



Simulated Learning Experience (SLEs) in Nursing Education

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<p>Abstract:</p> <p>Simulation in health education has been shown to increase confidence, psychomotor and professional skills, and thus positively impact on student preparedness for clinical placement. Simulation teaching combined with other teaching methods have been used to ensure that nursing students are able to receive the greatest educational benefits. This study therefore focused on the benefits of having simulation learning experiences before going out for practical training and competencies gained through simulation. The study was conducted as a literature review to investigate the research questions set by the authors. The two research questions concentrated on the importance of simulation and the competencies gained as a result of simulation experience. The study selection included inclusion and exclusion criteria. 21 topic-relevant articles were selected using different academic search databases. The articles were carefully chosen from various sources which included; Science Direct, SAGE, EBSCO and PubMed. The thesis also utilized qualitative content analysis where the outcomes were reported by means of inductive content analysis as a data analysis method (Graneheim and Lundman, 2004). The findings in this study showed that simulation was useful in creating a learning environment which contributed to knowledge, skills, safety, and confidence. It also showed that simulation can be a viable option in preparing nursing students for clinical practice. The study revealed a gap in the literature pertaining to the transfer of outcomes to the clinical setting, laying a foundation for further research that would measure the impact of simulation on patient outcomes. The results of this study suggested that simulation-based nursing aimed at promoting clinical competency and reflective thinking skills. It also showed that simulation-based involvements have a powerful influence on educational effects, the substantial change occur in the psychomotor domain. When conducted well, simulations can lead to increased student satisfaction and self-confidence.</p>	
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FOREWORD

We would like to take this opportunity to thank Almighty God for being with us and for guiding us throughout this process. Special gratitude goes to our supervisor Denise Vilkka. Your hard work and dedication has been an inspiration to us. Thank you so much for caring and for loving us students the way you do. This course would not have been possible without the backing of our families and friends and for that we remain grateful. Thank you, Arcada University of Applied Sciences, for providing conducive environment that made education in the premises attainable.

1 INTRODUCTION

Rapid changes are occurring in health care and in clinical nursing education making it necessary to use innovative methods to prepare nurses for practice. One approach to address this growing health care need is to educate nurses to meet and maintain competencies in increasingly complex situations. Simulation started as a novel supplement to traditional clinical experiences integrated into curricula in the 1960s (Cohen & Boni, 2016). Simulation has therefore been suggested as an alternative to face-to-face clinical experiences since care is becoming more complex and clinical placements are becoming hard to find (Junghee et al, 2016). In order to aid students in fostering their problem-solving skills, nursing education aspires to assimilate theory with practical know-how as met in everyday life. (Junghee et al, 2016). Simulation as a medical education tool is convenient for nursing students as it offers them the chance to exercise their skills in decision-making and medical care by means of actual medical situations while ensuring patient's welfare is not affected. (Junghee et al, 2016). Though simulation is useful as a technology, the nursing profession places importance on patient care, drawing on knowledge, theories, and expertise to administer patient care (Cohen & Boni, 2016).

Simulation is designed to resemble reality and involves replication of specific aspects of a clinical situation. The purpose of integrating simulation into nursing curricula is to increase the level of understanding and ability to manage a simulated situation when it actually occurs in the clinical setting (Broussard, 2009). Simulation-based education has a few benefits comprising flexibility to encompass different learning styles, instantaneous feedback, syllabus assimilation, customization ability and rehearsal. Simulation provides opportunities to apply knowledge and skill through the use of simulators, standardized patients, and virtual settings (Cohen & Boni, 2016). The authors of this thesis decided to choose this topic about the importance of simulation because they wanted to expound more on the benefits that simulation have prior to going out on practical trainings. Being both foreign nursing students in a foreign country, they knew the difficulties of getting practical training places in finish language. So, the competencies they got through simulation experiences made them skilled and comfortable to compete in the same way as any

other native student. This thesis builds on the knowledge that simulation is an integral part of competency development during training. It focuses on the benefits of having Simulated Learning Experiences throughout the entire four years of nursing study.

The first chapter of this study is the introduction part which explains the aim of the study. The second chapter is the background. This outlines nursing education in general and also in Arcada University of applied sciences. It is also in this section where simulated nursing experience is defined and also different simulation classifications are described. Chapter three discusses the theoretical framework that has formed the basis of this study. It is in this section that the authors explained the theory that they chose for this thesis and why. The authors explain the theory of Laws of Learning by Edward Thorndike. The aim and specific objectives of this investigation have been presented in chapter four. The fifth chapter is the methodology chapter and it discusses the research methods applied by the authors. Chapter six contains the results and the outcomes of the study. The seventh section is the discussion of the findings and it assesses whether the objectives of the study were attained by the investigation. The final section is the conclusion followed by strengths, limitations and recommendations.

2 BACKGROUND

Ensuring future nurses' responsiveness to current and anticipated needs of health care environments, keeping abreast of emerging health needs and research, can be challenging for nursing educators teaching in universities. Maintaining contemporary discipline knowledge, combined with remaining clinically active and trying to meet teaching and research standards, requires a set of complex skills. Tailoring learning experiences for undergraduate nurses is operationalized within cognitive, affective and psychomotor knowledge domains. A multitude of approaches is needed to enhance the development of knowledge, attitudes and skills that are required for students to become safe and competent practitioners as well as critical thinkers who are reflective, socially aware and responsive (Beccaria et al, 2018).

Nursing education goes back to its history and root by doctor of philosophy Mildred Montag who was renowned for her influence in nursing education (Harker, 2017). Mildred's evolutionary steps to address a nursing shortage moved nursing students into a decisive curriculum model and out of hospital-based programs. Her goal was to provide a workforce to assist the professional nurse who she envisioned having a baccalaureate degree. This called for radical transformation in how nurses are educated and prepared for clinical nursing practice. They are fully expected to learn and grow in a profession that they believe they will love for many years. Their transition into real practice is anything but ideal. The primary goal of educators needs to focus on closing the practice–education gap. Dr. Montag's model was based on creating technical nurses who were proficient at delivering care. Educators therefore, need to follow Dr. Montag's lead and shift their classrooms away from abstract theory and create learning environments that integrate knowledge into an actual practice context. Time spent helping the student learn about what is important and unimportant about a clinical situation would improve their holistic approach and support their ability to integrate practical reasoning into their care decisions. Creating a learning environment that integrates both clinical and classroom would support a multifaceted, assimilated use of knowledge and skills that nursing practice demands (Harker, 2017).



These demands needed to also be based on professional values. A research was done on professional values in nursing education. The study describes seven fundamental values of nursing as aesthetics, sacrifice, equality, freedom, dignity, justice and truth. Aesthetics in this case signifies care, affection, and self-discipline. She states that individuals who value aesthetics most prioritize a comfortable work environment and a positive image for them and others. Sacrifice basically refers to being considerate about other people's well-being. Equality can be defined as recognition of equal rights and privileges for everyone. Freedom is about self-discipline, independence and choices, particularly the capacity of making choices. Dignity means respecting people and groups and appreciating their unique characteristics. Justice is defined as courage, honesty, morality and an incentive to protect moral values and justice. These values are accepted as the ethical codes and adopted as common practice standards (Kantek, 2017).

This evolutionary step in nursing education moved nursing students into a decisive curriculum model designed to help them meet professional learning objectives and the same revolutionary model of change in nursing education can serve as a model for future change as we face complex, ever changing and multifaceted health care systems (Harker, 2017). Just as it is important for nurses to utilize evidence-based practices to improve patient outcomes, so too should nursing educators use evidence-based teaching approaches to improve student learning outcomes.

Nursing education at arcada is full-time degree program taught in English and the course takes 3.5 years to accomplish. The nursing degree focuses on an independent and responsible mode of operation anchored in the caring sciences field of knowledge. Students are able to care for the sick and suffering, and also employ health promotion on an individual, group and societal level, but the patient or client is in focus the whole time (Arcada 2018,-a). Upon completion of nursing studies at arcada, students have the ability to develop methods for evidence-based care procedures and contribute to the development of the health and medical care in Finland and globally. Students are able to participate in multi-professional teams as experts, can

function as representatives for the care process from a broader perspective, as experts within the areas of health promotion and disease prevention and have the competencies required to further educate themselves to teachers, managers and researchers (Arcada 2018,-a)

Arcada welcomes students from around the world and as such has developed a skill based syllabus in accordance with the national as well EU directives that combine different learning methodologies that incorporate lectures, workshops, case studies, simulations and web-based courses. Additionally, to align the students with the professional life, they are offered projects and practical training. Different speakers are also brought in occasionally to talk to students on topical issues related to the profession. Students also have the option of going abroad for exchange studies usually at the final year of their studies with Arcada partner institutions.

The Arcada patient Security and Learning Centre (APSLC) in the fourth floor offers an active simulation environment that connects theory and practice. Through simulations students learn to handle risk-filled situations and specialized equipment as well as gain practice in leadership and teamwork. A wide spectrum of difficult crisis and accident scenarios can today be recreated through the patient simulator, which in an authentic manner reflects reality. The simulation environment is safe and secure, easily adjustable and realistic. In comparison to more conventional teaching methods, for example, lectures, simulations have a developing and innovative approach with a great degree of knowledge processing, personal creativity and reflection (Arcada 2018,-a).

Arcada also works in collaboration with other institutions which have close contacts to the working life. Both representatives for working life and alumni participate in the development of the educational programs of the institution. This is to help students meet the demands of the future labor market. Through these networks with institutions of higher education and working life the students at Arcada profit from the latest expertise and valuable work experience already during their studies (Arcada 2018,-a).

2.1 An overview of simulated learning experience

The basis of this study is the concept and phenomenon of simulation in nursing institutions. Simulation is defined as a dynamic process involving the creation of a hypothetical opportunity that incorporates an authentic representation of reality, facilitates active student engagement and integrates the complexities of practical and theoretical learning with an opportunity for repetition, feedback, evaluation and reflection (Solveig & Ragna, 2016). Simulations are also described as constructed experiences that mimic processes or conditions that can or should not be experienced for the first time by a student because of student inexperience and risk to the patient. In health education, simulation is often described as a phenomenon or activity that mimics a clinical setting, in which one can practice procedures, decision making and critical thinking by using role play, video or simulators. Simulation within health care can consequently be anything from using high fidelity patient simulators, partial task trainers, and role play or to solving a case (Solveig & Ragna, 2016).

Fidelity in this context refers to the way the simulator and simulation experience represents the real context (Baptista et al, 2016). Fidelity of a simulated practice is based on three dimensions: (1) the patient dimension, which encompasses all the interactions the student performs with the simulator, such as communication or procedures where the anatomical and physiological realism is important. (2) The clinical setting dimension, which is related to the entire progression of the scenario and its complexity. (3) The health facilities dimension, which is related to all the material, equipment and realistic environment used for the simulation (Fritz et al, 2007). It has been proven in several research studies the advantages of simulation in getting knowledge and skills. Simulation gives students a way to promote cognitive and intellectual methods essential to advance clinical reasoning skills and communications that hand over to standard patient care (Parker et al, 2015). Simulation is accepted as being a vital learning method, which is learner centered, where the educator acts as a facilitator of learning (Jefferies, 2005).

Simulation is able to support the nursing student to use theoretical ideas to clinical application and settings, it helps to make smaller the integration gap. Due to increasing patient

acuity in inpatient settings, the students should come to the clinical place a higher standard able to manage with quickly changing situations and greater technological interventions. Patient safety can be enhanced as well as the decision-making ability. Awareness can also be improved by using simulation and quality debriefing (Wolfgram, 2012). Nehring et.al, 2001 describes simulators as ways that assist students to progress in their level of confidence, decision-making skills, and capability to think critically. This kind of learning also helps students to make mistakes in a protected, safe situation (Wolfgram, 2012). However, these simulators and realistic simulation environments are expensive, they demand a lot of practice and training for teachers, and they also require specialized maintenance and consume much advance preparation time for each scenario (Babtista et al, 2016).

Overall positive learner satisfaction has been noted in several studies using simulation (Parker et al, 2015). They also identify that although many studies have addressed self-efficacy, often referred to as self-confidence, most measurement of self-efficacy has not been linked to knowledge or skill attainment but rather rely on perceived self-efficacy. Many of these studies have used a comparative design, but the comparison is between lecture or case study or some didactic approach and simulation.

Table 1 Simulation definitions

Term	Description
Clinical Scenario	This means an arrangement of a probable and possible clinical practices that happen for a simulated clinical experience.
Debriefing	It is a practice directed by facilitator following simulation activity.
Facilitator	A teacher or person helps and supports students to reach a desired level and skills.
Fidelity	This describes the degree to which a simulated teaching come nearer to reality. When the level of fidelity increases, it resembles more to reality.
High-Fidelity Simulations	It uses a computerized manikins and digital systems for simulation experience.
Mid-Fidelity Simulations	This method applies standardized patients, computer programs or video games for simulation learning.
Low-Fidelity Simulations	It only uses role play and there are no computerized or digital systems on this simulation.
Task-Trainers	It helps to practice a skill for instance an IV arm, this can be used to practice IV insertions skills.
In-situ simulation	It refers to taking place the simulation to the place where the student is practicing. The procedure may happen in an ER trauma bay or surgical suite.

INACSL Standards of Best Practice (Aebersold & Tschannen, 2013)

2.2 Classification of simulated learning experiences (SLEs)

Simulations can be divided into a computer-based, human-based, experiential learning and vicarious learning experience (Poikela et al, 2015; Roberts & Greene, 2011). With the computer-based simulations, the whole learning technique can take place on your own or online with other students. A computer controls or runs screen-based simulation, the simulation learning method can be seen onto a large screen. Human-based simulation contains the use of a dummy simulator that is controlled by a computer (Poikela et al, 2015). Experiential learning is a way of learning based on knowledge that is created through experience. Vicarious learning is categorized by active listening and reflective thinking (Roberts & Greene, 2011).

2.2.1 Computerized based simulation learning method

Computer based simulation learning method includes goal-based digital simulations that take place through a computer screen. This learning method based on computer that gives an opportunity for students in realistic situations, depend upon software programs that are accessed directly from the Internet, or by using an application, or watched on a DVD. Such learning techniques help in the transfer of knowledge and improve learning outcomes (Cant, & Cooper, 2014; Poikela et al, 2015). Computerized based simulations surpass other forms of simulations as they are considered 'interactive, reproducible as well as reliable' (Seropian, 2003). This form of learning fulfils certain criteria that enable students to work in safe environments, learn from own mistakes as well as those of others (Rauen, 2001, Jefferies et al, 2005). They can be used repetitively to increase confidence and eventually increase recall. Increased confidence decreases anxiety while reducing the problems of variability students may face while doing their clinical practice (Jamieson et al, 2006). In addition to the aforementioned, computerized based simulations give students a chance to experience situations that they may not encounter in real-life clinical settings (Walsh, 2010).

2.2.2 Human based simulation learning method

Human based simulation learning method is a computer-driven dummies, run by sophisticated physiological and pharmacological models. It outlines their attributes and characteristics. This method functions using pre-programmed system with a variety of simulated clinical experiences or cases, which can be compared to a play or script and replicate realistic patient encounters (Roberts & Greene, 2011; Poikela et al, 2015). Human based simulation clinical experiences boost students to be more active and involved in their learning. It also improves their clinical skills, communication, clinical decision-making, critical thinking and fosters self-confidence and teamwork. These experiences are largely exempt from risk, and by representing the reality of clinical settings, they enable students to build knowledge, develop their assessment, explore different interventional hypotheses and develop psychomotor skills in a secure environment (Baptista et al, 2016).

2.2.3 Experiential learning method

The process of experiential learning method consists of the real experience, a period of reflection for learning to take place. Students carry on the role of nurse and act out the scene in front of an audience generally made up of their peers or students. This procedure is like that of problem-based learning, by which the student adopts the role of the qualified nurse while investigating the problem or issue at hand (Roberts & Greene, 2011).

The participation on acting in the simulated experience, students can enter a process of realization, whereby they will attempt to become the professional nurses that they are acting as. Students learn and value peers within both classroom and the clinical situation, it helps them in using each other to learn the subtle, unwritten rules and survive the world of clinical practice (Roberts & Greene, 2011; De Oliveira et al, 2015).

The experiential learning cycle in figure 2-1 contains four phases: Concrete experience, reflective observation, abstract conceptualization and active experimentation (De Oliveira et al, 2015). The first is a means of approach to theoretical content, and diverse teaching approaches that may be applied during this phase. The second stage is briefing,

this can be done just before the simulated time. In briefing students obtain detail information on the available materials and the simulation process. The simulated time is the interval during which the student delivers care by actively taking part an intense theoretical and practical exercise. Debriefing states the discussion interval after the simulated time, where students are advised to watch and reflect on their practice and their feelings in action; such reflection improves their knowledge and helps for additional effective actions (De Oliveira et al, 2015).

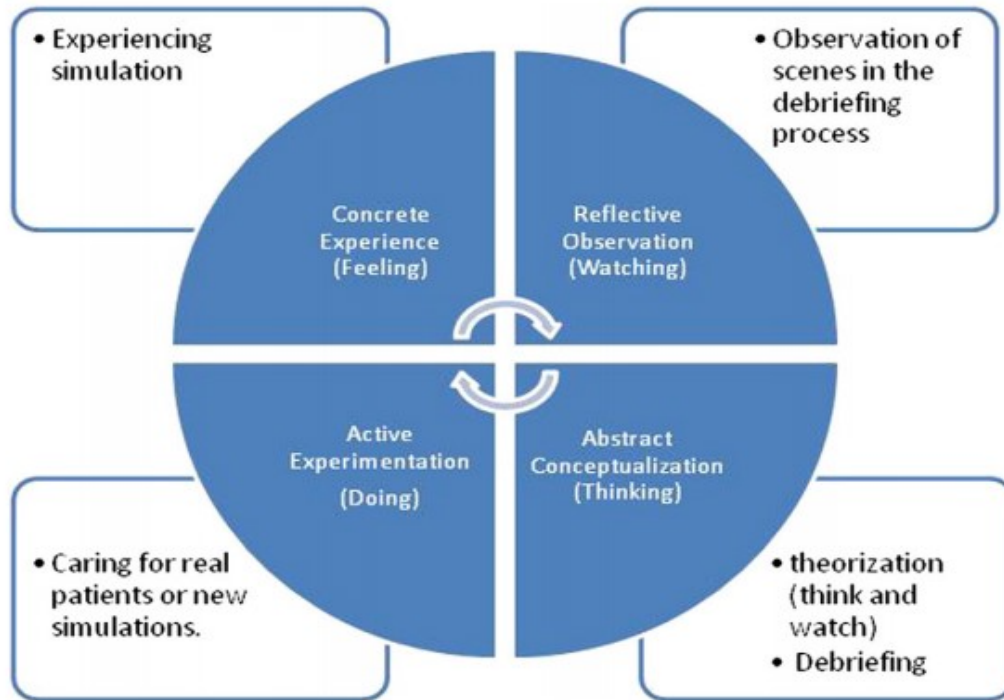


Figure 2-1 the experiential learning cycle (source: De Oliveira et al, 2015)

2.2.4 Vicarious learning experience

Vicarious learning experience is distinguished by listening to the teaching session and reflective thinking. This requires understanding and participating in the situation; the participants or students are learning and thinking at the same time as a group. The students evaluate their own experience as well as that of their peers. This learning technique allows that the students start to realize where they need to emphasis their attention. Everyone

will take up the character of actor and audience on a rotational basis, so that students are allowed to take part at various different levels (Roberts & Greene, 2011).

The digital system installation of a secure server and networked video cameras in the simulation room also gives the viewers an opportunity to watch the play from afar, which creates a life-like clinical experience as only the actors are present on set (Roberts & Greene, 2011).

2.3 Process of simulation-based learning

Simulation-based learning model of facilitating, training, and learning (the FTL model, in Figure. 2.2 below) was created based on the process of teaching, studying, and learning (TSL). In the model, diverse features are elucidated among them are: active, reflective, emotional, experiential, experimental, collaborative, goal-oriented, socio-constructive, competence-based, critical, individual and self-directive (Poikela et al, 2015).

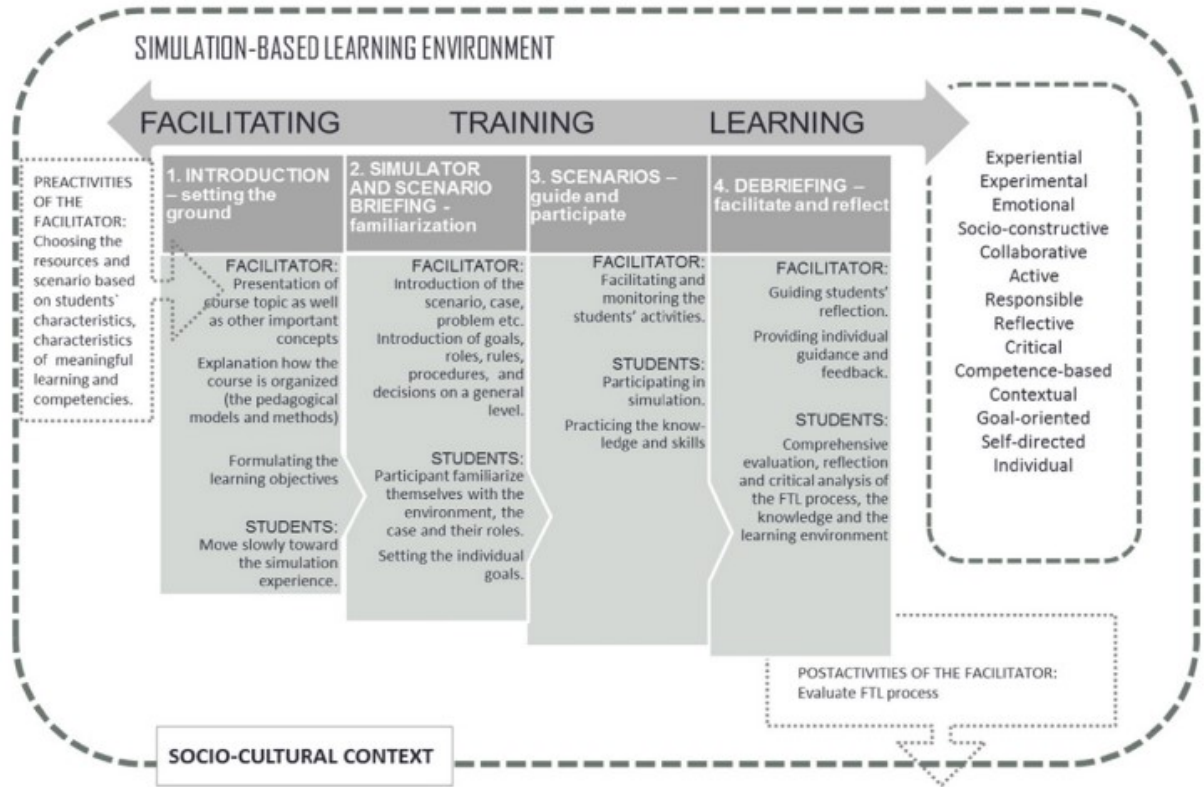


Figure 2-2 simulation-based learning environment model (source: Poikela et al, 2015)

3. THEORETICAL FRAMEWORK

This section gives a summary of the existing knowledge and best practices regarding the laws of learning based on Thorndike's research which will form the conceptual framework for this study.

For this research, the authors chose Laws of Learning by Edward L Thorndike because they relate closely to what nursing students learn in simulation labs. Thorndike was a behaviorist, and according to them thinking and feeling have little to do with learning because each cannot be measured. Advocates of this paradigm have three common points of agreement. First, behaviorists study current behavior and are not concerned with the past. Second, proponents suggest that only that what which can be measured and observed is important. Finally, behaviorists believe in specifying the desired results of instruction in measurable terms before it takes place. As a result, behaviorism is frequently used in skills and job training (Allen, 2007).

Thorndike proposed that most important type of learning contains the making of relations or connections between sensory experiences or actions or perceptions of stimuli and neural responses that distinguish themselves behaviorally. He suggested that learning occurs by trial and error, by means of selecting and connecting (Schunk, 2012). He began researching how animals learn in 1898. He suggested that new learners were like blank slates responding to stimuli in a haphazard way. Edward Thorndike and others published the first research on the topic of adult learning in 1928. In his research, people were tested under timed conditions on various learning and memory tasks (Allen, 2007). He started looking and closely examining with a series of experiments on animals. Animals in a matter regarded as unwelcome situations try to reach a goal such as finding food or reach a destination. The point at which the various responses the animals can accomplish, they choose one action and make it, and experience the consequences. If the animals make response to a great extent to a stimulus, the more determined that response begins to be connected to that stimulus. For instance, an experiment was done with a cat enclosed in a hatch. The cat was able to open and run away from the hatch by moving forward a stick or pulling a chain. During the period of a series of arbitrary responses, the cat in the end

moved away by making a response that opened the hatch. After the cat opened the hatch, it was taken back to the place where it was normally kept. By doing the trials, the cat reaches the desired result faster and makes fewer errors prior to responding correctly. (Schunk, 2012).

The process of experimenting with trial and error learning takes place little by little as successful responses are achieved. During the trial, unsuccessful ones are rejected. The relation or connections are brought together mechanically through the action of repeating. It doesn't require conscious awareness. As compared to animals, human learning is quite complex. The reason is that human activities involve different or distinct kinds of learning relating to linking ideas, analyzing and reasoning. In spite of that, the similarity in research findings from animal and human studies directed Thorndike to clarify complex learning with simple learning principles. It is believed that an educated adult holds lots of stimulus–response connections (Thorndike, 1913b; Schunk, 2012).

Thorndike developed a number of laws surrounding learning of animals and humans (laws of exercise, laws of effect, laws of readiness, laws of primacy, laws of intensity, laws of recency and laws of freedom) but, according to Allen, 2007, three that stand out were the law of readiness, the law of exercise, and the law of effect. The law of readiness focuses on the physical conditions surrounding the learning experience and how these affect learning. The Law of exercise states that as a muscle grows strong by use, so any faculty of the mind is developed by its use and exercise (Null, 2009). The law of exercise also encourages extensive repetition of experiential activities to master skills or techniques. In this work the authors focused more on the three primary laws of learning; laws of exercise, laws of effect and laws of readiness. This focus was chosen because simulation as a learning tool for student nurses relate closely to these laws. In the next section, the three laws will be defined.

3.1 Law of Exercise

The laws of learning theory form an essential foundation about learning and are given a tangible or visible form in the Laws of exercise. The Law of Exercise is divided into two parts: The Law of use is as a result of stimulus becoming stronger to their connection; the Law of disuse is a response not formed in a particular stimulus, the connection's extent of magnitude becomes weaker. With the law of exercise, Thorndike does not argue that a student's mind will become stronger in general with practice at a particular skill, but that the student will become more efficient in completing the skill being rehearsed. He argues that practice at one skill will not transfer to improved proficiency at another skill, which was the foundation of faculty psychology (Null, 2009; Schunk, 2012).

3.2 Law of Effect

The Law of Effect is the most fundamental in laws of learning theory. During this time a changeable connection between a set of circumstances and a response is formed by a particular process. This occurs together with or comes after a satisfying state of affairs. That connection's state of being strong is made bigger. But the opposite can happen when it is accompanied or followed by an irritating condition. Its strength is declined (Schunk, 2012). The Law of Effect focuses attention on the consequences of behavior. The responses evolve from satisfying or gratifying consequences and are learned but the responses creating irritating or punishing consequences are not familiarized oneself in the situation. This is a useful statement of learning for the reason that satisfying responses that create advantageous results allow individuals to be familiar to their environments. (Thorndike, 1913b; Schunk, 2012). The law of effect has to do with the consequences of the newly learned information. In direct line with the Law of Effect, Thorndike stated that education should make human beings wish each other well, should increase the sum of human energy and happiness and decrease the sum of discomfort of the human being. His work seemed to indicate that part of this discomfort that he mentioned would come from students being required to complete tasks that were not immediately and obviously applicable in their immediate world. Thorndike felt that one's ability to think about a task

could only be developed through working on the specific task. Thorndike only wanted teachers to teach those lessons that could be remembered and that would be used in adult life. Problems used in class must therefore have an immediate application to real world. They had to be the kinds of problems that an adult would solve during the course of an average day (Null, 2009).

3.3 Law of Readiness

A law of readiness theory is one of the key principles in the laws of education. It describes that when one is prepared or ready to take actions, the actions should be satisfying or rewarding and not punishing. The condition that one is hungry, responses that causes the food to be in a state of readiness. In contrast other responses not leading to food are not in a state of readiness (Thorndike, 1913b; Schunk, 2012). The idea of law of readiness helps students to learn. It is possible to say that when students are ready to learn a specific task in terms of developmental level or previous skill acquisition, the behaviors that will promote this learning will be satisfying and rewarding. When students are not ready to learn or do not have prerequisite skills, at that time trying to learn is punishing and a waste of time (Schunk, 2012).

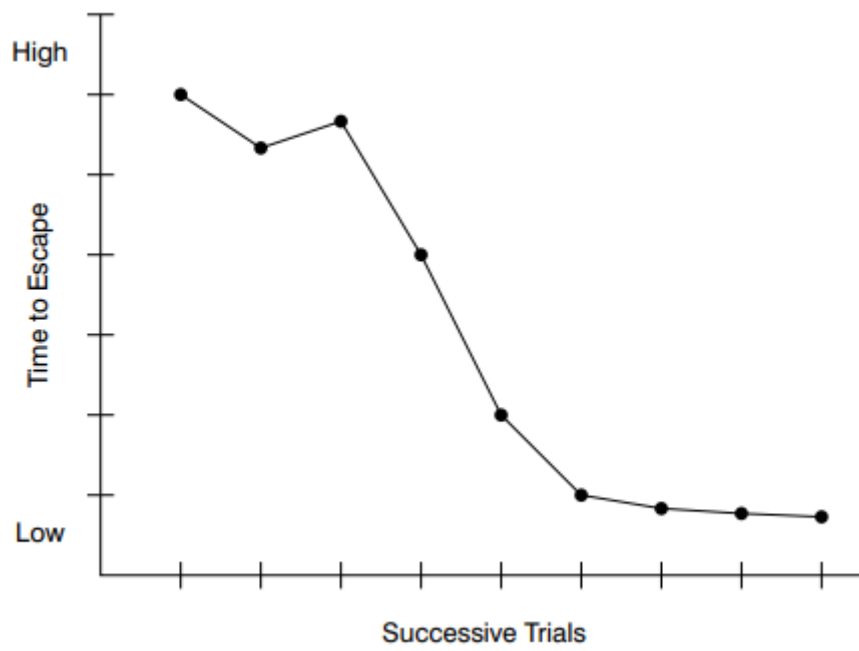


Figure 3-1 Thorndike's trial-and error learning source (Schunk, 2012).

4. AIM AND RESEARCH QUESTIONS

This chapter discusses the objectives and the research questions as relates to the use of simulation in nursing.

Clinical simulation in nursing degree programs is nowadays prevalent. Simulation teaching combined with other teaching methods have been used to ensure that nursing students are able to receive the greatest educational benefits. This thesis builds on the knowledge that simulation is an integral part of competence development during training. However, not all students have the opportunity to participate in simulation exercises in conjunction with practical internships. Therefore, this study focuses on the benefits of having SLEs throughout the entire four years of nursing study.

In order to reach the aims of the study the authors posed the following questions:

Research questions

1. What is the significance of having simulation experience before going out for clinical placements?
2. What kind of competencies do student nurses gain through simulation experience?

5. METHODOLOGY

In this chapter, the authors bring forward components pertaining to the methodology. Firstly, the data collection is delineated where the steps taken during the search for literature can be traced followed by a list of the articles chosen for the study. Next, the data analysis is brought forward. In the final section of this chapter, the method analysis is broken down and explained. The final section is ethical conduct where the authors outline the concrete steps taken to ensure the integrity of their investigation.

5.1 Data collection

A qualitative methodology using literature review was used in this study to examine the importance of simulated learning experience in nursing education. Two research questions were therefore used. Data was collected using scientific sources and systematic review. A systematic review has a stronger focus on research papers, which have been selected according to specific criteria, and has a narrower focus on one aspect of a general issue (Flick, 2011). The articles were chosen using inclusion and exclusion criteria. They were then analyzed using inductive method. Reviews of the following electronic databases were undertaken: EBSCO, PubMed, SAGE, and Science Direct. The search was based on an analysis of possible key text words used to describe simulation in the context of health professionals. Keyword combinations included: Simulation learning experience, Nursing education.

5.1.1 Inclusion and Exclusion Criteria

The study was performed by reviewing previous scientific articles that highlighted simulation and importance of simulation in health care. The articles were included if they focused in simulation in health care, full text articles, scientific articles, had free access and

if they were written in English language. Articles were excluded if they focused in simulation in other fields of study, if they were abstracts, if they were not scientific articles, if they needed to be paid for and if they were not written in English.

Table 2 below summarizes the inclusion and exclusion criteria used.

Inclusion Criteria	Exclusion Criteria
Full text articles	Abstracts
Scientific articles	Articles that were not scientifically written
Articles in English language	Articles not in English language
Articles not older than 2009	Articles older than 2009
Articles that had free access	Articles that needed to be paid for

5.1.2 Data collections and retrieval process

The first search was done in “Science Direct” using the search phrase “The importance of Simulation AND Nursing education”, the search resulted in 24 hits. The search period was with the range 10 years between 2007-2017, “open access articles”, full text and peer-reviewed articles for further to filter the relevant articles. According to the importance for this research, 11 articles were chosen. On the last selection process, the authors selected 6 articles related with this thesis topic. The second search database was carried out in “SAGE” by applying the search key words “Simulation AND Nursing education”, the search brought about 214 hits. The articles were to be published within the range 10 years between 2007-2017. The search parameter was based on availability of full text and peer-reviewed articles. On the basis of relevancy, 12 journals were selected. The authors picked out 4 articles similar with the topic of this thesis. The third search database was

carried out in “PubMed” by using the search phrase “The importance of Simulation AND Nursing education”, the search resulted in 224 hits. The period of the search duration was in the range 10 years between 2007-2017, the search included availability of full text and peer-reviewed articles. According to the relevancy, 12 journals were chosen. On the last stage of the section process, the authors selected 7 articles based on the topic of this thesis. The last search engine was “Academic Search Elite(EBSCO)” by applying the search phrase “Simulation in Nursing education”, the search brought about 30 hits. The articles were published with the range 10 years between 2007-2017, availability of full text and peer-reviewed articles. The most closely connected to the thesis was 10 articles. The authors picked out 5 databases on the basis of relevancy of this thesis. Table 3 indicates the databases while Figure 5.1 illustrates the selected articles.

Table 3 Selection process

Databases	Search words	Number of hits	Relevant articles	Selected articles
Science Direct	The importance of Simulation AND Nursing education	24	11	6
SAGE	Simulation AND Nursing education	214	12	4
PubMed	The importance of Simulation AND Nursing education	224	12	6
EBSCO	Simulation in Nursing education	30	10	5

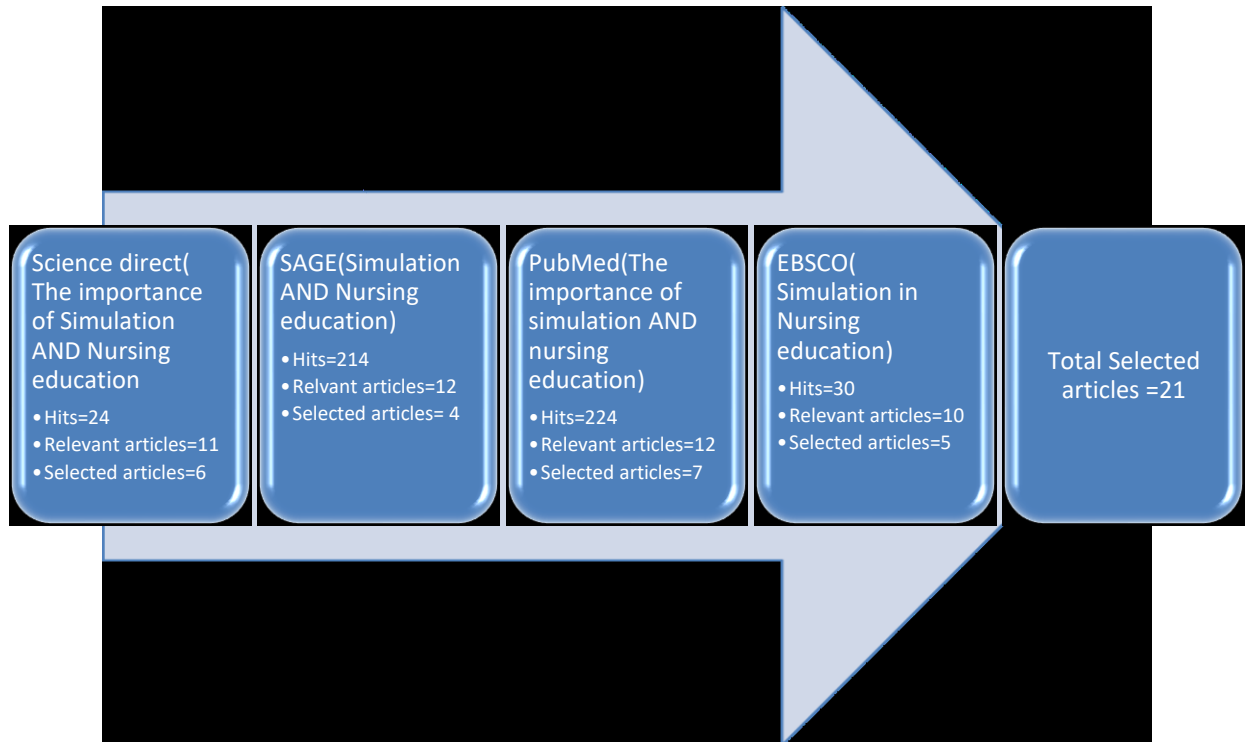


Figure 5-1 Selection process of the articles

5.1.3 List of chosen articles

The following articles were found to be of relevance to the study and were scientifically written.

1. Amanda J. Kirkpatrick, Mary Ann Cantrell, Suzanne C. Smeltzer (2017), Palliative Care Simulations in Undergraduate Nursing Education: An Integrative Review, *Clinical Simulation in Nursing* 13, 414-431
2. Andree S. Gamble (2017), Simulation in undergraduate pediatric nursing curriculum: Evaluation of a complex ‘ward for a day’ education program, *Nurse Education in Practice* 23 40e47
3. Arna Banerjee, Jason M. Slagle, Nathaniel D. Mercado, Ray Booker, Anne Miller, Daniel J. France, Lisa Rawn and Matthew B. Weinger (2016), A simulation-based curriculum to introduce key teamwork principles to entering medical students, *BMC Medical Education* (2016) 16:295 DOI 10.1186/s12909-016-0808-9
4. Bette Mariani and Jessica Doolen (2016), Nursing Simulation Research: What Are the Perceived Gaps? *Clinical Simulation in Nursing* (2016) 12, 30-36
5. Bonni S. Cohen and Rebecca Boni (2016), Holistic Nursing Simulation A Concept Analysis, *Journal of Holistic Nursing American Holistic Nurses Association*, Volume XX Number X XXXX 201X 1–11 © The Author(s) 2016
10.1177/0898010116678325
6. Jamil Norman (2012), Systematic Review of the Literature on Simulation in Nursing Education, *The ABNF Journal*, 24-29, Spring 2012
7. Jill S. Sanko (2017), SIMULATION AS A TEACHING TECHNOLOGY A Brief History of Its Use in Nursing Education, *The Quarterly Review of Distance Education*, Volume 18(2), 2017, pp. 77–85 ISSN 1528-3518 Copyright © 2017 Information Age Publishing, Inc
8. Junghee Kim, Jin-Hwa Park and Sujin Shin, Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis, *BMC Medical Education* (2016) 16:152 DOI 10.1186/s12909-016-0672-7

9. Karen A. Zapkoa, Mary Lou Gemma Ferrantoa , Rachael Blasimanb , Debra Sheles-takc, Evaluating best educational practices, student satisfaction, and selfconfidence in simulation: A descriptive study, *Nurse Education Today* 60 (2018) 28–34
10. Lisa Broussard, Rachel Myers, Jennifer Lemoine (2009), PREPARING PEDIAT-RIC NURSES: THE ROLE OF SIMULATION-BASED LEARNING, *Issues in Comprehensive Pediatric Nursing*, 32:4–15, 2009 Copyright © Informa Healthcare USA, Inc
11. Luciana Mara Monti Fonseca, Natália Del’ Angelo Aredes, nanda Maria Fernandes, Luís Manuel da Cunha Batalha, Jorge Manuel Amado Apóstolo, José Carlos Amado Martins, and Manuel Alves Rodrigues (2016), Computer and laboratory simulation in the teaching of neonatal nursing: innovation and impact on learning, *Rev. Latino-Am. Enfermagem* 2016;24:e2808 DOI: 10.1590/1518-8345.1005.2808
12. Mark A. Neill and Karen Wotton (2011), High-Fidelity Simulation Debriefing in Nursing Education: A Literature Review, *Clinical Simulation in Nursing* 7, e161-e168
13. Mary Gobbi, Eloise Monger, Mark J. Weal, John W. McDonald, Danius Michael-ides, David De Roure (2011), The challenges of developing and evaluating complex care scenarios using simulation in nursing education, *Journal of Research in Nursing* 17(4) 329–345), 2011.
14. Mayer Brezis , Yael Lahat , Meir Frankel , Alan Rubinov , Davina Bohm , Matan J Cohen , Meni Koslowsky , Orit Shalomson , Charles L Sprung , Henia Perry-Mezare , Rina Yahalom and Amitai Ziv (2017), What can we learn from simulation-based training to improve skills for end-of-life care? Insights from a national project in Israel, Brezis et al. *Israel Journal of Health Policy Research* 6:48 DOI 10.1186/s13584-017-0169-9
15. Nurcan Uysa (2016), Improvement of nursing students’ learning outcomes through scenariobased skills training, *Rev. Latino-Am. Enfermagem* 2016;24:e2790 DOI: 10.1590/1518-8345.1310.2790
16. Peggy Ward – Smith (2008), The Effect of Simulation Learning As a Quality Initia-tive, *Society of Urologic Nurses and Associates Urologic Nursing*, pp. 471 - 473.

17. Susan G. McNiesh (2015), Cultural Norms of Clinical Simulation in Undergraduate Nursing Education, *Global Qualitative Nursing Research* 1–10 © The Author(s) 2015 DOI: 10.1177/2333393615571361
18. Tamsin Pike a, Victoria O'Donnell (2010), The impact of clinical simulation on learner self-efficacy in pre-registration nursing education, *Nurse Education Today* 30 (2010) 405–410
19. Tonya Rutherford-Hemming (2012), Simulation Methodology in Nursing Education and Adult Learning Theory, *ADULT LEARNING*, Vol. 23 No. 3, 129-137, August 2012
20. Yasemin Çelik , Yeşim Ceylantekin , İbrahim Kiliç (2017), The evaluation of simulation maket in nursing education and the determination of learning style of students, *International Journal of Health Sciences* Vol. 11, Issue 1 (January - March 2017)
21. Young-Hee Kim, Kyung-Kye Hwang and Ok-Hee Cho (2018), simulation education with problem-based learning: effect on nursing students' communication apprehension, social behavior and personality, 2018, 46(1), 151–160 © 2018 scientific journal publishers limited. All rights reserved.

5.2 Data analysis

Content analysis is one of the classical procedures for analyzing textual material, no matter where the material comes from. According to Flick, 2002, the first step in content analysis is to define the material and to select those parts which are relevant for answering the research questions. The second step is to analyze the situation of data collection. In the third step, the material is formally characterized (how was the material documented, how was it edited?). In the fourth step Flick defines the direction of the analysis for the selected texts and what one actually wants to interpret out of them (Flick, 2002). The concrete methodological procedure basically includes three techniques. In summarizing content analysis, the material is paraphrased, which means that less relevant passages and paraphrases with the same meanings are skipped (first reduction) and similar paraphrases

are bundled and summarized (second reduction). This is combination of reducing the material by skipping statements included in a generalization in the sense of summarizing it on a higher level of abstraction (Flick, 2002).

The advantages of using this method are that the procedure seems clearer, less ambiguous and easier to handle. This is also due to possible reduction of the materials. The approach mainly suits a reductive analysis of large masses of text which is oriented to the surface of these texts. The formalization of the procedure produces a uniform schema of categories, which facilitates the comparison of the different cases to which it is applied throughout. This is an advantage over more inductive and /or case oriented analytic procedures (Flick, 2002). Authors in this work used another approach for qualitative analysis introduced by Graneheim & Lundman, 2004. This approach was used in this study because of its familiarity with nursing research and also because it uses an inductive method. This qualitative content analysis was also used because it is used in nursing research and education and it has also been applied to some various depths of interpretation. Thus, presumption of the authors is that a text always involves multiple meanings and there is always some degree of interpretation when approaching a text. This is an essential issue when discussing trustworthiness of findings in qualitative content analysis (Graneheim & Lundman, 2004).

Concepts used in qualitative analysis by Graneheim and Lundman, 2004 are manifest and latent content, unit of analysis, meaning unit, condensing, abstracting, content area, code, category and theme. Content aspect of this analysis deals with what the text says while manifest content describes the visible, obvious components. The label of a meaning unit has been referred to as a code and category is a group of content that shares a commonality. Creating categories is the core feature of qualitative content analysis. Categories are described as internally homogeneous and externally heterogeneous. It also emphasizes that categories must be exhaustive and mutually exclusive. This means that no data related to the purpose should be excluded due to lack of a suitable category. Furthermore, no data should fall between two categories or fit into more than one category (Graneheim & Lundman, 2004). Below are the steps used here in data analysis.

5.2.1 Reading and coding

The first step in the analysis was reading and coding of the articles chosen. In order to effectively analyze the data, the researchers first read all the 21 articles that had been selected from the exclusion and inclusion criteria indicated. The authors carefully read the articles and used a variety of marker pens to highlight crucial data findings. Then authors also highlighted the keywords and key statements from each article that were related to the research questions. The keywords that were searched were importance of simulation in nursing education, competences that nursing students gain through simulation experience, advantages of simulation experience. The highlighted keywords were considered as codes of the study. The authors also made notes at the margins of the article concerning the relevance of the codes to the research topic and the specific objectives of the study.

5.2.2 Listing and putting the codes into categories

After carefully going through the articles and identifying the codes that were present in each paper. The authors then put the codes into categories that were based on the textual content of the articles. The authors then interpreted the articles contained in findings based in regard to the research objectives.

Summary of the data analysis

Step 1: Reading and coding

- Thoroughly reading the 21 articles that had been selected
- Taking notes and marking them with different colored pens, whenever applicable and important data was found.
- Highlighting the keywords and key statements from each article that were related to the research keywords.

Step 2: Listing and putting the codes into categories

- In this stage, the notes that had been taken were thoroughly read through and information listed
- The codes were then put into categories that were based on the textual content of the articles

5.3 Credibility and Transferability

These two amongst others are concepts of trustworthiness. These two concepts were chosen because they are linked to the qualitative tradition when reporting findings of studies using qualitative content analysis. Credibility deals with the focus of the research and refers to confidence in how well data and processes of analysis address the intended focus. Selecting the most appropriate method for data collection and the amount of data are also important in establishing credibility. The amount of data necessary to answer a research question in a credible way varies depending on the complexity of the phenomena under study and the data quality. Credibility also deals with how well categories and themes cover data, meaning that no relevant data have been systematically excluded or irrelevant data included (Graneheim & Lundman, 2004).

Transferability refers to the extent to which the findings can be transferred to other settings or groups (Graneheim & Lundman, 2004). To facilitate transferability, it is always valuable to give a clear and distinct description of culture and context, selection and characteristics of participants, data collection and process of analysis. Transferability can also be enhanced by giving a rich and vigorous presentation of the findings together with appropriate quotations (Graneheim & Lundman, 2004). This means that the content of this study is not only credible but also trustworthy.

5.4 Ethical considerations

Ethical considerations are generally relevant. Flick defines research ethics as one that addresses the question of which ethically relevant issues caused by the intervention of researchers can be expected to impact on the people with or about whom they research. It is concerned in addition with the steps taken to protect those who participate in the research, if this is necessary. In the context of social sciences, an ethical theory that provides useful framework was developed. The theory is based on four principles; Non-maleficence researchers should avoid harming participants. Beneficence Research on human subjects should produce some positive and identifiable benefit rather than simply be carried out for its own sake Autonomy or self-determination research participants' values and decisions should be respected. Justice, all people should be treated equally (Flick, 2011).

Research ethics were followed in this study by researchers making sure that the sources used were clearly cited and referenced according to Arcada university's guidelines. The writers also used databases paid for by Arcada to make sure that copyrights rules regarding use of another people's work were not violated.

6. RESULTS

The authors after carefully collecting and analyzing the data in this part reports on different skills and competencies students gain through simulation experiences. Results are also divided into three groups; external outcomes, internal outcomes and evaluation of outcomes. Simulation design is also discussed in this chapter.

6.1 Using simulation learning experience before actual clinical placements

The result measurements obtained in the literature review on simulation in nursing education formed: knowledge and skills, safety, communication, clinical judgment, satisfaction, confidence, and clinical evaluation. These results were further divided into three groups: external outcomes, internal outcomes, and evaluation of outcomes. The external outcomes were named as factors that are learned: knowledge and skills, safety, and communication. Despite the fact the internal outcomes were described as those that are reliant on the students' feeling which included: clinical judgment, satisfaction, and self-confidence. The research results recommended that evaluation outputs are carefully related to the external and internal outcome measures (article 1,2, 3, 6,8,10,16,19,20).

The simulation emphasizes on giving students the chance to take part in clinical care, decision-making, ward management, leadership and working as part of a team. In general, their results showed that this was a positive experience, the student showing improvements in the implementation of their clinical skills (article 2). Nursing student can learn best through active participation, self-reflection, and the use of multimodal learning strategies for example by integrating visual, auditory, and kinesthetic reinforcement. Experiential learning is a useful method to help nursing education. The best effective learning practices are ones where the learner is involved in an occasion that simulates the real world (article 1, 2, 3). The results showed that simulation learning experience in nursing education, it has a huge impact in the psychomotor domain. The influence of simulation learning experience in nursing education was not comparable to the level of fidelity. Hence, the simulation process should apply appropriate level of simulation to achieve the educational goals and results (article 1, 8,10,11,12,13,14,15,18,21).

6.2 The competencies nursing students gain through simulation experience

The researches have revealed that simulation can be working successfully in preparing nursing students for clinical practice. Students have an impression that simulation is based on sound educational practice, it has likely a profound effect on success to their learning. When simulation carried out well, it can lead to increased student satisfaction and self-confidence. By doing continuous simulations and having students experience simulations more than once in consecutive years appears to increase their confidence, while current evidence demonstrates that simulation can increase competency and confidence in health care workers, provide instant feedback and reduce patient risk (article 1, 2,3,7, 9, 13).

Holistic nursing simulation (figure 6.1) lets for a better-quality outcome that can help patients, students, and school. The simulation process, for students learning is safe, showing a sensible and practical idea of what can be achieved, and permits for debriefing and reflection. Patients will get advantage from simulation and benefit from higher quality care from nursing students and new graduate nurses due to the integrative learning from holistic nursing simulation (article 5,7,8,11). When students take part in simulation activities, it is also an attractive to students. Students reveal a declined level of performance anxiety and become more intense sense of self-confidence in their psychomotor skills and critical thinking abilities after experiencing simulation-based learning (article 10,11 12,13,14,15,16,17). Taking in to account the assessment of the simulations such as virtual and laboratory, the students showed great satisfaction with taking part and practicing in a safe and simulated manner, with regard to the decision making well balanced and sensible in a situation that is common in a hospital (article 11,13,14,19). An additional advantage of simulation is that it delivers students with chances to make mistakes and to subsequently turn these mistakes into learning opportunities (article 10).

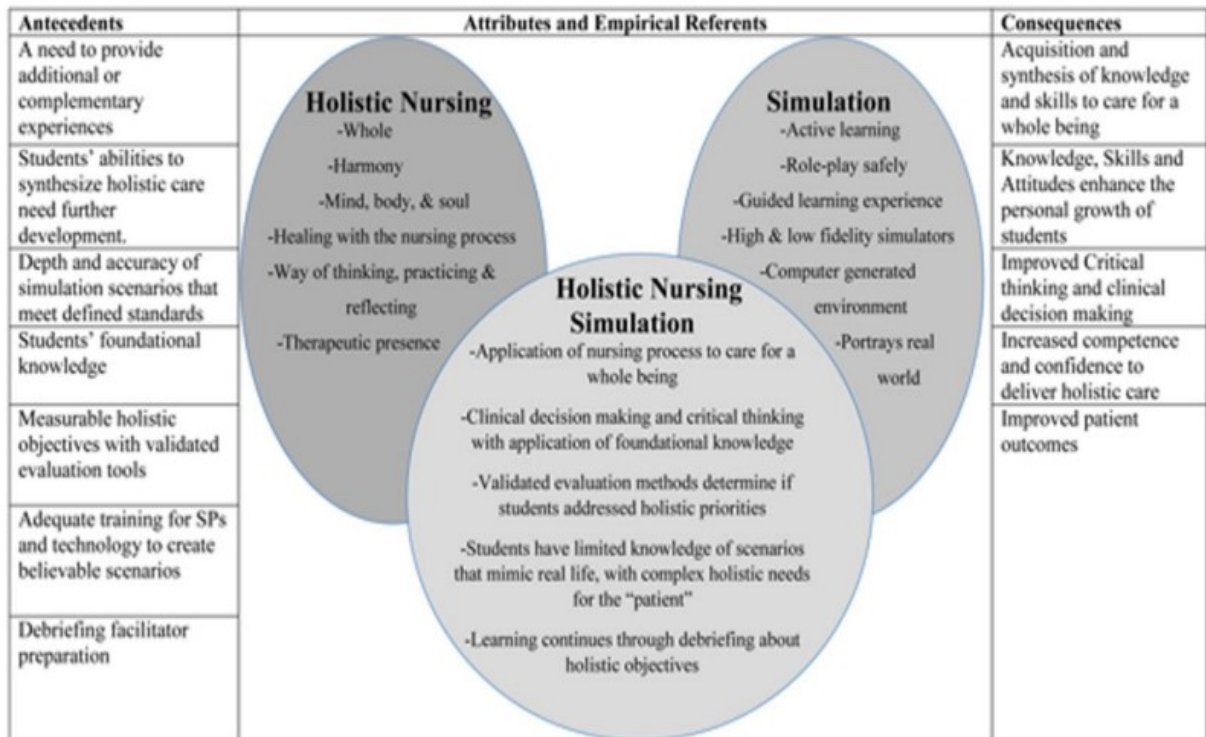


Figure 6-1 Visual Depiction of Holistic Nursing Simulation (Source Article 5)

6.3 Simulation Design

There are three levels of fidelity simulation in nursing education, i.e. low fidelity, moderate-fidelity, and high-fidelity simulation. Low-fidelity simulators deal with as task or skill trainers, there are intended to characterize a specific anatomical area of the body. Low fidelity simulators take into account useful for introducing and practicing psychomotor skills coming before acting them on real patients. Though, the simulators don't have the realism needed to transfer learning from student experiences in the laboratory to hospital situations. Some of clinical practice examples consist of urinary catheter insertion models and medication injection pads (article 7,10,11,12,13,15,16).

Moderate-fidelity simulators combine the application of modern computer technology to assist in progressing competencies in skills for example the identification of different anatomy such heart, lung, and bowel sounds. Moderate fidelity simulators are valuable as basic tools and as mechanisms for developing a profound comprehension of particular,

increasingly complex subject matter and competencies. These simulators provide knowledge, students can transfer this knowledge to implement in real patient situation more readily than with low-fidelity simulators. Moderate fidelity simulators are such as contains breath, heart, and bowel sounds, and allows for initiation of IV therapy, administration of IM injections, and rectal medication administration (article 7,10,12,14,15).

High-fidelity simulators are named as human patient simulators, these simulators create the most realistic simulated patient experiences. The simulators are computerized mannequins and permit psychomotor skill practice as well as observational responses to physical and pharmacological interventions through preprogrammed ways. These actual size simulators contain features such as palpable pulses, visible respirations, measurable blood pressure and pulse oximetry, vocal sounds, and movement. By applying computer interface, the data transferred from the simulator changes according to student choice and decisions. To make best use of high-fidelity simulators, setups, and case studies, which can be either simple or complex and individualized to the learning objectives. It can be developed by faculty or designed by the manufacturer, and are programmed into the simulator (article 7,10,12).

According to articles (1,2, 4,5,6 ,7, 10, 12), there are higher engagement and satisfaction with high-fidelity simulators and/or use of real actors for the patient versus stationary manikins. Overall, simulation design can include: type of simulation: formative or summative simulations, fidelity, the patient population, and the event take place. As to simulation design, subjects of interest comprised the prebriefing, executing the scenario, and debrief period of time. The researches proved on different participants that there was an important amount of descriptive work done on the numerous aspects of simulation-based design.

7. DISCUSSION

This part assesses whether the objectives of the study were met by the investigation. The authors start the discussion by relating the findings to other previous literature followed by the finding of this thesis. Challenges that come with the use of simulation are also mentioned. Finally, conclusion is presented followed by strengths, limitations and recommendations.

7.1 Discussion of results as related to other literatures

The goals of nursing in higher education institutions are that the student can interpret and execute challenges, and search for creative solutions based on scientific theory. The decision-making process must be developed by means of reflection about the problem to be solved and the use of critical thinking, associating the practice with theory. Many studies show a significant increase in students' knowledge when using the simulation associated with other teaching strategies, and that the digital technology is a valuable resource in the acquisition of information. The improvement of the processes that includes the complex task of teaching and learning is the target of investigations throughout human history, studied since antiquity. Increasingly, the teaching-learning process has been emphasized in the healthcare, due to the need to develop more creative professionals, engaged in problem-solving and guided by scientific evidence and ethics (Luciana et al, 2016).

Our study adds to the current body of literature on simulation as an effective pedagogy in clinical education by providing a deep description of the culture as articulated through interpreted cultural norms. Considering the difference between the cultural norms of the hospital clinical environment and simulation, one important finding that the authors of this study found out was the concept of relationality and communication. According to most literature that the authors went through during this study, students constructed their clinical decision making alongside their colleagues during the scenario as the primary nurse, orienting nurse, and charge nurse, and furthered this collective learning during the debriefing session that included other students who had observed the enacted scenario in

real time from the debriefing room. This formation of a learning community was also evident in McNiesh, 2015 study on the development of clinical judgment in simulation. In that study, students emphasized the value of learning from the experiences of others as well as the value of learning collaboratively. They noted that the more public aspect of group learning broadened their perspectives and gave them more intervention options within the simulation and debriefing activities (McNiesh, 2015).

7.2 Discussion of the results of this thesis study

Simulation environment more resembled an alternate world that students acted in, with an altered sense of time, self, and relationality. Students as experiential learners tended to take care of less complex patients within the real clinical setting. During practical trainings in real clinical settings, students felt that it was not safe for them to assume independent care of patients and that they often remained tethered to a nurse. In other cases, students were expected to act as if they were fully licensed registered nurses due to lack of workforce. This created many more possibilities for error. But the simulation environment enables the students to formulate their own plan for the patient, exercise their own critical thinking and have to be responsible for the patient. Having to make decisions and then take responsibility for their actions were significant processes for the students, with a clear acknowledgment. Simulation provided students with an opportunity to become the responsible party in more complex clinical situations simulated to unfold as they might in the real-world setting. This allows students that simulation was a safe place to make mistakes. The culture of simulation contained a modulated space between pretending and feeling the weight of situations that in the real world could include serious consequences. The simulation environment allowed students to perform actions that if done incorrectly on real patients could cause irreparable harm. The alternate reality of simulation also allowed for reflective time during the debriefing session.

Simulation nursing education effects have been shown not to be proportional to fidelity level. It is necessary to apply a suitable level of simulation to achieve all of the educational

targets and outcomes. The authors of this study being also nursing students who no prior exposure to simulation before joining Arcada, wanted to stress the importance of simulation and debriefing. Simulation debriefing guides students through a reflection on what occurred during a simulation scenario, with the goal of developing the knowledge, skills, and rationales underpinning clinical practice. Debriefing is central to the actual simulation event and equally beneficial, if not more so.

Simulation innovative teaching strategies can also be used to help nurses prepare to re-enter the workforce, to enhance specialty training, and to provide learners with the opportunity to work with other health professionals in interdisciplinary practice scenarios. Simulation-based learning provides opportunities for the integration of feedback and guided reflection, activities which increase the learner's ability to synthesize knowledge from multiple sources and make sound and safe nursing care decisions. (Broussard, 2009). It will be important though to know how much time is needed in simulation to achieve the same effect as clinical. However, effect of simulation on patient outcomes is still lacking. Concepts such as communication, interprofessionalism, transfer to practice, critical thinking, and patient safety needs further evidence of support as a significant outcome of simulation. There is also very little on outcomes of simulations related to improved performance during real situations and also lack of evidence to support transfer of knowledge/skills from simulation to clinical practice (Mariani & Doolen, 2016). The figure below demonstrates how simulation activities can accommodate varying degrees of complexity along with targeting different aspects of competencies necessary for the delivery of quality care.

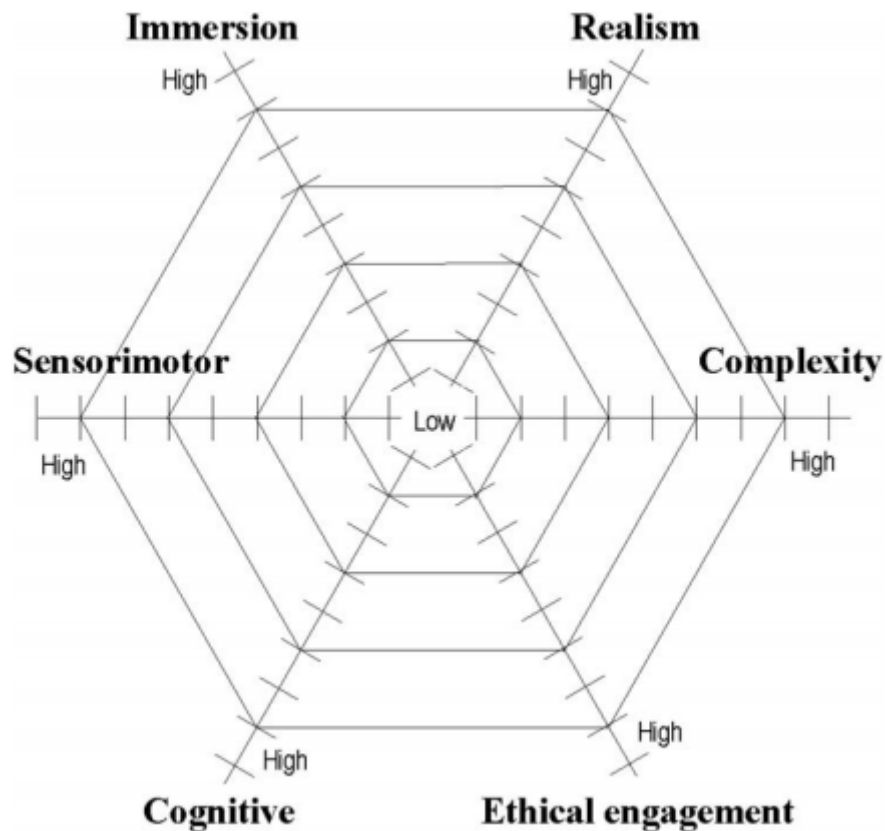


Figure 7-1 Factors influencing the student experience of simulation (source: Gobbi et al., 2011)

7.3 Challenges Using Simulation

The use of new technologies in simulation does not come without challenges for nursing faculty, nursing school administrators, and administrators of health care facilities that adopt simulation as a teaching strategy (Broussard, 2009). Practical challenges include expense, time, technical support, and dedicated space for storing and use of the simulation equipment. The cost of simulation equipment rises in proportion to the complexity of the simulation device. Faculty development time is needed for educators to learn how to use the highly sophisticated equipment, develop scenarios related to the learning objectives, and conduct research to validate simulation as an effective teaching learning strategy. Also, nursing schools and health care facilities that integrate simulation into the curricu-

lum or in-service programs are best served by establishing the position of simulation coordinator, in addition to other supportive technical personnel to run and maintain the hardware, software, and simulators (Broussard, 2009). Effect of simulation on patient outcomes is still lacking. Concepts such as communication, interprofessionalism, transfer to practice, critical thinking, and patient safety needs further evidence of support as a significant outcome of simulation (Mariani & Doolen, 2016). There is also very little on outcomes of simulations related to improved performance during real situations and also lack of evidence to support transfer of knowledge/skills from simulation to clinical practice.

8. CONCLUSION

The results of this study suggest that simulation-based nursing aims to promote clinical competency and reflective thinking skills. It also has shown that simulation can be a viable option in preparing nursing students for clinical practice. Simulation uses as a basis to create some powerful educational effects, it principally has big effects in the psychomotor domain. It necessary to apply suitable fidelity level in order to use a variety of educational methods to achieve the educational objectives. When conducted well, simulations can lead to increased student satisfaction and self-confidence. It is therefore a challenge to the nurse educators to provide learning environments that facilitate students 'critical thinking, self- reflection and prepares nursing graduates for practice in a complex, dynamic health care environment. As new simulation technologies emerge, the future looks bright for both students and patients alike.

8.1 Strengths, limitations and recommendations

The strength of this study was that it was a topic that had been widely researched on and the authors had many different scientific articles to choose from. It was also a very interesting area to the authors and they enjoyed working on this paper. The only limitation was that the authors would have preferred to use interviews as a method of data collection but due to lack of time, they resorted to doing literature review. Authors recommend interviewing medical professionals in the field to hear their opinion on simulation. It will be important to hear from the nurses in the field who tutor these nursing students if they also agree that having simulation before going out for practice is of help to the nursing students. Measurement of the impact of simulation on patient outcomes is also needed.

REFERENCES

Aebersold Michelle & Tschannen Dana. 2013, Simulation in Nursing Practice. The Impact on Patient Care.

Allen, Scott 2007. Adult Learning Theory & Leadership Development, Kravis Leadership Institute, Leadership Review, Vol. 7, pp. 26-37.

Arcada 2018, a. Available: <https://start.arcada.fi/en/department-health-and-welfare/nursing>. Accessed 30th February 2018

Beccaria Lisa, Kek Megan, Huijser Henk, (2018). Exploring nursing educators' use of theory and methods in search for evidence-based credibility in nursing education.

<https://doi.org/10.1016/j.nedt.2018.02.032>

Bette Mariani & Jessica Doolen (2016) Nursing Simulation Research: What Are The Perceived Gaps? *Clinical Simulation in Nursing*, 12(1), 30-36.

Bonni Cohen & Rebecca Boni (2016), Holistic Nursing Simulation: A concept Analysis. *Journal of holistic nursing*, vol 20 no 10

Clair D. Merriman, Louise C. Stayt, Barry Ricketts (2014), Comparing the Effectiveness of Clinical Simulation versus Didactic Methods to Teach Undergraduate Adult Nursing Students to Recognize and Assess the Deteriorating Patient, *Clinical Simulation in Nursing* (2014) 10, e119-e127.

D. Roberts, L. Greene, The theatre of high-fidelity simulation education, *Clinical Simulation in Nursing* (2011) 694–698.

Dale H. Schunk (2012), *Learning Theories An Educational Perspective, Sixth Edition*, by Pearson Education, Inc., publishing as Allyn & Bacon.

Flick Uwe (2011) *Introducing research methodology: a beginner's guide to doing research project*.

Flick Uwe, (2002) *An introduction to qualitative research. 2nd Edition* ISBN 0-7619-7436-9

Fritz P.Z, Gray, T., and Flanagan B. (2007). Review of mannequin-based high-fidelity simulation in emergency medicine, *Emergency Medicine Australasia*, 20(1), 1-9

Graneheim, U.H. and Lundman, B. (2004) *Qualitative Content Analysis in Nursing Research: Concepts, Procedures and Measures to Achieve Trustworthiness*. *Nurse Education Today*, 24, 105-113.

Harker, Melissa (2017). *History of nursing Education Evolution Mildred Montag*. <https://doi.org/10.1016/j.teln.2017.05.006>.

Jamieson R, Hovancsek M, Clochesy J (2006) A pilot Study assessing simulation using two simulation methods for teaching IV cannulation. *Clinical Simulation in Nurse Education*. 1, 9-12.

Jefferies, P. (2005), A framework for designing, implementing and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives*, 26(2), 96-103.

Jeffries P, Hovancsek M, Clochesy J (2005) Using clinical simulation in distance education, In Novotney J, Davis RH (Eds) *Distance Education in Nursing*. Second edition. Springer, New York NY.

Jill Sanko (2017) Simulation as a teaching technology: A brief history of its use in nursing education. *The Quarterly Review of Distance Education*, Volume 18(2), 2017, pp. 77–85

Junghee Kim, Jin-Hwa Park, Sujin Shin (2016) Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis. DOI 10.1186/s12909-016-0672-7

Kantek Filiz, Ayla Kaya, Nurdan Gezer (2017). The effects of nursing education on professional values: A longitudinal study. Volume 58, November 2017, Pages 43-46. <https://doi.org/10.1016/j.nedt.2017.08.004>

Lisa Broussard, Rachel Myers & Jennifer Lemoine (2009) Preparing Pediatric Nurses: The role of simulation based learning. DOI: 10.1080/01460860802610178

Luciana Mara, Natália Del' Angelo, Ananda Maria, Luís Manuel da Cunha, Jorge Manuel, José Carlos, Manuel Alves, (2016). Computer and laboratory simulation in the

teaching of neonatal nursing: innovation and impact on learning. DOI: 10.1590/1518-8345.1005.2808.

Mary Gobbi, Eloise Monger, Mark Weal, John MacDonald, Danius Michaelides & David Roure (2011) The challenges of developing and evaluating complex care scenarios using simulation in nursing education. *Journal of Research in Nursing* 17(4) 329–345. DOI: 10.1177/1744987112449969

McNiesh, Susan (2015) Cultural Norms of Clinical Simulation in Undergraduate Nursing Education. *Global Qualitative Nursing Research* 1-10. DOI: 10.1177/2333393615571361

Nehring, W. M., Ellis, W. E., & Lashley, F. R. (2001). Human patient simulators in nursing education: An overview. *Simulation & Gaming*, 32(2), 194-204. doi:10.1177/104687810103200207.

Null, Wesley & Twamley Cooper, 2009. Two Views on Mathematic curriculum and Teaching. *American Educational History Journal*, Vol 36 numbers 1&2.

Parker, R. A., McNeill, J., & Howard, J. (2015). Comparing pediatric simulation and traditional clinical experience: Student perceptions, learning outcomes, and lessons for faculty. *Clinical Simulation in Nursing*, 11(3), 188-193.

Paula Poikela a, Heli Ruokamo , Marianne Teräs, Comparison of meaningful learning characteristics in simulated nursing practice after traditional versus computer-based simulation method: A qualitative videography study, *Clinical Simulation in Nursing* (2015) 373–382.

Rauen CA (2001) Using simulation to teach critical thinking skills. *Critical Care Clinic of North America*. 13, I, 93-103.

Robyn P. Cant a, Simon J. Cooper, Simulation in the Internet age: The place of Web-based simulation in nursing education. An integrative review, *Nurse Education Today* 34 (2014) 1435–1442

Rui C.N. Baptista, Luís A.R. Paiva , Rui F.L. Gonçalves, Luís M.N. Oliveira, Maria de Fátima C.R. Pereira, José C.A. Martins (2016), Satisfaction and gains perceived by nursing students with medium and high-fidelity simulation: A randomized controlled trial, *Nurse Education Today* 46 (2016) 127–132

Saionara Nunes de Oliveira, Marta Lenise do Prado, Silvana Silveira Kempfer, Jussara Gue Martini, Jaime Alonso Caravaca-Morera, Mariely Carmelina Bernardi, Experiential learning in nursing consultation education via clinical simulation with actors: Action research, *Clinical Simulation in Nursing* (2015) e50–e54

Seropian M (2003) General concepts in full scale simulation: getting started. *Anesthesia and Analgesia*. 97, 6, 169S-1705.

Struksnes Solveig & Ingeborg Ragna. 2016, Nursing students' conception of clinical skills training before and after their first clinical placement: A quantitative, evaluative study, *Nurse Education in Practice* 16 (2016) 125-132.

Thorndike, E. L. (1911). *Animal intelligence: Experimental studies*. New York: Macmillan.

Thorndike, E. L. (1913b). Educational psychology: Vol. 2. The psychology of learning. New York: Teachers College Press.

Walsh M (2010) Using a simulated learning environment. *Emergency nurse*. 2010 May; 18(2):12-6.

Wolfgram, L. J.B., & Quinn, A. O. (2012). Integrating simulation innovatively: Evidence in teaching in nursing education. *Clinical Simulation in Nursing*, 8(5), e169-e175. Doi: 10.1016/j.ecns.2010.09.002.

APPENDICES

1.THE ANSWERS TO THE RESEARCH QUESTIONS AND UNIT ANALYSIS

Number	Studies or article name	Question 1. What is the importance of having simulation experience before going out for clinical placements?	Question 2. What kind of competencies do student nurses gain through simulation experience
1.	Amanda J. Kirkpatrick et al, 2017	Nursing students stated better satisfaction with simulators and/or use of real participants	Students gained or increased confidence, having better communication skills and reassurance.
2	Andree S. Gamble, 2017	Simulation helps to recreate the clinical environment with enough realism to immerse students in the learning experience. Due to its ability to engage students in a realistic yet safe environment, simulation offers students an opportunity to demonstrate and improve their knowledge, skills, professional qualities, confidence and overall preparedness for clinical placement	Simulation in nursing education has been proved to a greater confidence, psychomotor and clinical skills. It has a positive impact on student to be ready for clinical placement.

3	Arna Banerjee, 2016	It facilitates team-work principles and promotes interpersonal communication. Humans learn best when they learn through active participation and simulation fulfills this need and at the same time allows subsequent analysis and reflection on the experience and facilitates incorporation of behavioral changes into personal practice	Humans learn best when they learn through active participation. Simulation fulfills this need and at the same time allows subsequent analysis and reflection on the experience and facilitates incorporation of behavioral changes into personal practice.
4	Bette Mariani and Jessica Doolen, 2016	Nursing schools and students found simulation to be a positive and beneficial learning experience.	Simulation experiences help a student's ability to synthesize and apply knowledge.
5	Bonni S. Cohen and Rebecca Boni, 2016	Simulation provides chances to apply knowledge and skill through the use of simulators, standardized patients, and virtual settings	The holistic nursing simulation facilitates knowledge, skills, attitude, and personal growth of the student.
6	Jamil Norman, 2012	Simulation learning experience is an educational practice that produces an atmosphere helpful to experiential learning.	Simulation is useful in creating a learning environment which contributes to knowledge, skills, safety, and confidence.
7	Jill S. Sanko, 2017	Simulation is a procedure rather than a technology that is able to provide realistic environments or practice proxies for the purposes of learning, training, and practice.	Simulation can be applied for teaching or practicing both technical skills (insertion of intravenous catheters, suturing for example) and non-technical skills (communication and teamwork).
8	Junghee Kim et al, 2016)	Simulation-based nursing education is a well-accepted pedagogical	This study proved that simulation-learning experience in nursing education has a huge impact on educational

		<p>technique. This method gives students a good chance to exercise their clinical and decision-making skills through various clinical scenarios in a controlled environment.</p>	<p>effect, it affects in the psychomotor domain.</p>
9	Karen A. Zapkoa, 2018	<p>Simulation has been found to be a useful teaching strategy that contributes to learning, development of competencies, safety, and self-confidence.</p>	<p>An improvement in nursing knowledge and critical thinking resulted after simulation.</p>
10	Lisa Broussard et al, 2009	<p>Nurses face the continued demand for mastery of complex skills and nursing care management. Simulation attempts to achieve a level of fidelity sufficient to convince users they are engaged in situations that resemble what they would encounter in real life.</p> <p>Unlike the traditional classroom setting, a simulated situation allows the learner to think spontaneously and actively rather than passively. Participants involved in simulation-based learning also increase their level of comfort with technology so that the patient, rather than the technology, is the focus of care.</p> <p>An additional advantage of simulation is that it provides learners with chances to make mistakes and to subse-</p>	<p>Simulation provides learners with the opportunity to address multiple domains of critical thinking and skills performance. It provides innovative teaching strategies that can be used to help nurses prepare to re-enter the workforce, to enhance specialty training, and to provide learners with the opportunity to work with other health professionals interdisciplinary practice scenarios. Learners report a decreased level of performance anxiety and a heightened sense of self-confidence in their psychomotor skills and critical thinking abilities after experiencing simulation-based learning. A combination of computer programs, high-fidelity patient simulators, and virtual practice environments provides nursing students and novice nurses with the opportunity to practice critical technical, assessment, and communication skills before engaging in practice, thus by affirming students have appropriate knowledge and confidence essential to deliver nursing care safe and effective.</p>

		quently turn these mistakes into learning opportunities.	
11	Luciana Mara et al, 2016	Patient safety. Student will be better prepared for real situations after the previous simulation and learning opportunity	It is an important teaching tool for innovation and motivation of learning in healthcare. It provides experience and emotion by means of a simulated virtual environment transformed into meaningful learning providing support for education with solid concepts based on critical thinking, problem solving, planning, flexibility and adaptability. It increases cognitive learning of participants.
12	Mark A. Neill and Karen Wotton , 2011	High-fidelity simulation (HFS) provides a linkage between theory and clinical practice.	Nursing students possess well developed clinical and decision-making skill through high fidelity simulation.
13	Mary Gobbi et. al, 2011	Simulation as an educational tool to support learning and development in nursing education is well established, with simulation practices originating in 'practical rooms' where skills are rehearsed using inert mannequins, medical equipment and fellow students acting as 'patients'.	Simulation activities can substitute varying degrees of complexity, reality, student immersion in the process, sensory-motor skills, cognition and decision-making skills.
14	Mayer Brezis et al, 2017	Simulation studies have shown its effectiveness to improve communication skills.	Competency and teamwork culture.
15	Nurcan Uysa, 2016	It teaches nursing students psychomotor skills and nursing care in a safe environment. It allows students to experience self-learning and helping them to enhance their readiness for an actual clinical environment.	It facilitates the assessment of psychomotor skills as well as knowledge and attitudes.

16	Peggy Ward – Smith, 2008	The most beneficial aspect of simulation is in its ability to provide present crisis scenarios with no human risk.	Simulation learning in nursing education aims to promote clinical competency and reflective thinking skills.
17	Susan G. McNiesh, 2015	Simulation is an important addition to the clinical practice of health care professionals in training, as it helps students to confront the real world of practice through a “near experience” in a safe, non-punitive environment.	Simulation based education has strong support for high-fidelity clinical simulation as an effective tool for learning performance-based skills.
18	Susan G. McNiesh, 2015	It gives learning opportunities in a safe environment where learners can exercise skills they may not be exposed to in the clinical setting, and from a safety perspective, may not be right to practice first hand on real patients.	Simulation helps to increase learner confidence in their ability to perform clinical skills in the clinical situation.
19	Tonya Rutherford-Hemming, 2012	Simulation used in nursing education as a teaching practice, there are three learning theories, cognitive, social, and constructivist, describe how students gain knowledge with simulation experiences	Simulation facilitates nursing students can practice a variety of tasks and skills, and implement knowledge and decision making without the fear of causing harm to the patient.
20	Yasemin Çelik et al, 2017	Simulation is influential in the development of learners’ cognitive, psychomotor, and attitudinal knowledge and skills by providing a real learning environment, in which real-life situations are transformed into experiences.	Simulation learning process assists to increase in critical thinking skills, the improvement in the skill of using technology, putting theoretical knowledge into practice interactively and making corrections in the problems.

21	Young-Hee et al, 2018	Simulation education with problem-based learning is a combined program that relate problem-based learning and simulation practices whereby realistic practice activities are induced.	Simulation as a teaching–learning strategy that reduces communication apprehension and improves the nursing clinical self-efficacy of nursing students.
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