSENT

All the above has been explained to me and all my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of thisresearch study during this study, and that such future questions will be answered by the researchers listed on the first page of this form. By signing this form, I agree to participate in this research study. A copy of this informed consent form will be given to me.

Note: Coronavirus/COVID-19

I acknowledge the contagious nature of the Coronavirus/COVID-19 and that many public health authorities still recommend practicing social distancing.

I further acknowledge Al-Quds University and the researcher has put in place preventative measures to reduce the spread of the Coronavirus/COVID-19.

I further acknowledge that Al-Quds University and the researcher can not guarantee that I will not become infected with the Coronavirus/Covid-19.

I understand that the risk of becoming exposed to and/or infected by the Coronavirus/COVID-19 may result from the actions, omissions, or negligence of myself and others.

I voluntarily seek training provided by the researcher and acknowledge that I am increasing my risk to exposure to the Coronavirus/COVID-19.

I acknowledge that I must comply with all set procedures to reduce the spread while attending my training appointment.

I attest that:

* I am not experiencing any symptoms of illness such as cough, shortness of breath or difficulty breathing, fever, chills, repeated shaking with chills, muscle pain, headache, sore throat, or new loss of taste or smell.
* I have not traveled internationally within the last 14 days.
* I have not traveled to a highly impacted area in the last 14 days.
* I do not believe I have been exposed to someone with a suspected and/or confirmed case of the Coronavirus/COVID-19.
* I have not been diagnosed with Coronavirus/Covid-19 and not yet cleared as non-contagious by state or local public health authorities.
* I am following all CDC recommended guidelines as much as possible and limiting my exposure to the Coronavirus/COVID-19.

I hereby release and agree to hold the researcher harmless from and waive on behalf of myself, my heirs, and any personal representatives all causes of action, claims, demands, damages, costs, expenses, and compensation for damage or loss to myself and/or property that may be caused by any act.

I understand that this release discharges the researcher from any liability or claim that I, my heirs, or any personal representatives may have against the Al-Quds University and the researcher with respect to any bodily injury, illness, death, medical treatment, or property damage that may arise from, or in connection to, any services received from Al-Quds University and the researcher. This liability waiver and release extends to the Al-Quds University and the researcher together with all owners, partners, and employees.

APPENDIX-20 (continue). Informed Consent

APPENDIX-21. Debriefing Form

DEBRIEFING FORM
1. How did you feel during the previous simulation scenario?
2. What was done well? What was easy for you?
3. What was difficult for you? How did you deal with these difficulties?
4. If you were allowed to repeat this training, what would you like to do differently? What could be improved?
5. What have you learned from this simulation scenario? Can you describe it?
6. Do you have the knowledge and skills to do the application yourself? And what exactly do you need if you do not have the necessary knowledge and skill?
7. Do you believe you can apply this skill in the clinic? What do you need if you can't?
8. Would you like to ask about any part of the knowledge and skills related to the previous scenario?