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Nurse Educators’ and Students’ Experiences of the Integration of Complex Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia

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Declaration

I declare that I am the sole author of this thesis and that it has not been submitted for any other degree or professional qualification.

Sahar Alshaharani
30/08/2023
Abstract

High-fidelity simulation (HFS) is used in relation to a wide range of full-body mannequins that can simulate the functions of the human body to a high degree (Lioce et al., 2020). Based on the evidence (Munshi, Lababidi and Alyousef, 2015; Kim, Park and Shin, 2016), it can be argued that HFS may not be superior to low fidelity simulation (LFS) in every case. However, it can have a positive impact on students’ knowledge and skill acquisition, critical thinking, and psychomotor skills (Powell, Scrooby and van Graan, 2020; Li et al., 2020). Whatever the actuality, the literature has demonstrated that there are challenges that limit nurse educators’ use of the HFS in undergraduate nursing curricula (Dean, Williams and Balnaves, 2015; Najjar, Lyman and Miehl, 2015; Watson et al., 2021). The present study, undertaken in Saudi Arabia, aims to understand both nurse educators’ and students’ experiences and perceptions of the integration of complex scenario-based high fidelity learning into third- and fourth-year undergraduate nursing curricula. The study was conducted in the clinical skills and simulation centre at a Saudi university, the methodology being that of qualitative research enquiry utilising focused ethnography. In-depth, semi-structured, face-to-face and remote interviews were conducted to explore the experiences of 14 female nursing students and 10 female nurse educators. The study findings address the influence of socio-cultural factors on HFS within Saudi Arabia's nursing education and emphasises the significance of the interaction between educators, students, and peers in facilitating learning and teaching using HFS. Additionally, the study highlights the importance of preparing students and educators in mitigating any detrimental effects of HFS, recognising that social and cultural factors play a significant role. By addressing a gap in the literature, this research provides valuable insights that could shape the future of nursing education in Saudi Arabia and, arguably, beyond. By developing a conceptual framework that considers the impact of specific socio-cultural factors on high fidelity simulated learning, the validity of such simulated learning can be better understood.
Lay summary

Nursing education is evolving, and one innovative way of learning involves simulation. Think of it as practicing patient care using lifelike scenarios instead of real patients. This study focuses on a specific type of simulation called high-fidelity simulation (HFS) and its impact on nursing students in Saudi Arabia.

For this research, I talked to both nursing students and educators to understand their experiences with HFS. I conducted interviews to gather their thoughts and insights. The findings show that HFS can be a valuable learning tool, but it also comes with challenges. It is not just about how teachers teach; it is also about how students learn and how teachers support them.

I went further into the details and discovered what makes HFS effective in Saudi Arabia. It is not solely about the teaching method; the local culture and society also play a role. To understand these factors better, I developed a unique framework, akin to fitting together puzzle pieces.

Why does this research matter? Think of it as creating a recipe for successful nursing education. By understanding how HFS functions and what leads to its success, future nurses can be better prepared for their crucial roles in patient care.

In addition to the findings of the present study, a comprehensive framework that combines insights from social and cultural perspectives is introduced. The study also used a specialised model to apply the implications of the present study to real-world nursing practice. This research contributes to the growing knowledge in nursing education and has the potential to shape how nursing is both taught and practiced in Saudi Arabia.
Acknowledgement

I express deep gratitude for the invaluable opportunity to embark on this scholarly journey. I extend my sincere thanks to “Allah” for guiding me. This has been a long learning journey, and I am truly honoured to have experienced it.

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List of Abbreviations

SA: Kingdom of Saudi Arabia.
MoE: Ministry of Education in Saudi Arabia.
MoH: Ministry of Health in Saudi Arabia.
MoHE: Ministry of Higher Education in Saudi Arabia.
SCFHS: Saudi Commission for Health Specialties.
HFS: High-Fidelity Simulation.
LFS: Low-Fidelity Simulation.
NLN: National League for Nursing in United States of America.
SqS: Sequences Simulation.
ACLS: Advanced Cardiac Life Support.
NMC: Nursing and Midwifery Council.
HFHPS: High-Fidelity Human Patient Simulation.
HPS: Human Patient Simulation.
USA: United States of America.
BSN: Bachelor of Science degree in Nursing.
CSSC: Clinical Skills and Simulation Centre.
UK: United Kingdom.
WHO: World Health Organisation.
IRB: Institutional Review Board.
SHSS: School of Health in Social Science.
SP: Standardised Patient.
RCT: Randomised Controlled Trials.
MSND: Medical Surgical Nursing Department.
SLM—SE: Simulation Learning Model -Student Experience.
NJST: NLN Jefferies Simulation Theory.
OR: Operation Room.
TA: Teaching Assistance.
ST: Simulation Technician.
SpO2: Saturation of Peripheral Oxygen.
Glossary

**Fidelity**: Fidelity pertains to the extent to which a simulation accurately replicates a real event or a workplace situation. This encompasses various aspects, including the physical, psychological, and environmental elements. The simulation should effectively mirror the reactions, interactions, and responses that would naturally unfold in the real world (Lioce et al., 2020, p. 18).

**Authenticity**: Authenticity involves creating a learning environment that mirrors the application of knowledge and skills in real-life scenarios. It necessitates establishing a context, whether tangible or virtual, that emulates the complexity and limitations of the real world (Gulikers, Bastiaens and Martens, 2005, p. 509).

**Realism**: Realism denotes the quality of precisely representing a person, object, or situation in a manner that remains faithful to reality. It enables participants to engage with the simulation as if they were dealing with a real-life situation or problem (Lioce et al., 2020, p. 39).

**The scenarios**: A comprehensive plan for a clinical encounter consists of several integral components. This entails identifying the individuals participating in the event, preparing briefing notes, setting goals, and learning objectives, providing participants with instructions, gathering patient-related information, considering environmental conditions, preparing mannequins or standardized patients, arranging essential equipment, props, and tools, and ensuring the availability of resources to assess and manage the simulated experience. This meticulous outline ensures that all essential elements are in place to facilitate a purposeful and impactful simulation (Lioce et al., 2020, p. 41).
Chapter 1: Introduction
1.1 Introduction

Nursing education, a rapidly evolving field, has witnessed the emergence of simulation as a valuable pedagogical approach that offers nursing students invaluable experiential learning opportunities (Koukourikos et al., 2021). This method facilitates students to apply theoretical knowledge within simulated clinical environments, allowing them to make real-life decisions without putting patients at risk (Butler, Veltre and Brady, 2009; Konieczny, 2016). High-fidelity simulation (HFS), in particular, provides a secure learning platform that fosters transformative experiences for students (Lee, Kim and Park 2015; Brien, Charette and Goudreau, 2017; Carrero-Planells et al., 2021). However, this introductory chapter will briefly describe the global and Saudi Arabian applications of simulation, explain the rationale for conducting this study, and outline the thesis structure.

HFS has been endorsed by the National League for Nursing in the United States as an effective educational strategy for equipping nurses for the complex healthcare landscape (National League for Nursing, 2015). Nevertheless, Munshi, Lababidi and Alyousef (2015) and Kim, Park and Shin (2016) argue that HFS might not always be the optimal choice. While it has demonstrated positive effects on students’ knowledge and skill acquisition, critical thinking, and psychomotor skills (Powell, Scrooby and van Graan, 2020; Li et al., 2020), there is a lack evidence concerning the impact of integration and fidelity level on its effectiveness. Watson et al. (2021), Najjar, Lyman and Miehl (2015), Dean, Williams and Balnaves (2015) highlights the challenges educators and students encounter in achieving realism and determining the appropriate level of fidelity in simulations.

This thesis aims to explore educators’ and students’ experiences with HFS in nursing education in Saudi Arabia, assess its effectiveness in comparison to other teaching methods, and identify strategies to enhance its impact. In this study, I contend that HFS plays an influential role in improving learning outcomes for nursing students. Several studies reinforce this standpoint. Nonetheless, I argue that it is crucial to acknowledge that HFS's effectiveness is not universally superior to all other teaching methods and can be influenced by factors such as social and
contextual factors. The educator’s role in HFS is pivotal, with their skill set and teaching strategies greatly affecting HFS's effectiveness. However, they encounter various obstacles, including time constraints, apprehension surrounding the use of technology, and inadequate preparation. Furthermore, there is an urgent need to bridge the gap between theoretical learning and the practical application in HFS. This connection can be substantially strengthened by developing a more realistic simulation environment and exploring students' and the socio-cultural backgrounds in the HFS design. However, it is essential to acknowledge that most of the existing research on HFS is focused on Western contexts, emphasising the necessity for more investigations in non-Western settings like Saudi Arabia. Guided by the NLN/Jeffries simulation framework (2016), the present study probes the dynamics between educators and students during HFS within a Saudi Arabian context. It seeks to offer valuable insights into effective HFS, ultimately contributing to improvements in the quality of nursing education and practice in Saudi Arabia. This objective is pursued by employing a qualitative focused ethnography approach.

This thesis delves into the context of HFS in Saudi Arabia. According to Al-Dossary (2018) and Sadi (2013) Saudi healthcare has undergone significant changes in response to population and economic growth, aimed at further advancing the country’s healthcare system (Sadi, 2013; Al-Dossary, 2018). These changes primarily emanate from the government's Vision 2030, which seeks to enhance education across various healthcare professions to meet global standards (Vision 2030, 2017; Alsufyani et al., 2020). In addition, Vision 2030 aims to position five Saudi universities among the world’s top 200 (Vision 2030, 2017). This vision places particular emphasis on improving nursing education and practice to address workforce shortages (Vision 2030, 2017; Al-Dossary, 2018). AlYami and Watson (2014) assert that reforming the nursing profession in Saudi Arabia to cater to nurses’ learning needs is crucial. They argue that students' education is a vital tool, as it shapes their practice and ultimately determines the type of nurses they become (Albagawi, 2014; Landeen et al., 2015).

Despite recent strides in both education and practice, nursing in Saudi Arabia still confronts numerous challenges (Lamadah and Sayed, 2014; Al-Ghareeb and Cooper, 2016; Al-Dossary, 2018; Alghamdi et al., 2019). Al-Dossary (2018) identified other challenges faced by the Saudi nursing profession, such as an underdeveloped education system and an unclear scope of practice.

Chapter 1: Introduction
However, studies conducted in Saudi Arabia recommend enhancing university and college curricula by incorporating simulation as a key tool. They also propose increasing awareness among nurse educators and administrators about integrating HFS into their curricula (Albagawi, 2014; Al-Zayedi and Mansour, 2018).

1.2 Aims and Objectives of the Study

The purpose of this study is to investigate the experiences of both educators and students with HFS in nursing education in Saudi Arabia. It aims to address gaps in understanding the effectiveness of HFS compared to other teaching methods, identify potential challenges, and uncover strategies for improving its effectiveness. Additionally, the study endeavours to shed light on the role of nurse educators and the obstacles they encounter when implementing HFS. Through a qualitative investigation employing a focused ethnography approach, this research aims to bridge existing knowledge gaps in the field and enhance the quality of nursing education by incorporating the first-hand experiences of educators and students with HFS. The findings of this study provide valuable insights to nursing educators and students, empowering them to enhance their skills in utilising scenario-based HFS laboratories within nursing curricula at Saudi universities, supported by a well-developed conceptual framework.

1.3. Motivation for Conducting the Study

As I completed my bachelor’s degree and embarked on my clinical nursing journey during an internship at a Saudi hospital, I became acutely aware of the challenges nurses face in real clinical settings. As I transitioned from a clinical instructor to a nursing education lecturer, my drive to elevate the quality of nursing education in Saudi Arabia intensified. This drive propelled me to expand my horizons, leading me to pursue a master’s degree in nursing education in the United States. Throughout my master's programme, I discovered the potential of HFS to bridge the gap between theoretical knowledge and practical application in nursing education. Observing its positive influence on students’ learning and critical skill development, I felt compelled to further explore its effectiveness within the Saudi Arabian context.
Inspired by my experiences as a nurse-in-training, clinical instructor, and lecturer, I recognised the challenges faced by nursing students and educators alike. Motivated to enhance nursing education, particularly through the integration of HFS, I undertook this research journey. The primary objective was to explore the experiences of both educators and students with HFS in nursing education in Saudi Arabia. Through this study, I also aimed to address the gap in understanding HFS's effectiveness compared to other teaching methods, and to pinpoint potential challenges and strategies for improving its effectiveness. Ultimately, the research aims to contribute to better nursing care outcomes delivered by Saudi nurses.

1.4 Thesis Structure

This thesis comprises eight chapters. Chapter 1 introduces the study, providing an overview of its purpose. Chapter 2, the background chapter, provides a comprehensive understanding of the concept of simulation in general, with a specific focus on HFS. It also furnishes an overview of Saudi Arabia. Chapter 3 addresses the existing gaps in the literature concerning HFS. Chapter 4 presents the theoretical framework that guided the study. Chapter 5 delineates the methodology, detailing the research design, data collection methods, and data analysis procedures. Chapter 6 presents the study’s findings, providing an in-depth analysis of the collected data. Chapter 7 involves the discussion, where the findings are interpreted and compared to existing literature and the theoretical framework. Lastly, Chapter 8 encompasses the study's implications, which hold the potential to make substantial contributions to nursing education and the effective utilisation of HFS. By examining educators' and students' experiences with HFS, the study identifies factors that shape learning outcomes and instructional approaches. These insights can guide the evolution of nursing curricula in Saudi Arabia, addressing HFS feasibility, effectiveness, and challenges. The practical recommendations and a conceptual framework, grounded in the Jeffries simulation theory and employing the Plan-Do-Study-Act (PDSA) model, are poised to facilitate well-informed advancements in nursing education, ultimately enhancing the quality of nursing education in Saudi Arabia.
2.1 Introduction

The background chapter has been divided into three parts. The chapter begins by briefly examining the status of nursing as a profession in Saudi Arabia and explores its alignment with the Saudi Vision 2030 initiative. The second part examines the role of simulation in healthcare, encompassing its classification, types, and levels of fidelity, with a specific focus on nursing education. The final part provides an overview of the religious, social, and cultural contexts in Saudi Arabia. It also explores the healthcare system in Saudi Arabia, highlighting the status of simulation education and presenting a critical analysis.

2.2 Part I: Saudi Arabia’s Vision 2030

In 2017, Saudi Arabia underwent significant changes with the announcement by King Salman that women no longer required permission from a male guardian for travel or other activities (Eum, 2019). This marked a milestone for women's rights in the country (Vision 2030, 2017). Additionally, Crown Prince Mohammad bin Salman abolished the prohibition on women driving, granting them more freedom and independence (Al-Ghalib et al., 2018). These reforms were part of the larger initiative known as Vision 2030, aimed at transforming various aspects of Saudi society, including the economy and education (Rahman and Qattan, 2021). This thesis emphasises the importance of Vision 2030 for nursing in Saudi Arabia, underlining the significance of comprehending these advancements and their implications for the nursing profession.

2.2.1 The Call for Transformation in Nursing Education in Saudi Arabia

In the Saudi Arabian context, the healthcare system has undergone a transformative process led by the government’s Vision 2030 initiative. One of the objectives of this vision is to enhance the status of medical and nursing professions, making them more preferrable and attractive compared to other professions (Vision 2030, 2017; Al-Dossary, 2018). Furthermore, Vision 2030 seeks to elevate nursing education, reshape the perception of nursing as a profession, and improve the quality of nursing care (Vision 2030, 2017; Al-Dossary, 2018). Among its goals is the improvement
of nurse retention and the definition of the scope of nursing practice (Alsufyani et al., 2020). This entails ensuring that qualified nurses are motivated to remain in the profession and that their roles and responsibilities are clearly defined. Attaining these nursing-related goals within the scope of the vision necessitates robust, high-quality research. The present study aims to address issues related to nursing education within the ambit of Vision 2030, ensuring that the nursing is perceived as a preferred career and that the nursing role stands out among other healthcare positions (Al-Dossary, 2018).

2.3 Part II: Simulation in Healthcare

This section introduces the concept of simulation in healthcare, starting with the definition of simulation as a technique that recreates a situation or environment to enable individuals to undergo an experience resembling real-life scenarios (Gaba, 2004). Simulation serves various purposes, such as practice, learning, evaluation, testing, and gaining an understanding of multifarious purposes, including practice, learning, evaluation, testing, and fostering an understanding of systems or human actions (Gaba, 2004; Lioce et al., 2020; Watts et al., 2021). The discourse encompasses the classification of simulation and the spectrum of fidelity, offering a comprehensive understanding of its diverse aspects. Subsequently, the focal point centres on High-Fidelity Simulation (HFS), which constitutes the primary emphasis of this study.

2.3.1 Classification of Simulation in the Medical Field

The use of simulation in healthcare encompasses various classifications, each geared toward specific learning outcomes (Motola et al., 2013; Bangar, Venegas-Borsellino and Eisen, 2016; Ntlokonkulu, Rala and Goon, 2018). Simulation can be categorised into different levels of fidelity based on their realism and the resulting learning outcomes (Bangar, Venegas-Borsellino and Eisen 2016; Watts et al., 2021). To facilitate a holistic understanding, Appendix 1 outlines the various classifications of simulation in healthcare along with their respective general definitions. However, for the scope of this research, the main emphasis will be on HFS integrated into the nursing curriculum. Clarifying the level and type of fidelity involved in this context becomes pivotal.
2.3.1.1 Low Fidelity Simulation (LFS)

These simulations are intended to foster knowledge acquisition. They might appear less realistic to learners and can involve static models or two-dimensional displays. Additionally, task trainers like IV arms or CPR mannequins fall under the category of as LFS (Lioce et al., 2020).

2.3.1.2 Mid Fidelity Simulation (MFS)

These simulations aim to enhance competence by providing a heightened sense of realism and increased learning opportunities. Examples include full-body mannequins that replicate patient conditions, complete with breath, bowel, and heart sounds. Students can gain hands-on experience by practising various procedures such as intravenous line (IV) insertions, injections, nasogastric (NG) tube insertion, tracheostomy suctioning, and Foley catheter insertions (Ntlokonkulu, Rala and Goon, 2018).

2.3.1.3 High Fidelity Simulation (HFS)

These simulations focus on developing performance and practical skills. They offer the most realistic experience with extensive learner engagement in an environment closely resembling real-life situations. HFS utilise fully computerised mannequins that accurately replicate the anatomy and physiology of actual patients. These advanced mannequins can communicate, allowing students to enhance their communication and problem-solving abilities. Furthermore, high-fidelity mannequins can execute pre-programmed scenarios, enriching the learning experience (Lioce et al., 2020; Lei et al., 2022).

2.3.2 ‘Fidelity’ as a Concept

In the realm of simulation, ‘fidelity’ pertains to the degree of realism exhibited by the simulation, including its physical, conceptual, and psychological aspects (Lioce et al., 2020; Watts et al., 2021). It is imperative to recognise that fidelity is occasionally misconstrued as solely relating to
technological aspects. This misinterpretation overly accentuates the technical attributes of the equipment, disregarding its educational implications (Choi et al., 2017; Lavoie et al., 2020).

The subsequent information provides a thorough elucidation of how different aspects of fidelity contribute to the overall realism of the simulation.

2.2.2.1 Conceptual Fidelity

This ensures the logical coherence of the scenario. Are the laboratory procedures and medication choices aligned with the signs and symptoms presented by the patients? Professionals in the field must evaluate scenarios to optimise conceptual fidelity (Dieckmann, Gaba and Rall, 2007; Rudolph, Simon and Raemer, 2007).

2.2.2.2 Physical Fidelity

This denotes how closely the simulator resembles the appearance and tactile attributes of the actual system (Alexander et al., 2015).

2.2.2.3 Emotional or Psychological Fidelity

This concerns the extent to which a simulation can replicate the authentic experience of a real task, creating a sense of realism for students as they engage in the simulation (Munshi, Lababidi and Alyousef, 2015; Choi et al., 2017; Burford et al., 2023)

2.4 HFS in Nursing Education

Within the nursing profession, HFS has gained substantial popularity, leading to numerous nursing departments worldwide to incorporate it into their undergraduate nursing curricula (Breymier et al., 2015; Doolen et al., 2016; Aebersold, 2018). HFS leverages active learning principles to
enhance student engagement, providing nursing students with opportunities to refine their psychomotor and critical thinking skills (Butler, Veltre and Brady, 2009). Studies have also demonstrated that experiences facilitated by HFS bridge the gap between theory and practice for students (Butler, Veltre and Brady 2009; Wall, Andrus and Morrison, 2014; Fawaz and Hamdan-Mansour, 2016; Munangatire and Naidoo, 2017). The positive impacts of HFS on students encompass enhanced knowledge, self-confidence, performance, leadership skills, communication, clinical reasoning, critical thinking, and psychomotor skills (Bowling and Underwood, 2016; Doolen et al., 2016; Konieczny, 2016; Brien, Charette and Goudreau, 2017).

HFS holds the potential to effectively prepare students for safe practice, which could lead to improved quality of care (Konieczny, 2016). However, Munshi, Lababidi and Alyousef (2015) argue that HFS is not invariably superior to LFS; its effectiveness is contingent on the task and the learner’s educational level. Previous studies have often compared HFS and LFS primarily in terms of educational impact. This means that a comprehensive evaluation of each simulation must encompass aspects like fidelity, reliability, validity, and feasibility, while also explaining how each aspect influences students’ learning (Munshi, Lababidi and Alyousef, 2015). Similarly, Kim, Park and Shin (2016) assert that using the appropriate level of simulation to fulfil educational goals and outcomes is crucial, implying that HFS may not consistently outperform LFS. Thus, the effectiveness of HFS relies on teaching and learning approaches and the successful integration of theoretical knowledge with real-world scenarios (Butler, Veltre and Brady, 2009).

Nurse educators in developed countries like the USA and European nations have increasingly adopted HFS to enrich undergraduate nursing curricula (McGarry, Cashin and Fowler, 2014; Martins et al., 2018). While this is a positive stride towards preparing nursing students for complex clinical environments and high-quality patient care, the integration of new technologies, such as those involving human patient simulations, presents challenges. To address these challenges, governing bodies such as Nursing and Midwifery Council (NMC) in the UK and the National League for Nursing (NLN) in the USA offer essential guidance on using simulation effectively to support undergraduate learning (Motola et al., 2013). Although the current state of simulation education appears generally favourable, obstacles remain to be tackled (Jeffries, 2016). Among these challenges is the shortage of qualified and experienced teaching staff adept at seamlessly
integrating simulation into prelicensure/preregistration nursing programmes (Alexander et al., 2015).

Given the extensive adoption of HFS in nursing education, it becomes crucial to explore the perspectives and experiences of both educators and students regarding its implementation. Existing literature highlights the effectiveness of HFS compared to traditional instruction or clinical settings. Additionally, understanding the impact of these experiences on students and educators is crucial for guiding educational practices, addressing challenges, and ultimately enhancing learning outcomes. This study aims to enrich existing knowledge by providing insights into the experiences and interactions of educators and students within the context of HFS, ultimately contributing to the advancement of robust learning practices.

2.4.1 Characteristics of HFS in the Current Study

This section explains the specific types of mannequins and scenarios used within the HFS for the current study. It delves into the intricacies of HFS, detailing the chosen mannequin—particularly the widely recommended mannequin in Saudi Arabia—and the complexity level of the scenarios employed. To ensure privacy and confidentiality within the study’s settings, the visuals of HFS have been sourced from a referenced publication.¹

This control room, depicted in Figure 1, according to Levine et al. (2013), boasts features such as a one-way mirror to observe the ongoing simulation and facilitate swift adjustments. Soundproofing is implemented to minimise disturbances from observers. In cases of in situ simulation, innovative solutions like curtains or adjacent doorways are employed to create separation. Ideally, the control area should be located near the simulation zone (Figure 1), to enable convenient observation and post-scenario debriefing (Figure 2) (Levine et al., 2013).

¹ Adapted from [The Comprehensive Textbook of Healthcare Simulation] by [Levine et al.], published by [Springer Science and Business Media.], [2013].
SimMan™ (Figure 3), according to Levine et al. (2013), is a technologically advanced mannequin simulator that closely emulates a human in appearance and behaviour. Controlled by a computer, it features a specialised airway system for airway manipulation practice. SimMan™ can run pre-programmed scenarios or be operated in real-time. Additionally, it incorporates advanced
functionalities such as drug recognition, internal compressors, and reservoirs for water and simulated blood. This specific model of the mannequin has been equipped within the study’s setting.

To simulate realistic patient care scenarios, it is imperative to set up a simulation environment that closely resembles a real-life clinical setting. This entails having necessary equipment, such as a cardiac monitor, IV supplies, airway management tools, a defibrillator, and a code cart. Educators can access the scenario transcript and use a programme interface (Figure 4) to monitor and evaluate students’ actions throughout the simulation (Levine et al., 2013). The current study focused on the complex scenarios that go beyond basic simulations—these complexes underpin HFS sessions, enhancing students’ learning experience within the HFS framework and striving for a high level of learning outcomes.

*Figure 3: SimMan® 3G (source: Levine et al., 2013, p. 222).*
2.5 Part III: Overview of the Saudi context

2.5.1. The Geography of Saudi Arabia

Saudi Arabia, being the birthplace of Islam, holds the most sacred sites of Mecca and Medina (Janin and Kahlmeyer, 2015). Situated in the Arabian Peninsula, it shares borders with the Persian Gulf and the Red Sea (Al-Rasheed, 2010), occupying an expansive land area of approximately 2 million square kilometres (Central Intelligence Agency, 2023). The country maintains strong ties with neighbouring Gulf nations like Bahrain, the Emirates, Qatar, Oman, and Kuwait, as well as other countries including Iraq, Jordan, and Syria (Figure 5). Saudi Arabia is divided into thirteen regions, with Riyadh serving as the capital. Mecca and Medina hold profound religious significance, while Dammam and Jeddah function as major economic hubs. Arabic is the official language in Saudi Arabia and is widely spoken throughout society, though English is also taught and used, particularly in technology and sciences. While many professionals are fluent in both
English and Arabic, not the entire Saudi population is proficient in English, with around 30 percent possessing limited proficiency in the language (Albloushi et al., 2019).

![Map of Saudi Arabia](image)

*Figure 5: Map of the Kingdom of Saudi Arabia (OCHA, 2013)*

Saudi Arabia’s economic strength is largely derived from its oil and gas resources, which contribute to its robust global economy and reputation (Vision 2030, 2017). With the presence of the two holiest Islamic sites, the country assumes an elevated significance. Hence, delivering high-quality healthcare is considered crucial, not only for the Saudi populace but also for Muslims worldwide who visit the country for religious purposes (Janin and Kahlmeyer, 2015). This underscores the importance of conducting research within this context. Additionally, plans to increase Saudi Arabia’s population by 2025 adds further weight to the significance of studying healthcare in the country (United Nations, 2017).
2.5.2 Religion in Saudi Arabia

Islam predominates in Saudi Arabia, with approximately 95% of the population practising this faith (Koenig et al., 2014). Islam functions not only as a religion but also as an encompassing social system guiding daily life. It exerts a substantial influence on Saudi society, with numerous regulations and policies stemming from the Quran, Sunnah (teachings of Prophet Muhammad), and interpretations by Islamic scholars (Koenig et al., 2014). Islamic principles proscribe activities like alcohol consumption and suicide while promoting values such as good health, optimism, and respect for life. The norms of modesty outlined by Islamic necessitate specific body coverings, known as ‘awrah’, in the presence of unrelated individuals of the opposite gender (Bloomer and Al Mutair, 2013; AlYami and Watson, 2014). For females, this entails covering the entire body except for the face and hands, while for males, it spans from the navel to the knee (Bloomer and Al Mutair, 2013; AlYami and Watson, 2014). The influence of Islam is evident across various facets of Saudi society, including professional practices (Long, 2005). Understanding this religious context is pivotal for comprehending the factors shaping the experiences of nurse educators and students, as their religious beliefs and practices already exert an impact on their perspectives and actions. Exploring these religious aspects illuminates how these factors mould their roles and interactions within the realm of education.

2.5.3 Social and Culture Norms in Saudi Arabia

Saudi Arabia is distinguished by its unique cultural norms and hierarchical structure, significantly influencing the social dynamics and interactions within the society. This section delves further into these cultural norms and the concept of power distance within Saudi society, offering a comprehensive grasp of the study’s contextual backdrop.

In Saudi society, particular norms and values govern interactions and behaviour (DeLong-Bas, 2013; Alghamdi et al., 2019). One crucial aspect is respect for elders, where the oldest individual often assumes an authoritative role. This hierarchical arrangement is also evident in educational and professional domains, where deference and respect are bestowed upon those in higher
positions. Culturally, certain expectations guide individuals, with optimism and a positive outlook on life being highly valued (Al-Rasheed, 2013). Marriage and parenthood are considered fundamental to fulfilling societal and familial obligations. Raising children in accordance with cultural and religious principles is paramount. In addition, strong social connections hold immense value in Saudi Arabia, and a robust community network is deemed advantageous (Al-Rasheed, 2013). Traditional gender roles persist, with men typically responsible for providing for the family (Long, 2005), and women assuming the responsibilities of managing the household and caring for children. These gender roles are rooted in religious convictions and cultural norms, aiming to safeguard and support women (Al-Rasheed, 2013).

The concept of ‘power distance’ also holds significance. ‘Power distance’ refers to the degree to which authority and decision-making are centralised within a hierarchical framework (Weick, 2002). Saudi Arabia experiences a relatively high-power distance, signifying a distinct demarcation between those in positions of authority and those in subordinate roles. This hierarchical structure permeates numerous facets of life, including education, where students often exhibit deference and respect towards their teachers and instructors. Teachers’ authority is highly esteemed, and students are expected to heed instructions and abide by classroom regulations. Therefore, it is imperative to acknowledge that these cultural and hierarchical factors wield influence across multiple dimensions of life in Saudi Arabia, encompassing education, employment, and social interactions. They shape individuals’ expectations and behaviours within the society and contribute to the nation’s unique cultural fabric and social dynamics.

2.5.3.1 Cultural Tension and Nursing Education in Saudi Arabia

Saudi Arabia experiences a palpable tension between individuals advocating for the preservation of cultural norms and those advocating for progress and development, particularly in domains like education and the economy (Almutairi and McCarthy, 2012). This tension becomes most pronounced in the job market, particularly within professions like nursing, where questions about working in mixed-gender environments come to the forefront (Albloushi et al., 2019; Yaseen et al., 2021). These concerns reflect the ongoing discourse surrounding societal values and their
implications across various professional domains in Saudi Arabian society (Almutairi and McCarthy, 2012). Given that this dynamic significantly influences nursing and its educational framework in Saudi Arabia, grasping the nuances of Saudi society and identifying an educational model that harmonises with its values while fostering development was a foundational step in conducting the current study.

2.5.4 The Health Care System in Saudi Arabia

Since its inception in Mecca in 1925 by the Ministry of Health (MoH), Saudi Arabia’s healthcare system has undergone considerable development (Kinninmont, 2017; Al-Hanawi, Khan and Al-Borie, 2019). The government has introduced policies to offer free healthcare services to Saudi citizens (Al-Hanawi, 2017). With the population expanding rapidly, a well-equipped healthcare system is vital to meet the burgeoning demand (Al-Hanawi, 2017). The Saudization initiative, launched in 1992, aimed to reduce reliance on foreign healthcare professionals and create more employment opportunities for Saudi nationals (Sadi, 2013). In 2015, the government rolled out important updates and initiatives to bolster the local workforce, emphasising the creation of conducive work environments and the provision of training and development prospects for Saudi nationals in the healthcare sector (Sadi, 2013). The Ministry of Education (MoE) is committed to implementing Saudization policies and increasing the number of Saudi-trained nurses and healthcare professionals.

To effectively oversee the healthcare system and achieve these goals, the government instituted two specialised councils. These councils are responsible for regulations, plans, funding, and service coordination. However, a majority of hospitals in Saudi Arabia fall under the purview of the MoH (Sebai, Milaat and Al-Zulaibani, 2001). Within the context of Saudi Arabia’s healthcare system and the aspirations outlined in Vision 2030, this study zeroes in on understanding the experiences of students and educators as individual within the Saudi context. It seeks to furnish insights and findings aligned with the goals and aspirations of the country's transformative movement.
Chapter 2: Background

2.5.5 Nursing Education in Saudi Arabia

In 1958, the MoH in Saudi Arabia collaborated with the World Health Organisation (WHO) to establish the inaugural health institute programme in Riyadh. Subsequently, the MoH established a nursing programme in Jeddah, where students could obtain their degrees within a year (Aljohani, 2020). However, in 1981, the MoH partnered with Gulf countries to extend the nursing programme to three years (Tumulty, 2001). In 1976, the MoE introduced the initial nursing baccalaureate programme in Saudi Arabia at King Saud University in Riyadh. Following suit, King Abdulaziz University in Jeddah introduced a full BScN programme in 1977, and King Faisal University in Dammam implemented a similar programme in 1987 (Tumulty, 2001).

Apart from universities, nursing education in Saudi Arabia is also offered by 21 health institutes and 25 junior colleges (Albloushi et al., 2019). In 2008, management of all these institutions was shifted from the MoH to the Ministry of Higher Education (MoHE) to ensure the delivery of high-quality nursing education to students. This move aimed to leverage MoHE’s academic expertise, financial resources, and educational facilities to achieve this objective (Almalki, FitzGerald and Clark, 2011b). This transfer also enabled the MoH to prioritise its core function of delivering to Saudi Arabia’s populace (Almalki, FitzGerald and Clark, 2011a; Aljohani, 2020).

2.5.5.1 Bachelor of Science Degree in Nursing (BSN) in Saudi Arabia

Currently, nursing students in Saudi Arabia undergo a five-year university-level programme, culminating in the award of a BSN (Aljohani, 2020). English serves as the primary language of instruction in nursing colleges at Saudi universities, facilitated by instructors fluent in English (Alqahtani, 2022). English is also the language employed for learning resources such as texts, skills instructions, teaching slides and other learning materials (Albagawi, 2014). However, it is important to acknowledge that nurses and nursing assistants prepared through pre-degree programmes continue to hold value and serve for at least another decade. This endeavour seeks to reduce the reliance on foreign nurses and address the existing shortage of nursing professionals (Almalki, FitzGerald and Clark, 2011b). While nursing has evolved considerably in education and
practice, the nursing profession in Saudi Arabia still faces several challenges (Al-Dossary, 2018; Alghamdi et al., 2019; Aljohani, 2020; Alsadaan et al., 2021). Aside from the shortage of nurses, Al-Dossary (2018) and Alghamdi et al. (2019) have identified challenges in the underdeveloped education system and an unclear scope of practice. Gaining insights into the educational experiences of the key stakeholders—nurse educators and students—holds the potential to yield findings that support novel and improved strategies for nurse education aligned with Saudi aspirations (Landeen et al., 2015).

Currently, the first year of the BSN in Saudi Arabia is dedicated to building foundational knowledge. Students engage with general science courses, English language proficiency, and communication and learning skills, which are essential for attaining a bachelor's degree in nursing (Phillips, 1989). In the second and third years, students undertake specific nursing science courses such fundamental in nursing and adult nursing courses. The fourth year introduces specialised courses such as critical and emergency courses (for further details, refer to Chapter 5, section 5.4.4). The university is responsible for organising and overseeing the internship, ensuring that training transpires at designated sites (Phillips, 1989). The internship spans 52 weeks, including four weeks of scheduled holidays. During this period, nursing students rotate through various departments, including emergency, intensive care, medical-surgical, paediatric, maternity (for female students), psychiatric, and primary health care clinics. Presently, male students do not have the opportunity to gain real-life experience in perinatal care settings. However, as part of their undergraduate education, they receive extensive training utilising HFS mannequins and equipment (Aljohani, 2020).

2.5.5.2 Nursing Educational Environment in the Saudi Arabia

In Saudi Arabia, the education system adheres to a distinctive structure that segregates males and females from childhood through university. This gender segregation extends to the healthcare sector, where interactions between genders are limited in the patient-provider relationship. However, within the healthcare workforce, both male and female professionals are expected to collaborate as colleagues (Carty et al., 1998). Employment laws in Saudi Arabia permit men and
women to work together exclusively in hospitals (Vidyasagar and Rea, 2004). Nevertheless, a previous study (Yaseen et al., 2021) reported that female nurses encounter challenges in delivering care to male patients in clinical settings. This is also consistent with the findings of an earlier study by El Gilany and Al Wehady (2001), which revealed that 98.3 percent of female Saudi nurses expressed reluctance to provide care to male patients.

Gender-related barriers have been identified in Saudi nursing education, affecting both students’ academic readiness and healthcare institutions’ expectations of nursing graduates (Aljohani, 2020; Yaseen et al., 2021). In Saudi Arabia, cultural norms impose restrictions on male students, prohibiting their training in units specific to females, such as maternity and delivery rooms (Aljohani, 2020). Similarly, female students may face limitations in accessing male-specific units. Consequently, nursing schools have established sophisticated simulation laboratories to bridge the practical experience gap in these specific areas. However, concrete evidence to support the implementation of gender quotas for nursing students remains inadequate.

According to the Saudi Commission for Health Specialties (SCFHS) report, the number of female students enrolled in nursing programmes surpasses that of male students (Alomran et al., 2017). However, the report does not address the gender-specific needs of the healthcare system (Aljohani, 2020). This underscores the significance of further exploration into the challenges encountered by male and female nursing students, including the mismatch between learning outcomes and real-world experiences, limited practice opportunities, and language barriers. Addressing these gender-related issues in nursing education is crucial for the advancement and growth of the nursing profession in Saudi Arabia, as emphasised in a previous study (Al-Dossary, 2018). Policymakers should focus on mitigating the nursing shortage and refining nursing education strategies in alignment with the Vision 2030 goals. These findings suggest the necessity for targeted interventions tailored to the Saudi context.
2.5.6 Nursing as a Profession in the Saudi Arabian Context

As previously discussed, the nursing profession in Saudi Arabia encounters several challenges, including an underdeveloped education programme that could be seen as training nurses rather than educating them. Furthermore, a notable issue is that nurses are not held truly accountable for their actions, primarily because they operate under the control of medical professionals. As a consequence, nurses are not ultimately responsible for their decisions (Lamadah and Sayed, 2014). While medical errors persist within Saudi hospitals (Alshaikh, Mayet, and Aljadhey, 2013; Alreshidi, 2016), scant research exists that highlights the importance of integrating simulation into nursing curricula as a transformative strategy (Al-Elq, 2010; Anderson et al., 2012; Al-Ghareeb and Cooper, 2016). To address these challenges, Saudi Arabia aims to elevate the profession's status to make it an esteemed career choice (Almalki, FitzGerald and Clark, 2011b). As part of this effort, Almalki, FitzGerald and Clark (2011b) propose reducing the required training duration to three years—the norm in most developed countries—instead of the current five-year requirement (Almalki, FitzGerald and Clark, 2011b). Concurrently, the sector must ensure that nursing students graduate with a thorough awareness of and competence in safe practices (Almalki, FitzGerald and Clark, 2011b; Alshaikh, Mayet, and Aljadhey, 2013; Alreshidi, 2016). As the population expands, urgent reforms are necessary to ensure an adequate number of well-trained nurses capable of providing high-quality care (Jardi et al., 2013; AIYami and Watson, 2014). Consequently, the present study focuses on HFS as a critical component in achieving this objective.

2.5.7 The State of Nursing Simulation in the Saudi Context: The Current Landscape

To address the existing gap in nursing education in Saudi Arabia and raise standards to align with the government's vision, a thorough exploration of current practices is crucial. Despite the existence of five well-equipped simulation centres, nursing education continues to face challenges, while medical errors persist. This study endeavours to better equip nursing students to navigate the complexities of real-world healthcare settings, particularly within the Saudi context, by harnessing the potential of simulation.
The integration of simulation learning into nursing education is steadily advancing in Saudi Arabia. The country is home to five simulation centres, with three situated at renowned public universities: King Saud University, Princess Nourah Binit Abdulrahman University, and King Abdulaziz University. The remaining two centres were established by governmental agencies and are located at King Fahad Medical City (Saudi Society of Simulation in healthcare, 2019). Simulation holds a pivotal role in nursing curricula to achieve the desired learning outcomes for delivering high-quality nursing care to Saudi society (Al-Dossary, 2018; Alsufyani et al., 2020). This was supported by the Saudi government’s announcement in 2016 regarding a transformation plan, coined Vision 2030, that utilises natural resources and investments outside of the oil industry. One of the key objectives developed by the MoE to meet nursing education standards was the improvement of nursing curricula and instructional methods (Al-Dossary, 2018; Alsufyani et al., 2020). Simulation serves to enrich the learning process, offering a hands-on approach that allows nursing students to practice real-world clinical scenarios in a controlled, risk-free environment. This immersive experience fosters critical thinking and enhances confidence. Given the tangible benefits and the global trend towards experiential learning, numerous nursing schools in Saudi universities are presently allocating substantial funds towards HFS equipment. However, these valuable resources often fall short of their potential owing to a lack of comprehensive documentation on their utilisation. This study is critical within this context, as it seeks to explore and address the perceived deficit in Saudi Arabia.

Few studies have focused on nursing students’ experiences with HFS as a learning and assessment tool in Saudi Arabia. While HFS has been associated with improved self-efficacy, confidence, knowledge, and skill levels in clinical settings (Saied, 2017; Al-Zayedi and Mansour, 2018; Alkhalaf and Wazqar, 2022), these studies commonly overlook how students and educators perceive these simulation learning experiences and the factors that impact learning processes and outcomes. This gap is illuminated in previous studies (Al Hazmi and Windsor, 2013; Al Mutair and Al Mana, 2015), which report that the role of nurse educators remains unclear, especially within the Saudi Arabian context. The expanded role of nurse educators in Saudi Arabia is a relatively recent development, leading to limited historical documentation on nurse educators in the country (Al Hazmi and Windsor, 2013). Thus, the present study is poised to be among the first to explore nurse educators’ and students’ experiences with HFS. The ultimate aim is to enhance
the quality of nursing education in Saudi universities. Nurse educators and students together play a pivotal role in facilitating and actively participating in HFS, working towards achieving desired outcomes for the nursing profession in Saudi Arabia.

2.6 Conclusion

Previous research has demonstrated the global success of integrating HFS into nursing education, yielding improvements in various student learning dimensions such as knowledge acquisition, self-confidence, satisfaction, critical thinking, and psychomotor skills (Butler, Veltre and Brady, 2009; Aqel and Ahmad, 2014; Wall, Andrus and Morrison 2014; Badir et al., 2015; Üzen Cura et al., 2020). However, certain studies have presented counterarguments suggesting that the differences between HFS and alternative teaching methods might not be significant. Given these divergent findings, coupled with ongoing changes in nursing education in Saudi Arabia, it appears pertinent to explore the effectiveness of HFS within the high-resource environment of Saudi Arabia, where HFS has recently been introduced into nursing education.

Furthermore, Saudi Arabia’s societal and cultural frameworks, shaped by religious and societal norms, have significantly influenced the education system and nursing practices. Nonetheless, there exists a paucity of research that delves specifically into the experiences of nursing students and educators within the Saudi context. Gaining insights into these experiences is vital for both students and educators, fostering a deeper understanding of the educational landscape and the factors influencing their experiences. With this in mind, the present study sought to contribute to the existing knowledge base by investigating the effectiveness of HFS within the Saudi setting. Additionally, it aims to shed light on the distinct experiences of nursing students and educators. By addressing this research gap, the study intends to offer invaluable perspectives to enhance nursing education and propel the nursing profession in Saudi Arabia.
Chapter 3: Literature Review
3.1 Introduction

This chapter offers a comprehensive exploration of the global integration of high-fidelity simulation (HFS) into nursing curricula. The chapter presents an analysis of the evidence base, delving into the utilisation, implementation, and processing of HFS within nursing education. The purpose of this literature review was to evaluate, synthesise, and explore the existing body of literature encompassing both theoretical and empirical studies that employ HFS in nursing education. Furthermore, this review places significant emphasis on discerning the perspectives of educators and students regarding the technology's efficacy in teaching and learning. A central goal of this review was to identify the gaps within the current literature, thereby highlighting the pressing need for future research endeavours.

3.2 Defining the Scope of the Review

The investigation into integrated HFS within nursing education encompasses a diverse array of theoretical and empirical studies, employing various research methodologies such as quantitative, qualitative, and mixed-methods. These studies range from quasi-experimental designs to randomised controlled trials (RCTs), observational studies, and descriptive approaches. Within the expansive body of literature, much emphasis has been placed on demonstrating how the integration of HFS into nursing curricula can enhance the teaching and learning processes. The focal point of a considerable body of quantitative research has been measuring skills, abilities, perspectives, feelings, attitudes, and experiences pertaining to the incorporation of this technology into education, along with understanding how students and educators interact within educational environments and in clinical contexts with patients. Therefore, this literature review draws on a broad and diverse literature base to inform its analysis.

One of the main objectives of this review was to identify the shared experiences of educators and students who have engaged with HFS, while also investigating their perceptions and emotions regarding its utilisation in complex scenarios. The review seeks to elucidate the factors that contribute to effective HFS implementation, as well as those that may hinder its effectiveness.
Furthermore, it aims to assess the impact of incorporating HFS into nursing education and to gauge the accomplishments yielded through this technological integration. Equally important has been the objective to comprehend the findings of international research concerning HFS, shedding light on the factors that shape the teaching and learning processes within HFS.

Despite a handful of studies that have attempted to examine HFS in the Middle East context, a singular study has been conducted on the experiences of nursing students in Saudi Arabia. Given the relative lack of knowledge about HFS in the Saudi context, it was imperative to draw insights from research conducted in other countries to better understand the application of HFS in Saudi nursing education. The review encompasses a wide spectrum of research methods, including qualitative, quantitative, and mixed-methods studies. In Section 3.3.2, the review expounds on the criteria for inclusion and exclusion, outlines the screening process, and highlights the studies that were excluded from the analysis.

3.3 Review Methodology

The aim of this review is to comprehensively examine the evidence concerning the operation and integration of HFS in nursing education, as well as the effects resulting from the implementation of this technology. Moreover, it was essential to systematically identify the facilitators of and barriers to HFS in nursing education. Nevertheless, the primary goal of this review was not interpretative, as it did not involve conducting a meta-analysis or systematic review (Russo, 2007). The main objectives of this review were to identify, explore, and assess the impact of HFS on nursing curricula, educators, and students. Identifying gaps and addressing issues within the literature review was another crucial objective. The review has been conducted using diverse databases and grey literature, along with employing search strategies and predetermined key terms (Jesson et al., 2011).
3.3.1 Search Strategy

This review systematically utilised seven databases: i) Cumulative Index for Nursing and Allied Health Literature (CINAHL Plus), ii) Ovid MEDLINE(R), iii) APA PsycInfo, iv) Excerpta Medica Database (Embase), v) British Education Index, vi) The Education Resources Information Centre (ERIC), and vii) SPORTDiscus, along with Google Scholar. The key terms employed in the review are listed in Table 1. These key terms varied depending on the database, as some databases required truncation.

Given the limited nursing studies published in the Middle Eastern and Saudi contexts, it was imperative to gain insight into global research on HFS. As HFS represents a relatively recent teaching innovation in nursing, being up to date with the most recent publications in this domain was essential. Additionally, the review focused on studies published in the last ten years, as the literature indicated a significant surge in HFS-related research during this timeframe. The articles considered for inclusion in this review were either published in English-language journals or translated into English within the specified decade. The articles were screened and reviewed based on their methodological quality and relevance to determine whether they met the criteria for inclusion or exclusion (Jesson et al., 2011). The specific inclusion and exclusion criteria are elaborated upon in Section 3.3.2.

Table 1 Search terms

<table>
<thead>
<tr>
<th>Or</th>
<th>And</th>
<th>And</th>
<th>And</th>
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</tr>
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<tbody>
<tr>
<td>High fidelity simulation.</td>
<td>Experience (s).</td>
<td>Complex Scenario (s).</td>
<td>Educator (s).</td>
<td>Student (s).</td>
</tr>
<tr>
<td>High patient simulator.</td>
<td>Perception (s).</td>
<td>Critical Scenario(s).</td>
<td>Teacher (s).</td>
<td>Learner (s).</td>
</tr>
<tr>
<td>High fidelity simulate (s).</td>
<td>Perspective (s).</td>
<td>Attitude (s).</td>
<td>Faculty.</td>
<td></td>
</tr>
<tr>
<td>3G Simman.</td>
<td>Feeling (s).</td>
<td></td>
<td>Trainer (s).</td>
<td></td>
</tr>
<tr>
<td>Simman.</td>
<td></td>
<td></td>
<td>Mentor (s).</td>
<td></td>
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<tr>
<td>High fidelity mannequin (s).</td>
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<td></td>
</tr>
<tr>
<td>High fidelity mannequin (s).</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Nurse (s).</td>
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</table>

Chapter 3: Literature Review
3.3.2 Eligibility Criteria

It was crucial to incorporate studies that elucidated the utilisation of HFS in educational settings and provided insights into the experiences of educators or students within undergraduate programmes. The inclusion and exclusion of studies were determined by the eligibility criteria, as outlined in Table 2.

3.3.2.1 Assessment Quality Tool

Throughout the literature review, the Mixed Methods Appraisal Tool (MMAT) was employed to evaluate different study designs (Hong et al., 2018). The MMAT is designed to assess the quality of various types of research, including qualitative, quantitative, and mixed-methods studies (Hong et al., 2018). While this review does not involve a systematic review, the assessment tool proved valuable in appraising the studies and determining whether studies should be included or excluded, based on the criteria outlined in Table 2. Studies characterised by inadequate methodology or poor quality were excluded from the review. The inclusion of this process in the review underscores its emphasis on maintaining a high standard of methodological rigour (Hong et al., 2018).

In this study’s literature review, the MMAT was not employed as an appraisal tool for a systematic review but served as a guiding framework. The purpose was to critically assess the methodologies of included studies in a systematic manner, acknowledging that this literature review is not structured as a systematic review. Despite the MMAT’s traditional association with systematic reviews, Hong et al. (2018) highlighted its applicability applicable to broader research evaluations, making it apt for this study. The MMAT systematically critiqued the qualitative, quantitative, and mixed-methods research included in the review. Each study design was evaluated against the MMAT criteria, which facilitated an in-depth analysis of their designs and methodologies and helped identify both strengths and limitations within the evidence base.
This careful application of the MMAT criteria ensured that the review was grounded in a systematic evaluation of methodological quality. The tool’s structured approach for a thorough dissection of each study’s methodology, providing a rigorous critique that, in turn, informed the synthesis of the literature. By providing a framework to structure my thinking, the MMAT supported a methodologically robust critique throughout the review process.

Table 2: Inclusion and exclusion criteria for studies

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Articles utilising, operating, or integrating HFS.</td>
<td>1. Articles discussing simulation in general, rather than focusing specifically on HFS.</td>
</tr>
<tr>
<td>2. Articles discussing the impact of HFS on the teaching or learning process.</td>
<td>2. Articles discussing a particular intervention or model, such as virtual simulation (VR).</td>
</tr>
<tr>
<td>3. Nursing education articles that discuss HFS or complex scenarios using mannequins as the primary focus.</td>
<td>3. Articles that use standardised patients or other teaching methods as their primary focus.</td>
</tr>
<tr>
<td>4. Research focusing on nurse educators or nursing students.</td>
<td>4. Research focusing on interprofessional sessions involving both nurses and doctors.</td>
</tr>
<tr>
<td>5. Participants (educators or students) in undergraduate nursing programmes (bachelor’s).</td>
<td>5. Articles focusing on accelerated or postgraduate programmes.</td>
</tr>
<tr>
<td>6. Articles discussing medical-surgical subjects.</td>
<td>6. Articles discussing non-medical-surgical subjects, such as obstetrics, paediatrics, community, and mental health.</td>
</tr>
<tr>
<td>7. Articles conducted in an educational setting.</td>
<td>7. Articles conducted in a clinical or hospital setting.</td>
</tr>
<tr>
<td>8. Articles written between 2012 and 2023 and written in English or English translation.</td>
<td>8. Articles published outside the timeframe of 2012–2023 and written in a language other than English.</td>
</tr>
<tr>
<td>9. Only articles that include primary data.</td>
<td>9. Articles containing secondary data, including systematic reviews and integrative reviews.</td>
</tr>
</tbody>
</table>
3.4 Findings

3.4.1 Literature Search Results

Using the search terms listed in Table 1, a simultaneous search was conducted in Ovid MEDLINE(R); this search combined two databases: APA PsycInfo and Excerpta Medica Database (Embase), resulting in a total of 690 articles after removing duplicates and applying the timeframe. Upon reviewing the titles, 582 articles were deemed irrelevant. Subsequently, the abstracts of the remaining 108 articles were examined, of which 66 were eliminated based on abstract content. Finally, the eligibility of 42 articles was assessed.

A combined search of the CINAHL Plus database and three additional databases, namely the British Education Index, ERIC, and SPORT Discus, yielded a total of 550 articles. After removing duplicates and considering language and timeframe criteria, 362 articles remained. Following a review of the titles, 188 articles were deemed relevant. Upon assessing the complete abstracts of these 188 articles, 164 were excluded. The eligibility criteria were then applied to the remaining 24 articles. Figure 6 provides a breakdown of the reasons for excluding certain articles.

To determine the inclusion or exclusion of articles, a total of 66 full-text articles were read and evaluated for their eligibility based on predefined criteria. Among these, 24 articles met the inclusion criteria and were consequently included in the review. The entire process of article selection, as well as the number of articles included, is illustrated using a PRISMA diagram in Figure 6. For a comprehensive overview of the included articles, a summary of each article is presented in the Appendices Appendix 2, Appendix 3, Appendix 4.
Records identified from:
MEDLINE(R); APA PsycInfo; Embase Classic; Ovid
MEDLINE(R) and Epub Ahead: (n = 690)
CINAHL Plus; British Education Index; ERIC; SPORTDiscus: (n = 550)

Records screened (n = 303)

Reports sought for retrieval (n = 127)

Reports assessed for eligibility (n = 66)

Studies included in the review (n = 24)

Additional records retrieved through other sources:
Google Scholar: (n = 7).

The total number of records identified from all sources:
(n = 1,247)

Records removed before screening:
Duplicate records removed and deemed ineligible by automation tools:
(n = 944)

Records excluded (n = 176)

Reports not retrieved (n = 61)

Reports excluded for reasons (n = 42):
- Virtual simulation = 4
- Irrelevant subject (non-medical surgical) = 12
- Specific model or interventions used = 5
- Different degree program (not undergraduate) = 8
- Not focusing on HFS = 4
- Irrelevant to educational settings = 5
- Methodological issues = 4

Figure 6: Flow diagram of selection criteria
3.4.2 General Study Features

The articles' primary findings were extracted and organised using a matrix framework (see Appendix 2, Appendix 3, Appendix 4). Of the 24 studies, there were 9 qualitative, 9 quantitative, and 6 mixed-methods studies. Table 3 presents the various approaches employed in these studies and their global distribution. Each study in this literature review elaborates on the integration of HFS on both local and global levels, capturing insights from students and educators following their exposure to HFS as a learning and teaching strategy. The ensuing Section 3.5 describes the specific themes and subthemes under which the main study findings have been categorised and explored.

Table 3: Distribution of studies based on methodology and geographical context

<table>
<thead>
<tr>
<th>Type of studies</th>
<th>North and South America</th>
<th>Canada</th>
<th>Europe</th>
<th>Oceania</th>
<th>Middle East</th>
<th>East Asia</th>
<th>Africa</th>
<th>Total number of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative studies</td>
<td>3 USA 1 Brazil</td>
<td>N/A</td>
<td>1 Poland</td>
<td>N/A</td>
<td>1 Saudi Arabia 1 Lebanon 1 Jordan</td>
<td>N/A</td>
<td>1 South Africa 9</td>
<td></td>
</tr>
<tr>
<td>Mixed-methods studies</td>
<td>1 USA 1 Canada 1 Spain 1 Australia</td>
<td>N/A</td>
<td></td>
<td></td>
<td>1 China 1 Korea</td>
<td>N/A</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Qualitative studies</td>
<td>2 USA 1 Canada 1 Spain 1 Australia</td>
<td></td>
<td></td>
<td></td>
<td>1 Turkey 1 Korea 1 Singapore 1 Macau</td>
<td>N/A</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>7 2 3 2 4 5 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

3.5 Main Themes

The findings of the literature review have been organised based on the hierarchy of evidence, starting with quantitative studies, followed by mixed-methods, and finally, qualitative studies. As shown in Table 4, the key findings have been classified into three primary themes and their
respective subthemes. Each theme encompasses a singular approach study, while each subtheme is presented in a chronological sequence.

Table 4: Major themes and subthemes in the literature review

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Influence of HFS on students and educators</td>
<td>1.1 Impact of utilising HFS on students' skills and knowledge</td>
<td>Quantitative studies</td>
</tr>
<tr>
<td></td>
<td>1.2 Effectiveness of different student roles in HFS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3 Challenges of HFS from the perspectives of educators and students</td>
<td></td>
</tr>
<tr>
<td>2. Status of HFS in nursing education</td>
<td>2.1 Skill transfer from HFS to practice</td>
<td>Mixed-methods studies</td>
</tr>
<tr>
<td></td>
<td>2.2 Factors influencing students and educators</td>
<td></td>
</tr>
<tr>
<td>3. Importance of establishing a collaborative HFS environment</td>
<td>3.1 Value of communication between educators and students</td>
<td>Qualitative studies</td>
</tr>
<tr>
<td></td>
<td>3.2 Role of interaction in enhancing the level of realism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3 Educators’ and students’ responsibilities for psychological safety</td>
<td></td>
</tr>
</tbody>
</table>

3.5.1 Influence of HFS on Students and Educators

A total of nine quantitative studies on this topic were identified. These comprised six quasi-experimental studies, two randomised trials involving two participant groups, and one quantitative descriptive study. Detailed summaries and characteristics of each of these studies are presented in Appendix 2. Within this theme, three distinct subthemes emerged.
Within this subtheme, three studies were identified that specifically explored the effects of HFS on learning outcomes, shedding light on how this technology influences student learning. All three studies focused solely on nursing students, with two being quasi-experimental and one being a randomised two-arm trial.

Examining the effectiveness of HFS and its influence on the competence of nursing students from Saudi Arabia in managing chemotherapy extravasation in cancer patients, Alkhalaf and Wazqar (2022) assessed how these factors subsequently facilitated the transfer of skills to practical settings. The student cohort comprised participants from a third-year Bachelor of Nursing programme (n = 68, average age = 21 years), with no available gender data. Employing a quasi-experimental two-group pre- and post-test design, the study implemented scenario-based HFS during the intervention, albeit without explicit scenario validation. Competency in chemotherapy extravasation was gauged using a standardised assessment checklist called Extravasation Chemotherapy Management Competency, originally developed by Beaurivage and Roland in 2002.

The study began by pretesting the competency of the 68 students who underwent training sessions related to chemotherapy extravasation. Subsequently, the third-year nursing students were randomly assigned to either the intervention or control groups through convenience sampling. The intervention group engaged in HFS sessions, involving case study scenarios, mannequins, and trainer tasks. Meanwhile, the control group adhered to traditional laboratory practices for managing chemotherapy extravasation. Post-tests were conducted immediately after the intervention in the laboratory, with a follow-up post-test conducted at the end of the semester.

Interestingly, post-intervention results revealed that the control group exhibited lower competency scores compared to the intervention group, despite skill transfer scores not being statistically significant. An intriguing implication was drawn, suggesting that nurse educators have the flexibility to choose either HFS or traditional teaching methods to effectively address
chemotherapy extravasation. Alkhalaf emphasised the necessity for more research on the transfer of nursing students' skills to clinical settings in Saudi Arabia. Nevertheless, Alkhalaf's (2022) study has a few limitations, such as its small sample size of 68 students (Handley et al., 2018), which may limit its ability to accurately detect small or moderate effects, consequently affecting the findings’ generalisability (Faber and Fonseca, 2014). Additionally, the study’s dual follow-up assessments, immediately post-intervention and three months later, might require a more extended duration to thoroughly assess the intervention’s long-term impact (Domanski and McKinlay, 2009). Prolonged follow-up periods would provide a more holistic perspective on the sustainability of the observed outcomes (Handley et al., 2018). Furthermore, the recommendation of HFS over the control group could be seen as contradictory, considering the control group’s lower competency levels despite random allocation. This raises concerns about the findings’ validity and reliability, as well as the appropriateness of the recommendation. Furthermore, the absence of information regarding the gender distribution of the participants hinders understanding potential gender-related disparities or biases that could have influenced the results.

In contrast to these findings, Aqel and Ahmad (2014) contend that HFS assists students in augmenting and retaining their knowledge of nursing procedures, such as cardiopulmonary resuscitation. Thus, they advocate for integrating HFS into nursing curricula to enhance knowledge retention. Their research, conducted in Jordan, explored the impact of HFS on students’ knowledge retention and cardiopulmonary resuscitation (CPR) skills through a randomised two-arm trial, comparing HFS with low-fidelity simulation (LFS). The study involved 124 second-year undergraduate nursing students, although only 90 students completed all phases, resulting in groups of 45 participants each. The majority of participants were female, aged between 19 and 28 years.

The study employed a two-part instrument. Initially, a demographic data sheet was used to detect any potential variations between the groups. The second section was a 14-item multiple-choice questionnaire regarding CPR knowledge, adapted from The American Heart Association (AHA, 2012). This test was used to evaluate CPR knowledge during both the baseline and acquisition phases of the study. After completing the pre-test examination on CPR knowledge, students participated in a traditional lecture that involved PowerPoint slides, covering CPR knowledge over
a 4-hour session. The intervention consisted of a PowerPoint presentation elucidating adult basic life support and automated external defibrillator techniques. Practical demonstrations were also provided using a CPR mannequin. Additionally, the intervention group received training on HFS, although the specific instructor of this training remains unclear. Following these initial steps, the participants were randomly divided into two groups: the control group and the intervention group. Subsequently, they underwent post-test assessments for both knowledge and skills immediately after the intervention and again after a three-month interval for knowledge and skills retention assessment.

The findings from the study by Aqel and Ahmad (2014) reveal that students in the HFS group demonstrated more effective CPR knowledge and skill acquisition and retention compared to those in the LFS group. Nevertheless, during the three-month follow-up examination, both groups exhibited decreased levels of knowledge and skills. Employing a three-month follow-up period may entail limitations in adequately assessing the long-term retention of knowledge and skills. Ideally, one would expect to observe an increase or at the very least, sustained levels of knowledge and skills over time. Therefore, it is imperative to consider the necessity for extended follow-up periods to accurately gauge the long-term impact of the intervention (Domanski and McKinlay, 2009; Handley et al., 2018). Furthermore, using the term ‘knowledge and skill retention’ as opposed to ‘knowledge retention’ would provide a more comprehensive grasp of the intended outcomes. Additionally, one notable limitation is the absence of information regarding whether the participants were blinded to their group assignment. Implementing blinding measures aids in mitigating bias and ensures that the evaluation of outcomes remains uninfluenced by knowledge of group allocation.

Aqel and Ahmad's study (2014) offers recommendations aimed at assisting nurse educators in effectively integrating HFS and implementing CPR simulation scenarios. This guidance serves to enhance the educators' and students' knowledge base related to these critical skills. Furthermore, the study underscores the importance of integrating HFS, particularly given the challenges of clinical staff shortages and the growing number of nursing students. The authors advocate for increased utilisation of HFS and emphasise the creation of diverse scenarios tailored to specific learning objectives. As suggested by Aqel and Ahmad (2014), the incorporation of clinical
scenarios becomes pivotal in preventing the loss of knowledge, thereby facilitating nurses’ interaction with and application of knowledge within real-world settings. Consequently, in light of these insights, it becomes crucial to incorporate this aspect into future studies, given the pressing need to gain a deeper understanding of how HFS’s influence on students’ learning persists over the long term, especially within the Saudi Arabian context.

Differing from Alkhalaf and Wazqar (2022) and Aqel and Ahmad (2014), Shinnick and Woo (2013) present an alternative perspective. They contend that HFS might not always be the preferred teaching method due to its limited effectiveness in helping students acquire and develop all necessary skills, despite its role in enhancing knowledge—unlike the outcomes observed in the other studies. Shinnick and Woo (2013) conducted a single-group quasi-experimental pre-test post-test design study aimed at identifying prelicensure American nursing students with the highest critical thinking scores before and after exposure to human patient simulation. The study involved a sample of 154 students, with an average age of 25 years, recruited through convenience sampling. Most participants were female, and they were selected from three schools sharing a common curriculum. Shinnick and Woo’s (2013) study employed a single-group design without a control group. It utilised a variety of tools and scales to evaluate critical thinking, knowledge, and self-confidence among the participants. These tools included the Sciences Reasoning Test (HSRT), the Kolb Learning Style Inventory, as well as scenarios created by the authors and a knowledge scale. All scales and tools had been validated. Prior to their exposure to the simulation session, students underwent a pre-test evaluation. Following two weeks of engagement with the HFP session, students then completed a post-test assessment.

Shinnick and Woo (2013) found that the effect of HFS on students’ knowledge acquisition and the development of other vital skills was not clearly demonstrated. According to Shinnick and Woo (2013), an increase in knowledge does not necessarily lead to changes in students’ critical thinking or other skill areas such as cognitive or behavioural/psychomotor skills. Nonetheless, the study itself presents several limitations. One key limitation of the study’s one-group quasi-experimental design is the absence of a control group (Berger, 2007). This absence makes it challenging to definitively ascertain the actual effectiveness of the intervention (Handley et al., 2018). Additionally, the study lacked a baseline for comparison, which limits the ability to contrast the
intervention group’s outcomes with those of another group. Another limitation is that the study lacks detailed information about participant selection bias and how it was managed (Berger, 2007). Participant selection bias can introduce confounding variables that influence the study’s outcomes, thus posing a potential limitation to the findings’ validity. Additionally, the relatively short two-week follow-up period could potentially restrict the study’s capacity to thoroughly evaluate the long-term effects of the intervention (Domanski and McKinlay, 2009). This brief duration might not capture the complete extent of the intervention’s impact over an extended period. To address these limitations, future research endeavours should aim for more rigorous methodologies; incorporating control groups, establishing baselines for comparison, and addressing participant selection bias will help enhance the study's validity. Additionally, extending the follow-up period could provide a clearer understanding of the intervention's sustained effects.

3.5.1.1.1 Conclusion

In essence, this subtheme has highlighted studies investigating the impact of HFS on students, comparing it to other educational tools with varying levels of fidelity, including mainstream fidelity. The aforementioned three studies collectively reveal that HFS contributes to the enhancement of cognitive and psychomotor skills. However, these studies fall short of reconciling the contradictory viewpoints surrounding HFS. Notably, two of the studies discussed in this subtheme were conducted within Islamic nations in the Middle East, with one specifically in Saudi Arabia. Despite the shared religious and sociocultural backdrop, these studies have not elucidated the sociocultural or other factors that potentially influence student learning within such communities or societies. Consequently, these shortcomings warrant further investigations to gain a deeper understanding of the experiences of educators and students in Saudi Arabia who utilise HFS.

Furthermore, a debate has emerged concerning the effectiveness of HFS and its impact on student learning outcomes. While some studies conclude that HFS does not hold superiority and that nursing education can successfully transition skills to practise using either HFS or traditional teaching methods, others present opposing viewpoints. Although previous studies have employed
a range of research designs like quasi-experiments and RCTs, they still lack comprehensive explanations of the dynamics at play during HFS sessions and the most effective instructional strategies for seamlessly integrating HFS into nursing curricula. HFS entails more than simply assessing cognitive skills to augment knowledge—it embodies a broader scope.

It should be noted that the aforementioned three studies have examined the development of competency and knowledge through skills. However, it is important to address the validation of the skill itself, as this is a significant gap that these studies must address. Moreover, the previous studies have solely focused on knowledge and cognitive and psychomotor skills—areas where HFS excels. Nevertheless, it is crucial to recognise that these studies have several design limitations (as previously explained) that affect the results. Therefore, a robust exploration of HFS’s potential necessitates further research employing rigorous methodologies to rectify these limitations and explore the full potential of HFS. Given the conflicting outcomes regarding the efficacy of HFS, these incongruities have spurred me to undertake the current study. This investigation aims to ascertain the impact of HFS on learning from two vantage points: that of the educators and the students. Additionally, I seek to establish how nursing students’ skills are effectively transferred from HFS to practical application within the context of Saudi Arabia.

3.5.1.2 Effectiveness of Different Student Roles in HFS

This subtheme encompasses three studies that present arguments concerning the distinct roles of students (as observers or participants) and their impact on final learning outcomes. This subtheme comprises three quasi-experimental studies with an exclusive focus on students. Two of these studies were conducted in the USA, and one in Lebanon.

Bates et al. (2019) conducted a single-group quasi-experimental study in the USA to ascertain whether the anxiety levels differ between students in observer and active roles and how these roles affect their learning outcomes. The study involved a non-random sample of 132 undergraduate students at sophomore and junior levels. Although participants’ gender and age were mentioned, no accompanying table provided these details.
Bates *et al.* (2019) employed the NLN Jeffries Simulation Theory (NJST) as the theoretical framework and designed simulation activities based on this theory. These activities included a pre-briefing session introducing the scenario and a post-briefing session at the conclusion of the three-week activity. Data were collected in three phases. Following the pre-briefing, students’ simulation roles were randomly assigned by drawing roles from a hat. The roles encompassed observers (n = 3, 4, or 5) and active participants (n = 4), yet the precise numbers for each group were not specified. On the one hand, the active participants engaged fully in the session, administering medication and practising skills. On the other hand, observers played a supportive role. The study utilised validated tools to assess anxiety levels, satisfaction, self-confidence, problem-solving skills, and clinical abilities, including i) the State-Trait Anxiety Inventory for Adults, ii) the Student Satisfaction and Self-Confidence in Learning Scale, and iii) the Simulation Learning Effectiveness Inventory.

Bates *et al.* (2019) affirmed the importance of diverse student roles in the HFS. Their study highlights the value of assigning students to both active and observer roles, facilitating the achievement of learning objectives. Their study identified elevated anxiety levels, given role responsibilities, which decreased after simulation completion. The lack of a control group was a study limitation. Incorporating both intervention and control groups could have enabled comparisons of the findings (Handley *et al.*, 2018). In addition, Bates’s study employed a non-random sample, introducing selection bias that could distort estimates and reduce the generalisability of the study’s findings; even when randomisation was carried out later, the total numbers were not clear (Berger, 2007; Handley *et al.*, 2018). Additionally, since the study spanned multiple days over three weeks, contamination between groups was possible. The absence of a demographic table detailing participants’ backgrounds is worth noting. Consequently, further studies with rigorous designs are necessary to address these limitations and comprehensively explore students’ roles in HFS.

Scherer *et al.* (2016) presented a perspective that aligned with the findings of Bates *et al.* (2019) on the importance of assigning diverse roles to students for enhancing learning outcome assessment in HFS. However, Scherer *et al.* (2016) placed more emphasis on providing more opportunities for students to assume observer roles, a consideration they integrated into the design
phase. The quasi-experimental study by Scherer et al. (2016) examined the impact of HFS exposure frequency on nursing students’ outcomes following an acute asthma exacerbation scenario in the USA. The study recruited a convenience sample of 80 junior college students, with 40 assigned to each group (one exposure and second exposure), although it remains unclear whether the participants were randomly allocated to each of these groups. The participants were aged 21–22 years and were primarily female undergraduates. No inclusion and exclusion criteria were applied. The study utilised various instruments to assess group satisfaction, self-confidence, and clinical performance, including: i) Medical Education Technologies Incorporated, and ii) Simulation Effectiveness Tool and the National League for Nursing’s Sudden Satisfaction and Self-Confidence Scale in Learning. The authors independently developed demographic questionnaires and a knowledge test, all of which were validated. Scherer et al. (2016) designed an acute asthma exacerbation scenario, based on guidelines by the American Academy of Allergy, Asthma (Camargo et al., 2009). The scenario's validity was not tested prior to its use in the study. Following the scenario, a post-test was immediately administered.

Scherer et al. (2016) reported significant correlations between increased HFS exposures and enhanced students' satisfaction, knowledge, self-confidence, and clinical performance. For a comprehensive assessment of students' clinical performance, educators should expand the observer role in HFS design to foster the integration of cognitive, technical, and behavioural skills. A limitation of the study by Scherer et al. (2016) pertains to the scenario complexity tailored primarily for novice students. Investigating scenario effectiveness among advanced undergraduates through a more complex version of the same scenario could provide valuable insights. Additionally, the undisclosed validation status of the scenarios employed in the study by Scherer et al. (2016) and the non-random sampling may have impacted the validity of the findings (Domanski and McKinlay, 2009). The absence of randomisation raises concerns about potential selection bias and internal validity compromise (Berger, 2007). Furthermore, the study lacked explicit inclusion or exclusion criteria, prompting inquiries about the sample's representativeness (Berger, 2007). While participation in the simulation-based exercise and completion of pre- and post-testing were obligatory for all students, it remains unclear whether the sample truly represented the target population or if certain individuals were excluded based on specific criteria.
Thus, there is a need for more rigorous studies to investigate the role of students. The present study, therefore, seeks to bridge the literature gap on student roles and HFS frequency.

In contrast to Scherer et al. (2016) and Bates et al. (2019), Fawaz and Hamdan-Mansour (2016) advocate for students' active and participatory roles in HFS, transcending the role of mere observers. Employing a post-test quasi-experimental design, Fawaz and Hamdan-Mansour (2016) investigated whether exposure to HFS has a positive impact on enhancing clinical judgement among final-year undergraduates at two Lebanese private universities. The study involved a convenience sample of 56 nursing students, primarily female and aged 18 to 23. They were divided into two groups, with 30 in University A and 26 in University B; the allocation was not randomised. The group at University A was exposed to a simulation intervention, whereas University B adhered to conventional classroom instruction. The congestive heart failure scenarios utilised in this study were adapted from the NLN Jeffries Simulation Framework (2013). All guidelines and instruments were translated into Arabic using a guide provided by World Health Organisation’s (WHO), during the translation process to ensure a high degree of reliability. The translation process enlisted the aid of a research assistant for initial content translation, subsequently followed by a re-translation into English by another research assistant. The instruments employed in this study comprised: the Lasater Clinical Judgment Rubric and the Motivated Strategies for Learning Questionnaire, both of which underwent validation procedures. These instruments were used to determine the level of learning and ascertain student motivation. The post-test was promptly conducted after the session.

In contrast to the B group, sessions featuring HFS simulations yielded a significant increase in students' clinical judgement skills and motivational levels. Consequently, the A group improved elevated clinical judgement capabilities and heightened motivation towards accomplishing their learning goals. As posited by Fawaz and Hamdan-Mansour (2016), the utilisation of HFS provides students with the opportunity to make mistakes, thereby fostering their curiosity to seek additional practice through experimental endeavours. This process, in turn, facilitates the acquisition of cognitive skills. They argued that students express a preference for active involvement in HFS, a paradigm that aids in the development and enhancement of critical thinking, decision-making, and clinical aptitude, rather than the traditional instructional approach. Fawaz and Hamdan-Mansour (2016) discuss how their study could serve as a valuable point of reference for other researchers.
who are considering the integration of HFS, offering insights to facilitate their success in its implementation.

Nonetheless, it was intriguing to discover a study that employed (WHO) scenarios translated into Arabic and subsequently applied in the Middle Eastern context. To the best of available knowledge, this is the first study incorporated within a literature review. I was concerned that Fawaz and Hamdan-Mansour (2016)'s study did not indicate whether the scenarios were used as-is state or if they underwent modifications. The inclusion of such information by the authors would have amplified the value of the study's findings, specifically in discerning the applicability of these scenarios within the Middle Eastern context. One limitation of Fawaz et al.'s (2016) study is its reliance on convenience sampling, which resulted in a small sample size comprising only 56 students. This sample size potentially compromises the precision of detecting small or moderate effects accurately and may limit the extent to which findings can be generalised to a broader population (Faber and Fonseca, 2014). Another limitation pertains to the timing of the post-tests. Administering these post-tests immediately after the intervention might not afford adequate time to observe any potential long-term effects or outcome changes (Handley et al., 2018). Extending the follow-up period would provide a more comprehensive understanding of the intervention's enduring impact (Handley et al., 2018). Therefore, further investigations are imperative to gain a better understanding of the impact of HFS and explore the intricate correlation between the frequency of HFS exposures and the evolution of students' experiences.

3.5.1.2.1 Conclusion

This subtheme has underscored that a nuanced comprehension of students' roles in HFS substantively contributes to an enhanced grasp of HFS effectiveness and the concurrent expectations laid upon educators and students. Certain segments of the literature have revealed that different student roles within HFS exert discernible impacts on learning outcomes, whereas contrasting scholarship has posited divergent outcomes. Notably, these investigations have fallen short in explicating the precise benefits accruing to students within their designated roles. Moreover, it is noteworthy that the aforementioned studies primarily emanate from Western
contexts, prominently the US, with one study conducted in Lebanon. However, the limited sample sizes in these studies pose challenges to the generalisation of findings to nations like Saudi Arabia.

Importantly, all the referenced studies adopted a quasi-experimental design, which, by nature, limits the depth of insight into the concomitant experiences of educators and students. Recognising this research gap, the present qualitative study adopts a twofold perspective, examining the roles of students and educators in HFS within the Saudi Arabian context. This qualitative approach serves as a pertinent means to engender an enriched understanding of the dynamics and roles played by both educators and students, further elucidating their experiential interpretations. This approach is judiciously complemented by the incorporation of the social context factor, amplifying the comprehensive understanding of the intricate nuances characterising HFS in the Saudi context.

### 3.5.1.3 Challenges of HFS from the Perspectives of Educators and Students

This subtheme delineates the array of challenges experienced by students engaged in HFS, encompassing distinct stressors. Stress is defined as ‘an emotional state that can express itself in mental and physical symptoms and that may fade away once the stressor is removed’ (Rosielle and Hamblin, 1981, p. 2). In contrast, one of the studies described the additional challenges that educators face in HFS. This section describes one quantitative study, one descriptive study, and one experimental RCT. Two of these studies focused exclusively on nursing students, while one was limited to educators.

Czekirda et al. (2022) conducted a quantitative study using two methods, with an unspecified study design, to appraise the extent of distress experienced by students after exposure to HFS and LFS. Both objective (cortisol levels) and subjective measures (scores from the Stress Appraisal Questionnaire, KOS-B) were employed. The study was carried out in Poland with 164 students, of whom 124 were female and 22 were male. The age range of the participants was 19–50 years. However, the study did not elucidate the procedure employed for assigning students to either the HFS or LFS groups. The research employed two distinct methodologies. Firstly, blood cortisol levels were measured in a laboratory setting, both before and after the HFS and LFS sessions.
Secondly, a questionnaire assessing the subjective level of distress was administered immediately following the session. The findings of the study indicate that participants in both groups, regardless of whether they were above or below 25 years of age, underwent a considerable degree of distress following the HFS and LFS sessions. Notably, the distress level was higher in the LFS group.

The Appraisal Questionnaire indicated that the LFS group exhibited elevated cortisol levels post-session, contributing to the reduction of perceived threat; conversely, the HFS group displayed heightened cortisol levels before their sessions, potentially enhancing cognitive function and performance. Consequently, the diminished stress encountered by students undergoing LFS or HFS equips them to employ these tools to lower their perceived threat, thus optimising workplace efficiency. The main finding of the study by Czekirda et al. (2022) underscores that students would not be significantly impacted by stress levels induced by HFS or LFS. The study's scope is limited owing to the researchers' focus on blood tests for stress comprehension. This reliance on questionnaires coupled with blood tests undermines the study's result reliability due to limited control over confounding variables. A more compelling approach might have entailed interviews or focus groups, delving into participants' stress perception, stressors, and coping mechanisms. To address this, the current study conducted interviews to elucidate how students and educators have managed such stress, probing initial experiences and their evolution. This approach aims to yield more precise recommendations for educators and students using HFS, catering to the unique challenges they face.

Another limitation of the study pertains to the inadequate clarity surrounding the study design. The study lacks a precise articulation of the employed design, impeding the evaluation of its suitability and overall research rigour. The absence of a transparent description of the study design makes it challenging to determine its alignment with the research objectives. Furthermore, the study omits details concerning the allocation of participants to their designated groups. The lack of information regarding the assignment procedure, encompassing factors like randomisation or alternative methodologies, gives rise to apprehensions about potential biases or confounding variables that could influence the study's results.
In a similar vein, Boostel et al. (2018) found that students exposed to HFS exhibited higher levels of anxiety compared to their counterparts. Boostel et al. (2018) conducted an RCT to investigate the stressors faced by nursing students in Brazil before and after exposure to the HFS. The study's sample consisted of 54 individuals (average age: 20 years), with 21 in the first semester and 13 in the second. Allocation to the two groups was accomplished through a software programme, resulting in 27 participants in each group. Both the intervention and control groups attended a theoretical class on cardiothoracic physical examination. Stress levels were measured using the validated KEZKAK questionnaire administered both before and after the HFS session. Both groups attended a theoretical class. However, the intervention group underwent scenarios drawn from the NLN/Jeffries Simulation framework, though the validation status of these scenarios remains unclear. Conversely, the control group participated in a traditional skills laboratory. A debriefing session took place immediately after the session, but the duration between the intervention and the administration of the post-questionnaire to students remains undisclosed.

Boostel et al. (2018) observed distinct anxiety patterns between the intervention and control groups. Notably, students within the intervention group exhibited significant anxiety related to personal competence deficits and interpersonal connections. Conversely, students in the control group displayed anxiety concerning encounters with suffering, primarily fearing the prospect of witnessing a patient's death. The stressors encountered by the intervention group encompassed feelings of helplessness in patient interactions, apprehension about causing psychological harm to patients, uncertainty in responding to patient requests, and a general sense of unease when navigating unfamiliar situations. Their anxiety was compounded by the challenge of managing patient care steps when lacking comprehensive knowledge. Equally significant was their uncertainty about fostering relationships with colleagues. In contrast, the sole stressor encountered by the control group centred around the apprehension associated with witnessing a patient's death.

Boostel et al.'s (2018) study affirmed the influence of HFS on students' perceptions of stressors, highlighting its role in increasing their sense of patient-related responsibilities, which was identified as part of the HFS learning process. The increased responsibility prompted a more critical approach, enhancing their ability to assess situations effectively and respond appropriately. In contrast, the control group primarily expressed concern for the patient's suffering. Nonetheless,
the generalisability of Boostel et al.'s (2018) findings is constrained by the limited sample size and the students' lack of experience in both HFS and clinical settings, having participated in just one HFS session. To gain a better understanding of students’ stress levels, it would have been interesting if students attended multiple sessions. Therefore, the current study sought to address this limitation by focusing on undergraduate nursing students in their third and fourth years programme, capturing their experiences, as well as any exposure to anxiety or stress. This approach seeks to offer a more comprehensive understanding of the complexities surrounding stressors in HFS.

Another limitation of Boostel et al.'s (2018) study is the absence of explicit clarification regarding blinding protocols. The study does not elucidate whether blinding measures, such as single-blind or double-blind methods, were employed—a crucial aspect in RCTs for minimising biases and ensuring objectivity. The omission of information regarding blinding procedures has the potential to undermine the validity of the study's outcomes (Handley et al., 2018). Furthermore, the study lacks clarity regarding the timing of the follow-up questionnaire administration (Handley et al., 2018). The specific point at which the follow-up questionnaire was administered, whether it was immediately post-intervention or at a later stage, remains ambiguous. This ambiguity represents a substantial limitation in an RCT, as it does not allow for an assessment of the intervention’s long-term effects (Domanski and McKinlay, 2009).

Nonetheless, a primary concern associated with the studies conducted by Boostel et al. (2018) and Czekirda et al. (2022) revolves around their perspective on stress as a factor solely conducive to enhancing student performance. Both studies seemingly overlooked the nuanced reality wherein stress levels can have either positive or negative implications depending on the context. The omission of this critical consideration hinders a balanced understanding of stress’s effects. A more insightful approach would have entailed an examination of stress's dual impact—both beneficial and detrimental—alongside an exploration of stress thresholds that are conducive versus those that are counterproductive. To address this knowledge gap, the present study endeavours to investigate how HFS-based complex scenario sessions contribute to the learning and teaching processes, encompassing both positive and negative aspects of stress's influence.
On the contrary, Powell, Scrooby and van Graan (2020) provided a contrasting perspective by demonstrating that nurse educators also encounter stress within the context of HFS, leading to an impact on their self-efficacy. Powell, Scrooby and van Graan (2020) adopted a descriptive quantitative approach aimed at examining the experiences of nurse educators responsible for implementing HFS within nursing programmes at private colleges in South Africa. In gathering data from nurse educators with HFS involvement, the authors utilised a descriptive quantitative research methodology. Employing an all-inclusive sampling strategy, the study initially selected 120 educators across 7 simulation learning centres; however, only 69 educators ultimately participated. The research tools used in the study were developed by Jones (2005), including a self-administered questionnaire based on the Benner theory. This indicates that the instrument had been validated prior to use. While the study does not explicitly specify the gender distribution or age range of participants, it does provide a table presenting the demographic characteristics, including the educator's level, position, years of simulation experience within hospitals, and teaching background. Notably, the majority of participating educators held a bachelor's degree in nursing, with only 11% possessing more than 6 years of experience in HFS settings.

Powell, Scrooby and van Graan (2020) identified a significant discrepancy between educators' familiarity with LFS and HFS, attributed to factors like equipment shortages and computer skills limitations. The extent of their experience with this technology played a pivotal role, where educators with over 15 years of HFS experience demonstrated greater ease in integrating this technology into their teaching, showcasing a higher comfort level with its use. Consequently, the study underscored the necessity for enhanced training and skill development among educators to effectively implement HFS as an instructional technique. However, it was noted that educators faced challenges due to inadequate teaching expertise.

Although the HFS was acknowledged as an effective teaching method facilitating the application of theoretical knowledge to practical scenarios, enhancing cognitive, psychomotor, and affective learner abilities, Powell et al.'s (2020) study had notable limitations. The descriptive nature of the study and the limited sample size constrain its findings (Faber and Fonseca, 2014). Another limitation arises from the absence of a specified hypothesis, which could have offered a clearer research direction. It would have been insightful if the authors had outlined any hypotheses prior
to commencing the study. Moreover, while the study provided information about educators' positions, teaching experiences, and academic levels, it omitted essential demographic details such as age and gender. This information is crucial for a comprehensive understanding of the sample. The use of all-inclusive sampling presents another limitation, introducing the potential for selection bias (Berger, 2007; Handley et al., 2018). When the sample includes all eligible individuals or elements from a population are included in the sample, there might be limited control over the sample’s composition. Such limited control can result in a sample that does not fully represent the broader population, potentially leading to biased or non-generalisable findings. In light of these considerations, there's a pressing need for future studies with enhanced rigour to thoroughly investigate and elucidate the experiences of both educators and students when navigating challenges and stress. The present study aims to provide a more comprehensive insight into this subject matter, shedding light on various dimensions of the topic.

3.5.1.3.1 Conclusion

The literature on HFS has highlighted various emotional effects resulting from its integration into nursing curricula. This observation remains evident, despite the scarcity of studies quantifying the full extent of these effects on students, educators, the teaching process, and learning outcomes. While these studies have described the stressors inherent in HFS and the resulting stress levels experienced by students, they have regrettably not clarified the importance of understanding these dynamics. Additionally, the exploration of the optimal stress level during HFS sessions has been absent from previous research. Furthermore, a limited number of studies have outlined the emotional impact of HFS on nurse educators involved in its integration. Given these gaps, the current study aims to delve into the experiential aspects of both educators and students through qualitative interviews. In doing so, it seeks to provide a more nuanced understanding of the emotional landscape within the context of HFS, offering valuable insights into the challenges and advantages of its implementation.
3.5.1.4 Summary

As demonstrated by this theme, most studies have used quasi-experimental quantitative approaches, which involve pre- and post-testing. One limitation of this approach is the lack of a causal relationship between the intervention and the outcomes of the studies. Additionally, these studies have failed to adequately explain what happened in each group and the reasons behind the results. Although the majority of studies show a preference for using HFS, they do not sufficiently consider how to integrate HFS effectively and with a deeper understanding. Despite showing statistical relationships between variables, these studies do not provide enough explanation or in-depth knowledge about how these relationships occur. It is unclear how HFS actually impacts the learning environment, such as how educators and students perceive it differently, and what other factors influence the integration of HFS. Therefore, this present study aims to explore the influential factors and experiences of educators and students by using an explorative qualitative approach.

Despite the limitations of previous studies, a predominant body of literature substantiates the value of HFS within nursing curricula. As corroborated by Powell, Scrooby and van Graan (2020), HFS emerges as an efficient pedagogical approach that warrants more incorporation within nursing education. It stands as a beneficial strategy facilitating the seamless transference of students' acquired knowledge from the classroom to real-world clinical settings. Underscoring the importance of translating knowledge into practical application, Alkhalaf and Wazqar (2022) underscore that paramount to this endeavour is patient safety. In this vein, educators bear the responsibility of leveraging the most reliable evidence base to deliver high-quality oncology education within nursing programmes, especially within the context of Saudi Arabia. Such an approach will ultimately have an impact on patient safety outcomes. This finding aligns with the conclusion drawn by Fawaz and Hamdan-Mansour (2016), who advocate for the significance of nurse educators’ role in implementing HFS within nursing education. This role stems from the necessity of fostering students' motivation and practice improvement, thereby effectively translating theoretical knowledge into practical application. Reinforcing this perspective, Alkhalaf and Wazqar (2022) emphasise the significance of the relationship between patient safety and students' competency in HFS, particularly within the specialised realm of oncology nursing.
Consequently, this impelled her to conduct a study, aimed at ascertaining the validity of this assertion within a distinct educational system and context. Furthermore, this study seeks to determine the effectiveness of HFS within this specific environment.

### 3.5.2 Status of HFS in Nursing Education

Limited to six studies, this theme exclusively included mixed-methods studies. As delineated by this theme, HFS plays a pivotal role in facilitating students' seamless transition of knowledge and skills into practical settings, augmenting a spectrum of abilities. Additionally, it sheds light on the factors determining the extent to which educators and learners are impacted by their pedagogical and learning and teaching experiences. A succinct overview and characteristics of each study are presented in Appendix 3.

#### 3.5.2.1 Skill Transfer from HFS to Practice

This subtheme elucidates how HFS supports students in effectively applying their skills and knowledge to practical scenarios, fostering self-confidence and motivation. Furthermore, it highlights how students' ability to learn from their mistakes will also contribute to this process. The entirety of the studies within this subtheme employs a mixed-method approach. Among these, three studies are noteworthy: two focus solely on students, while one targeted both students and educators.

Carrero-Planells et al. (2021) conducted a two-phase, mixed-methods investigation to assess the efficacy of HFS as an instructional tool in nursing education. This study, conducted in Spain, garnered insights from both students and educators. The sample comprised second-year nursing students (n=91, gender= NA, mean age= 23.7 years) during the 2018 academic year. Following the conclusion of HFS sessions, the researchers conducted a cross-sectional, descriptive study using a validated questionnaire. Student satisfaction was measured using the Clinical Experience Simulation Satisfaction Scale (ESECS scale), developed by Baptista et al. (2014). The study's second phase involved a singular focus group with three educators (2 female and 1 male) who had
teaching experience in the academic setting. Carrero-Planells et al. (2021) found that according to the quantitative phase involving 91 participants, student satisfaction with HFS was rated at 9.3 out of 10. Notably, students demonstrated high proficiency in the practical dimension but exhibited low motivation to attend sessions, according to the quantitative findings. Conversely, the qualitative phase offered clearer insights. During debriefing sessions, students displayed a positive attitude towards HFS, which enabled them to apply their theoretical knowledge to practical scenarios and alleviated anxiety levels before entering clinical environments.

Additionally, in the qualitative phase of the study by Carrero-Planells et al. (2021), the use of HFS allowed educators to reflect on their experiences and perspectives, prompting a recognition of its value as an effective teaching tool. Nonetheless, this approach demands a certain level of energy investment, as a substantial number of educators noted experiencing considerable stress. Collaborating with students to facilitate the learning process, while beneficial, can increase stress levels, given the responsibilities and challenges tied to effectively supporting student learning. Another crucial aspect emphasised by the researchers is that HFS enables students to practise their skills prior to encountering real-world situations. However, Carrero-Planells et al. (2021) underscored the value of HFS; however, the potential for a richer understanding by including student interviews alongside educator perspectives is worth noting. Although the study collected student responses through questionnaires and only conducted a focus group with educators, a more comprehensive understanding could be derived by involving both groups in a qualitative study. The omission of student gender information also stands out, suggesting that its inclusion could have enhanced the study's depth and insights.

The study by Carrero-Planells et al. (2021) is further constrained by its reliance on just a single focus group involving three educators. This limited number makes it challenging to generalise the qualitative phase findings from the educator’s perspective, as saturation might not have been fully achieved (Elliott and Timulak, 2005). Another limitation lies in the cross-sectional nature of the study, which offers a snapshot of data at a specific point in time but precludes causal inferences owing to the absence of longitudinal tracking of participants (Setia, 2016). However, Carrero-Planells et al. (2021) put forth suggestions regarding the necessity for more extensive studies centred on educator experiences with HFS. These recommendations aim to enable a comparison
of findings between educators and students, ultimately contributing to the enhancement of both groups’ future performance. Therefore, the current study’s objective was to examine more profoundly both educators’ and students’ perspectives and experiences. The study also involves a comparative analysis of results alongside student findings, employing qualitative methodologies for both groups. To achieve this, identical tools and approaches were utilised to interview both educators and students. This methodological alignment offers several benefits, including coherence and facilitating the exchange of experiences. This allowed for a more comprehensive exploration of their respective encounters, representing the core objective of the present study.

In contrast to Carrero-Planells et al. (2021), Brien, Charette and Goudreau (2017) assert that HFSs provide nursing students with an opportunity to acquire practical experience and learn from their mistakes before engaging in clinical settings, thus facilitating the transfer of skills into practice. This perspective is also shared by Brien, Charette and Goudreau (2017), who conducted a mixed-methods study employing questionnaires and focus group discussions in Canada. Their study aimed to compare the experiences of undergraduate nursing students between HFS and clinical settings in critical care courses. The authors of the study failed to provide clear details about the participants' academic level, gender distribution, or age. The study encompassed two distinct methods: first, 314 students completed questionnaires; second, 23 students engaged in two focus group discussions. The self-administered questionnaire designed by the authors was employed, and both the questionnaires and focus group discussions were structured based on Jefferies' simulation framework (2012). Unfortunately, the questionnaires used in the study were not subjected to validation prior to the research.

Brien, Charette and Goudreau (2017) found that HFS offers students a bridge between classroom learning and real-world practice, enabling them to learn through making mistakes and affording additional opportunities to engage in procedures beyond the scope of clinical placements, where students often assume observer roles during procedures conducted by others. However, this study does possess a few limitations. Notably, there was a lack of participant discussion following the analysis, which could have bolstered the study's credibility. Additionally, the study was limited by the use of instruments that were neither validated nor pre-tested prior to the research, subsequently impacting the reliability of the findings (Elangovan and Sundaravel, 2021). Lastly, the authors did
not provide details of participants' gender, backgrounds, and experiences—elements that could have provided a more comprehensive understanding of the individuals involved and their potential influence on the study's outcomes.

In contrast to Carrero-Planells et al. (2021) and Brien, Charette and Goudreau (2017), Lee, Kim and Park (2015) emphasise the importance of considering both the positive and negative effects when integrating HFS, along with factors such as collaboration and realism, to effectively transfer skills into practice. Lee, Kim and Park (2015) conducted a mixed-methods study aimed at understanding the initial experiences of nursing students in Korea when introduced to HFS for the first time. The primary objective was to establish guidelines for future HFS utilisation. The study involved 33 junior nursing students, with females outnumbering males and having an average age of 21 years. Data were collected from students using questionnaires and reflection journals, after their engagement in HFS sessions. Notably, reflective journal completion was limited to 18 students, while 31 students completed the questionnaires. The intervention was adopted from Elfrink Cordi, Leighton and Ryan (2012), employing Wenger's scenarios that were translated into Korean prior to their use. After a 10-day exposure to HFS, the author collected reflective journal entries from the students.

The study by Lee, Kim and Park (2015) revealed both negative and positive experiences regarding the HFS in nursing outcomes. Positive aspects included an observed enhancement in students' critical thinking abilities, their capability to identify changes in a patient's condition, peer observation, and improved description skills. Intriguingly, the study also illuminates the negative aspects of HFS as perceived by students. They reported that the constrained time for arrangements and the need for swift action had a detrimental impact on their experiences. This time constraint was not the sole concern; a lack of realism, effective communication, confidence, interactions, and personal attitudes also hindered the process. These findings offer valuable insights for developing programmes that emphasise positive experiences while addressing the negative aspects (Lee, Kim and Park, 2015). However, it is important to note that the study’s 10-day duration might not provide a comprehensive understanding of the long-term effects or sustained impact of the intervention. This limited timeframe may also constrain the depth of reflections captured in students' reflective journals, thus affecting the findings. Moreover, the small sample size poses a
challenge to generalisation (Faber and Fonseca, 2014). Another limitation arises from the translation of scenarios without a clear explanation of how the rigour of translation was maintained, particularly from English to Korean (Ho, Holloway and Stenhouse, 2019). In the qualitative phase, using interviews or focus groups would likely yield more effective findings and increase their discrepancy. This is because students would be able to express themselves and their thoughts more freely, aided by body language and nuanced expression. This approach would enable a richer exploration of their experiences compared to relying solely on an online questionnaire or reflective journals.

3.5.2.1.1 Conclusion

Studies previously published on the transfer of skills from HFS to practise exhibit inconsistencies. The existing literature underscores the influence of HFS on students' and educators' satisfaction and motivation, as well as how they perceive and evaluate HFS when compared to alternative teaching methods. Within this literature, certain studies endorse the positive effects of HFS, while others present opposing viewpoints. Recognising the dual nature of HFS effects—both negative and positive—it becomes imperative to consider both aspects to enhance its integration, as this will ultimately reflect reality. Consequently, addressing this gap becomes crucial. The current study endeavours to bridge this gap by conducting a qualitative exploration of the experiences of undergraduate nursing students across two distinct academic levels, in conjunction with insights from nurse educators.

3.5.2.2 Factors Influencing Students and Educators

This subtheme encompasses three mixed-methods studies elucidating the challenges encountered by educators and students, alongside facilitating factors. Among these, two studies focused on students, while one exclusively examined educators' utilisation of HFS.

In a study conducted by Li et al. (2020) in China, a mixed-methods convergent parallel design was employed. The study aimed to comprehend the experiences of undergraduate nursing students and
identify factors influencing their learning. Additionally, the effectiveness of HFS was assessed among Chinese students. In the quantitative phase, 533 third-year undergraduate nursing students (average age 21.44 years) participated. The majority of participants were female, as evident from the collected data. To gauge the effectiveness of HFS, the Simulation Learning Effectiveness Inventory by Huang et al. (2019) was utilised.

In the course of semi-structured interviews, 22 participants were asked to provide their perspectives on their experiences with HFS. Li et al. (2020) demonstrated that HFSs constitute an effective component of educational strategies. However, certain student-influencing factors, such as equipment resources and environmental arrangements, were identified as contributors to decreased student confidence. Meanwhile, qualitative findings underscored the substantial effectiveness of HFS during briefing sessions and in fostering clinical competence, particularly in problem-solving within HFS training.

In conclusion, the design of nursing curricula and educational processes should account for students' individual characteristics. Additionally, the significance of enhancing course arrangements with the necessary equipment is highlighted, given its impact on students' confidence. However, a critique of the study arises from its failure to compare traditional teaching methods with HFS-based teaching, as well as the absence of a follow-up investigation of simulation learning’s long-term effectiveness. This limitation impedes a comprehensive understanding of HFS's relative effectiveness and its sustained impact compared to traditional approaches. Future research endeavours should aim to address these knowledge gaps, thereby enhancing the current understanding of the efficacy and evolving learning effectiveness brought about by HFS.

In contrast to Li et al. (2020), Al-Ghareeb, McKenna and Cooper (2019) present a distinct viewpoint concerning challenges faced by nursing students, particularly focusing on anxiety. They contend that optimal learning for HFS students necessitates maintaining low anxiety levels. To investigate this perspective, Al-Ghareeb, McKenna and Cooper (2019) conducted a mixed-methods study in Australia, aimed at exploring the impact of psychological anxiety on clinical
performance during HFS of emergency scenarios. The study enrolled a sample of 33 undergraduate nursing students in their second and third years, with ages ranging from 22 to 56 years. Predominantly, the participants were female, with only two male participants included. The simulation intervention model employed in this study was (FIRST2ACT). Students participated in a two-hour simulation session and completed questionnaires, which included a psychological anxiety scale, prior to the session.

The research employed the following instruments: i) Objective Structured Clinical Examination checklist by Bogossian et al. (2014), ii) Stressors Appraisal Scale and heart rate variability (HRV) by Constantino et al. (2014). Importantly, all these instruments were validated prior to use. Heart rate assessment was conducted by affixing an HRV monitor to each student's chest. During the simulation session, which included cardiac and respiratory scenarios enacted by professional actors portraying patients, students' HRVs were monitored. Following the session's completion, students were given the opportunity to evaluate their performance by reviewing video recordings.

In the study by Al-Ghareeb, McKenna and Cooper (2019), anxiety levels among students were elevated both before and after the HFS session. However, physiological anxiety gradually decreased as students became less anxious as the session progressed. Furthermore, certain student groups exhibited improved performance during the second scenario. Notably, this study identified a positive influencing factor of clinical performance, specifically the students' progression within the nursing programme and their exposure to clinical and emergency situations. Nevertheless, the study highlights the negative impact of heightened anxiety levels on student performance. This underscores a correlation between optimal performance and a lower degree of anxiety.

The study by Al-Ghareeb, McKenna and Cooper (2019) on the effect of anxiety level is substantiated by Yerkes and Dodson Curve’s works (Nickerson, 2021), which suggests that an optimal level of anxiety yields the best performance. According to Yerkes and Dodson, the appropriate stress level should align with the task's complexity. For complex tasks, lower stress is ideal, while for simpler tasks, moderate stress is beneficial. Consequently, it becomes imperative to furnish adequate training that diminishes anxiety and equips individuals to navigate complex
clinical situations (Al-Ghareeb, McKenna and Cooper, 2019). To do so, it was necessary to understand the dynamics at play, including the experiences of students and educators, along with their respective roles and challenges within the HFS context in Saudi Arabia.

The limited sample size of the study conducted by Al-Ghareeb, McKenna and Cooper (2019) poses challenges in generalising the findings (Faber and Fonseca, 2014). An additional limitation arises from the use of heart rate monitors on students, potentially inducing heightened anxiety due to the perception of being under scrutiny and surveillance by an external observer. It would be intriguing to explore whether the researchers provided training to students before the session, as such preparation might aid in stress management during HFS. Another limitation is that the students may have a medical condition that increases their heart rate; it would be useful if the authors were aware of this beforehand.

On the contrary, Davis, Kimble and Gunby (2014) illustrate the challenges faced by nurse educators and the effect of HFS on self-efficacy. In a parallel mixed-methods, one-phase study, Davis, Kimble and Gunby (2014) investigated the utilisation of high-fidelity human patient simulation (HFHPS) within a specific undergraduate nursing programme. The study's primary objectives included identifying the obstacles encountered by educators during HFHPS implementation and exploring nurse educators' first-hand experiences with HFHPS. The participant sample included 139 faculty educators within a US undergraduate nursing programme, with a higher representation of female participants. The average age of the participants was 50 years. To gather both quantitative and qualitative data, a web-based survey was employed. The quantitative phase involved instruments such as: i) the Clinical Site Scale and Student Readiness for Simulation Learning Scale (Jones and Hegge, 2007), ii) the Comfort Levels Scale, and iii) the Modified Teacher's Sense of Efficacy Scale. These tools are validated to assess faculty perceptions, covering aspects like the proportion of traditional clinical involvement in their programme and the likelihood of student engagement in HFHPS sessions. They also gauge the level of comfort with HFHPS. Guiding this study was a nursing education simulation framework introduced by Jeffries and Rogers (2007), postulating that educators and students jointly impact the educational milieu, subsequently influencing learning goals. The qualitative phase encompassed open-ended questions within an online survey, prompting respondents to share their perceptions of HFHPS.
In the study by Davis, Kimble and Gunby (2014), a substantial usage of HFHPS in nursing programmes was revealed. During the qualitative phase, a noteworthy observation emerged: faculty members who substituted clinical hours with HFHPS demonstrated diminished self-efficacy levels compared to their counterparts. This discrepancy stemmed from the faculty members lacking complete conviction in considering HFHPS as a suitable alternative to traditional clinical hours. Immersing themselves further in HFS, these faculty members became cognizant of inherent issues in the simulation process. Other factors contributing to this phenomenon encompassed peer and student pressures to implement more intricate simulation scenarios. These pressures exerted an influence counterintuitive to nurse educators' self-efficacy. Instances of malfunctioning simulators or inadequate staffing in the laboratory could lead to lower self-efficacy levels among nurse educators. In such situations, their ability to execute the simulation scenario might be compromised, necessitating more time and preparation. Additionally, challenges tied to technical components, extended time requirements for simulation implementation, and managing the simulation within large class settings further compounded these difficulties.

The study conducted by Davis, Kimble and Gunby (2014) had a few limitations. Notably, the qualitative phase, structured akin to an interview through survey questions, fell short in providing a comprehensive insight into the faculty's experiences with the teaching strategy. An intriguing avenue for more insights could involve conducting these interviews in person, as face-to-face interactions tend to facilitate the expression of feelings and perceptions (Ritchie et al., 2014). Moreover, in-person interactions enable researchers to observe participants' body language, enhancing the depth of understanding beyond what can be gleaned solely from questionnaire responses (Ritchie et al., 2014). Another limitation pertains to the use of two instruments originally designed for students, which were repurposed to measure faculty perceptions. Given the distinct learning requirements of educators and students, a prudent approach would involve employing an instrument specifically tailored to faculty experiences. Such an instrument would offer higher validity and precision in reflecting the unique perspectives of educators (Elangovan and Sundaravel, 2021). In other words, the study could have yielded more accurate insights into the educators' experiences by employing a faculty-specific instrument, rather than relying on a student-specific one.
3.5.2.2.1 Conclusion

The literature review sheds light on the diverse challenges faced by HFS in nursing education. Li et al. (2020) focused on undergraduate nursing students in China, highlighting equipment and environmental concerns as primary challenges. A different perspective comes from Al-Ghareeb, McKenna and Cooper (2019), who identified that anxiety levels significantly influenced nursing students' performance in HFS. Meanwhile, Davis, Kimble and Gunby (2014) provided insights into the experiences of nurse educators, emphasizing technical difficulties and the complexities of managing large classes. These studies underscore both the benefits and challenges of integrating HFS into nursing education.

3.5.2.3 Summary

Several studies have endorsed the use of HFS as a means to enhance students’ clinical skills, knowledge, self-confidence, and critical thinking. In contrast, alternative viewpoints have argued that the choice between using the clinical setting or HFS as a teaching strategy within nursing curricula yields negligible distinctions. While the literature within this domain affirms the importance of transferring skills to real-world practice through the use of HFS; however, it falls short in explicating the specific mechanisms and strategies that facilitate its accomplishment. Consequently, these studies have not substantiated their assertion that both methods effectively facilitate skill transfer within the nursing curriculum. This existing gap is of considerable magnitude and necessitates immediate attention to enhance the effectiveness of the nursing curriculum. Therefore, a comprehensive exploration of the simulation, as well as the roles of educators and students and their experiences with HFS sessions, becomes paramount. This serves as one of the primary motivations driving the present study. Consequently, it is imperative to examine whether previous research has overlooked how HFS transfers skill to practise. Additionally, it is important to evaluate the effectiveness of HFS for educators and students, while also adopting a transparent and comprehensive approach. Addressing these fundamental aspects stands as a core objective of this investigation. Hence, the present study aims to bridge this notable gap through a qualitative study, meticulously exploring the multifaceted experiences of both students and educators.
Moreover, recent research has highlighted stressors that impact students' experiences, including deficiencies in communication skills and apprehension about harming patients, both physically and psychologically. Additionally, students grappled with a lack of confidence to manage situations due to their incomplete understanding and the fear of witnessing patient death. Given the diverse findings on the psychological effects of HFS on nursing students, the role of nurse educators becomes particularly significant. However, while student experiences have garnered some attention, the feelings of educators regarding HFS have remained largely unexplored. Thus, the current study aimed to explore the experiences of both educators and students with HFS.

This literature review suggests that the mixed-methods approach did not fully capture the intricate nature of integrating HFS. Moreover, the experiences of nurse educators and students regarding the use of the HFS may not allow for an in-depth qualitative exploration. To address this limitation of mixed-methods studies, it is important to incorporate qualitative approaches to comprehensively examine the experiences of nursing students and educators with HFS within the Saudi Arabian context. Moreover, it is crucial to understand the various factors that influence their experiences. Gaining a comprehensive perspective on their viewpoints is essential to assess the potential impact of social and contextual factors, which could be effectively examined through focused ethnography. In light of existing literature that emphasises a knowledge gap regarding suitable learning and teaching strategies for HFS and the potential for better integration through qualitative research, it was necessary to conduct this study.

3.5.3 Importance of Establishing a Collaborative HFS Environment

In this theme, nine qualitative studies are discussed. The nine studies include two descriptive phenomenological studies, two qualitative inquiries, two exploratory qualitative studies, two case studies, and one grounded theory study. The summary and characteristics of each study are presented in Appendix 4.
3.5.3.1 Value of Communication between Educators and Students

This subtheme includes two studies: one descriptive phenomenology study and one descriptive qualitative study. One study solely focuses on educators in Canada, while the other solely focuses on students in the USA.

Mulli et al. (2022) conducted a descriptive phenomenological study to investigate the experiences of educators using HFS in undergraduate programmes in Canada. All nurse educators from eight Canadian colleges were recruited for this study. However, it is worth noting that all the participants were female and on average 60 years old. Mulli et al. (2022) analysed the experiences of educators in Western Canadian provinces who use reflection-in-action. Eleven semi-structured interviews were conducted with undergraduate educators who have experience in HFS teaching. ‘Reflection-in-action’ (Schön, 1987) is defined as the educator's immediate response to the actions of the students during the HFS. It is automatic and serves as a reflection of students' performance. It is different from ‘reflection-on-action’, which often occurs during debriefing, and ‘reflection-before-action’, which occurs during a briefing. However, reflection-in-action takes place during the HFS session.

Mulli et al. (2022) found that educators were highly aware of reflection-in-action. They realised that when students could openly share their thoughts and communicate, they would modify their course of action and collaborate. However, there were barriers associated with reflection-in-action, such as students' anxiety and fear, the inefficiency of the simulation's design, and inadequate preparation of educators and students. Meanwhile, Mulli’s study revealed facilitators, such as pre-briefing, providing cues, building confidence, and fostering curiosity among facilitators. The most common outcome of reflection-in-action is the development of collaborative learning and the opportunity for individuals to reflect on their own critical thinking in practice. However, one limitation of the study is that all participants were female, which was unexpected considering that the recruitment process included both men and women. Furthermore, eleven interviews were not sufficient to achieve data saturation (Elliott and Timulak, 2005), making it difficult to generalise the study's findings to other genders or contexts. Another limitation is the lack of information about
the sample size, participant selection criteria, and diversity of perspectives (Vasileiou et al., 2018). These details are crucial to determine if the sample adequately represents the population of interest and if the findings can be generalised (Vasileiou et al., 2018). In addition, conducting 11 interviews from different settings may be insufficient to generalise the findings owing to the specific contexts and characteristics of the participants. Thus, Mulli et al.'s (2022) study has explained some challenges and difficulties that the female nurse educator faced during the integration of HFS. However, there is a lack of research on the needs of both male and female educators. Identifying the educators' learning needs and gaining a deeper understanding of their experiences in a different context, such as Saudi Arabia, is essential, as it will provide a distinct perspective from Mulli's study, which is the aim of the present study.

Expanding on this discourse, Mulli et al. (2022) emphasise the importance of students' communication skills, underscoring how these skills reverberate through educators' responses. In a similar vein, Jeffers et al. (2022) describe the challenges that impede student communication during HFS. They identified the reasons behind students’ communication difficulties, a critical factor in initiating activities and enhancing interactions. Contrary to assumptions, Jeffers et al. (2022) did not find that improving communication skills corresponded to a heightened sense of realism within HFS scenarios. Instead, Jeffers et al. (2022) argue that while communication skills might not amplify realism, they do serve to facilitate other proficiencies and concurrently alleviate anxiety and stress. Jeffers et al. (2022) conducted a qualitative descriptive study focused on verbal and nonverbal communication skills demonstrated by students on HFSs in the USA. Their aim was to evaluate and gain insights into the perceptions of undergraduate nursing students regarding their communication skills in an end-of-life care course. The study sought to dissect the factors that enable effective student communication among students, using semi-structured interviews. A convenience sample of 117 nursing students enrolled in an undergraduate nursing programme, particularly seniors who had completed the medical-surgical course, participated in the study. The demographic composition was primarily white females, with a smaller representation of males and African Americans. After participating in end-of-course scenarios, students engaged in debriefing sessions aimed at identifying communication pitfalls. This study seamlessly incorporated Pandora's social cognitive theory into the debriefing process, allowing students to evaluate their
Jeffers et al. (2022) found that communication in the end-of-life care course within HFS was extremely challenging. The study's central theme revolved around the arduous task of delivering distressing news, reflecting the intricate and challenging nature of this task. Students’ reactions to the scenarios were predominantly negative, marked by a prevailing sense of apprehension, anxiety, and reticence. However, some students faced difficulties in communicating with patients and their families during HFS, primarily stemming from a lack of self-confidence in their skills and an inability to regulate their emotions. Conversely, a subset demonstrated adeptness in this aspect. One of the recommendations made by Jeffers’s study underscores the need to expose students to such scenarios to better equip them for clinical practice. According to the findings, anxiety emerged as an important factor impeding students' self-efficacy in effectively communicating amidst challenging situations. This anxiety not only lowered their self-confidence and understanding of their performance but also hindered their ability to gauge their performance, thereby exerting a detrimental impact on their overall performance. Jeffers' study puts forth a crucial recommendation, emphasising the improvement in communication skills as a pivotal component that warrants consideration within the HFS framework.

According to Jeffers et al. (2022), communication skills, particularly in complex scenarios, should be incorporated into undergraduate curricula, given their significant role in achieving long-term goals. However, a limitation of the study is the sample size, which exceeds 117 participants—a considerable number for a qualitative study—yet it remains unclear when data saturation was achieved (Elliott and Timulak, 2005). With the study relying on convenience sampling, inherent bias was introduced (Ritchie et al., 2014), affecting the generalisability of conclusions beyond the context studied, such as the Saudi Arabian context. Furthermore, the use of a descriptive methodology limits the study’s depth. The incorporation of thick description and data interpretation would have been valuable for understanding the students’ experiences more thoroughly (Guba and Lincoln, 1989). As a result, I was not adequately convinced that strong communication would not contribute to realism when working with mannequins, potentially rendering the study's findings invalid. Hence, my study was pivotal in grasping the experiences of
educators and students when implementing HFS and exploring potential interactions influencing these experiences.

3.5.3.1.1 Conclusion

The scarcity of studies exploring the utilisation of HFHPS by nurse educators in undergraduate settings underscores the necessity of understanding communication and interaction dynamics between educators and students. Existing research has unveiled a substantial communication gap that demands resolution to facilitate effective learning in HFS sessions. Examining how educators' interactions with students contribute to the learning process becomes crucial. While the challenges faced by educators have been highlighted in these studies, it is equally imperative to acknowledge that students must interact with them. Therefore, the focus should be on enhancing communication between educators and students. Recognising communication’s vital role in HFS, it is recommended that future studies explore this aspect further. Consequently, this study sought to investigate the impact of communication on interaction within the Saudi Arabian context.

3.5.3.2 Role of Interaction in Enhancing the Level of Realism

This subtheme comprises four studies: one phenomenological approach, one grounded theory, and two case studies that explain the importance of interaction to facilitate learning and teaching, all offering insights exclusively from students’ perspectives.

Within this subtheme of literature review, the perception of undergraduate nursing students towards the HFS and their lack of knowledge about it are explored. This section demonstrates the realism inherent in HFS, as characterised by the definition of realism as “an environment that represents the situation as it is in reality” (Lioce et al., 2020, p. 39). The literature review revealed that both educators and students lack a comprehensive understanding of HFS—its mechanisms, operations, and intended outcomes for optimal learning. Given the pivotal role of achieving realism, students are required to engage authentically, emulating real-life scenarios within a real environment. To this end, alternative teaching methods have been proposed in other studies to
enhance the attainment of realistic experiences. This section will describe six studies that
demonstrate how learning outcomes can be attained with HFS that also take the level of realism
into account.

Watson et al. (2021) conducted a study in Spain aimed at determining nursing students’
perceptions of their first experiences with HFS. Employing a qualitative approach, specifically
phenomenology, the study engaged 16 students through one-on-one semi-structured interviews.
The participants, second-year nursing undergraduates, were selected purposively, although
specific details regarding their gender and age were not extensively provided.

The findings by Watson et al. (2021) underscored that the perceived role of educators as facilitators
significantly influenced the level of realism in HFS. Notably, the level of realism increased when
facilitators effectively interacted with students during HFS sessions, employing varying levels of
fidelity. These interactions were instrumental, as educators adjusted scenarios, offered cues, and
occasionally provided guidance based on students’ actions within the simulation. After completing
the HFS, students reported improved decision-making skills, a positive change in mood, and
valuable practice opportunities to address mistakes within scenarios resembling real-world
environments. This, in turn, facilitated their preparedness for real-life professional situations. The
study’s results accentuated realism as a pivotal factor in fostering engaging learning experiences.

However, the study by Watson et al. (2021) had certain limitations. The absence of a specified
theoretical framework guiding the study and the descriptive nature of the methodology might not
have fully explained the nuances of the experiences (Collins and Stockton, 2018). The small
sample size also posed a challenge to generalisation (Vasileiou et al., 2018). Bias in participant
selection or data interpretation cannot be ruled out since the study focused solely on second-year
undergraduate nursing students who had completed a scheduled HFS training programme.
Additional insights could have been gained by providing a brief description of participants’
background, encompassing factors like gender and age, which were not adequately clarified.
Returning to the importance of interaction in relation to the level of realism, Najjar, Lyman and Miehl (2015) offered a different stance from the findings of Watson et al. (2021). They asserted that in achieving a heightened level of realism, peer interaction surpasses educator interaction. However, Najjar et al.’s (2015) study conducted in the USA adopted a grounded theory approach, aiming to develop a model showcasing nursing students’ experiences within a simulation environment. The study’s goals encompassed not only guiding future qualitative and quantitative research but also developing an in-depth conceptual framework elucidating nursing students’ experience with HFS. The authors proposed the NLN Jeffries Simulation framework as a potential commentary for this model. This sample for this study comprised students enrolled in a bachelor's degree (sophomores, juniors and seniors together) programme, totalling 5–10 participants. The study sought to explore and capture the essence of their simulation experiences. Najjar et al.’s (2015) study employed focus groups involving three cohorts of undergraduate students, who engaged in simulations ranging from 4 to 12 instances throughout an academic year. The participants were selected through purposive sampling.

Najjar et al.’s (2015) study found that students in the three groups exhibited enhanced learning outcomes within the simulation setting when possessing self-confidence, experience, and the ability to engage with peers. In addition, the study highlighted that interaction influences student behaviour, but this study also underscored the need for further investigation to develop strategies that optimise learning experiences in HFS. Najjar et al.’s (2015) study culminated in the creation of a comprehensive model, the Simulation Learning Model—Student Experience (SLM—SE), which encapsulates the multifaceted learning encountered by students during HFS. This model was based on the NLN Jeffries Simulation framework. As stated by Najjar, Lyman and Miehl (2015), the framework lacked a focus on students’ learning experiences. By incorporating these experiences, the aim is to enhance the framework’s effectiveness in promoting optimal learning objectives and augmenting peer interaction to elevate the efficacy of fair learning experiences.

However, Najjar et al.’s (2015) study has a few limitations, which cast doubt on the effectiveness of the SLE—SE model for HFS or its potential to increase the level of realism in such settings. In contrast, the study by Park and Kim (2021) contradicted Najjar et al.’s (2015) findings. They contended that peers could serve as a source of stress, as students often felt ill at ease when

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interacting with one another, resulting in negative effects on their learning experiences. Nevertheless, the discourse on the influence of peers and the role of educators remains inconclusive and inadequately explored. It was, therefore, essential to explore the experiences of students and educators to better understand their interaction dynamics.

Najjar et al.’s (2015) study has several limitations, notably the absence of participants’ demographic information, including their age or background details. This missing context is pivotal in gaining a better understanding of how participants' backgrounds could have influenced their experiences and the overall transparency of findings. Grounded theory studies demand that data situation is achieved before concluding data collection, allowing for a more robust development of a theory or model (Strauss and Corbin, 1997). An interesting avenue for enhancing credibility and study validity could have been the inclusion of a theoretical sample to fortify their approach (Strauss and Corbin, 1997; Ritchie et al., 2014). Furthermore, Najjar et al.’s (2015) study lacks clarity regarding the source or basis of the guideline employed in the focus groups. It remains ambiguous whether member checks or peer debriefing were employed to enhance the trustworthiness of the theory development process (Lincoln and Guba, 1985). Addressing these omissions could have bolstered the study’s persuasiveness, making it more convincing in proposing a novel model.

Watson et al. (2021) and Najjar, Lyman and Miehl (2015) both contend that fostering interaction between facilitators, peers, and students stands as the most effective pedagogical method for increasing the realism of HFS. In contrast, Dean, Williams and Balnaves (2015) have proposed a different approach, suggesting that to enhance HFS’ realism, students suspend disbelief, immersing themselves as if in a real-life environment. Dean, Williams and Balnaves (2015) conducted a case study in Australia to examine students' experiences with high-fidelity patient simulation mannequin (HPSMs) and their perceptions of these mannequins. ‘Empathy’ is defined as responses to another’s emotional situation (Oliver et al., 2018), and the purpose of this study was to simulate empathy at the cognitive and emotional levels and to measure it on a larger scale through focus groups and interviews. This study utilised an exploratory case study and a literature review focused on empathy in using HPSMs in nursing. The sample consisted of eight undergraduate nursing
students divided into two case study groups, employing purposive sampling. However, participants’ gender and age were not mentioned.

Dean, Williams and Balnaves (2015) found that the HFS posed challenges to students, requiring them to overcome obstacles and convincingly treat the mannequin as a real patient. However, the authors determined that the use of a mannequin in HFS did not contribute to improving students' skills or fostering a positive interpersonal connection with the patient (mannequin). To enhance the level of realism, Dean's study concludes that, if valid, evidence should be gathered to justify the utilisation of mannequins in HFS, alongside a robust pedagogical approach. A limitation of Dean et al.'s (2015) study is that demographic information about the participants was necessary to provide background information and understand how their experiences were affected, improving transferability. Another limitation is the small and self-selected sample size, which may limit the generalisability of the findings to all nursing students using HFS (Vasileiou et al., 2018). Additionally, the use of a case study approach further restricts the applicability of the findings to other contexts or cases (Priya, 2021). Therefore, it is necessary to conduct larger and more diverse studies to validate and build upon these findings.

Regarding the role of interaction in facilitating learning and moving this discussion forward, Badir et al. (2015) note that preparation plays a part in facilitating interaction in HFS. This preparation helps students work in a collaborative environment. Badir et al. (2015) conducted a qualitative study using a case study approach to investigate how undergraduate nursing students in Turkey perceive the use of the HFS in their courses. The sample consisted of 32 senior nursing students who were enrolled in intensive care courses. Five focus groups were conducted with nursing students, with approximately 29 females and 3 males. The ages of the students were not specified. In preparation for data collection, the authors created three types of scenarios, previously untested. The first scenario focused on communication skills, while the second and third scenarios involved discussions on cardiac life support algorithms. These scenarios were integrated into the nursing curricula by the authors. A week before data collection, the scenarios were shared with the students. Before each session, students and educators prepared the environment and familiarised themselves with the given scenario. After each session, a 30-minute debriefing was provided for students to discuss their errors and experiences.
Badir et al. (2015) identified three key factors associated with the implementation of HFS into nursing curricula in Turkey. The authors underscored the significance of advance preparation and briefing, as well as the structural arrangement's influence on students' experiences. Most participants found value in the preparatory phase. It was also recommended that HFS sessions align with clinical placements and precede clinical rounds. This timing aids students in understanding their roles before entering the clinical setting. Moreover, a crucial ethical and moral dimension is emphasised, underlining the intensive responsibilities that nurses bear in patient care. However, there are many limitations to the study by Badir et al. (2015). The study did not clarify whether the scenarios used were validated or pre-tested before integration into the nursing curriculum, raising concerns about the study's rigour. The study was conducted on a sample size, possibly limiting the generalisability of the findings (Priya, 2021). Further research on the effectiveness of peer feedback in HFS, on a larger scale, is warranted. Additionally, the study was confined to a specific Turkish nursing programme, prompting questions about the transferability of findings to other contexts (Priya, 2021). Lastly, the study did not address potential limitations or biases during data collection or analysis, which may have impacted the reliability and validity of the results (Leung, 2015).

In light of Watson et al.'s (2021) study, there emerged a pressing need to define educators' roles as facilitators. This was prompted by students' accounts of how varying educator roles influenced the realism of their learning experiences. In contrast, Dean et al.'s (2015) advocated for robust pedagogical strategies to enhance communication skills with the mannequin, aiming to increase the level of realism. The importance of enhancing realism, whether in interactions with mannequins, peers, or educators, has been reiterated across all studies in this subtheme. These investigations span diverse geographical contexts—from the United States and Spain to Turkey—yet a comprehensive understanding of this concept within the realm of HFS remains limited and debated. Consequently, the current study assumes a pivotal role in unveiling and comprehending educators' experiences and perspectives concerning HFS's impact on students’ learning process, particularly in the Saudi Arabian context. To accomplish this, the study draws upon the NJST, which underscores the critical nature of the interaction between educators and students—a notable gap in the existing discourse. Subsequent chapters will detail how this theory influenced the study's approach and findings.
3.5.3.2.1 Conclusion

This subtheme succinctly encapsulates the key arguments synthesised in the literature review. As previously highlighted, a multitude of elements and factors related to educators and students contribute to enhancing realism in the context of HFS. While some studies have discussed the educator's role in facilitating optimal learning outcomes through enhanced communication, this perspective is challenged here. Nonetheless, a study contends that student experiential learning and peer interaction are crucial in increasing realism, presenting a novel model to support this notion (Najjar, Lyman and Miehl, 2015). However, within this existing literature, a critical gap persists concerning the understanding of how a collaborative learning environment is forged and its direct impact on realism in HFS. Furthermore, the precise roles educators and students assume in establishing this collaborative environment remain ambiguously defined. Therefore, conducting further research in this domain is imperative to bridge this knowledge gap and contribute to the advancement of HFS practices. While previous research has predominantly focused on the student perspective, a crucial aspect overlooked is the viewpoint of educators. Hence, the current study takes on added significance in addressing this lacuna by investigating educators' perspectives and contributing novel insights. Furthermore, while prior studies have largely been conducted in Western countries, with only a handful exploring the Middle Eastern context, the present study uniquely enriches the body of knowledge by shedding light on the Saudi Arabian landscape, where such research remains scarce.

3.5.3.3 Educators' and Students' Responsibilities Regarding Psychological Safety

This subtheme comprises three studies: two qualitative exploratory studies and one qualitative study that utilises an open-ended questionnaire. These studies illustrate students' experiences of HFS stress and the importance of psychological safety. The primary focus of all three studies is on student experiences, and they were all conducted in East Asia, specifically in Korea, Singapore, and Macau.
Park and Kim (2021) conducted an exploratory qualitative study using the focus group method by Tong et al. (2007). The goal was to investigate nursing students' perceptions of psychological safety in the HFS learning environment. This study involved four focus groups with 20 Korean nursing students who were in their third and fourth years of an undergraduate nursing programme. The majority of the 18 participants were female, and their average age was not specified. Psychological safety is defined as “a feeling of security in the face of mistakes and a sense of confidence in the safety of relationships” (Kang and Min, 2019, p. 1). The study's findings delved into the level of anxiety and distress experienced by students during HFS sessions. It was revealed that students encountered various obstacles and stress both during and after HFS sessions. Notably, students expressed discomfort in interacting with their peers and also found being observed, filmed, and evaluated by their peers to be distressing.

Park and Kim (2021) shed light on the reasons behind students' heightened pressure during HFS sessions. Accordingly, the study suggests that simulation educators play a pivotal role and should employ strategies in alleviating stress levels among students, both before and after HFS integration. Moreover, the study recommends a strategic approach to designing HFS within the nursing curriculum, taking into consideration potential negative factors during the design, briefing, and evaluation phases. This underscores the importance of fostering a stress-free and psychologically positive learning environment. However, Park and Kim's (2021) study does have some limitations. The authors did not provide clear insights into how they developed the guidelines for the focus group or the source of the focus group data. Adding a well-defined framework rooted in literature or curriculum could bolster the credibility of the study's findings (Ritchie et al., 2014). Another limitation pertains to the absence of information regarding the sampling technique employed and the average age of the students (Ritchie, Lewis and Elam, 2014). This additional context would enhance the reader's understanding of the thought processes of students within a specific age group.

In contrast to Park and Kim (2021), Zhang et al. (2019) present divergent viewpoints regarding innovative strategies aimed at alleviating stress and anxiety among students. Notably, their study focused on the implementation of these strategies during the debriefing phase. Specifically, Zhang et al. (2019) investigated the perceptions of undergraduate nursing students regarding video-
assisted debriefing (VAD) following their engagement in HFS activities in Singapore. Employing an exploratory qualitative approach, the study gathered data through six distinct focus groups. The participants, drawn from a purposeful sample, constituted 27 undergraduate nursing students, of whom 24 were females and 3 were males, with an average age of 22 years. Within the context of a code blue simulation session, students were designated either as observers or actors, with the session being recorded using cameras. This recorded VAD content was used by facilitators to guide the ensuing briefing session.

Zhang et al. (2019) found that this approach contributed to enhancing emotional responses during the debriefing process, in contrast to the limitations associated with verbal debriefing. The study's findings indicate the importance of addressing students' apprehensions about using video and honing their skills prior to implementing VAD. Nonetheless, the study has limitations stemming from socioeconomic disparities and varying IT infrastructures, which might affect the generalisability of the findings to diverse nursing student populations. It is thus crucial to carefully consider the specific contextual factors that shaped the study's outcomes when interpreting and applying the results to different settings. The discourse surrounding the timing of interventions, whether before or after the session, to enhance the efficacy of HFS prompted me to undertake the present study. The goal of my investigation is to thoroughly explore the most effective teaching strategies employed within the Saudi Arabian context to optimise the effectiveness of HFS in nursing curricula.

In contrast, Au et al. (2016) present an alternative perspective on students' perceptions of HFS. According to their findings, the students not only enjoyed their experiences with HFS but also found them highly beneficial. HFS provided more learning opportunities, enabling students to learn from their mistakes and providing abundant resources for practice. This differs markedly from the clinical setting, where students had limited opportunities to practise. Conducted in Macau, the qualitative study by Au et al. (2016) aimed to gain insights into how undergraduate nursing students used HFS and to investigate their perceptions of HFS activities as compared to clinical placement activities. This study was conducted in 2015 and recruited a purposive sample of first-year nursing students participating in clinical courses. The sample comprised 80 nursing students aged 18–22 years, with the majority being female (approximately 74 females and 6 males). Data
for this exploratory study were collected via a self-administered, open-ended questionnaire. During sessions lasting 2–4 hours, students engaged in simulation activities, which were based on Jeffries' simulation model, developed using ‘Laerdal SimManTM’, for the simulations. Questionnaires were administered after students completed the simulation activities.

Au et al. (2016) found that nursing students had a favourable perception of HFS, finding it suitable for a conducive learning atmosphere. They believed that HFS improved their resourcefulness more effectively than did clinical placements. The students expressed a high level of satisfaction with the use of HFS, irrespective of whether they had prior experience with it. This study highlights the importance of nurse educators being cognizant of potential misunderstandings during HFS activities. Additionally, careful consideration of activity and scenario design before integrating HFS is crucial. However, it is worth noting that the study conducted by Au et al. (2016) had some limitations. The sample consisted of first-year students with limited clinical experience. The employment of open-ended questionnaires can result in detailed responses (Ritchie et al., 2014), but it might also lead to a smaller sample size, limiting the generalisability of the findings (Vasileiou et al., 2018). Moreover, using content analysis for the questionnaires could introduce some subjectivity and require a more systematic and structured approach to minimise potential researcher bias (Unerman, 2000). An alternative approach, such as conducting interviews or face-to-face focus group discussions, might have yielded richer insights. These methods would have enabled students to elaborate more comprehensively on their experiences and perceptions, providing a deeper understanding of the phenomenon.

3.5.3.3.1 Conclusion

Overall, this literature review conducted for the present study has illuminated disparities in the impact of psychological stressors and anxiety levels on students. While some studies indicate that participation in HFS can lead to high levels of stress among students, other studies suggest that VAD can effectively reduce stress and anxiety levels in nursing students. Interestingly, undergraduate nursing students in Macau were found to enjoy HFS experiences with minimal stress. Notably, previous research findings regarding the perceptions of psychological safety
among educators and students have generated conflicting results. However, it is important to note that all prior research was conducted solely from students' perspective, with no exploration from educators' viewpoint. Therefore, it is argued that a comprehensive understanding of the overall experiences, challenges, and facilitators during HFS necessitates insights from both students and educators. This is especially pertinent in the context of nursing programmes that have recently introduced HFS. Given the contradictory nature of the existing findings, the present study contributes to the body of knowledge by investigating both nursing students' and educators’ experiences within a different context. The aim is to identify factors that potentially contribute to psychological safety during HFS. This information could prove invaluable to educators and institutions seeking to enhance the HFS experience for nursing students in Saudi Arabia.

3.5.3.4 Summary

This theme concludes by examining the influence of the mannequin's presence in HFS on student learning and the educator's role in facilitating this interaction. Furthermore, it elucidates how students' communication challenges during HFS sessions contribute to heightened anxiety levels. However, only a subset of studies have employed innovative methods like VAD either before or after the sessions to enhance the realism of HFS. Notwithstanding these efforts, there remain several dimensions of achieving realism in HFS that warrant deeper exploration.

In light of these observations, the present study seeks to clarify the experiences of educators and students, as well as identify the most effective teaching and learning methods for achieving this goal. The literature review underscores the need for educators and students to understand the intricacies of HFS – its mechanics and intended learning outcomes. To achieve realism in their interactions, students must understand the importance of performing and acting as though they are in a real-life situation within a real environment. While innovative teaching methods have been proposed for achieving these learning outcomes, there is an ongoing debate about how effectively HFS can drive learning outcomes, particularly in specific contexts like the UK and Saudi Arabia.
Moreover, the current literature gap underscores the absence of a single qualitative study that comprehensively addresses the development of a collaborative environment in HFS. Such an environment entails interactions and communication that minimise psychological impacts on both students and educators. Consequently, the need to conduct the present study emerged, with a focus on integrating HFS to optimise robust learning outcomes through educator-student interaction within collaborative environments. This is approached from two perspectives: the educators’ and the students’. The research employs focused ethnography as a qualitative research methodology, and it considers the influence of social factors on teaching and learning experiences.

The literature review exposes a significant void in the exploration of both student and educator experiences within HFS. By bridging this gap and incorporating both viewpoints, this study seeks to provide a more holistic understanding of their shared experiences and respective roles. Such an endeavour is essential for refining the effectiveness and impact of HFS, by acknowledging the vital contributions of educators and cultivating a collaborative learning atmosphere within the context of Saudi Arabia.

3.6 Conclusions: Evidence and Research Gaps

The literature review examining the impact of HFS on nursing students reveals a plethora of studies focusing on the positive influence of simulation. These studies highlight evident enhancements in students' knowledge, confidence, overall performance, and crucial attributes like critical thinking, communication, and psychomotor skills. Conversely, only a handful of studies advocate for the judicious application of simulation based on specific goals and outcomes, asserting that HFS does not universally outperform other teaching approaches. Moreover, some studies suggest that HFS effectively enhances the learning process when compared to clinical placement learning, thus fostering practice-based learning through the simulation experience itself. These diverse findings emphasise the necessity for further investigation into the effectiveness of teaching methods deployed to achieve desired learning outcomes. This underscores the very essence of the current exploration, focusing on educators and learners in the Saudi context.
As indicated by most studies conducted on nursing students, the use of HFS has a positive impact on nursing learning outcomes. It enhances students' psychomotor, cognitive, and self-efficacy skills, as well as their professional competencies. However, some studies have argued that HFS may not always have a positive effect on students. Additionally, a few studies have shown the level of stress experienced by students during HFS and the stressors they encounter, which have a significant impact on their psychological well-being. Nonetheless, there is a lack of evidence on the most effective strategy for helping students overcome these stressors, as well as a poor understanding of the causes of these stressors and how to prevent them in the future. Previous studies have focused primarily on quantitative or mixed-method approaches, neglecting a qualitative approach to gain a more detailed understanding of the experiences of educators and students. Therefore, this study aimed to explore and explain the causes of the identified stressors and propose ways to avoid them in order to enhance the effectiveness of HFS in Saudi Arabia.

As previously stated, the findings suggest that educators should connect the available scenarios to the learning objectives and outcomes. Further investigation is needed to understand their experiences. The literature also highlights the need for evidence-based guidelines to inform nurse educators' practice and ensure the development of scenarios that support learning objectives. The literature review additionally reveals a gap in understanding the role of nurse educators and the need for improving their own education, especially in the context of Saudi Arabia. Therefore, this qualitative study sought to be the first to explore and understand nurse educators' experiences with using the teaching strategy of HFS; the findings of this study can be used as a basis for enhancing the quality of nursing learning in Saudi universities. Since the skills and characteristics of nurse educators considerably impact student learning, this study will focus on both the nurse educators and students.

Some studies in this literature review demonstrate the challenges that limit the use of HFS in undergraduate nursing curricula. Nurse educators face challenges such as limited time and space, apprehension regarding technology, and a lack of available training programmes. These factors prevent nurse educators from effectively implementing HFS in undergraduate nursing curricula. In addition, few studies have highlighted the challenges nurse educators face in applying scenario-based HFSs that align with students' learning objectives globally, as well as in the specific context.
of Saudi Arabia. This literature gap exists due to the underdevelopment of nursing education and the unclear scope of practice, which contribute to medical errors still occurring in Saudi Arabia.

In this literature review, the most important issues are how to bridge the gap between theory and practice, establish a connection with HFS, and convince students that the HFS scenario is a real environment. To achieve this, evidence suggests that educators should enhance the realism level associated with students' motivation and their interactions. Therefore, it is essential to address the gap in the literature review and comprehend the educators' and students' experiences with HFS. It is also crucial to examine the progression of their simulation learning experiences and consider the often-overlooked social factors. This will help facilitate the learning process. It is necessary to investigate how educators and students view HFS, especially the complex scenarios that involve mannequins. Most studies in the literature have focused on the effects and outcomes of HFS on nursing students, without considering other teaching strategies. Additionally, little is known about how to incorporate the educators' and students' backgrounds into the design of HFS simulation's content. Therefore, conducting a qualitative study to gain a deeper understanding of their experiences is important to gather data on HFS. Considering the practice of both the educators and the students will increase the level of realism and motivation in HFS, which is rarely mentioned in previous studies.

The majority of studies have been conducted in Western nations, such as the USA, Australia, Europe, and Brazil. Only a small number of studies have been conducted in Asian nations and the Middle East. However, it is difficult to generalise their findings to a broader context. Therefore, there is a great need for further studies to investigate the impact of HFS, support its integration, and gain a deeper understanding of educators' and students' perspectives of HFS. It is also important to identify skills showing improvements.

In the current study, it is crucial to explore the barriers to HFS implementation, as well as the existing teaching strategies, especially when using mannequins in complex scenarios. The literature review revealed a lack of studies focusing on complex scenarios, which emphasises the need for the present study. Moreover, the literature search conducted only identified one study that
explored HFS in Saudi Arabia, primarily focused on students using a quasi-experimental approach. This limited an in-depth understanding of students’ and educators’ experiences. Therefore, this current study is the first qualitative exploration of the perspectives and experiences of nursing educators and students in Saudi Arabia.

Existing studies have not sufficiently explored the dynamics of interaction between educators and students using the NLN/Jeffries simulation theory/framework. This theoretical framework has only found limited application in the studies reviewed within this literature. While some studies have employed the NLN/Jeffries simulation theory/framework conceptually or as a guiding framework for their instrument design, only one study has critically assessed and proposed modifications to the NLN Jeffries simulation framework. However, the credibility of this new model is limited due to certain aspects that require further validation and empirical support, which could potentially impact its wider acceptance and adoption. Despite these endeavours, a comprehensive exploration of the educator-student relationship within the context of HFS remains notably absent. The question of how both educators and students can collaboratively establish an effective teaching and learning environment, as suggested by this theory, remains unanswered by the existing literature. This study, therefore, takes on the challenge of utilising the NLN Jeffries simulation theory as its theoretical framework. In Chapter 4, ‘Theoretical Framework’, of this thesis, more detailed information about the rationale for its selection, its applicability, and a comparative analysis with other learning and teaching theories will be elaborated upon.

This study is focused on examining the experiences of nurse educators and students who engage with scenario-based HFS within the undergraduate nursing curricula in Saudi Arabia. The objective is to contribute valuable insights that can support faculty members in effectively integrating HFS into nursing curricula and optimising the utilisation of simulation laboratories. Additionally, this research aims to provide insights for the development of scenarios aligned with students' learning objectives, various pedagogies, and the cultural context of Saudi Arabia (details in Chapter 8, Sections 8.3 and 8.4). Furthermore, the study seeks to offer valuable perspectives from nurse educators that can inform policies aimed at enhancing the quality of nursing education and practice in Saudi Arabia.
Chapter 4: Theoretical Framework
4.1 Introduction

The previous chapter extensively explored the existing literature on the effectiveness and impact of High-Fidelity Simulation (HFS) on learning outcomes. Furthermore, it illuminated the widespread utilisation of HFS and identified the existing research gaps within the realm of complex scenario-based HFS, both internationally and particularly in Saudi Arabia. To enhance the current understanding of HFS in relation to educators and students in the Saudi context, this study employed the National League for Nursing Jeffries Simulation Theory (NJST) as its theoretical framework. While numerous learning theories exist, NJST was chosen owing to its alignment with the core focus of this thesis and its ability to provide novel insights into HFS within the context of Saudi culture. This chapter briefly outlines learning theories associated with simulation while providing the rationale for their exclusion from this study. The chapter concludes by offering a comprehensive explanation for the selection of NJST (2016) and the justifications underlying its choice.

4.2 Adult Learning Theories

Learning encompasses all the processes of achieving, acquiring, and processing knowledge. For over five decades, learning theories have served as frameworks systematically elucidating adult educational learning (Bearman, Nestel and McNaughton, 2017; Babin, Rivière and Chiniara, 2019). More recently, these learning theories have been applied in simulation-based education, offering guidance for the design and implementation of nursing simulations (Lavoie et al., 2018). Lavoie et al. (2018) identified that the most prevalent learning theories employed in explaining simulation within nursing education are Kolb’s experiential learning and Bandura’s social cognitive theory. However, the need emerged for a theory that specifically addressed nursing practice and healthcare at large. Consequently, in 2016, the NLN and Pamela Jeffries formulated a theory known as the NJST. The NJST expounds on the utilisation of simulation in nursing pedagogy and clinical contexts, drawing from various learning theories (Jeffries, 2016; Jeffries, 2020). The following section will review Kolb’s experiential learning theory and Bandura’s social
cognitive theory, along with relevant simulation-based learning theories, while also considering their potential mismatch for this study (Rutherford-Hemming, 2012). The subsequent sections will critically evaluate the NJST and establish its suitability for integration within the present study.

4.2.1 Kolb’s Experiential Learning Theory (ELT)

Kolb (1984) posits that the process of learning is marked by an unceasing journey of knowledge generation through transformative encounters. Kolb’s (1984) model of the experiential learning cycle (Figure 7) delineates four distinctive stages: concrete experience, reflective observation, abstract conceptualisation, and active experimentation. These stages are anticipated to elucidate how nurse educators and students engage in experiential learning within a simulation environment. In the initial phase, concrete experience (represented by scenarios), students are afforded the opportunity to acquire knowledge and immerse themselves in psychomotor activities. Subsequently, in the stage of reflective observation (during debriefing), students are prompted to introspect upon their HFS experiences, including observations and emotions felt throughout the process. Transitioning to the abstract conceptualisation stage, students are guided to link the scenarios' occurrences to their acquired knowledge, facilitating the avoidance of future errors through thoughtful consideration. The active experimentation stage signifies the transformation of experience, wherein students are expected to approach subsequent encounters with the same scenario in a different manner. This phase centres on students harnessing their experiences for application in real-world clinical scenarios or fieldwork. The implementation of these phases aligns with Kolb’s (1974) four learning styles—diverging, assimilating, converging, and accommodating. The simulation environment, thus, functions as a learning space that accommodates diverse learning styles.
Chapter 4: Theoretical Framework

Figure 7: Kolb’s Experiential Learning Theory Cycle (Stocker et al., 2014).

The Kolb learning cycle has served as a predominant model for elucidating the implementation and design of simulation in nursing education (Laschinger, 1990; Lavoie et al., 2018; Murray, 2018). It has been used to gauge various student learning outcomes within simulations, such as self-efficacy (Çelik, Ceylantekin and Kiliç, 2017), knowledge acquisition (Amod and Brysiewicz, 2019), student confidence (Alinier, Hunt, and Gordon, 2004), and improved skills mastery (Edwards, Hanson and Raggatt, 2013). The ELT describes how individuals engage with experiences, shifting between concrete experience and abstract conceptualisation, ultimately translating experience into knowledge through reflective observation and/or active experimentation. Nevertheless, there exist limitations in applying ELT to nursing research. As pointed out by Lavoie et al. (2018), the majority of ELT-based studies have focused on how individuals gain experience through the concrete experience and active experimentation stages. ELT predominantly emphasises individual actions and reflections while overlooking other crucial human factors (Murray, 2018; Babin, Rivière, and Chiniara, 2019). This discrepancy prompted the rejection of this theory for the present study, which endeavours to understand simulation experiences of educators and students in-depth and explore how their interactions, along with other social learning factors, shape their experiences.
Despite the advantages offered by ELT, certain elements do not align with the study's objectives. It has been argued that Kolb's learning cycle disregards alternative learning approaches. Rogers and Horrocks (2010) identified three distinct learning approaches unaddressed by Kolb, each with its own assortment of learning styles. Rogers and Horrocks (2010) argue that Kolb's model inadequately addresses the comprehension of objectives, decision-making, and choices, all fundamental aspects of the learning process, with the placement of these elements within the learning cycle remaining unclear (Harrison, 2002; Forrest, 2004). Moreover, ELT has been critiqued for insufficiently considering emotions, context (Boud, Keogh and Walker, 1985), and culture (Anderson, 1988), leading to ambiguity about the relationship between learning processes and knowledge acquisition, as well as the stage at which learning occurs (Laschinger, 1990). Kelly (1997) also challenges Kolb’s inventory, asserting that the outcomes of a learning style are based on self-evaluation, focusing solely on the individual learners without considering others. Consequently, the validity of learning outcomes is questionable, as social factors’ influence on the learning experience is not taken into account (Holman, Pavlica and Thorpe, 1997). In this context, ELT does not align with the constructs under examination in the present study.

For Miettinen (2000), the phases of Kolb's learning cycle lack interconnection due to the eclectic nature of Kolb's work. Nonetheless, the cycle remains an influential model for experiential learning, widely applied in nursing simulation (Kaakinen and Arwood, 2009; Lavoie et al., 2018; Babin, Rivière, and Chiniara, 2019), as well as in interprofessional healthcare simulation (Fewster-Thuente and Batteson, 2018), albeit not without weaknesses (Bergsteiner and Avery, 2014; Seaman, Brown and Quay, 2017). Seaman, Brown and Quay (2017) argue that Kolb’s learning cycle impedes a comprehensive understanding of the factors facilitating successful experiential learning. Furthermore, ELT falls short in explaining the influence of educators, other human factors, and contextual elements on the learning process (Boud, Keogh and Walker 1985; Fenwick, 2001). Given the present study's aim to explore simulation experiences within the Saudi context, while accounting for these influencing factors, these shortcomings became pivotal in the decision to reject ELT as the study's theoretical framework. The present study's focus extends beyond student-centred simulation learning and the mechanics of experiential learning, which are the primary focuses of ELT.
4.2.2 Social Cognitive Theory (SCT)

SCT has been largely derived from social learning theory (Holloway and Watson, 2002; Manjarres-Posada, Onofre-Rodríguez and Benavides-Torres, 2020). SCT has been defined as a learning principle that is based on the social context (Bandura, 1986; Glanz and Bishop, 2010). Later, Bandura (1986) further refined the theory, focusing on understanding human functionality through actions (Bandura, 1986; Kiliç, Yildiz and Harmanç, 2018). SCT assumes that personal, environmental, and social factors collectively influence changes in behaviour, as depicted in Figure 8 (Bandura, 1986). Moreover, this theory factors in prior experiences that influence an individual's expectations regarding engaging in an action (Wayne, 2019). The cornerstone principles of SCT concerning behaviour modification include reciprocal determinism and self-efficacy. Reciprocal determinism is the main principle that encompasses individual, environmental, and behavioural factors (Bandura, 1986). Self-efficacy refers to an individual's confidence in their ability to perform an action. It arises from a combination of personal capabilities and environmental factors (Bandura, 1995).

![Figure 8: Bandura's social cognitive theory (Harare, 2016).](image-url)
According to Bandura (1995), self-efficacy refers to “the belief in one’s capabilities to organise and execute the courses of action required to manage prospective situations” (p.2). Self-efficacy stems from the achievement outcomes based on an individual's goals (Bandura, 2004), and is a particularly valuable learning outcome within simulation contexts (Lavoie et al., 2018). Therefore, monitoring this learning outcome is crucial (Lavoie et al., 2018). Notably, Bandura's (1986) concept of self-efficacy assumes that learners can apply acquired knowledge after observing others and gaining insights from their behaviours. However, Wayne (2019) has critiqued the theory, arguing that it considers multiple factors without clarifying their interplay or relative importance. While the advantages of Bandura’s approach are evident, they do not correspond with the focus of the present study. This study does not seek to examine how learners' behaviours are reinforced through observation, nor does it aim to comprehend learner behaviour in the manner that self-efficacy does.

As previously explained, SCT melds behaviourist and cognitive concepts (Kilinç, Yildiz and Harmanci, 2018). According to this perspective, individuals learn by observing others, without necessarily imitating or practising the observed conduct (Bandura, 1986). Learning through observation has four components: attention, retention via symbolic coding operations, reproduction, and motivation (Lavoie et al., 2018). As previously stated, reciprocal determinism is important because it explains how individual and environmental factors influence people's behaviour (Bandura, 1986). The intentions of individuals are demonstrated by the goals they have established, their motivation to adapt, and their awareness of self-efficacy (Lavoie et al., 2018). Lavoie et al. (2018) have pointed out that simulation embodies these four components of observational learning within the framework of Bandura's theory. This implies that self-efficacy creates learning environments that can facilitate and organise individuals’ behaviour for learning (Lavoie et al., 2018; Manjarres-Posada, Onofre-Rodríguez and Benavides-Torres, 2020). Meanwhile, Kaakinen and Arwood (2009) argue that learning in a simulation is not solely dependent on reinforcing skills, patterns, or role-playing; it encompasses the broader concepts of knowledge, values, and beliefs—elements not addressed by Bandura's self-efficacy theory. Most of the effort in self-efficacy theory focuses on behaviours and teaching skills, rather than the
conceptualisation of knowledge, value, belief, and attitude (Kaakinen and Arwood, 2009). These limitations formed the basis for rejecting this theory in the present study, as the research scope extends beyond the exploration of learner or educator actions, as encapsulated within the self-efficacy theory.

The concept of self-efficacy has been extensively applied in nursing research to evaluate students’ performance (Goldenberg, Andrusyszyn and Iwasiw, 2005), improve critical thinking (Rhodes and Curran, 2005), and develop communication skills (Wayman et al., 2007). While self-efficacy is considered a useful theory in nursing education (Kilinç, Yildiz and Harmanci, 2018), it has some limitations (Biglan, 1987). Kardong-Edgren (2013) has criticised the theory for overlooking the importance of continuous practice in skill enhancement, implying that it does not necessarily lead to validated competency and true self-efficacy (Kardong-Edgren, 2013). Similarly, Goldenberg, Andrusyszyn and Iwasiw (2005) found it challenging to establish a direct correlation between self-confidence and students' performance using the self-efficacy theory as a framework. Additionally, the theory's assumption that any environmental change automatically translates to behavioural change does not always hold (Wayne, 2019). That said, learning in simulations is influenced by a gamut of factors, including social and personal factors inadequately addressed in the self-efficacy theory, placing considerable emphasis on individual behaviourism (Wayne, 2019). These limitations, which hinge on the individual's control over behaviour to achieve goals based on past experiences, stand contrary to the scope of the present study. The study's primary objectives revolve around exploring experiences from both educator and student perspectives and examining the impact of social interaction and other factors within the Saudi context.

Consequently, the NJST was adopted for this study. This theory provides a lens through which to conduct the investigation and analyse the data, facilitating an in-depth exploration of educators' and students' experiences within the Saudi context.
4.3 The National League for Nursing Jeffries Simulation Theory (2016)

There were four iterations of the Nursing Education Simulation Framework (NESF) from 2005 to 2012 before it underwent revision and enhancement, culminating in the development of the NJST (Rizzolo et al., 2016). The NESF stood as the initial model for effectively implementing simulation in nursing education, impacting students’ learning capabilities and serving as a guiding tool for educators in the application and evaluation of HFS outcomes (Martins et al., 2018). In 2012, Jeffries introduced the NESF after several years of collaboration with nursing simulation experts. The successive iterations of NESF aimed to address the comprehensive aspects of ‘designing, implementing, and evaluating simulation integration’ in nursing education, leading to the refinement and evolution of the theory into an enhanced version known as NJST (Jeffries, 2016; Martins et al., 2018).

Jeffries utilised the framework as a starting point and further refined the theory using theoretical evidence (Rizzolo et al., 2016). This pragmatic approach was driven by the goal of creating a theory that would offer substantial guidance for promoting the implementation of effective simulation and provide a robust foundation for theory-based research (Jeffries, 2016). Drawing from the synthesis and systematic review conducted by Dr. Katie Adamson and Dr. Jeffries, significant evidence validated the components of NESF, prompting the addition of more variables to enhance the theory (Ravert and McAfooes, 2014; Jeffries, 2016). The terminology was modified, replacing ‘teachers’ and ‘students’ with ‘facilitators’ and ‘participants’. For facilitators, additional variables like personality, roles, technological skills, attitude, and interpersonal relationships were introduced (Jeffries, 2016). Likewise, participants’ roles saw the incorporation of variables such as age, gender, preparedness, readiness to learn, level of anxiety, goals, self-confidence, and learning style (Jeffries, 2016). These adjustments aimed to allocate broader roles and responsibilities to both parties, reflecting their more complex contributions within the simulation context. In 2016, the NJST was formally published after undergoing numerous reviews. However, refinements were applied to the conceptual framework, as explained previously (Jeffries, Rodgers and Adamson, 2015), to yield a more robust theory, as depicted in Figure 9. However, in its 2020 revision, the theory maintained its core structure; the figure and components remained
consistent with the 2016 version. The significant update in 2020 provides a more elaborate
definition of the context, incorporating cultural and hierarchical factors more comprehensively.
While it highlights the importance and identifies a substantial gap regarding these aspects, it does not explicitly provide extensive detail.

Figure 9: Diagram of NLN Jeffries Simulation Theory (NJST) (Jeffries, 2016).
The NJST is a middle-range nursing theory, offering specific and tangible linkages between grand nursing theories and nursing practice (Peterson and Bredow, 2009; Risjord, 2019). Middle-range nursing theories are characterised by their lesser abstraction and greater potential for empirical verification through testing (Risjord, 2019). According to Peterson and Bredow (2009), middle-range theories have a narrow focus, incorporate few concepts, and are readily applicable for implementation and explanation. This trait endows middle-range theories with attractive advantages, including enhanced flexibility for nursing research, particularly in theory-based investigations (Peterson and Bredow, 2009; Risjord, 2019). In contrast, grand theories hold a broader scope, with abstract and complex characteristics (Peterson and Bredow, 2009). However, this very abstraction renders them challenging to test and apply within nursing research or practice (Lundh, Söder and Waerness, 1988). Consequently, middle-range theories have gained prominence in nursing research due to their practical utility (Peterson and Bredow, 2009).

The NJST serves as a framework that elucidates the factors crucial for designing, evaluating, and effectively applying simulation experiences within nursing education (Jeffries, 2016; 2020). According to Jeffries, “effective teaching and learning using simulations are dependent on teacher and student interactions, expectations, and roles of each during these experiences” (P.97) (Jeffries, 2005). This perspective accentuates the dynamic interplay between participants and facilitators, encompassing other learning components within simulations, as well as the relationships between these components and their variables, as shown in Figure 9. The theory's essential components comprise context, background, design, simulation experiences, environment, participants, facilitator, and outcome.

The NJST is underpinned by three complementary learning theories, namely sociocultural, constructivist, and learner-centred theories (LaFond and Van Hulle Vincent, 2013; Jeffries, 2016). The sociocultural theory asserts that learning occurs through interactions and relationships with others (Billings and Halstead, 2019). The constructivist theory posits that knowledge acquisition stems from interpretive experiences that build upon prior knowledge (Billings and Halstead, 2019). In learner-centred learning, students actively engage in the learning process alongside instructors...
These theories align with the seven undergraduate education principles by Chickering and Gamson (1987), which “encourages contact between students and faculty, develops reciprocity and cooperation among students, encourages active learning, gives prompt feedback, emphasises time on task, communicates high expectations, respects diverse talents and ways of learning” (P.2). Jeffries integrated these principles as variables within the educational practice concept of the simulation theory (Chickering and Gamson, 1987). The NJST's foundation in learning through social interaction, experiences, and learner-centredness makes it a fitting choice for exploring educators' and students' experiences in complex HFS scenarios.

Jeffries (2005) defined simulation as the process of creating a learning environment mirroring real clinical settings. It offers a platform for practising procedures, clinical reasoning, and decision-making through tools like mannequins, videos, or roleplays. This definition encapsulates the nursing metaparadigm's elements—the environment, nursing goals, and processes (LaFond and Van Hulle Vincent, 2013). The NJST, with its emphasis on fidelity and realism's influence on learning outcomes and nursing practice, aptly aligns with these nursing elements (Fawcett and Desanto-Madeya, 2012). The theory clarifies the relationship between humans and their environment, particularly highlighting the significance of fidelity within the learning environment (LaFond and Van Hulle Vincent, 2013). The NJST's emphasis on a realistic environment is pivotal in nursing education (LaFond and Van Hulle Vincent, 2013), thus making it the most suitable theory to explore educators' and students' nursing experiences within HFS environments.

The NJST emerges as the pioneering principles-based learning theory that integrates technology into nursing education pedagogy (Park et al., 2017). It elucidates how simulation shapes participants' learning experiences and guides facilitators in implementing and evaluating outcomes. Importantly, it outlines how facilitators and participants collaborate to create effective teaching and learning simulation experiences, in harmony with other theory components (Park et al., 2017; Jeffries, 2020). Given this study's aim to explore educators' and students' experiences—key components in developing effective learning environments—the utilisation of NJST gains further validation (Martins et al., 2018; Cowperthwait, 2020).
The aim of the NJST is to provide essential guidelines and practices for nursing education (Jeffries, 2016; Coppa, Schneidereith and Farina, 2019). Moreover, it helps in designing and characterising simulation learning in the nursing context (Jeffries, 2016; Coppa, Schneidereith and Farina, 2019). It has been deemed effective in developing teaching strategies for students across levels and evaluating outcomes (Park et al., 2017). The NJST highlights factors that enhance simulation experiences, including interaction, collaboration, learner-centredness, and experiential learning (Hallmark, Thomas and Gantt, 2014; Wang and Petrini, 2017). It motivates participants to think critically and assume the role of a real nurse in real-life scenarios (Coppa, Schneidereith and Farina, 2019). Park et al. (2017) add that the NJST explains the factors that should be considered in planning learning experiences, the most important of which is the dynamic interaction between the facilitators and participants. However, Chu et al. (2019) argue that the NJST does not fully consider the theoretical perspectives of workplace learning.

Notwithstanding Chu et al.’s viewpoint, it has been shown to offer a comprehensive understanding of the interplay between variables, concepts, designs, teaching strategies, and outcomes across levels (Jeffries, 2016; 2020; Park et al., 2017; Redmond et al., 2020). Thus, NJST's comprehensive nature positions it as an ideal foundational theory for this study.

NJST has found application in the USA (LaFond and Van Hulle Vincent, 2013; Jeffries, 2020), China (Wang and Petrini, 2017), Korea (Park et al., 2017), and Ireland (Redmond et al., 2020). However, the lack of research on its potential value and application beyond these regions, particularly in a distinct cultural context like Saudi Arabia, presents a theoretical gap that warrants investigation (LaFond and Vincent, 2013; Jeffries, 2020). Thus, this study introduces NJST to the Saudi context for the first time, aiming to contribute novel insights and a deeper understanding of the theory within a distinct cultural milieu (Foronda et al., 2020). Sections 8.3 and 8.4 of Chapter 8 explain how this identified gap is addressed through the development of a personalised conceptual framework tailored to Saudi Arabia. This framework aligns with the NJST theory, adding substantial value to the enhancement and effectiveness of nursing simulation in the Saudi Arabian context.
4.3.1 Rationale for Selecting NJST as this Study’s Theoretical Framework

The literature review (Section 3.6) demonstrated how the NJST is specifically tailored for nursing programmes incorporating simulation into their curriculum. The NJST aptly aligns with the focal point of this study by elucidating learning experiences with HFS, delineating the roles of educators and students, and capturing the dynamics of their interactions (Park et al., 2017). Additionally, it provides guidance for developing an effective learning milieu through the interplay of educators, students, and other essential HFS components (Wang and Petrini, 2017; Redmond et al., 2020). Thus, the NJST's breadth accommodates a comprehensive exploration of the entire spectrum of simulation experiences, particularly in the context of complex scenario-based HFS.

In this study, the simulation scenarios function as tools that optimise the effectiveness of learning and teaching encounters in simulations (Shovein et al., 2005). While scenario-based high-fidelity patient simulation is a powerful pedagogical tool, its optimal utilisation necessitates a deeper understanding of pedagogical principles (Shovein et al., 2005; Parker and Myrick, 2009). Furthermore, the effectiveness of implementing HFS is intrinsically tied to the learning outcomes it generates. In other words, the true measure of the success of HFS implementation extends beyond the mere act of implementation and is closely linked to the tangible learning achievements it yields. More importantly, the awareness of teaching or learning principles derived from learning theories and other philosophical paradigms like constructivism (LaFond and Van Hulle Vincent, 2013).

Within the NJST framework, educators assume the role of facilitators2, their experiences and insights shedding light on simulated scenarios and their implications. This theory furnishes educators with a structured approach to devising and executing simulation experiences that foster positive student learning outcomes (LaFond and Van Hulle Vincent, 2013). Conversely, students serve as active participants, their experiences and insights offering a lens into their unique

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2 Facilitators are individuals who respond adeptly to student actions, adapting educational strategies based on their interactions. They provide guidance when needed, employing cues during simulations and extending their involvement to post-briefing phases (Jeffries, 2016). Unlike traditional teachers who primarily transmit knowledge, facilitators engage in dynamic interactions with students.
perspectives on the scenario. Once again, this theory proves invaluable for the current investigation, as it affords an in-depth understanding of how nurse educators navigate simulation scenarios and how students articulate their learning experiences through the framework's components (Figure 9). Therefore, this theoretical framework comprehensively addresses the roles of educators and students, their interactions within the simulation environment, and their holistic impact on the complex scenario-based HFS experience.

In my study, the 2016 iteration of NSJT was employed as the guiding framework. I chose this version because it thoroughly articulates the simulation components pertinent to my research objectives. The 2020 version of NSJT, while maintaining the core structure, extends the concept of context to include cultural and social hierarchies. Although this addition provides valuable insight, it did not fundamentally alter the framework in a way that required its exclusive use for my study.

The theoretical underpinnings of the 2016 NSJT provided a solid foundation for examining simulation design and educational outcomes, as well as the importance of the interaction between the educators and students. Nonetheless, I have taken into account the enhancements made in the 2020 update, particularly the expanded definition of context and considerations of cultural and social hierarchies. I have incorporated these enhancements into my analysis in Section 7.3.2, where they contribute meaningfully to the research discussion and the overall contribution of my study. The stability of the NSJT theory from 2016 to 2020 is further justified using the earlier version as the primary framework. By combining the strengths of both the 2016 and 2020 versions, my study bridges the foundational theory with contemporary advancements, ensuring a robust and current application of NSJT in nursing education and simulation.

4.4 Conclusion

The NJST has been used in nursing research, to guide the implementation and evaluation of simulation, especially in the context of HFS. This chapter has emphasised the importance of this
theory in the nursing profession, highlighted the benefits of its utilisation, and established its relevance to the study's objectives. The theory has been chosen to shed light on the experiences of nurse educators and students in Saudi Arabia, with a detailed exploration of the reasons for selecting it over alternative learning theories. Moving forward to the next chapter, a comprehensive discussion of the aim of the study, methodology, research design, and the techniques employed for data collection and analysis are provided.
Chapter 5: Methodology and Research Design
5.1 Introduction

This chapter provides an overview of the study’s research design and methodology. Initially, the research objective and questions were formulated by identifying knowledge gaps through a comprehensive literature review (Chapter 3) and a solid theoretical framework (Chapter 4). The chosen methodology, focused ethnography, is presented as a suitable approach to address the research questions. Subsequently, the research process is outlined, covering key aspects such as the setting, participant access, data collection and data analysis. The interview data were analysed using a framework model. Lastly, the chapter discusses ethical considerations, trustworthiness and reflexivity, to ensure the research’s integrity and credibility.

5.2 Purpose and Aim of the Study

5.2.1 Purpose and Study Aims

The study’s main objective is to understand the experiences and perceptions of nurse educators and students regarding the integration of complex scenario-based High-Fidelity Simulations (HFSs) within the 3rd and 4th undergraduate nursing curricula in the Saudi Arabian context.

5.2.2 Research Objectives

1. To explore the teaching experiences of educators and the learning experiences of students in integrating complex scenario-based HFS as a teaching pedagogy. This objective aims to elucidate the facilitators, challenges, teaching strategies and learning outcomes associated with the integration. Additionally, it seeks to highlight the contributions and benefits of using such a learning strategy in the Saudi Arabian context.

2. To gain insights from both educators and students about using HFS as a teaching pedagogy, with the aim of enhancing the integration of HFS within the Saudi Arabian educational
context, as well as to provide valuable recommendations for educators and administrators based on their perspectives.

3. To explore the overall experiences of educators and students to improve the implementation of HFS in nursing education, taking into account social and cultural factors that may influence the learning process.

4. To investigate and understand the dynamic interaction between educators and students during complex scenarios in HFS. This objective seeks to better understand how educators and students collaborate and engage with HFS and how these interactions impact educational outcomes in the Saudi Arabian context.

5.2.3 Research Questions

Three research questions guide this investigation:

1. What are the experiences of nurse educators and third- and fourth-year undergraduate nursing students regarding the integration of complex scenario-based HFS into the curriculum in the Saudi Arabian context? (Addresses Objectives 1 and 2).

2. How do educators and third- and fourth-year undergraduate nursing students perceive and experience complex scenario-based HFS in the undergraduate curriculum within the Saudi Arabian context? (Addresses Objective 3).

3. How do educators and students perceive their respective roles in the learning process, particularly as influenced by the utilisation of HFS? (Addresses Objectives 3 and 4).

5.3 Philosophical Assumptions

5.3.1 Ontology

According to the research philosophy, ontology pertains to “the study of being”, focusing on the nature of existence and the structure of reality (Crotty, 1998, p. 10). According to Blaikie and Priest
(2017), there are two ontological positions for social inquiry, based on beliefs and human interpretation of reality (Ritchie et al., 2014). These positions are realism and idealism. Realists argue that the beliefs and understandings of an individual determine whether an external reality exists (Ritchie et al., 2014), whereas idealists propose that individual belief and comprehension determine the existence of external reality, there is no external reality. However, Crotty (1998) explains that qualitative researchers hold diverse beliefs about the nature of reality. The majority believe that expectations and understanding influence the social world, and it lacks rigid control, being flexible in nature.

This ontological stance adopted in the current study is supported by the notion that reality in the social world is an existence that emerges through the construction of meaning. The study assumes that social constructionism shapes reality through shared experiences, understanding and social influences. This interpretation can vary across different groups and individuals, depending on the context of their interactions (Guba and Lincoln, 1989; Ritchie et al., 2014). Given the focus of this present study on the shared experiences of nurse educators and students in HFS-based complex scenarios in Saudi Arabia, social constructionism is deemed the most appropriate method for addressing the research question. The reality presented in this study is depicted through the perceptions and experiences of nurse educators and students, depending on the perspective taken, during their learning and teaching interaction in the HFS environment in Saudi Arabia.

### 5.3.2 Epistemology

Epistemology refers to the study of how knowledge is acquired and “*how we know what we know*” (Crotty, 1998, p.8). In simpler terms, it examines the process of learning and knowledge acquisition (Ritchie et al., 2014). The foundation of this study lies in constructionism, as emphasised by Blaikie and Priest (2017), who argue that humans actively construct knowledge rather than passively receive it. Crotty (1998) further contends that meaning is not merely discovered by individuals but is actively constructed through their interactions with social and cultural contexts, which shape the meanings in their everyday lives. The constructionist view holds that knowledge is not solely determined by individual beliefs, but it emerges through the interaction between...
individuals and society, reflecting what society collectively believes (Schwandt, 2014). This perspective does not imply that individuals lack ideas or beliefs; rather, it highlights how social context influences their ideas and beliefs (Schwandt, 2014).

*Epistemology* serves as the lens through which *ontology* can be examined in this study, specifically focusing on the experiences and perceptions of nurse educators and students regarding the integration of HFS. This study adopts a social constructionist ‘ontology’ to explore HFS integration within the complex scenario of Saudi Arabia. In doing so, this study understands how educators and students experience and interact with each other in the process of HFS integration while considering the broader social context.

### 5.3.3 Theoretical Perspectives

Crotty (1998) defined theoretical perspectives as providing:

> “...a context for the process involved and a basis for its logic and its criteria” (Crotty, 1998, p. 66).

To comprehend the theoretical rationale of nurse educators and students regarding HFS integration, this study adopts an interpretive approach based on their perceptions and experiences. As suggested by interpretivism, the study explores the social world from the participants’ perspectives, acknowledging that truth is context-dependent and subject to interpretation (Bryman, 2016; Creswell and Poth, 2016; Blaikie and Priest, 2017). Through interpretivism, this study aims to gain a holistic and comprehensive understanding of how nurse educators and students think and behave in their learning and teaching environments (Creswell and Poth, 2016; Flick, 2014).

To develop thinking further, according to Crotty (1998), a broad range of *interpretivism* exists including objectivism, constructionism and subjectivism. Blaikie and Priest (2017) point out that all these approaches emphasise understanding social phenomena from the participants’
perspectives, aligning with the constructionist epistemology employed in this study. Therefore, the Interpretivism perspective suggests that the interpretation of social reality and the significance attributed by participants to their experiences shape their daily activities (Seale et al., 2004). In essence, it “looks for culturally derived and historically situated interpretations of the social life-world” (Crotty, 1998, p.66). Considering the focus of this study on culture and HFS integration, adopting an interpretive perspective was deemed appropriate to understand how participants’ cultural experiences influence their experiences.

While strict adherence to a singular epistemological or ontological standpoint is not mandatory, clarity about the most appropriate methodology is crucial. My selection of investigative methods, data collection and analysis hinges on my understanding and construction of reality (Blaikie and Priest, 2017). In this study, an interpretive perspective incorporating a constructionist approach was employed to identify the factors that support nursing students and educators in dealing with complex HFS scenarios. This approach facilitated the comprehension of social, cultural and environmental factors that inculcate individual knowledge without enhancing its complexity (Crotty, 1998). Additionally, it facilitates a comprehensive comprehension by considering the context and its impact on the specific group. As the present study examines nurse educators and students as a group rather than individuals, it is in keeping with the constructionist approach from an interpretive perspective.

5.3.4 Abductive Logic

5.3.4.1 Overview of Logic of Enquiry

In qualitative research within the social sciences, various logical approaches to inquiry exist: inductive logic, deductive logic and abductive logic (Mantere and Ketokivi, 2013; Blaikie and Priest, 2017). Inductive logic involves discovering prior assumptions to develop a theoretical basis through interpretive reasoning (Blaikie and Priest, 2017; Flick, 2014). It starts with data related to social phenomena, general descriptions or patterns, and generates generalisations derived from the data. Meanwhile, deductive logic uses existing theories or predefined evidence to test or compare
to collected data (Blaikie and Priest, 2017; Flick, 2014). In other words, deductive reasoning starts with existing evidence or hypotheses and collects data to confirm or reject them. While qualitative research, including ethnography, often relies on inductive processes, Atkinson (2007) argues for the need to incorporate abduction. Abduction, according to Coffey and Atkinson (1996) and Tavory and Timmermans (2014), is essential for theory development, and depending on the level of abstraction of a theory, all three approaches may be necessary at different times (Coffey and Atkinson, 1996; Tavory and Timmermans, 2014). This idea originates from the philosophy of pragmatism (Peirce, 1974), as abductive reasoning involves an equal engagement of theoretical underpinnings and empirical data, not solely driven by assumptions or evidence (Atkinson, Coffey, and Delamont, 2003; Timmermans and Tavory, 2012).

For philosophers, including Charles Sanders Peirce, researchers do not begin their research with a ‘tabula rasa’ (Blaikie and Priest, 2017; Atkinson, 2017), as they utilise their theoretical knowledge to distinguish between relevant and irrelevant aspects of their study (Peirce, 1974; Atkinson, 2017). Their aim is not to find a single objective truth, but rather to fit their findings into existing theories (Hurley, Dietrich and Rundle-Thiele, 2021). Instead of solely attempting to discover the most effective method for comprehending the phenomenon underlying scientific explanation, their attention is now directed towards identifying it (Peirce, 1974; Coffey and Atkinson, 1996; Hurley, Dietrich and Rundle-Thiele, 2021). Thus, in this study, I employed abduction logic to connect insights from ‘a priori’ frameworks/analyses obtained via indicative methods with my knowledge and theoretical concepts.

Owing to the complexity, Peirce (1974) utilised abductive and retroductive reasoning at different times when developing his philosophical positions on abduction. However, it is important to distinguish retroduction from abduction. Retroductive logic involves discovering a mechanism to explain the regulations in a particular context (Blaikie and Priest, 2017). In contrast, abductive logic involves the unexpected discovery that does not correspond with theoretical understanding. This reveals a gap in the existing theory that cannot explain the data (Coffey and Atkinson, 1996; Alvesson and Kärreman, 2007; Tavory and Timmermans, 2014). To address this, the abductive researchers must develop theoretical concepts that explain the data and are consistent with it.
Abductive research is iterative, which means that the theoretical concepts generated from data are refined as new data emerges (Timmermans and Tavory, 2012). This process leads to theoretical contributions that transform the individual’s immediate social context and link to the existing body of knowledge.

The current study uses abductive logic to explore and explain educators’ and students’ experiences and to better understand their views about using HFS. This approach was reflected in how the data were analysed and interpreted. In the early stage of this project, I identified research problems through a review of the literature and acquired some concepts about the research even before data collection. This accords with Blaikie’s (2017) and Atkinson’s (2017) arguments that it is difficult to begin research without some basic knowledge; I made use of sensitising concepts from the literature review. Moreover, I employed the National League for Nursing (NLN) Jeffries Simulation Theory to guide the design of the study and create tools for fieldwork. This means that I began the research with some preconceived thoughts and knowledge that influenced how I approached the data. In this regard, adopting this approach provided transparency in the analysis of the data (Meyer and Lunnay, 2013; Blaikie and Priest, 2017).

Abductive logic was used to interpret the meaning and patterns of the key social actors’ (educators and the students in the current study) accounts of their everyday lives (Blaikie and Priest, 2017; Atkinson, 2017). To achieve the study goal during the analysis, I grounded my interpretation of the data with the existing framework during the early stages of analysis (Ritchie and Spencer, 2002). During the later stages of the analysis, I brought the data (indexing) into a wider context by reviewing existing literature and theories (the abductive approach). As a result, the analysis and findings were entirely grounded in the data and then connected back to existing theories and the literature review (Tavory and Timmermans, 2014). Subsequently, I used the existing theory to develop the current study’s conceptual framework Section 8.3.1. Thus, an abductive approach was deemed the best way to explore the experiences and offer valuable knowledge about the Saudi context.
5.4 Methodology: Ethnography

5.4.1 Adopting a Qualitative Approach

This study aims to gain a deep understanding of the subjective experiences of participants while using the teaching strategy of HFS, which is relatively innovative. Employing a focused ethnography, the research intends to comprehend the social world and the experiences of the participants, specifically exploring how and why educators facilitate student practice in HFS as a teaching strategy (Coffey, 2018; Silverman, 2013). By focusing on the participants’ perspectives and experiences, this study intends to shed light on the implications of HFS implementation in the educational setting and provide valuable insights for educators and the students.

5.4.2 Ethnography

Ethnography, a qualitative research methodology, seeks to analyse and interpret the way of life of a specific culture or group (Creswell and Poth, 2016; Roper and Shapira, 2000). Through data analysis, insights into the behaviours, beliefs, or knowledge of the studied group or culture emerge (Coffey, 2018). Traditional ethnographic studies often entail extended periods of field observations (Aktinson and Hammersley, 1998). In these studies, the researcher serves as both participant and observer, immersing themselves in the culture under study to describe, analyse and interpret it (Creswell and Poth, 2016).

Ethnography’s application extends beyond anthropology, finding use in other disciplines like education and nursing. This approach encompasses a number of styles, each rooted in different philosophical underpinnings, such as traditional, critical, visual and focused ethnography (Morse and Richards, 2002). The selection of ethnography is justified by its suitability to the study’s aim, which is to understand educators’ and students’ experiences within the specific context of simulation in nurse education in Saudi Arabia (Creswell and Poth, 2016).
5.4.3 Focused Ethnography

In this study, the chosen methodology was focused ethnography. To explain the difference between classic ethnography and focused ethnography, Knoblauch (2005) describes it as follows:

“it is a strategy that has been widely used particularly in the investigation of research fields specific to contemporary society which is socially and culturally highly differentiated and fragmented” (Knoblauch, 2005, p. 1).

Focused ethnography involves examining a distinct issue within a specific setting, typically focusing on a subcultural group rather than an entirely different cultural group from the researcher’s own (Muecke, 1994; Roper and Shapira, 2000; Knoblauch, 2005). For this study, the investigation took place within the Saudi Arabian context, which is where I am from, and as a lecturer, I can offer an emic perspective.

In the nursing context, focused ethnography is defined as the study of “distinct and delineated health concepts within a contextual perspective” (Roper and Shapira, 2000, p. 7). Muecke (1994) published “Aspects of focused ethnography,” and Cruz and Higginbottom (2013) organised it within Tavory and Timmermans' framework (2014), as shown in Table 5:

<table>
<thead>
<tr>
<th>Characteristics of focused ethnography</th>
<th>Description of focused ethnography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-focused and context-specific</td>
<td>Focused ethnography centres around addressing specific issues within a particular context or setting as opposed to traditional ethnography.</td>
</tr>
<tr>
<td>Focused on a discrete community, organisation, or social phenomenon</td>
<td>This approach concentrates on studying a distinct community, organisation, or social phenomenon, providing in-depth insights into their practices and dynamics.</td>
</tr>
<tr>
<td>Conceptual orientation of a single researcher</td>
<td>Typically, focused ethnography is conducted by a sole researcher who shapes the conceptual framework and maintains consistency in data collection and analysis.</td>
</tr>
</tbody>
</table>
Characteristics of focused ethnography

<table>
<thead>
<tr>
<th>Description of focused ethnography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement of a limited number of participants</td>
</tr>
<tr>
<td>Compared to traditional ethnographic studies, focused ethnography involves a smaller number of carefully selected participants, enabling a deeper understanding of their experiences.</td>
</tr>
<tr>
<td>Episodic participant observation</td>
</tr>
<tr>
<td>Observations in focused ethnography are conducted intermittently rather than continuously over an extended period, allowing the researcher to capture specific events or interactions.</td>
</tr>
<tr>
<td>Participants usually hold specific knowledge</td>
</tr>
<tr>
<td>Participants in focused ethnography often possess specialised knowledge or expertise related to the research focus, contributing valuable insights.</td>
</tr>
<tr>
<td>Used in academia as well as for development in healthcare services</td>
</tr>
<tr>
<td>Focused ethnography finds applications in both academic research and the development of healthcare services, providing practical implications for real-world contexts.</td>
</tr>
</tbody>
</table>

This study was designed to explore the experiences of nursing educators and students in Saudi Arabian education settings. The main objective was to explore the implications of using complex scenario-based HFS. Accordingly, the study primarily focused on the participants’ experiences within this context, making ethnography a suitable methodology to investigate the integration of HFS further.

Another reason for choosing focused ethnography is the establishment of research questions before data collection commences, and the data collection process centres around these predetermined questions within a specific location and over a short period of time. This differs from conventional ethnography (Table 6), where researchers typically begin without specific research questions (Roper and Shapira, 2000). Instead, they usually start with few prior conceptions of the phenomenon to allow the setting to “tell [them] what’s going on” (Erickson, 1977, p. 62). However, for the current study, I determined this approach would not be the most suitable and decided to begin with specific research questions connected to nursing knowledge and experiences, rather than relying solely on open observations. Knoblauch (2005) highlighted the advantage of
focused ethnography in enabling the collection of a large amount of data on a specific phenomenon in a short timeframe, which has been accomplished in this study.

Furthermore, the selection of focused ethnography is attributed to my ‘emic’ stance, which sets it apart from traditional ethnography. In conventional ethnography, researchers are required to actively participate in the studied group, whereas in focused ethnography, the researchers adopt the role of a field observer (Knoblauch, 2005; Wall, 2015). Consequently, conventional ethnography demands insider knowledge, whereas focused ethnography relies on appropriate background knowledge (Knoblauch, 2005). In the present study, I share the same cultural background as the participants, but I am not part of the group under study, which validates my role as a beneficial observer. Further details about my ‘emic’ stance in this study is provided in Section 5.4.4 of this chapter.

Table 6: Comparison of conventional and focused ethnography approaches (Knoblauch, 2005, p. 7)

<table>
<thead>
<tr>
<th>Conventional ethnography</th>
<th>Focused ethnography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term field visits</td>
<td>Short-term field visits</td>
</tr>
<tr>
<td>Experientially intensive</td>
<td>Data/analysis intensity</td>
</tr>
<tr>
<td>Time extensity</td>
<td>Time intensity</td>
</tr>
<tr>
<td>Writing</td>
<td>Recording</td>
</tr>
<tr>
<td>Solitary data collection and analysis</td>
<td>Data session groups</td>
</tr>
<tr>
<td>Open</td>
<td>Focused</td>
</tr>
<tr>
<td>Social fields</td>
<td>Communicative activities</td>
</tr>
<tr>
<td>Participant role</td>
<td>Field observer role</td>
</tr>
<tr>
<td>Insider knowledge</td>
<td>Background knowledge</td>
</tr>
<tr>
<td>Subjective understanding</td>
<td>Conservation</td>
</tr>
</tbody>
</table>
5.4.3.1 Immersion Without Traditional Observation

In ethnographic studies, participant observation is considered a fundamental data collection method, and there exists a close association between participant observation and focused ethnography (Roper and Shapira, 2000). This is significant because the researchers must immerse themselves in the culture and context. However, the current study did not incorporate participant observation (Roper and Shapira, 2000), owing to ethical considerations and practical reasons. Instead, I adopted a reflexive approach to immerse myself in the research field, even amidst the COVID-19 pandemic-related restrictions, without conducting participant observation. The subsequent section explains the rationale behind the exclusion of participant observation from this research.

The first reason pertains to the focus of the current study. While participation observation can be valuable in certain research contexts, it was deemed less suitable for the current study’s objectives. The focus was to explore participants’ thoughts, feelings and perceptions, rather than observing their behaviours. The main aim was to understand their subjective experiences and the meanings they attributed to simulated learning, rather than evaluating their actual actions during the simulation.

The second reason is rooted in ethical considerations, particularly concerning cultural values and the wearing of the Hijab in Saudi Arabia. In Saudi Arabian culture, the Hijab is worn as a religious and cultural practice by Muslim females and holds significant importance. During the HFS, where male educators may be present, the female students’ wearing of the Hijab becomes particularly significant. Many students may choose to cover their faces and remain quiet during the session,
which would create challenges for participant observation. My presence alongside the students may add additional stress and discomfort to their experience. In this situation, introducing participant observation could potentially contravene cultural norms.

Moreover, within the Saudi Arabian cultural context, observing and occupying personal spaces, especially for female participants, is not acceptable and is considered disrespectful, even for research purposes. The female academic setting in Saudi Arabia upholds strict rules to respect females, as numerous policies are applied to this setting. Acknowledging and respecting personal boundaries and cultural norms within the research context is of utmost importance. Therefore, the study setting advises against participant observation to avoid causing stress to the students and educators and to respect their privacy.

In addition, safeguarding participant confidentiality and anonymity is a crucial consideration in this study. Participant observation, even when carried out discreetly, raises concerns about disclosing sensitive personal information and violating the cultural emphasis on female privacy. Given the strict role and restrictions in the simulation setting, respecting social norms, preserving privacy, and excluding female participant observation are deemed essential. Conducting in-depth interviews provides an alternative approach to exploring participants’ experiences while upholding their privacy and cultural requirements, as detailed in Section 5.8.

Another factor contributing to the exclusion of participant observation in this study is practicality within the specific context. The nature of the HFS and the dynamics between students and educators influenced this decision. Unlike other research contexts where direct observation may be feasible, HFS sessions involve highly interactive and time-sensitive scenarios. Students and educators engage in complex tasks and decision-making processes during these sessions, requiring focused attention to achieve the desired learning outcomes. HFS sessions typically adhere to a structured schedule involving multiple scenarios and limited timeframes. My presence conducting participant observation could disrupt the natural flow of interactions and introduce additional stress among students and educators.
Consequently, participant observation, as a method, was excluded. Roper and Shapira (2000) propose that researchers can effectively engage with the cultural context of their research field by cultivating a sense of intimacy without compromising objectivity. In this study, I immersed myself in the field without conducting observation, as further elaborated in my emic perspective and reflexivity discussed in sections 5.4.4 and 5.10.1 of this chapter.

It is acknowledged that, although the research methodology did not explicitly involve participant observation, there was inherent observation during the interviewing and recruitment processes (Melia, 1982). The interviews, conducted following the focused ethnography approach, naturally included a degree of participant observation (Melia, 1982). However, this did not require separate ethical approval, as the primary research focus was not on observing but rather on engaging with interviewees to understand their experiences. This subtle yet important distinction aligns with focused ethnography, which emphasizes contextually rich, concentrated interactions over extended observations typically associated with traditional ethnography. This approach was deemed the most appropriate for the study’s aims and ethical considerations.

5.4.4 The researcher’s ‘Emic’ Position

In social science research, maintaining complete separation and objectivity from the phenomena under investigation is often challenging (Holloway and Galvin, 2017). Given that the current study, I employed focused ethnography, it was expected that I would adopt an insider or ‘emic’ perspective (Holloway and Galvin, 2017). Additionally, as the study involved being an observer in the field, having a background and familiarity with the specific context was considered essential (Melia 1982; Knoblauch, 2005). Therefore, in Section 5.10.1 on reflexivity, I explain how the insider perspective was achieved, as well as reflect on my own biases and positionality.

Since 2012, I intermittently worked as a lecturer at a university in Saudi Arabia and have gained experience in HFS both in the United States and Saudi Arabia. Although I did not hold an official lecturing position at the recruitment site for the current study, I was familiar with the site through providing and attending HFS workshops and participating in annual simulation conferences. My
immersion in the ethnographic term as an ‘insider’ was facilitated by the relationship I had with some of the nurse educators interviewed, as they were former colleagues. These nurse educators invited me to conduct HFS workshops at the site, establishing a friendly and non-biased rapport. However, it should be noted that I had limited prior knowledge of the other educators and students at these institutions. Maintaining professional boundaries was a priority for me, considering the relationships between educators and students and between me and the participants. I exercised caution to ensure clear boundaries were established and respected. Field notes, memos and reflective notes were diligently taken during data collection to maintain confidentiality and build participant confidence.

Even though I was not a lecturer at the study site, I could attend a meeting between educators and students and joined a tour for third- and fourth-year students. When I began recruiting students, it was not the first time the students had heard of me. Being familiar with me could have a positive impact, as participants were not faced with a stranger and likely felt more comfortable and at ease. This familiarity allowed for a more natural interaction, as participants knew me. From the standpoint of Saudi culture, it would have been challenging for these students if I had been an ‘outsider’/ ‘etic’.

**5.5 Access and Recruitment Procedures**

Figure 10 explains the access and recruitment processes for this study.
5.5.1 Study Settings

The study was conducted in Riyadh, Saudi Arabia, a city that houses four simulation and clinical skills centres which are under the authority of either the Ministry of Health (MoH) or the Ministry of Education (MoE). The simulation centres in Riyadh, which is the capital city of Saudi Arabia, are listed in Table 7: This study was conducted at a clinical skills and simulation centre affiliated with one of the universities under the jurisdiction of MoE. For confidentiality reasons, the university’s name is not disclosed. The reason for conducting this study at this particular university was its possession of the HFS Laboratory, which is the largest in the Middle East. The laboratory is equipped with various simulation scenarios, ranging from basic skill modules to more complex...
ones (scenarios bank).\textsuperscript{3} In this study, the focus is on complex nursing scenarios. This allows for the simulation of realistic and challenging nursing education and practice scenarios.

Furthermore, the university’s facilities offer a secure and structured environment for skills development without compromising patient safety. Both nursing students and educators have access to these facilities, as well as the opportunity to teach and learn in this simulation centre for the BSN programme. This means that the nursing educators and students participating in this study have a comprehensive understanding of the simulation scenarios and the Centre itself. Moreover, this university serves as a role model for other institutions that implement HFS in health education within the nursing domain, despite exclusively providing education to female students.

\textit{Table 7: The simulation centres located in Riyadh, Saudi Arabia (Source: Saudi Society of Simulation in Healthcare, 2019)}

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
\hline
\textbf{Institutional Affiliation} & \textbf{Simulation Centre Name} & \textbf{Location} \\
\hline
Princess Nourah Bint AbdulRahman University & Simulation and Skills Development Centre & Riyadh, Saudi Arabia \\
\hline
King Saud University & Clinical Skills and Simulation Centre at King Saud University & Riyadh, Saudi Arabia \\
\hline
King Fahad Medical City & The Centre for Research, Education and Simulation Enhanced Training & Riyadh, Saudi Arabia \\
\hline
King Fahad Medical City & Clinical Skills Centre & Riyadh, Saudi Arabia \\
\hline
\end{tabular}
\end{table}

\textsuperscript{3} The scenario bank in the simulation centre is a collection of diverse scenarios that are either derived from Western culture or created by educators after receiving approval for their use. The educators chose scenarios that aligned with their specific specialties and learning objectives from this bank.
5.5.2 Gaining Access

Securing approval from an institutional review board was a crucial prerequisite before initiating data collection for this study (Appendix 6). It was also essential to obtain local permission to access the recruitment site in Saudi Arabia (Appendix 7). Obtaining early access to the research site assisted me in gaining the support of gatekeepers and individuals in positions of authority (Creswell and Poth, 2016). This study included both gatekeepers and participants. Gatekeepers are individuals or social groups that provide formal or informal access to the organisation to facilitate fieldwork (Coffey, 2018). Moreover, the participants are key for systematically exploring various perspectives within the setting (Coffey, 2018).

The Ethics Committee of the School of Health and Social Sciences at the University of Edinburgh (UoE) and a Saudi university’s Research and Ethics Committee both granted ethical approval. Copies of the ethical approvals from each institution are included in Appendix 6 and Appendix 7. In addition, Section 5.7.3 explains in detail the amendments made to the ethical assessment regarding the interview methods.

5.5.2.1 Familiarisation After Gaining Access

During a four-week period, from February 2020 to March 2020, I dedicated time to familiarise myself with the research setting. Various activities were undertaken to create awareness and establish rapport with the educational institution and its members. These activities included distributing flyers (Appendix 17), conducting informal discussions with groups, emailing educators (Appendix 16), and interacting with students using recruitment methods (see Table 8). It is important to note that I had previously conducted a workshop in this setting, contributing to their familiarity with the environment. The purpose of these activities was to ensure that the study

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4 Due to confidentiality requirements, the specific name of the institution cannot be disclosed in the thesis. However, the ethical approval letter has been included in the thesis, with measures taken to ensure the institution’s identity remains confidential. An official copy of the ethical approval letter is retained by the SHSS committee for future reference, if necessary. The inclusion of the letter in the thesis serves the purpose of providing a reference for future use and demonstrating compliance with ethical procedures. To maintain confidentiality, the term ‘Anonymised’ has been used in place of the institution’s name in the thesis.
was visible, known and understood by potential participants. By allowing time for the participants to become acquainted with the study’s objectives and to recognise me, the aim was to create a supportive and informed environment for the subsequent recruitment process.

Table 8: The recruitment methods in the female college

<table>
<thead>
<tr>
<th>Participants</th>
<th>Methods</th>
</tr>
</thead>
</table>
| Educators   | - Invitation email  
|             | - Faculty meeting (at the end of the meeting) |
| Students    | - Flyer on the online Blackboard page and the simulation laboratory  
|             | - The classroom (at the end of the lecture, 10 mins before dismissal).  
|             | - Before starting the practical class |

The study invited potential participants among female nurse educators, considering their varying levels of experience and duration in scenario-based HFS, which were determined based on interviews with novice to experienced educators. During this process, novice lecturers up to associate professors were included to ensure a diverse representation of educators at different career stages and experience levels. These interviews with various educators provided invaluable insights into their perspectives on the scenario-based complexity of HFS.

For the female students’ familiarisation process, students were informed about the voluntary nature of participation and their ability to withdraw from the study at any time. Before the COVID-19 pandemic and subsequent lockdown measures, I had the opportunity to recruit students in person at the end of the educator’s lecture (Table 8). During this time, I explained the study, recruited interested students and provided them with my contact information.

5.5.3 Purposive Sampling

Purposive sampling was employed to recruit participants who had first-hand experience with the phenomena being studied (Ritchie, Lewis and Elam, 2014). This sampling method is commonly used in qualitative research as it allows researchers to deliberately select participants who are
considered rich sources of data (Ritchie, Lewis and Elam, 2014). Consequently, this strategy helped this qualitative research study achieve data saturation (Elliott and Timulak, 2005), which denotes the point at which no new data or themes are emerging (O’reilly and Parker, 2013).

In this study, I utilised purposive sampling to select participants based on specific characteristics, features and experiences (Ritchie, Lewis and Elam, 2014; Ritchie et al., 2014). This approach ensures a comprehensive understanding of the phenomenon under investigation and guarantees representation from all relevant groups (Creswell and Poth, 2016). By employing purposive sampling, a diverse range of participants, including nurse educators and nursing students with relevant experiences and perspectives, were included in this study (Ritchie, Lewis and Elam, 2014; Ritchie et al., 2014). This study aimed to offer an in-depth understanding of HFS by capturing variations within the nurse educator and nursing student populations through purposeful participant selection from these groups. Focusing on nurse educators and students through purposive sampling is essential for gaining insights into the HFS process and developing useful recommendations for nursing education. In addition, purposeful sampling takes into account socioeconomic and other important factors (Bryman, 2016).

As outlined in Section 5.5.2.1, the participants in this study belonged to two groups: i) female nurse educators and ii) female nursing students. The criteria for selecting the participants were established early in the research process; see Table 9 and Table 10 for the inclusion and exclusion criteria. These criteria were determined based on the research question, a literature review and existing knowledge in the specific context. Nurse educators were chosen because they were deemed to be in the best position to provide in-depth insights into the phenomena under study (Sargeant, 2012). According to Sargeant (2012), the appropriateness of the sample is determined by the participants’ ability to effectively convey their views and perspectives. Meanwhile, undergraduate nursing students were chosen to gain further insights and understanding about the learning experiences and to develop a holistic understanding of the learning context. The decision to include third- and fourth-/final-year students was to ensure a fresh perspective on their HFS simulation experiences and avoid bias from their experiences. In addition, complex scenario-based HFS are taught during the third and fourth years of the nursing curriculum (further details later in
this section). The decision to include females in the study was based on cultural constraints and the specific context. As I am female, permission was sought to conduct fieldwork exclusively in a female college, considering the cultural limitations in Saudi Arabia and the unique nature of the research setting. Owing to these restrictions, I obtained specific approval to conduct the study solely within the female setting.

*Table 9: The inclusion and exclusion criteria for selecting nurse educators*

<table>
<thead>
<tr>
<th>Inclusion criteria for nurse educators</th>
<th>Exclusion criteria for nurse educators</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Nurse educators employed in clinical skills and simulation centres in the female section, including international and Saudi educators</td>
<td>- Other healthcare educators who work outside simulation centres</td>
</tr>
<tr>
<td>- Nurse educators who hold a full master’s degree qualification or above (lecturer or above)</td>
<td>- Male nurse educators who have taught female nursing students</td>
</tr>
<tr>
<td>- Nurse educators with at least one year of teaching experience in HFS within the Saudi context</td>
<td></td>
</tr>
<tr>
<td>- Nurse educators with an academic background in designing and running complex scenarios in undergraduate programmes</td>
<td></td>
</tr>
<tr>
<td>- Nurse educators who have taught the third and fourth/final years in the undergraduate curriculum.</td>
<td></td>
</tr>
<tr>
<td>- Nurse educators who are proficient in either English or Arabic, or both.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 10: Inclusion criteria for selecting nursing students

<table>
<thead>
<tr>
<th>Nurse students’ inclusion criteria</th>
<th>Nurse students’ Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate Saudi nursing students in the third and fourth/final years who have learning experiences with complex scenario-based HFS.</td>
<td>Undergraduate nursing students in the first and second years.</td>
</tr>
<tr>
<td>Undergraduate nursing students (female) who have participated in at least three sessions of complex scenario-based HFS.</td>
<td>Undergraduate nursing students who have not participated in at least three sessions of complex scenario-based HFS.</td>
</tr>
<tr>
<td>Undergraduate nursing who has been taught clinical skills lab at simulation centres in the female section.</td>
<td>Undergraduate nursing students who have not been taught clinical skills lab at simulation centres in the female section.</td>
</tr>
<tr>
<td>Undergraduate nursing students who are proficient in both English and Arabic languages.</td>
<td></td>
</tr>
<tr>
<td>Undergraduate nursing students who are currently learning in the same simulation lab that is facilitated by nurse educators meeting the aforementioned inclusion criteria.</td>
<td></td>
</tr>
</tbody>
</table>

In a similar process, female undergraduate nursing students in the third and fourth years, who had participated in at least three sessions of the HFS, were recruited for this study. The nursing undergraduate programme in Saudi Arabia spans five years and includes a final-year internship, as outlined in Section 2.5.5.1. The first year is dedicated to foundational knowledge, encompassing general sciences courses, English language proficiency, communication, and learning skills. The nursing course extends over four years, starting from the second year, and is divided into eight levels, with each academic year consisting of two semesters or levels. The nursing programme includes several specialised departments (Figure 11) including: i)

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5 The nationalities of the students were not considered for identification in this study, as all undergraduate students in Saudi Arabia are Saudis.
Community Health Nursing Department, ii) Psychiatric and Mental Health Nursing Department, iii) Nursing Services Administration, iv) Medical-Surgical Nursing Department (MSND), v) Maternity and Child Health Nursing Department. Each department comprises a variety of courses and requirements that undergraduates must fulfil in order to graduate. For example, the MSND which is the focus of the current study, includes a range of courses from fundamental to advanced (Table 11): 1) Two fundamental nursing care courses in the second year, 2) Two courses in adult nursing in the third year and 3) Two courses in Intensive and Critical Care in the fourth. Therefore, I focused on the medical-surgical courses, given their essential nature and significance as a cornerstone of nursing education. These courses comprise a comprehensive curriculum across each year of the nursing programme, starting with the foundational courses in the second year and culminating with Critical Care courses in the fourth year.

Figure 11: Nursing departments based on the specialities in Saudi universities
Table 11: MSND courses based on the year/levels

<table>
<thead>
<tr>
<th>MSND courses based on the year/levels</th>
<th>Second year (Levels 3 and 4)</th>
<th>Third year (Levels 5 and 6)</th>
<th>Fourth year (Levels 7 and 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the courses</td>
<td>- Fundamental nursing care I</td>
<td>- Adult nursing care I</td>
<td>- Critical care nursing care</td>
</tr>
<tr>
<td></td>
<td>- Fundamental nursing care II</td>
<td>- Adult nursing care II</td>
<td>- Intensive nursing care</td>
</tr>
</tbody>
</table>

As stated in the previous paragraph, in the second year of their nursing programme, students begin their introduction to medical and surgical courses while participating in simulation sessions (more details are available in the Chapter 2, Section 2.5.5). However, it is during the third year that nursing students begin their clinical rotations in the HFS lab. Before recruiting the students, I considered the timeline for the start of the semester/level in Saudi Arabia, which typically begins in February each year. This consideration ensured that the third-year students had ample exposure to the HFS. As a result, third- and fourth-year students were recruited in the current study, to gain a comprehensive understanding of the HFS integrations process, starting from the introductory course and incorporating additional inclusion and exclusion criteria in Section 5.5.4. The primary objective was to determine how the students’ experiences have evolved since their initial exposure to the HFS.

To explore the experiences of nurse educators and students in HFS, this study refrains from relying on a predetermined set of scenarios. The focus is not on specific medical conditions or content; rather, it aims to understand how participants perceive and engage with the HFS process. The study primarily emphasises the following aspects of the scenarios-based HFS within the medical-surgical department:

i) Complex scenarios in areas such as adult care, critical care, and intensive care courses.
ii) Utilisation of 3G Sim man mannequins.

### 5.5.4 The Recruitment Process

The recruitment took place between April 2020 and December 2020 at the nursing college in one university in Riyadh, Saudi Arabia. Recruitment is an important process and determines the purposive sample’s quality and effectiveness, on which the research relies (Ritchie, Lewis and Elam, 2014; Ritchie et al., 2014). After obtaining approval from the Research Ethics Committee of the School of Health and Social Sciences at the University of Edinburgh (UoE) (Appendix 6), the IRB in Saudi Arabia granted their approval (Appendix 7).

Careful planning characterised the recruitment process, leveraging the familiarity established in the previous phase, where participants were already acquainted with the research study and its focus on HFS. This facilitated their engagement and involvement. Ethical considerations played a pivotal role, ensuring that participants provided informed consent and had the freedom to withdraw from the study at any stage. Recruitment activities included approaching educators and students interested in participating.

After selecting participants from the female college, I individually contacted them to provide further details about the study, using information sheets (Appendix 10 and Appendix 11). As part of the ethical procedures, participants were required to sign consent forms (Appendix 8 and Appendix 9) to confirm their agreement to participate in the interview. However, the beginning of the COVID-19 pandemic coincided with the start of data collection, posing challenges with recruitment, and providing updates on data collection progress. Further explanations regarding these challenges are provided in Sections 5.5.5 and 5.6.1.

As stated previously, this study took place in a nursing college in Saudi Arabia. Figure 12 illustrates the recruitment process for educators and students. From the total population of potential participants, 18 educators and 150 third- and fourth-year students were invited by me. Of them, 15
educators and 40 students expressed their willingness to participate enthusiastically. However, after sending the consent form and making arrangements for interviews, a few did not respond or declined for certain reasons. Some participants, both students and educators, requested the postponement of the May 2020 interviews because of Ramadan and COVID restrictions. Data collection continued until no new categories for the theme emerged, reaching data saturation with 24 interviewees, comprising 10 educators and 14 students. Nevertheless, I encountered some difficulties with recruitment, which are described in detail in Section 5.5.5.
Figure 12: The recruitment process
5.5.5 Reconsideration of the Recruitment Process During the COVID-19 Pandemic

In 2020, the nursing student recruitment process underwent significant modifications in response to the challenges posed by the COVID-19 pandemic. The originally planned approach, which involved conducting recruitment activities in the lab, was replaced with an online method using the Blackboard platform. The recruitment of educators did not change as they were recruited in person before the pandemic-induced lockdown (See Table 8). In addition, the recruitment process experienced delays due to COVID-19 restrictions and other cultural factors. In response to the situation, I sought and obtained approval for these changes from the Ethics Committee within the school’s Health and Social section (SHSS). Further elaboration on this matter is provided in Section 5.7.3.

5.5.6 Sample Size

In qualitative research, the sample size is considerably smaller compared to quantitative research (Creswell and Poth, 2016). According to Creswell and Potth (2016), “One general guideline for sample size in qualitative research is not only to study a few sites or individuals but also to collect extensive detail about each site or individual studied. The intent and qualitative research is not to generalise the information but to elucidate the particular” (p.158). Data saturation holds paramount importance in focused ethnography research, as it helps determine the sample size (Morse, 2000; Higginbottom, Pillay and Boadu, 2013). Furthermore, other factors such as the study’s purpose, participant characteristics, data collection methods and available time resources can also influence the sample size (Aktinson and Hammersley, 1998; Creswell and Poth, 2016). Thus, in this study, data saturation was achieved through a thorough and detailed description of the data gathered from interviews conducted with 24 educators and students.

5.6 Data Collection Methods: Semi-structured Interviews

The main method for data collection in this study involves semi-structured interviews. Semi-structured interviews offer interviewees the opportunity to direct the conversation and explore
relevant topics, allowing them to raise concerns and delve deeply into the issues at hand (Rubin and Rubin, 2011). The purpose of the semi-structured interviews was to collect information about the experiences, perspectives and insights of the nurse educators and students regarding HFS. These interviews were designed based on the principles of focused ethnography, which seeks to gain a deeper understanding of participants’ experiences within a specific context.

Through the interviews, the study sought to gather qualitative data to provide valuable insights into how the participants perceived and experienced HFS (Silverman, 2013). The in-depth semi-structured interviews allowed participants to reflect on their experiences, express their viewpoints and contribute to a more comprehensive understanding of the research topic (Rubin and Rubin, 2012).

I developed two distinct flexible interview guides based on the literature review. There were two interview guides: one for the nurse educators and one for the nursing students. The reasons for employing the flexible interview guides are to facilitate the interview process and ensure that key areas of inquiry were addressed, by using an ‘aide memoire’. This guided the use of open-ended questions developed for the interview, drawing from insights gleaned during the literature review. I modified these initial questions based on supervisor feedback and then piloted them first with colleagues and subsequently with the first participants from both groups (one educator and one student). This step was important to assess how the language of the interview guide influenced the sharing of experiences (Silverman, 2013). Through this iterative process, it became evident that educators and students preferred to conduct the interviews in Arabic when it was their mother tongue as doing so enabled them to more effectively express their thoughts and relate their experiences (using English significantly hindered their ability to convey the full essence of their experiences). Based on this preference, I offered the option of using Arabic or English or a combination of both languages. Further details about the translation process and related issues can be found in Section 5.10.2.
5.6.1 Reconsideration of the Interview Method due to the COVID-19

Face-to-face and online, semi-structured interviews were the main data collection methods in this focused ethnography study. Initially, face-to-face interviews were conducted at the nursing college. However, the COVID-19 pandemic and the implementation of social distancing policies necessitated a re-evaluation of data collection methods. To ensure the continuity of the study, I shifted from physical to digital interviews (Howlett, 2022). As such, educators and students participated in the interviews through online video or voice conferencing. It is important to note that online research is not a recent phenomenon in the social sciences, with content analyses and digital ethnographies utilising social media platforms and existing online content (Beaulieu, 2004; Hine, 2017). Social science researchers have also been conducting interviews via telephone, Skype and instant messaging services for many years (Johnson, Scheitle and Ecklund, 2021; Sullivan, 2012; Jenner and Myers, 2019). Thus, online interviews in the current study are not novel.

I followed the same protocol for both online and in-person interviews (Dodds and Hess, 2020). Data collection and analysis were carried out from April 2020 until February 2021. Prior to the interviews, participants provided consent and received an explanation of the study (Marshall, 2006). They also completed a brief demographic information questionnaire before the interview (Appendix 12 and Appendix 13). Probes were used during the interview to elicit more in-depth explanations about specific topics, and the interview questions were guided by the interviewees’ responses. These probes facilitated a deeper exploration of how educators and students perceived and experienced HFS (Rubin and Rubin, 2011). Given the focused ethnography approach, each participant underwent a single interview. I, who was the interviewer, assumed the role of a listener, asking questions to gather more information related to nurse educators’ and students’ experiences and understanding of the social process (Coffey, 2018). Digital recording equipment was used to capture the interviews, ensuring that all conversations were transcribed verbatim. The female nurse educators and female students were interviewed separately, either in a private space within the nursing college or through a secure online platform to maintain confidentiality and privacy. This separation allowed students to explore their experiences and perceptions without the presence of their educators. Additionally, it facilitated the comparison of perspectives between nurse educators
and students regarding HFS as teaching pedagogy. To capture common themes, I analysed responses and took notes throughout each interview, alongside field notes (Speziale, Streubert and Carpenter, 2011).

A total of 24 interviews were conducted, including both educators and students. This was done to ensure harmony between the two groups, which proved beneficial during the iterative analysis process and data collection. It is worth mentioning that owing to the pandemic-induced lockdown in 2020, all student interviews were conducted remotely (further details are given in Section 5.6.1.1). Table 12 provides an overview of how the interviews were conducted, including the number of online and face-to-face interviews. As previously mentioned, participants were given the opportunity to choose the language that was most comfortable for them to discuss their experiences in greater depth. The majority of students preferred the interviews to be conducted in Arabic. Thus, I transcribed the interviews myself and had them translated by a bilingual translator, with subsequent back translation by me (further details are provided in Section 5.10.2). It is also important to note that the study focused on third- and fourth-year undergraduate students. Table 12 outlines the method used for conducting the interviews and the number of students in the third and fourth years.

Table 12: The method of conducting the interviews

<table>
<thead>
<tr>
<th>Methods of conducting interviews</th>
<th>Language of interviews</th>
<th>Number of transcriptions and translations</th>
<th>Level of students</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>Arabic</td>
<td>Transcription</td>
<td>3rd year</td>
<td></td>
</tr>
<tr>
<td>In person</td>
<td>English</td>
<td>Translation</td>
<td>4th year</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educators</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

For the educators, the situation was different; I conducted some of the interviews face-to-face, while others were carried out remotely as the educators worked from home. This approach allowed me to establish eye contact and observe body language during some of the interviews with
educators, generating additional field note data (further details are provided in Section 5.7.2). For
other educators, the interview process was similar to that of the students. I considered the
differences in nationality and provided participants with the option to select the language of the
interview, either Arabic or English. As previously described, I transcribed the interviews and had
them translated by a bilingual translator, followed by back translation by me, to gain a deeper
understanding of the data. Data collection and data analysis processes were continued until
saturation was achieved and the research question was adequately addressed (Elliott and Timulak,
2005; Speziale, Streubert and Carpenter, 2011; Coffey, 2018).

5.6.1.1 Timing and Content of Interviews

As previously mentioned, this study employed both online and face-to-face interviews. The length
and content of the interviews were standardised for both methods of interviews, with variations
primarily concerning the preparation of interview settings and scheduling (Dodds and Hess, 2020);
further details are elaborated in this section.

The scheduling of interviews took ethical considerations and the study’s rationale into account.
Nurse educators and students were recruited either in person or via the Internet, avoiding
unnecessary travel and associated costs. I was mindful of transportation challenges, particularly
for female participants, and allowed them to choose the interview time and date. As almost all
face-to-face interviews were conducted in person, educators preferred early morning sessions
before classes commenced or late in the day after classes concluded. The interviews were
conducted in private spaces at the simulation and skill centre or nursing school. To ensure
confidentiality, the interviews were conducted separately and individually. I reserved a private
meeting room to minimise interview interruptions.

For online interviews, students were afforded the flexibility to select a convenient time and date. I
used the Zoom platform and shared a link with participants, specifying the interview’s time, date
and purpose. Conducting a password-protected meeting helped ease participants’ anxiety regarding
the confidentiality and privacy of the online platform (Howlett, 2022). Before the interviews, I
sent reminders to the participants, ensuring that they were well-prepared and could maintain a quiet environment to minimise interruptions during the interview. However, because of the pandemic lockdown and how people could not leave their houses, finding a suitable and quiet place for the interviews and an appropriate time for the interview posed challenges for some students, and I took this into consideration. Additionally, participants were given the option to choose between video interviews and voice-only interviews, recognising the importance of respecting participants’ comfort levels, especially for female participants who might observe religious and privacy practices that involve covering their faces. As I am Saudi female, I was attentive to the technical and cultural limitations regarding video calls. Finally, participants had the autonomy to determine the length of the interviews, which typically ranged from 35 to 80 minutes, based on their availability and willingness to share their experiences.

During the interview, the main concepts and principles of NJST (2016) theory and the existing literature review were utilised as a framework for exploring the research topic. During the educators’ interviews, I encouraged educators to share their teaching experiences, specifically related to preparing and running complex scenario-based HFS. Educators were also prompted to elaborate on how they facilitated the learning simulation environments for students. During the students’ interviews, I encouraged them to share their learning experiences while practising the complex scenario-based HFS. In addition, students were given the opportunity to express their perceptions about this teaching pedagogy. The use of interview guides in this study was flexible to allow for a dynamic and responsive interaction with participants. The structure and organisation of the interviews were tailored based on participants’ responses (McIntosh and Morse, 2015). I focused on fostering participant engagement and interaction, treating participants with respect and probing for more information based on their unique responses, rather than relying solely on predetermined questions. This approach proved highly effective in eliciting more detailed and rich accounts of participants’ accounts.
5.6.1.2 Interview Guide

Marshall and Rossman (2014) argue that using an interview guide offers several advantages as it enables a thorough and systematic exploration of topics while keeping the interview focused on its intended direction. The interview guidelines for the educators and students (see Appendix 14 and Appendix 15, respectively) were developed based on the literature review and the NJST (2016) theoretical framework of this study, using an ethnographic approach to frame the interviews. The interviews began with an introduction, followed by general questions about the participants’ experiences and how they felt at the start of their HFS simulation. This step was crucial in establishing rapport with the participants and reducing interview-related stress. In other words, the interview shifted from general topics to more specific, in-depth questions about their experiences, learning and teaching, facilitators, barriers to their learning and their interactions in HFS. After each interview, I inquired if there were any new insights relevant to future research or any additional perspectives that needed to be covered in the interview. This approach helped shift the participants’ perspective from any potential negativity or anger to a more positive outlook by encouraging them to provide advice based on their experiences.

As previously mentioned, the guide interviews were pilot-tested with both groups to ensure clarity of language and concept for the participants. Minor modifications were made to improve the guide. This aided in acquiring more in-depth information; it should be noted that this guide was not modified significantly after the piloting process (Brinkmann, 2013). Prior to engaging with the remaining participants, I conducted pilot interviews to become familiar with the interview procedure and enhance my interview skills. The data from these pilot interviews were not included in this study’s data analysis. The interview guides for both groups (Appendix 14 and Appendix 15), presented in English, proved practical in documenting the interview’s direction and facilitating discussions between me and the team during data collection and analysis (Rubin and Rubin, 2012).
5.6.1.3 Socio-demographic Data of the Participants

The following sections provide a descriptive analysis of the participants in the current study. Table 13 displays the characteristics of the educators, and Table 14 presents the data for the students.

The study included 10 female educators (Table 13), with varying age groups. Among the educators, 50% fell within the 30-35 age group, 30% were aged between 36-40 years, and 20% were aged 41-45 years. The educators represented various regions⁶, it is important to note that all the participants in this study were from the EMRO region, with diverse nationalities and languages. In terms of qualifications, 60% of the educators held a master’s degree or equivalent, while 40% had a Doctoral degree. The educators’ job titles included Lecturer (60%) and Assistant Professor (40%). As for their experience in courses, the majority of educators (70%) taught Adult 1 and Adult 2 courses, while 70% also had experience in Critical Care courses. Regarding the number of years working as educators, the distribution was as follows: approximately 20% had 1-3 years of experience, 30% had 4-6 years, 30% had 7-9 years and 20% had 10-12 years of experience. No educators possessed more than 13 years of experience. Additionally, the number of years of experience in simulation in the Saudi context varied, with 60% having 1-3 years and 40% having 4-6 years.

The study included a total of 14 female students⁷ (Table 14), all falling into the 20-25 age group. The courses undertaken by the students varied, with all 14 enrolled in Adult 1 and Adult 2 courses. Additionally, 4 students (28.57%) were taking Critical Care, while 1 student (7.14%) was enrolled in the Fundamental of Nursing course. Regarding their level in the nursing programme, 6 students (42.85%) were in their 3rd year, while 8 students (57.14%) were in their 4th year. Concerning the

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⁶ The nationality of the educators was determined based on the WHO region classification as a means to protect their identity. Dividing their nationality into specific regions, such as AFRO, PAHO, SEARO, EURO, EMRO and WPRO, helps protect the anonymity of the educators, particularly in the Saudi context. This approach ensures that individual identities cannot be discerned, maintaining confidentiality and respecting the privacy of the educators.

⁷ The nationality of the students was not explicitly mentioned in the demographic sheet because all of the students included in the study are from Saudi Arabia. Therefore, the demographic information regarding nationality was not included in the analysis.
number of HFS sessions attended, 10 students (71.42%) had participated in 3-5 sessions, while 4 students (28.57%) had attended 6-8 sessions.

Table 13: Demographic information of the female educators

<table>
<thead>
<tr>
<th>Demographic information</th>
<th>Number of educators (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of educators</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Age range (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-35</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>36-40</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>41-45</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African regions (AFRO)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Regions of the Americas (PAHO)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Southeast Asia regions (SEARO)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>European regions (EURO)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Western Mediterranean regions (EMRO)</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Western Pacific regions (WPRO)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s degree or equivalent</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Doctoral degree</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Job title</td>
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<td></td>
</tr>
<tr>
<td>Lecturer</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Assistant professor</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Associate professor</td>
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<td>-</td>
</tr>
<tr>
<td>Courses</td>
<td></td>
<td></td>
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<tr>
<td>Fundamental in nursing</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Demographic information</td>
<td>Number of educators (N)</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Adult 1 Adult 2 Critical care</td>
<td>7 8 7</td>
<td>70 80 70</td>
</tr>
<tr>
<td>Number of years working as an educator</td>
<td>2 3 3 2 -</td>
<td>20 30 30 20 -</td>
</tr>
<tr>
<td>Number of years’ experience in simulation in the Saudi context</td>
<td>6 4 - -</td>
<td>60 40 - -</td>
</tr>
</tbody>
</table>
Table 14: Demographic information of the female students

<table>
<thead>
<tr>
<th>Demographic information</th>
<th>Number of students (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td><strong>Age range (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-25</td>
<td>14</td>
<td>100</td>
</tr>
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<td>26-30</td>
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<td>-</td>
</tr>
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<td>31-35</td>
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<td>-</td>
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<tr>
<td>36-40</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamental in nursing</td>
<td>1</td>
<td>7.14</td>
</tr>
<tr>
<td>Adult 1</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Adult 2</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Critical care</td>
<td>4</td>
<td>28.57</td>
</tr>
<tr>
<td><strong>Level in the nursing programme</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third year</td>
<td>6</td>
<td>42.85</td>
</tr>
<tr>
<td>Fourth year</td>
<td>8</td>
<td>57.14</td>
</tr>
<tr>
<td><strong>Existing nursing qualifications</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Number of HFS sessions attended</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5</td>
<td>10</td>
<td>71.42</td>
</tr>
<tr>
<td>6-8</td>
<td>4</td>
<td>28.57</td>
</tr>
<tr>
<td>9-11</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
5.7 Data Management

5.7.1 Recording and Transcribing Data

Recording interviews represent the most accurate approach to preserving participants’ statements (Holloway and Galvin, 2017). Since this study adopts an ethnographic methodology, it benefits from extensive and in-depth data collection (Knoblauch, 2005; Wall, 2015). With the participants’ consent, I used an encrypted recording device protected by a digital password to record the interview responses. All interviews were tape-recorded using an encrypted device and then transcribed verbatim by me, ensuring no information that could disclose participants’ identities (coding) was included. The bilingual translator also adhered to this procedure for both interview methods. Nonetheless, owing to the qualitative study’s limitations in the Saudi Arabian context, I anticipated potential participant reluctance to engage with the recording method. To address this concern, I provided a clear explanation to potential participants regarding the purpose of audio recording and assured them about the confidentiality and security measures in place to safeguard their data. In addition, I explained the translation and transcription process to the participant to help them understand how their personal information would be handled. The sample comprised educators and students, requiring me to respect the hierarchical structure of the learning and teaching environment. During the sampling phase and before each interview, the participants were reminded of the confidentiality and privacy of their responses. However, it should be noted that despite these efforts, one of the educators objected to recording the interviews, while the other educators and students had no objections.

Each interview’s transcription (Appendix 18) and translation were conducted in parallel with the analytical and reporting phases. As I am bilingual, I transcribed the interviews immediately after the interviews and engaged a bilingual independent translator for the translation process. Subsequently, I personally conducted the back translation by myself (more details about the translation process are given in Section 5.10.2). The transcripts were anonymised by removing any identifying information such as names, locations, positions and other personal data that could link back to participants. To maintain anonymity, each participant was given a pseudonym and a code.
on the demographic, transcript and recorder (Orb, Eisenhauer and Wynaden, 2001). Transcribing the interviews occurred simultaneously with the interview sessions. The analysis of the transcribed data provided valuable insights that informed and guided the structure and content of the subsequent interviews (Van Nes et al., 2010).

After generating the transcripts for both Arabic and English interviews, I listened to the interviews multiple times to cross-check them with the transcriptions. This step was essential for ensuring the accuracy of interpretation and translation, encompassing intonation and capturing essential details’ meaning. To capture non-verbal language, I used *italics* and incorporated reflexive-filled notes (Maharaj, 2016). The transcript’s rough margins provided spaces for me to take notes and perform the initial coding process. Personally undertaking the transcription and back translation allowed me to immerse further into the data, a vital step in the interpretation process (Ritchie et al., 2014).

### 5.7.2 Field Notes

I maintained a reflective journal to capture the participants’ understanding of the ongoing research. Field notes were utilised to document and record various aspects, including environmental details, human interactions and my understanding and analysis of the situation (Silverman, 2013). This practice ensured research quality by acknowledging and addressing any potential personal biases that might influence the findings or analysis, thus promoting transparency. Reflection also aided in identifying areas where more data might be needed (Dowling, 2006). As mentioned in Section 5.6.1.1, many interviews were conducted online using the platform Zoom. This approach provided the opportunity to observe participants’ body language and facial expressions, offering valuable insights into their experiences. Moreover, it facilitated an understanding of the participants’ surrounding environment, enabling me to consider the context in the analysis. By incorporating visual cues and non-verbal communication, the Zoom interviews enhanced the comprehensiveness of the data and rigour of the study. However, considering the limitation in Internet connectivity and cultural factors, one interview had to be conducted over the phone. In such cases, I focused on voice tone, loudness, clarity and moments of silence during the interview to capture the surrounding environment (Howlett, 2022).
The students willingly and eagerly shared their experiences, as this was their first time, being involved in such a study. Throughout the interactions, I did not detect any signs of discomfort from either the students or educators. However, during one face-to-face interview, an educator expressed concern over the use of prop questions in the field note. I took note of her body language to demonstrate how it influenced the subsequent interview. During the lockdown phase of the online interview, I also considered the potential impact of the participants’ family members and children being present.

5.7.3 Researcher’s Reflections on Data Collection

Recognising the methodological sensitivity of this study, particularly concerning the utilisation of the focused ethnography method for conducting interviews, I was fully aware of the need for careful consideration and ethical awareness throughout the research process. As a result, particular attention was given to sensitive issues and cultural limitations using persuasive argumentation. Several obstacles were encountered during the study, especially during data collection, starting with obtaining ethical approval and continuing with the challenges inherent in conducting participant interviews and recording narratives. Additionally, cultural obstacles were acknowledged, as I am being an insider familiar with these issues. However, the unanticipated COVID-19 pandemic required methodological updates and reconsideration on my part.

Obtaining ethical approval in Saudi Arabia presents distinct differences compared to Western countries, especially for this study, which involved participant interviews and narrative recordings (Orb, Eisenhauer and Wynaden, 2001). Given that all of the participants were female and that face-to-face interviews, consent forms and recordings were required, the adherence to these procedures might not align with Saudi cultural norms. It took considerable time to obtain ethical approval for the first intended interview setting, leading to a decision to shift the research setting upon arrival in Saudi Arabia. Regrettably, the initially obtained ethical approval did not meet the study criteria, rendering it impossible to meet the inclusion criteria for the participants. This realisation came to light after meeting with nurse educators, discussing the study’s objectives and inclusion criteria and gathering accurate information about the situation. It became evident that the HFS teaching,
the focus of the study, was not being implemented in their courses, despite the presence of HFS labs. Consequently, it was clear that this setting did not align with the project aims and would not contribute relevant data or knowledge to the study. Thus, I decided to explore other potential settings that would allow me to conduct the research within the inclusion criteria and obtain valuable data for my study. As a result, I initiated a second ethical approval process for a different setting, where the current study took place. This particular setting has the largest simulation centre in the Middle East and features a nursing college that offers HFS teaching. The consultation with my supervision team about this procedure was very supportive. However, the Ethics Committee at SHSS at the UoE agreed to this amendment of the setting.

After obtaining ethical approval the second time, I encountered ongoing recruitment challenges. As mentioned earlier, only a few educators and students showed a willingness to participate in the research. Meanwhile, despite giving initial verbal approval during the familiarisation phase, many potential participants did not respond to my emails. This offers a profound understanding of Saudi society, where a lack of understanding about consent forms may lead an individual to believe they are legally compliant simply by signing them. Thus, cultural norms and practices in Saudi Arabia posed difficulties for recruitment, exacerbated by the pandemic, which also likely heightened participants’ anxiety.

The significant impact of the global COVID-19 situation necessitated changes in the recruitment and interviewing processes. Conducting numerous interviews remotely presented some connection issues. Attempting video calls with some participants was challenging, owing to cultural limitations and religious considerations, particularly concerning women covering their faces. Therefore, some female participants were more comfortable with phone calls rather than video calls, as previously explained in Section 5.6.1.1. These experiences provide a more nuanced understanding of the conservative nature of Saudi society, where faith and values are highly valued and influence learning and teaching processes. Moreover, these understanding sheds light on why some participants were anxious about the presence of males during the HFS sessions, while others were not, as discussed in more detail in Chapter 6, Section 6.2.3.2. Before and during the data collection process, I was prepared to address any potential problems and had a contingency plan.
in place. This involved thoroughly explaining my research and assuring the university and all participants of the confidentiality of their personal information. As I am Saudi, I showed respect for the cultural and religious factors that influenced the study and acknowledged the cultural and religious values of Saudi Arabia. In addition, I provide several recommendations based on the participants’ religious and cultural perspectives to facilitate the integration of the HFS into learning in Saudi Arabia (see Chapter 8, Recommendations and Implications).

Concerning data analysis, I was aware of the difficulties in gathering data and the time required for translating each interview transcript and performing back translation (Ritchie et al., 2014). However, the back translation and analysis of the extensive data were time-consuming, taking longer than initially planned. Nevertheless, this meticulous process instilled sufficient confidence in the data and aided in the subsequent interpretation, as well as in data cleansing, indexing and summarisation for all data sets.

To assure the rigour and quality of the present study, I maintained reflective journals for the interviews. This was important because I serve as the instrument for data collection in an ethnographic study (Coffey, 2018; Roper and Shapira, 2000). Moreover, I assume the role of data interpreter and analyst. As such, the process of reflexivity, involving reflecting on my personal beliefs, biases and preconceived notions, is vital to identify how these aspects might impact data collection (Coffey, 2018; Higginbottom, Pillay and Boadu, 2013). I explain my role and ‘insider’ position in Section 5.4.4, with further elaboration on reflexivity in Section 5.10.1.

5.8 Ethical Consideration Issues

Ethical considerations play a crucial role in research and should be diligently addressed at every stage, starting from the planning phase of the study to the presentation of results. Qualitative studies entail close interaction between researchers and participants, thereby raising numerous ethical issues that demand careful attention. To ensure the protection of participants’ well-being and rights, it is imperative to adhere to specific ethical principles and guidelines. According to
Ryen (2011), there exist several widely recognised ethical principles in qualitative research, aimed at safeguarding the interests of participants. These principles include: a) obtaining informed consent, b) avoiding adverse consequences for participants and c) maintaining confidentiality and anonymity throughout the research process.

5.8.1 Obtaining Informed Consent

Obtaining informed consent is a paramount ethical concern and a legal requirement when conducting research involving interviews with individuals (Marshall, 2006; Ritchie et al., 2014). In this study, adherence to the University of Edinburgh’s (UoE) data protection policy ensured appropriate data management. Consent forms, provided to educators and students (see Appendix 8; Appendix 9), along with information sheets (see Appendix 12; Appendix 13), were integral to the recruitment process. During recruitment, I verbally explained the study’s purpose and assured participants about the confidentiality of their personal information. To safeguard the data, regular backups of collected information were performed. The interview duration, spanning 35–80 minutes on average, allowed for a detailed exploration of participants’ experiences and perspectives.

Considering the participants’ language preferences and the cultural context in Saudi Arabia, I developed the informed consent form using straightforward language to enhance readability and comprehension (Marshall, 2006; Ryen, 2011). The goal was to ensure ease of understanding for all participants. Privacy notices were included in the information sheet for the participants (Appendix 10; Appendix 11), assuring them that only me would be privy to their personal details. To uphold the participants’ confidentiality, an encoding and pseudonym system was employed. Each participant was assigned a unique code number, representing their research data, while personal information like names and contact details were stored separately from research documents, such as audio recordings and demographic information sheets. By using pseudonyms instead of real names in sharing findings, participant identities remained protected in accordance with ethical guidelines. I had exclusive access to raw data, and interview transcripts and notes were
anonymised. Consent forms were securely stored in the UoE system (further details are given in Section 5.8.3).

5.8.2 Avoiding Adverse Consequences for Participants

While the primary focus of biomedical research revolves around avoiding negative consequences, it is crucial to recognise that certain aspects of qualitative methodologies can also impact the potential difficulties participants may encounter (Ritchie et al., 2014; Bryman, 2016). This section discusses two specific aspects: the potential for proximity between I and participants and the use of probing questions during interviews to elicit personal beliefs and emotions. To address these concerns, I took measures to ensure participant comfort and autonomy. Participants were informed that they could control the amount of information they disclosed and had the right to decline answering any questions that made them uncomfortable. Despite these potential challenges, it was observed that a significant number of participants willingly participated in the interviews and even reported positive implications for themselves. They identified several benefits, such as gaining improved insights into their own experiences. During the interviews, I demonstrated high sensitivity to non-verbal expressions and signs of unease, particularly when discussing sensitive topics or when students expressed unfavourable comments about their educators. Adequate time was provided to participants for introspection during these moments. Fortunately, no emotional distress was experienced by the participants throughout the study.

5.8.3 Confidentiality and Anonymity

Ethical guidelines underscore the importance of researchers taking all necessary measures to ensure the confidentiality and anonymity of participants in their study (Ryen, 2011; Ritchie et al., 2014). To address these concerns, collected data, encompassing the demographic data, audio files, interview transcriptions, interview notes, consent forms, translation files and reflective journals, were immediately encrypted using the software Veracrypt and stored in the UoE secure system. An audit trail was employed to ensure dependability and confirmability. To further protect participants’ identities, anonymised research data and audio recordings were deposited in a UoE data repository.
with no personal data disclosed. To maintain privacy, each participant was assigned a unique code number that was solely used to identify their research data. Personal information, such as names and contact details, were stored separately from research materials, including audio recordings and demographic data. Following the completion of the research project, in compliance with the Data Protection Regulation of the UoE, interview recordings were deleted, and transcription files were erased to safeguard privacy.

As I am from Saudi Arabia, I was aware that recording interviews might be met with some refusals owing to the limited recognition of qualitative research within the cultural context. Nevertheless, I took proactive steps to reassure participants about the confidentiality and anonymity of their information. Despite my efforts, one educator participant refused to allow the recording of the interviews, even after multiple assurances of privacy. As a result, I did not recruit a replacement for this educator since the entire staff had been invited, and she declined to participate in the recording during its execution. To ensure rigour and the quality of the study, I made the decision to exclude this particular participant from the analysis. In contrast, all other participants expressed no objections and were comfortable with the recording of their interviews.

**5.9 Analytical Process**

The analysis of in-depth interviews was complex, entailing a meticulous review and exploration of the data to attain a comprehensive understanding of the social facets under study. It is essential to highlight that data collection and analysis took place simultaneously. This means that the analysis was not just carried out after gathering all the data; it was a continuous part of the whole research journey (Silverman, 2013).

**5.9.1 Analysis Process Using the Framework Analysis Method**

This study utilised the framework analysis method, which encompassed the identification, interpretation and extraction of themes from the data, as outlined by Ritchie and Spencer (1994).
While falling under the broader category of thematic analysis, this approach delves deeper into more abstract and interpretive dimensions, moving beyond surface-level representations (Ritchie et al., 2014; Braun and Clarke, 2006). The fundamental principles of framework analysis comprise a powerful progression from descriptive, data-driven analysis towards more conceptual themes. It emphasises explanation without focusing on quantification. Framework analysis, along with thematic analysis and grounded theory, is considered a substantive approach to data analysis, as they focus on the comprehension of the conveyed meaning within the text (Gibbs, 2014). While grounded theory aims to generate social theory, the framework approach is not inherently focused on theory development. Nevertheless, it facilitates constant comparative techniques, enabling data review across a matrix of frameworks (Gale et al., 2013).

The choice of framework analysis for this study was also driven by its suitability for a focused ethnography approach, which generated a large volume of data requiring structured management and organisation (Ritchie et al., 2014). Unlike other analytical approaches, framework analysis was not tied to a specific epistemology, philosophy, or theory, offering flexibility to align with the research objectives, questions and unique characteristics of the study (Ritchie and Spencer, 2002). Additionally, the framework approach is regarded as a systematic method that does not favour either inductive or deductive analysis, as argued by Gale et al. (2013). The study’s stance on the inductive-deductive continuum is determined solely by its objectives and research questions. Thus, the framework approach’s analysis methodology was well-suited for the research questions, overall objectives and underlying philosophical assumptions of the current study. Figure 13 illustrates the process of framework analysis and the application of the five steps, which were detailed to ensure accuracy and transparency in the research findings (Ritchie et al., 2014).
**Figure 13: The framework analysis process**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| Familiarisation with data | • Engaging in active listening while reviewing the recorded interviews and simultaneously assessing the transcripts alongside the corresponding audio files.  
• Recognising overarching patterns. |
| Coding and identifying a thematic framework | • Utilising a line-by-line open coding approach to analyse the data.  
• Maintaining a concentrated focus on individual transcripts during the analysis process.  
• Identifying recurring and intriguing themes that emerge from the data.  
• Developing a comprehensive thematic framework to organise and interpret the identified themes. |
| Indexing and sorting | • Applying the thematic framework to transcripts.  
• Clustering related content.  
• Organising data by identified themes. |
| Summarising data using a framework matrix | • Constructing a framework matrix for every theme.  
• Condensing the information from each transcript according to the pinpointed theme and entering it into the matrix. |
| Abstraction and interpretation | • Identifying elements and dimensions within the data.  
• Grouping elements into different typologies to form categories.  
• Constructing categories and classes based on the grouped elements.  
• Identifying patterns of connection between the categories.  
• Developing implicit explanations. |
5.9.1 Familiarisation

The first step in the data analysis phase involved becoming acquainted with the transcripts, context and reflective journals. To achieve this, multiple iterations of listening to the recordings, reviewing the interview transcripts and examining the fieldnotes were undertaken. A thorough line-by-line analysis of the transcripts was conducted to deeply immerse in the data and recognise overarching patterns within the dataset. Through this process, a thorough grasp of the core content was achieved. This methodological approach ensured that any ensuing categories and themes were solidly based on and validated by the data itself (Ritchie et al., 2014).

5.9.2 Coding and Identifying a Thematic Framework

After becoming familiar with the data during the initial stage of analysis, I conducted the initial coding (see Appendix 19) and corresponding preliminary analyses for the transcripts. To identify thematic frameworks, I employed open coding through coding sheets in a Word document (see Appendix 21). Behaviours, incidents, values and emotions were assigned codes based on their perceived relevance from multiple perspectives. At times, an ‘in vivo’ coding method was employed, involving the adoption of terms or expressions used by the interviewees to describe or define specific phenomena. Furthermore, I took detailed notes and documented comprehensive concepts in the right margin of the open coding sheet. These notes highlighted areas that required revisiting or further explanation in future interviews (Appendix 21). Saldaña (2021) argues that the practice of line-by-line coding encourages researchers to carefully examine elements that may necessitate further clarification or appear inconsistent with the overall narrative, thereby enhancing the analytical process. In this coding phase, I used Microsoft Word to code the interviews separately as each interview transcription had its own file. This approach was necessary to prevent prior assumptions or expectations from influencing the emergence of themes. Despite not solely relying on an inductive methodology, open coding, according to Charmaz (2014), ensures the inclusion of all crucial elements of the data. The results of the initial/open coding process are shown in Appendix 21). During this phase, meetings with supervisors played a significant role, as they allowed for discussions on open coding and other options from different viewpoints.
This step was helpful, given the nature of the ethnographic study. Initially, I contemplated connecting the codes that presented the issues or common topics and sorting them into more general groups to form initial framework themes. Upon reviewing the initial framework themes derived from the data (Appendix 22), it became evident that these initial themes were not final and underwent an iterative process. To facilitate recognition later on, I assigned numbers to these themes. Furthermore, I remained receptive to the possibility of having subthemes under each main theme and avoided disregarding other topics not directly related to a theme by using the term ‘others’. The thematic framework generated underwent multiple revisions before all potential themes emerged, indicating that it was not a final version.

5.9.3. Indexing and Sorting

In this stage, the established thematic framework was utilised by arranging the transcripts according to the identified themes and subthemes. To streamline this process, all the transcripts were uploaded to NVivo 12, a Computer Assisted Qualitative Data Analysis Software (CAQDAS) (see Appendix 20). During the indexing stage, I assigned labels to text segments and data portions that represented the same concept and corresponded to specific thematic categories. This step ensured that data extracts with similar labels were reviewed for further analysis. An example of the indexing process is illustrated in Figure 14.
After completing the indexing phase, the data were organised in a manner that grouped textual data with similar attributes or content, resulting in multiple thematic sets. The use of NVivo software made this phase swift and efficient. Furthermore, a benefit of employing CAQDAS for data organisation is the capability to view data segments within their context. With the NVivo software, data extracts can be highlighted and quickly located in their interview transcript context by clicking the title link (Bazeley and Jackson, 2013). Figure 15 presents an example of the sorting process.

Figure 14: A sample of indexing in NVivo 12
Figure 15: A sample of sorting in NVivo 12

5.9.4 Data Summary and Display Using Framework Matrix

This phase was instrumental in reducing the data to a manageable level by constructing a framework matrix for each theme (Figure 16). The first column of the matrix was allocated for recording the demographic information of each participant. Further, a consistent row was assigned to each participant across all matrices to facilitate individual-level comparisons. The charting process involved condensing the data from each transcript into a matrix based on themes, preserving the exact language used by the participants that corresponded to each theme. Using NVivo 12 was crucial for creating the framework matrices (Figure 16 and Figure 17).
Figure 16: A sample framework matrix for one thematic framework in NVivo 12.
5.9.5 Abstraction and Interpretation

In this final stage, the analysis of the key topic identified from the matrices is achieved through a series of steps. The process commenced by establishing categories and classes, which was then followed by identifying relationships and patterns among them. The explanations for these patterns were formulated after completing the majority of the descriptive and typological analysis. To achieve this, I revisited the study’s objectives, theoretical framework and the concepts that emerged from the data through inductive reasoning.

Figure 17: Sample framework matrices in NVivo 12.
To identify elements and dimensions within the raw data extracts, it was crucial to aim for a comprehensive understanding of ‘what is happening’ within the data. To allow for multiple revisions, it was preferable not to use NVivo software at this imperative stage of conceptualisation. Table 15, Column A showcases the raw textual data related to the subtheme ‘High fidelity simulation preparation’, representing the initial step of this process. Column B presents an initial list of the elements found in the text under the subtheme ‘Background for Students and Educators’. In Table 16, Column A presents a list of elements present throughout the ‘High fidelity simulation preparation’, while Column B depicts the underlying dimensions.

*Table 15: The first step in identifying elements and dimensions*

<table>
<thead>
<tr>
<th>High fidelity simulation preparation theme</th>
<th>B. Detected elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Data summaries for subtheme: Background for students and educators(^8)</td>
<td></td>
</tr>
<tr>
<td>N.E.1: “These workshops included lectures and individual sessions tailored to educators’ needs. For example, they covered topics such as how to build scenarios, prepare every scenario, and select scenarios for HFS sessions. The simulation centre instructors were actively involved in these workshops, providing assistance and guidance during one, two, or three sessions as required.”</td>
<td>Workshops for preparation</td>
</tr>
<tr>
<td></td>
<td>The content of the developed workshop</td>
</tr>
<tr>
<td>N.E.10: “Actually, I think there is a gap between the theory and practice because not all the things that the students are taking in the simulation, they have taken [them] already during the theory. Sometimes for the lab result, when I ask the student about what the BT CT is, not all the students are aware of these results. I think [it is worth] covering the aspect in the theory. You already know that the student will take this in the simulation. I know not at the beginning of the simulation but maybe during the end of the simulation, the student will take this aspect in the simulation. It is better to mention it in the theory. When the student come[s] to the simulation, they know what this is and what is the correct intervention regarding this aspect.”</td>
<td>Lack of preparation from the theoretical part</td>
</tr>
<tr>
<td></td>
<td>Believing that students need to have a theoretical background</td>
</tr>
<tr>
<td>N.E.2: “If the student didn’t have a good background, especially considering the difference in learning styles, the simulation may not provide significant benefits.”</td>
<td>Theoretical background has benefits</td>
</tr>
</tbody>
</table>

\(^8\) All of these are direct quotations from the interviews.
<table>
<thead>
<tr>
<th>High fidelity simulation preparation theme</th>
<th>B. Detected elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Data summaries for subtheme: Background for students and educators⁸</td>
<td>Practical and theoretical backgrounds facilitate the learning</td>
</tr>
<tr>
<td><strong>N.S.1:</strong> “Uhh, that we read a scenario before we enter the simulation laboratory like I already took the theoretical part, I already learned the practical part in the laboratories, how I will give the medication, how I will insert the IV line for the patient, how I will prepare the solution for the IV line.”</td>
<td>Impact of lack of theoretical background on their action during the HFS</td>
</tr>
<tr>
<td><strong>N.S.13:</strong> “There was something that stressed me [about] Adult 2, when we entered a simulation about burn injury and we still didn’t take the theoretical information about burning, so we were entering into something that we don’t know but we are required to act on. I mean, we neither study burns nor any procedures about it, so every one of us before entering the simulation browsed YouTube to learn how to act and then inform each other. Also, at the same time, it was unfair, because there were girls who took the simulation after studying burning, so there was a difference for sure. There were girls who entered without any knowledge of burning. While there are girls who entered while studying burns.”</td>
<td>Using YouTube for preparation</td>
</tr>
<tr>
<td></td>
<td>Timetable increased the ST interaction</td>
</tr>
</tbody>
</table>
### Table 16: The second stage of detecting elements and dimensions.

<table>
<thead>
<tr>
<th>High fidelity simulation preparation theme</th>
<th>B. Key dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Detecting elements across the data set for ‘high fidelity simulation preparation’</strong></td>
<td></td>
</tr>
<tr>
<td>- Benefits of having a theoretical background</td>
<td>Theoretical Background</td>
</tr>
<tr>
<td>- Importance of students having a theoretical background</td>
<td></td>
</tr>
<tr>
<td>- Impact of a lack of theoretical background on actions</td>
<td></td>
</tr>
<tr>
<td><strong>B. Key dimension</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>- Benefits of technical training for educators</td>
<td>Educators’ Training and Experience</td>
</tr>
<tr>
<td>- Importance of educators’ level of experience</td>
<td></td>
</tr>
<tr>
<td>- Belief in the necessity of technical skills for educators</td>
<td></td>
</tr>
<tr>
<td>- Absence of clinical experience for educators</td>
<td></td>
</tr>
<tr>
<td><strong>Student Training and Orientation</strong></td>
<td></td>
</tr>
<tr>
<td>- Importance of students being aware of the reality of HFS</td>
<td></td>
</tr>
<tr>
<td>- Emphasis on HFS as a safe learning environment</td>
<td></td>
</tr>
<tr>
<td>- Effectiveness of providing orientation and pre-briefing to students</td>
<td></td>
</tr>
<tr>
<td>- Influence of previous peers and supporting materials</td>
<td></td>
</tr>
<tr>
<td>- The timetable increased ST interaction</td>
<td>Factors Influencing Students’ and Educators’ Engagement and Interaction</td>
</tr>
<tr>
<td>- The feeling of pressure during exams decreases students’ chance to think and interact</td>
<td></td>
</tr>
<tr>
<td>- Missed equipment influences student interactions</td>
<td></td>
</tr>
<tr>
<td>- The HFS mimics real situations</td>
<td></td>
</tr>
<tr>
<td>- The content of the assessment sheet posed challenges for the educators</td>
<td></td>
</tr>
<tr>
<td>- Provide conceptual cues during the session</td>
<td></td>
</tr>
<tr>
<td>- The benefit of encouraging and empowering students</td>
<td></td>
</tr>
<tr>
<td>- The level of realism increases student stress</td>
<td></td>
</tr>
<tr>
<td>- The level of interaction impacts student intervention</td>
<td></td>
</tr>
<tr>
<td>- Emotional distress crying and panic attacks</td>
<td>Emotional Responses</td>
</tr>
<tr>
<td>- Students fall on the floor</td>
<td></td>
</tr>
<tr>
<td>- Students’ fear of failure or success in HFS</td>
<td></td>
</tr>
<tr>
<td>- Influence of evaluation on students’ emotions and feelings</td>
<td></td>
</tr>
<tr>
<td>- Embarrassment among educators due to an unprepared environment</td>
<td></td>
</tr>
</tbody>
</table>
After identifying dimensions, I categorised the elements into distinct typologies, resulting in clear and well-defined categories. During this step, there was a noticeable shift in language from that used by the participants towards the development of theoretical concepts and themes influenced by the core concepts of NJST (2016). The categorisation process underwent multiple iterations, exploring various groupings of elements to ensure a comprehensive classification that captured all relevant aspects necessary to address the research questions (Ritchie et al., 2014).

According to Ritchie et al. (2014), describing the patterns of linkage within the data can present challenges regarding explanation. This process involves reading, following leads and examining associations until a coherent understanding emerges. The explanations can be either explicit—derived directly from participants' statements—or implicit—inferred by the researchers. During this analytical stage, I incorporated theoretical concepts that aligned with the data to elucidate the challenges and opportunities faced by participants in integrating HFS. By incorporating the theoretical framework at this later stage, I ensured the preservation of the richness of the data and avoided the imposition of preconceived notions on the findings. Drawing on relevant theoretical ideas from existing literature allowed for an expanded interpretation of the findings and the development of coherent themes that thoroughly explained the data. The data analysis process concluded with documenting emergent themes and subthemes, which are supported by quotations from the interview data.

5.9.6 The Software for Qualitative Research

To effectively manage and organise the extensive amount of data gathered in this study, NVivo version 12 by QSR was employed. This software package enables me to centralise my data files and establish a structured framework for analysis (Bazeley and Jackson, 2013). The software's coding functionality, memo and annotation features, as well as the ability to summarise and visualise data using framework matrices, were all utilised. NVivo proved to be invaluable in indexing and categorising text into coding categories once initial coding and thematic frameworks were established in the Word documents. The memo writing function in NVivo allowed for the
storage of notes alongside relevant categories or subthemes and facilitated the creation of links between memos, aiding in the conceptual development process.

The utilisation of CAQDAS offers several advantages over manual methods, including enhancing research design, improving analytical rigour and facilitating the demonstration of data quality (Flick, 2014). Tools like NVivo, a CAQDAS software, contribute to research transparency by providing electronic audit trails that document the analysis process (Bazeley and Jackson, 2013). Additionally, NVivo supports the integration of PDF files and graphics, allowing for their inclusion in the analysis process.

5.10 Quality in Qualitative Research

5.10.1 Reflexivity

Reflexivity plays a crucial role in this study as it involves the act of reflexive journaling, which enhances self-awareness by capturing the thoughts, impressions, beliefs and values of the researcher during the study (Roper and Shapira, 2000). This self-awareness is thought to mitigate my potential biases and subjectivity, thereby increasing the academic rigour of the research (Roper and Shapira, 2000). I had a background as a lecturer in a nursing college in Saudi Arabia, which can be considered an emic perspective. For these reasons, in the current study, the use of personal reflexive journaling during the data collection process helped me to be aware and focus on the study's aim without preconceived judgements. This approach is particularly relevant, given my experience in the same cultural context and academic setting. Moreover, focused ethnography centres on the activities and experiences of nurse educators and students and captures their interactions within a specific social environment (Knoblauch, 2005). This approach deviates from traditional ethnography, which typically focuses on broader social aspects.

As asserted by Guba and Lincoln (1989), reflexivity is a crucial process of critical self-reflection for researchers. In this study, I, took steps to recognise and address any prior knowledge or assumptions I may possess (Sandelowski, 2004). To accomplish this, I engaged in a reflection
activity that involved documenting my awareness of prior knowledge, explicitly identifying what it entails and carefully considering how it might impact my data analysis and, ultimately, the development and understanding of my findings. Throughout both the data collection and analysis stages of this study, I diligently maintained a journal of my reflections. This reflective practice was vital for ensuring the credibility and rigour of the research, making it an essential component of all qualitative research methods. I have been mindful of how my own thoughts, beliefs and values could potentially influence my interpretation of the participants' stories.

Since I share the same social-cultural background as the participants, it was impossible for me to separate this from the interviews. Consequently, my familiarity with the cultural context might have guided some of the questions and probes, and the influence could have persisted during the analysis process. To avoid this, I informed the participants of my background in teaching and learning and reassured them that I was a researcher and not evaluating them as an educator. This reflects how the participants shared and reflected on their experiences during the interviews and influenced the manner in which the interviews were conducted. For instance, as I reflected on what the students told me about their learning experiences, I realised that their viewpoints on HFS were clear. One of the students asked me various questions about the research and how her story would benefit it. Meanwhile, a few other educators emphasised the positive experiences and described the HFS integration process as completely perfect and brilliant. The discussion with my supervisors on this topic was valuable.

Being a Saudi lecturer, I had knowledge of the educational setting in Saudi Arabia and the status quo of the HFS there. The HFS represents a recent teaching strategy in nursing, particularly at the site where I conducted the study, which is one of the two educational settings that integrate the HFS significantly in one region of Saudi Arabia. I had experience as a student in Saudi Arabia and also had teaching experience. I was aware of Saudi Arabia's gender-sensitive educational setting. Throughout the study, I immersed myself in the data through transcription, reading, back translation and re-reading with a reflective journal. I conducted the inductive analysis while maintaining transparency (details are given in Section 5.10.2). I used reflexivity in various stages of my earlier study processes, including participant selection, interview question development,
data sufficiency and data analysis. This was crucial in acknowledging any bias and being aware of my feelings and thoughts. However, I conducted the entire analysis process by myself. The research findings are based on the participants' perspectives and my understanding of the significance of their experiences and how their social context influences them. During this phase, additional practices to ensure reflexivity include consulting with colleagues and supervisors.

I obtained an insider perspective in this study through various means. Firstly, my prior experiences at the research site played a significant role in developing this understanding. Additionally, my cultural background, nationality and qualification as a lecturer in Saudi Arabia further enriched my insider perspective. Moreover, my involvement in providing online courses conducted at the same site deepened my immersion and understanding. Despite the limitations imposed by the COVID-19 restrictions (details given in Section 5.6.1), I made dedicated efforts to immerse myself in the research site using the available resources (Section 5.10.1). Even with the challenges brought on by the pandemic, I was committed to gaining a comprehensive understanding of the context and ensuring my research was conducted with rigour and depth.

5.10.2 Translation

Using a different language and carrying out a translation process are crucial elements in qualitative research, as I was responsible for handling the translation. To ensure minimal interruptions in this study, I transcribed the interviews shortly after they occurred and enlisted the services of a professional bilingual translator to translate the Arabic interview transcripts into English. Subsequently, I personally performed the reverse translation from English to Arabic to assess the accuracy of interpretation and conceptual understanding. These steps were taken to ensure validity since qualitative research is considered valid when the meanings conveyed by the participants and interpreted by me align as closely as possible (Polkinghorne, 2007). Moreover, during the interviews, I took notes in English and maintained a reflexive journal to mitigate interpretation issues in the present study, providing opportunities for discussion with supervisors. The information sheet and consent form were presented in English to accommodate the Arabian nurse
educators and students who are proficient in both English and their native language. Additionally, the interview guide was made available in both Arabic and English.

5.10.2.1 Maintaining Rigour during Translation

Maintaining rigorous translation was of utmost importance in handling most of the transcripts. In qualitative research, consistency in meaning when translating between two languages is vital (Ho, Holloway and Stenhouse, 2019). To achieve this, I prioritised transparent reporting of translation decisions in my qualitative research, enhancing research transparency and improving the reliability of my findings. As the interviews were a mix of Arabic and English, I opted to translate the Arabic transcripts and subsequently categorised and themed them in English. This translation process was significant for my study, especially since the initial interviews were conducted in Arabic. During the early stages of data collection, the translation process provided an opportunity to discuss the interviews with my supervisors and reflect on them, which in turn improved my interview skills. Maintaining the quality of translation is critical to avoid altering the meaning from the original language (Temple and Young, 2004). To avoid these issues, I used Chen and Boore's work (2010) as a guide for the translation process. Although I did not follow the exact steps, I used it as a guide for carrying out the translation. Initially, I transcribed all the transcripts in Arabic before forwarding them to a professional bilingual translator who has knowledge of both Arabic and English, along with a medical background, which helped them in the use of medical terminologies used in the study. I performed a backward translation to assess the translation's quality, ensuring that the meaning was preserved and considering any social context differences. One of the main challenges during this process was the differing sentence structures in Arabic and English languages (see table 17). To overcome this, I engaged in discussions with the translator to ensure the accurate representation of meaning. Personally, conducting the back translation immersed me deeper into the data, enriching my understanding of the material.
### 5.10.3 Subjective Meaning

This process was crucial, as it involved acknowledging my insights and incorporating them into the analysis of the participants' accounts. This aspect aligns with the evaluation criteria for qualitative health research proposed by Popay, Rogers and Williams (1998). To achieve an understanding, the primary data for analysis and interpretation relied on participant narratives and quotations, based on the suggestion by Horsburgh (2003). A systematic approach was employed to support data interpretation, which involved integrating participants' narratives. Acknowledging the social context was of utmost importance, and my insights and interpretations of the participants' narratives played a significant role in providing meaningful accounts of their experiences.

To facilitate this process, detailed background information was provided, including demographic details and descriptions of the settings where the interviews were conducted. This contextual information served to place the data within a broader context, contributing to a comprehensive understanding of the research findings.

### 5.11 Trustworthiness and Rigour

In qualitative research, I make judgements throughout the research cycle, including the accuracy of transcripts, transcription, coding, categorising and the employed scheme, to ensure...
trustworthiness and rigour in maintaining research quality (Lincoln and Guba, 1985). In this study, I follow four trustworthiness and rigour criteria: ‘credibility’, ‘transferability’, ‘dependability’ and ‘confirmability’ (Lincoln and Guba, 1985).

5.11.1 Credibility

Credibility, as described by Lincoln and Guba (1985), encompasses two fundamental aspects: the methods employed to demonstrate the accuracy of the findings and the techniques undertaken in handling the data. To achieve credibility, I employed several methods, including ‘prolonged engagement’ (Lincoln and Guba, 1985; Maher et al., 2018), ‘triangulation’ (Lincoln and Guba, 1985; Noble and Heale, 2019) and ‘member checking’ (Maher et al., 2018), all of which are elucidated below.

I successfully achieved ‘prolonged engagement’ by immersing myself in the recruited nursing college and fostering a strong rapport with the research participants. This extended presence throughout the research process was imperative to ensure the generation of reliable and trustworthy findings, as emphasised by Lincoln and Guba (1985). To maintain this prolonged engagement, I dedicated three months of physical presence in the simulation lab, both before and after the COVID-19 pandemic. During the lockdown period, while adhering to social distancing measures, I adeptly established rapport with the participants by actively participating in their online classes and meetings. This comprehensive involvement encompassed various stages, including recruitment, data collection and even online teaching. Additionally, I provided another course, which further solidified the bond with the educators and students. Furthermore, I had prior connections with the nursing college, stemming from my attendance and facilitation of courses there, facilitated the establishment of rapport with both educators and students. Moreover, I participated in courses and workshops, which facilitated interactions with educators and students. This insider's perspective, derived from extensive engagement with the research participants, offered valuable insights into the dynamics and nuances of the educational environment. The Reflexivity section of this chapter (5.10.1) thoughtfully addresses these aspects.
To ensure the credibility of this research, I employed the data ‘triangulation’ method was employed, as suggested by Lincoln and Guba (1985) and Noble and Heale (2019). This involved recruiting and interviewing multiple participant groups to triangulate their perceptions and perspectives. Another strategy I used to enhance the qualitative research's credibility was ‘member checking’, which could be performed formally or informally (Lincoln and Guba, 1985; Maher et al., 2018). In this study, I achieved rigorous member validation by interviewing varied participant groups. Their perspectives were corroborated by contrasting the shared concerns or topics concerning HFS integration among these groups. I thoroughly analysed the data from each group to deepen understanding and extract further insights.

5.11.2 Transferability

To ensure the research’s credibility, I was committed to transparency. The objective was to make all study aspects visible, enabling readers to understand the decision-making process and analytical approach fully. This transparency was achieved by justifying the selected data collection and analysis methods. In addition, I maintained detailed records of research activities, including memos and journals, to enhance transparency in the analysis. Throughout the study, all data collection and analysis procedures were meticulously described to uphold transparency. Step-by-step descriptions of the interpretive process were provided, along with an explanation of the basis on which specific conclusions were reached.

Regarding transferability, which refers to the applicability of the findings to potential users, I employed a strategy called ‘thick description’ (Guba and Lincoln, 1989; Lincoln and Guba, 1985). This involved providing rich and detailed descriptions of the research and its procedures (Rashid, Hodgson and Luig, 2019). While the methodology and methods have been elucidated in the current chapter, additional details pertaining to the study setting and participant characteristics are provided in Sections 5.5.1 and 5.6.1.3.
5.11.3 Dependability and Confirmability

To ensure the dependability of the research, which pertains to its reliability, an audit trail can be employed. This entails offering a detailed and precise description of the study procedure (Korstjens and Moser, 2018). In this research, every step of data collection and analysis has been thoroughly recorded in this chapter, allowing external examiners to conduct an audit if required.

Confirmability, which refers to the neutrality and objectivity of the research, can also be achieved through an audit trail and external examination. Ensuring the research's confirmability and dependability involves multiple strategies. According to Korstjens and Moser (2018), a method to consider is establishing an audit trail, which involves presenting a clear and thorough account of the research procedure. In this research, each step of data collecting, and analysis is diligently detailed in this chapter, making it accessible for verification and potential scrutiny by an external party. As Lincoln and Guba (1985) suggested, peer consultations are another way to increase confirmability. Throughout the research, periodic consultation sessions took place with the research supervisors, who acted as overseers, to discuss and assess the different phases of data collection, evaluation, interpretation, and composition. These sessions contributed to the reliability and confirmability of the research, where the entire study process was shared and discussed. This approach ensured confirmability by incorporating multiple perspectives and feedback.

5.12 Conclusion

This chapter provides a comprehensive description of the research process, elucidating the rationale for each decision. This chapter sets the scene for Chapter 6 where, the findings from the interviews are presented and synthesised. The findings illustrate the experiences of nurse educators and students when incorporating the HFS of complex clinical scenarios. The data are categorised into five major themes, offering a reimagined understanding of the subject matter.
Chapter 6: Findings
6.1 Introduction

This chapter presents the valuable insights gained from individual in-depth interviews, the primary aim of which was to comprehensively examine the thoughts and perceptions of nurse educators and students regarding the use and integration of High-fidelity Simulation (HFS) in their curriculum. In doing so, this study aimed to identify factors that facilitate effective technology integration and those that hinder its adoption. Participants described the challenges and facilitators of incorporating HFS within the Saudi context, illuminating the impact of cultural and religious backgrounds, as well as the level of realism in HFS, on their teaching and learning experiences. Before proceeding with this chapter, it is essential to familiarise readers with the educational and cultural terminology used in HFS learning in Saudi Arabia’s nurse education. To ensure a comprehensive understanding, I encourage readers to refer to Appendix 23 for a glossary of terms.

The findings of this study have been organised into five major themes: i) personal characteristics, ii) the preparation process, iii) the sociocultural context, iv) dynamic interaction within HFS, and v) emotional states. Each subtheme is structured around contextual information. Phenomena shared across groups are depicted in peach colour in Figure 18. Subthemes predominantly addressed by educators are in purple, and those primarily explained by students are in green. As explained by both educators and students, these themes and subthemes illustrate the interconnectedness and complexity of the teaching and learning processes in nursing education. They offer a comprehensive analysis that reflects the realities of learning and teaching. Each theme influences the others, contributing to a cumulative outcome called a ‘Mixed Blessing’.

While some themes and subthemes are distinct to the accounts of either educators or students, most are jointly addressed, highlighting the collaborative nature of educational experiences. To gain a deeper understanding of the challenges educators and students face, theoretical concepts drawn from the literature review have been applied to the data. This step enabled the development of

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9 Compared to the glossary at the start of this thesis, the one here, at the beginning of the findings and discussion chapter, is different. The first glossary helped to explain the principal terms used in the thesis. This glossary focuses on the terms first seen in the findings and discussion chapters.
coherent themes and a comprehensive exploration of the effective application and integration of complex scenarios based on HFS.

Figure 18: Major themes and subthemes. The peach-coloured blocks represent common themes and subthemes: purple\textsuperscript{10} for educators, green for students\textsuperscript{11}, and pink for the culminating outcomes of integrating HFS in Saudi Arabia.

\textsuperscript{10} Educators described the influence of institutional support, such as well-equipped laboratory workshops and training courses, on their experiences. They also discussed how religious factors affected student learning, influencing their decision-making, interventions, and the development of communication skills.

\textsuperscript{11} Both educators and students commonly experienced stress. However, it was specifically the students who articulated the causes of their distress and reported that a deep understanding significantly influenced their experiences.
6.2 Major Themes

6.2.1 Personal Characteristics

The first theme identified in this study was personal characteristics, which explores the impact of how personal characteristics on their experiences in complex HFS scenarios. Within this theme, participants discussed how personal characteristics, specifically background factors and interpersonal skills, played a significant role in shaping their experiences. The participants elaborated on how these personal characteristics influenced their encounters and interactions within the complex scenario.

6.2.1.1 Background Factors in Students and Educators

The first theme identified in this study is personal characteristics, which explores the impact of personal characteristics on educators’ and students’ experiences in complex HFS scenarios. Each relevant component and element of participant background is detailed further in this section, including theoretical background, participants’ previous experiences, the academic level of the students, and the preparation of the educators.

The educators discussed how the theoretical background of students improved their learning in HFS sessions. Further, the educators explained how students’ experiences with different learning styles had been affected by background. Jamilah\(^{12}\), a lecturer aged 33, explained:

“\textit{The students in nursing at [anonymous] University already have enough background which makes it easier for us, but I guess their learning style is different from ours when it comes to observation. If the student didn’t have a good background, especially considering the difference in learning styles, the simulation may not provide significant benefits.}”

N.E.2.

\(^{12}\) The names of the participants in this chapter are not their real names. I had use pseudonyms to protect the participant identities.
Jamilah’s views were supported by Ghala, a 45-year-old assistant professor:

“For example, let’s consider the students with different backgrounds. If for the other students, they are working already and they have experience. Of course, it is completely different for those who don’t work.” N.E.6.

The majority of students noted and emphasised that what the educators said regarding theoretical background was an effective strategy to assist them in learning. The students explained how information is processed differently when they have previous backgrounds. Maryam, 21 years old and in her third year of an undergraduate programme mentioned:

“We know for sure that there is a huge difference between learning a piece of information during a lecture and learning it through practice. As someone who prefers to receive knowledge during listening and then apply it afterwards, we understood the concept of hypovolemic shock from what the professor had explained during the lecture. However, when it came to the simulation, it presented a very different experience.” N.S.3

Similar to Maryam, Huda, a fourth-year student, highlighted the importance of studying and researching unfamiliar diseases before encountering them. She commented on the significance of gaining theoretical knowledge and reading about the disease beforehand:

“Sometimes we haven’t studied that disease theoretically so, it was important for us to search and read about it before we go in. Uh, that’s what I think helped us as a strategy.” N.S.1.

Additionally, Kholoud, in her third year, explained how this knowledge helps students identify the appropriate interventions to engage in during the HFS session. She provided further detail:

“For example, in the Adult I lecture, we studied that hypovolemic shocks can be a complication of post-operation, and the nursing management necessary for such cases. Therefore, when we went for that simulation scenario and the patient suffered from a hypovolemic shock, we immediately knew we should focus on the oxygen saturation level and that we should apply I.V. solutions to compensate for the dehydration and change the
patient’s position. *What you study in the lectures could help you in the simulation scenarios.*” N.S.4.

The students described how the HFS enabled them to act based on their previous knowledge. They explained how the HFS allowed them to reflect on and apply their theoretical and practical knowledge. Consequently, they believe that HFS gave them the chance to reflect on their experiences (this will be discussed in Section 6.). Huda, a 21-year-old fourth-year student, further clarified:

“*Uh, that we read a scenario before we enter the simulation laboratory like I already took the theoretical part, I already learned the practical part in the laboratories, how I will give the medication, how I will insert the IV line for the patient, how I will prepare the solution for the IV line.*” N.S.1.

In addition to their theoretical background, students’ previous experiences also contributed significantly to their learning in the HFS session. Some of the students’ previous experiences might have included working at hospitals or clinics, some simulation experiences, or they might have worked or be working part-time as a nurse. Consequently, some students were more knowledgeable and confident than others in their skills in the HFS session. In the words of Ghala, assistant professor:

“They practise this, they practise more in the hospital, or they are already working, and they have some experience. That means they are familiar with the equipment, more than those that have never seen it. So, we have to take all these things. We have to put them on the agenda and see how we can handle them. So, I would not put like four, five professionals with one that does not know anything, because she would feel very uncomfortable.” N.E.6.

There was a clear understanding among both groups of participants of the importance of the level of students and the level of complexity in the HFS session. Maha, aged 38, a lecturer from the Mediterranean region, discussed how the complexity of the scenarios can be adapted to suit students’ academic levels:
“We make the scenarios complex in the Adult II course. When we move to the critical care course, the scenarios become even more difficult and challenging, matching the students’ advanced level.” N.E.1.

Many of the students emphasised what the educators had remarked on. The students’ academic level was a significant factor in how they experienced complex scenarios based on HFS. Afnan, 21 years old in her fourth year, clarified:

“I took the Adult I course, and it just really discusses general illnesses that are common with adults like blood and heart complications, for example. In Adult II, however, the information was deeper and more complex, it discussed things like bone, kidney complications, cancer, and things like that. So, it had deeper information than Adult I. We even felt like we already had known everything we took in the Adult I course.” N.S.9.

This subtheme illustrates that the educator’s background is also significant. It also reveals that educators need professional development workshops before implementing the HFS. Their background includes the technical experience that empowers them to run scenarios more efficiently and interact with students more effectively. The educators, on the whole, demonstrated how their prior experience had significantly impacted their educational strategies and student engagement. However, it was observed that some educators had worked more diligently than others, by preparing supplies in advance and managing them more effectively during sessions. Not only that, but they were also capable of solving technical problems as they had taken a course over a couple of months to enable them to run the HFS without technical assistance; therefore, the scenarios would not be inadvertently affected even if a technician were unavailable. An assistant professor from the Mediterranean region, Hanadi, aged 39 years, described this situation:

“Yeah! Two weeks beforehand I learnt how to turn the mannequin off and on, and how to go to the educator’s laptop as this is controlled by an educator in the vitals. In the last term, we dealt with the technician who prepared every item for us.” N.E.5.

A small number of the participants also suggested that educators should have clinical experience, as this would greatly facilitate the sequencing of scenarios according to the students’ interventions. This would result in educators having a better sense of what a real situation is like. By doing so,
they would be able to visualize the scenario and know which steps are involved and what portions are missing. Identifying malpractice, mistakes, missed steps, or fatal errors would enable students to correct them. Ghala, the assistant professor from the Mediterranean region, explained:

“I found the clinical experience crucial because I was assigned to a medical-surgical scenario, but my expertise lies in the community setting. The scenario was not closely related to what I’m familiar with. However, my twenty years of experience in the clinical area back in my country allowed me to easily facilitate certain aspects. Having seventeen years of clinical work before starting here helped me tremendously in that situation.”

N.E.6.

Some educators emphasised the importance of a development workshop as a key component for effectively managing complex scenarios in the HFS. Others, however, argued that educators’ passion for learning and integrating HFS is crucial for running it effectively. Few of the educators, several came from different backgrounds and religions, and their responsibility was to teach Saudi Muslim students. This is critical, as they need to provide care not only for the patients but also for the whole Muslim community. In this study, the educators explained the importance of preparing students to care for patients from diverse religious backgrounds. For example, during the pilgrimage (see Appendix 23 for the definition), there were many different cultures, and nurses needed to treat patients despite language barriers. The HFS can help healthcare providers develop skills to deal with such situations. Kholoud, a lecturer from the Mediterranean region, has a decade of experience in pilgrimage and became acquainted with the HFS while studying abroad in England. She explained her experience in detail:

“At first, I was drawn to simulation when I got my Master’s in the UK. It was new to me, as I mentioned previously. Because when I was a student many years ago, we used to just go to the clinic and introduce ourselves as students and practise on our patients, that’s it. So, when I went to the UK to get my Master’s we had some clinical part to the Master’s as well, and we had to use the simulation. So, it was a different universe for me. I started to attend some lectures there about simulation and I started to consult with the technicians and supervisors there and attend sessions with them for other programmes to see how they would facilitate, just as an observer.”

N.E.4
6.2.1.2 Interpersonal Skills

Under the theme of personal characteristics, the students and nurse educators recognised the importance of interpersonal skills, which significantly impacted their experiences. This concept was explained with reference to the use of communication skills, social skills, and personal skills that influence how participants interact and engage with one another during the simulation sessions. The term ‘interpersonal skills’ is defined in Appendix 23. These skills are crucial in shaping students’ cognitive abilities, technical competencies, and overall performance during the HFS. How students communicate, interact, and collaborate with their peers and educators is deeply influenced by their interpersonal skills, ultimately affecting the quality of learning and teaching within the HFS environment.

During the interviews, participants identified various factors that influence students’ experiences in the HFS environment, including individual characteristics. Ghala, an assistant professor aged 45, pointed out:

“There are factors that impact the student experience, such as the student’s level and sometimes the student’s personality and character. Some students are more talkative and less shy, expressing themselves easily, while others may hesitate and feel insecure, taking more time to interact with others.” N.E.6.

Afnan, a fourth-year student aged 21, highlighted how her interpersonal skills were essential in handling challenges during the simulation:

“My personal skills helped me face the scenario’s challenges, and other skills allowed me to cope with difficulties and receive support from my group. Interacting with my peers helped me understand why certain challenges happened and how to effectively resolve them.” N.S.9.

According to the educators and students, there were some situations where students did not engage well with each other or work effectively in teams during the HFS. Some educators suggested that
the presence of pre-existing personal issues among students could have contributed to this. As a few of them explained, the students had some personal problems with each other, which hindered their ability to work as a team and interact and communicate effectively. These interpersonal issues had arisen before the simulation, and as a result, the students struggled to collaborate and simply waited for the session to end. For instance, Mashial, a 33-year-old lecturer, said:

“Additionally, they learned to work in a team, but it depends on the person. Some teams start with people who already know each other. I think it’s best to have a simulation with people you don’t know because otherwise, there can be some tension. I would expect to have some tension during the simulation. Other students in the group don’t get the full experience because of instances like that — because of one or two students.” N.E.8.

On the other hand, some students preferred to work with peers they already knew well, as it made communication easier, reduced anxiety and stress, and boosted the overall motivation of the team. They resisted the educators’ suggestion to work with unfamiliar people because they believed that working with familiar peers allowed for better communication and understanding among team members. This familiarity also helped to lower fear and stress levels, enabling them to collaborate more effectively and support each other. However, this perspective is in contrast to the educators’ opinion that working with strangers would facilitate easier learning; this contrast is further explored under the theme of dynamic interaction within HFS in Section 6.2.4.

According to students like Hilama, aged 20, in her third year, educators’ personalities significantly impact student learning in HFS scenarios. Positive and supportive educators motivate students to actively participate in the simulation, creating an enjoyable learning environment. However, educators with less supportive personalities can adversely affect student performance, making them anxious and unable to engage effectively. Hilama said:

“But some educators have not appreciated the interaction and learning in HFS, or they do not allow the students to do or even to live their experience at the simulation. They should feel ashamed and guilty because they will let us deal with our mistakes in the future and deal with the humans.” N.S.2.
In addition to their personalities, educators’ interpersonal skills are fundamental to student learning during HFS scenarios. The data suggests that strong interpersonal skills help educators guide and support students effectively, leading to better learning experiences. On the contrary, weak interpersonal skills can hinder effective communication and collaboration, decreasing engagement and affecting learning outcomes.

6.2.2 The Preparation Process

Categorised as the preparation process theme, the essential aspects of HFS preparation as experienced by students and educators were explored. This theme encompasses the different preparation processes of participants during practice sessions with complex scenarios in HFS. The collected data highlights the significance of preparation, both positive and negative, and identifies factors such as ‘missing-in-action’ preparation, and the role of institutional support. By examining these elements, valuable insights are gained into the impact of preparation on HFS scenarios and its implications for students and educators alike.

6.2.2.1 ‘Missing-in-Action’ Preparation

Regarding ‘missing-in-action’, a subtheme of the preparation process, the participants discussed how the preparation process impacted their learning and teaching experiences. During their explanations of how HFS practice operates well, both groups of participants identified aspects that were not taken into account in their experiences with HFS. These aspects were not sufficiently considered in their experiences. By providing well-prepared laboratories and specific orientation for HFS, the importance of adequate physical, environmental, and cognitive preparation for their teaching and learning experiences was highlighted. This subtheme discusses in greater detail how these factors were sometimes helpful, but sometimes not. Under this subtheme, the preparation process was discussed in terms of the following: i) the scenario design, including a needs

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13 The ‘Missing -in -action’ term, refers to participants who were not adequately prepared or lacked essential knowledge and understanding during the scenario-based learning process, were not fully engaged, or were unprepared for the learning experience.
assessment for simulation scenarios, customisation, site and time, and the evaluation criteria; ii) physical preparation; and iii) cognitive orientation, including readiness to learn.

Several of the nurse educators provided insights into integrating HFS into the nursing curriculum and the development of complex scenarios. They acknowledged the importance of understanding the process for integrating HFS and utilizing it based on the specific needs of the educational context. Some educators submitted that HFS might not be suitable for all circumstances and that its implementation should be guided by a thorough needs assessment. They stressed the significance of conducting a needs assessment before integrating HFS into the curriculum. According to educators, the needs assessment is crucial to informing the development of primary simulation goals. It helps educators understand whether HFS is the appropriate strategy to address their specific needs or if a different approach might be more suitable. Suha, aged 40 years old and an assistant professor, emphasises the significance of this:

"Start with a needs assessment before introducing anything new. Not everything suits everyone. New fashion, strategy, technology, or equipment should match specific needs, not just personal preferences. Do not adopt simulation without considering goals and assessments; it is not universally necessary." (N.E.11)

Integrating HFS into the nursing curriculum involves a needs assessment process that educators approach differently. While a minority of educators consider the needs assessment an essential step in customizing simulations to their learning objectives, others argue that this process can be overly lengthy and complicated, requiring multiple steps, approvals, and revisions. This is particularly true when educators choose to create their own customized scenarios based on specific learning needs. As a result, many educators prefer to use scenarios from a scenario bank\(^\text{14}\) of hundreds of scenarios that are aligned with learning objectives and pre-approved by the Simulation Centre Committee. This approach saves time and eliminates the need for extensive approval for

\[^{14}\text{The scenario bank in the simulation centre is a collection of diverse scenarios that are either derived from Western culture or created by the educators themselves, after receiving approval for their use. It serves as a valuable resource for educators and colleagues to choose scenarios that align with their specific specialties and learning objectives.}\]
custom scenarios. Nevertheless, for educators who still choose to create their own scenarios, Maha, an experienced lecturer, explained the approval process they must undergo:

“*We need to send the scenario to the course coordinator first. Then, we have a meeting within our department to finalize it. Once it’s approved in our department, we send it to the simulation centre, which has its own review process. They send us a form asking for details about the scenario design, and after completing it, we return it to the simulation centre for further review. They will then schedule a meeting with us to either approve the scenario as is or suggest modifications.*” N.E.1.

Educators emphasised the importance of conducting a needs assessment and considering various factors such as the site, time, and transcript of the scenarios during the design phase. They also stressed the significance of incorporating the learning objectives into the curriculum. Creating their scenarios proved challenging for many educators, leading them to opt for scenarios from a scenario bank as a suitable alternative. However, many educators expressed the hope of developing scenarios that align with the Saudi Arabian cultural context, learning objectives, and curricula to better reflect the reality of the Saudi context. This will be discussed in more detail in the section on the sociocultural context theme Section 6.2.3. Mashial, a 33-year-old lecturer, highlighted the importance of updating their knowledge about the scenarios and the need to encourage critical thinking among students:

“It is vital. We, as educators, need to continually update our knowledge about the case because these students are very naive. We are the experts, and we are responsible for making them think critically. We often go to clinical settings, and it is crucial to apply what is happening in Saudi Arabia and the current healthcare system in our teaching.” N.E.8.

Samirah, a 30-year-old lecturer, emphasised the need for scenarios to correspond to the students’ reality and the impact of this on their subsequent practice-based learning:

“*Think about the scenario carefully when updating it. We should consider how a real Saudi patient and their family members would behave in that situation. For example, we*
have both the patient and family members in the stroke scenario. Usually, our scenarios do not fully capture all the challenges that family members face in real hospitals. In practice, they may feel anxious, aggressive, or concerned about specific treatments, including traditional treatments common in our religions. We need to incorporate these real issues into the scenario. Sometimes, I made adjustments based on the actual simulation session we have. However, I usually start with the basic scenario provided by the faculty and sometimes make minor changes based on how the patients react. It is essential to be flexible to ensure our scenarios align with real-world experiences and provide our students with a more effective learning experience.” N.E.10.

Several educators expressed dissatisfaction with the scenarios’ content, citing the need for updates. They believed that the scenarios did not align with the learning objectives and lacked focus on the theoretical background for specific situations. Furthermore, they observed that the scenarios were not sufficiently advanced for undergraduate students. This raises the question of whether these educators are utilizing HFS to its full potential, as they may not be equipped with the latest practice-appropriate learning outcomes and technical knowledge. Mashial, a lecturer, with extensive clinical experience and knowledge, explained:

“Actually, what we’re doing is not really focusing on the care for a stroke patient, for example, it must be more advanced. As I told you, I think our educators and our course coordinator are not updating the scenarios. One more thing, they are away from clinical practice. They need to update their knowledge. They need to go for clinical to see what is happening in the healthcare system, or at least, they need to search for more updated scenarios.” N.E.8

On the other hand, the students appreciate the preparation materials and content handbooks\textsuperscript{15} that the educators provided to them before the sessions, finding them helpful in preparing for the HFS sessions. Furthermore, it is worth noting that the sources of content in the preparation materials are in English, which can pose a challenge for the students during the HFS sessions. While the majority of academic specialties in Saudi Arabia are taught in English and the students are

\textsuperscript{15} The Handbook is a comprehensive resource with various learning materials such as reading recommendations, papers, videos, and extra readings. It aims to prepare students effectively for simulation-based learning.
accustomed to reading, listening, and taking examinations in English, speaking in English as a second language remains difficult for them. This language barrier can impact their interactions and increase stress levels during the HFS. Noura, aged 21, a third-year student, stated:

“In the handbook, they include the nurse interventions in English, so I read them all. Later, I read the book. The handbook is extracted from the book, so I read the source. That’s how I became knowledgeable about the topic. During the lab, I struggled to communicate with my peers in a different language.” N.S.10.

The handbook was not the only challenge described by the students and educators; the evaluation criteria, (see Appendix 23), also posed difficulties. The students explained that there is a need to revisit the HFS session’s evaluation criteria for their performance during and after the session, as it includes grading. They asked whether this needed to be considered when designing the HFS for the curriculum. The students want the scenarios not to be graded, they will be able to learn and make mistakes without fearing for their evaluation, as this is one of the major factors that affected their performance. These concerns are discussed further in Section 6.2.5, which covers the theme of the emotional state. However, Abeer, 21 years old, in her third year, stated:

“In fact, I asked the educator in charge the same question. Why not make one session educational and the next a test session? The best way is to administer simulation sessions, give marks for attendance, and then administer tests. So, we will have the best of both worlds, where we study a subject seriously because we wish to learn all about it and not just because it will get us good grades, but nothing has changed as we still got bad marks for our performance in HFS.” N.S.13.

In terms of physical and environmental preparation for the HFS, the majority of students commented on how impressed they were with the realism of the HFS environment. They explained that the HFS labs mimic a hospital room. Some educators and students highlighted how the laboratory’s appearance and the resources and equipment they have in their laboratory closely resemble those of a real hospital. Abeer, having attended 4 sessions of HFS and further described her experience:
“Due to the decoration, they really put things related to the operations, such as blood bags, medicines, operations, and sterilization. The room itself makes you feel like you are inside the hospital, sterilized with the things as they are in the hospital. When we entered the operations, we did not enter a real hospital, but we felt as if it was an operating room.” N.S.13.

There is a need, not only for physical and environmental preparation, but also for cognitive preparation, which involves a common understanding of students’ attitudes and performance before the simulated events. Some educators have explained how they mentally prepare the students for the scenarios. When done effectively, this cognitive preparation ensures that students are better equipped for the actual scenario. It includes instructing them on how to prepare their uniforms and use specialized equipment, as this provides insight into their readiness to learn. Maha, a lecturer, shared her experience:

“In the Adult I course; they learn how to enter the operation room (OR). We then create a scenario in the OR, and they prepare for it. For example, they practice wearing sterile gowns and gloves, and how to avoid touching anything. Sometimes, we set up the room with a crowded environment, and other times, we leave it empty, letting the students decide how to arrange things. They prepare the tissues, the soap, and we have everything ready for them.” N.E.1.

Another educator described how technology specialists were effective and how their participation was useful both during the preparation stage and when the equipment was not available. Hanadi, aged 39, an assistant professor, clarified:

“Every item we need from the Simulation Technician (ST), they try to provide us with everything. We should meet them at 9 o’clock, but they come at half past eight to make sure that everything is OK. Before we start the session as a whole, often some things are not available; they told us before taking students and going to the simulation centre. Thanks to Allah all tools and things are available including supplies and tools. It depends on the educator if it is ready. I have to make the same things at all times, i.e. changing the vital signs. It does not take more than a minute or 20 seconds. I have the transcript in front of me. Also, I have a counter on a mobile phone to count time.” N.E.5.

It is not only the role of the Simulation Technician (ST) that has proven to be effective but also that of the educators. Several educators were required to conduct ‘dry runs’, i.e., rehearsals of the
scenarios in advance, which are described in more detail in Appendix 23. By conducting these rehearsals, rather than being surprised by the lack of equipment or equipment that was unavailable during the HFS, the educators were made aware of what equipment was available and how to replace it before the session began. According to Ghala, working as an assistant professor, the dry runs have a significant impact on how educators utilize resources and how students’ potential learning is optimized:

“Before we run the scenario, we could run it with another educator. For example, if I’m creating a scenario, I would get one of my colleagues from the same department. And I will ask her to run the scenario, but I will not tell her what the scenario is. I will talk to her as a student. I will let her go through scenarios and see if he can follow. Though of course, the mentality or knowledge and the critical thinking of educators are different than the students. But at least this would be good feedback to see if my scenario is clear. If the colleague is having a hard time, most probably the students would have a hard time.” N.E.6.

However, there have been instances where both educators and students, though surprised at the availability of resources in the HFS laboratory, were frustrated that these resources were not effectively utilized. Some attributed this issue to perceived laziness among ST staff and educators in adequately preparing and setting up the necessary equipment and materials for the sessions. This lack of preparation affected the learning experiences of the students. Several educators highlighted the need for improved organisation and advanced preparation of the HFS laboratory to ensure an efficient and realistic learning environment. They also emphasised the importance of arranging the laboratory to accommodate the specific interventions required for each session. One educator, Mashial, aged 33 years, shared her experience:

“Sometimes, there are missing medications, and I have to improvise by putting stickers with the medication names to make it more realistic for my students. Additionally, I faced challenges with the laboratory’s resources, as technicians would sometimes promise to prepare the materials for me but fail to do so, leaving me with inadequate supplies during the session. This situation can be embarrassing, as I have to scramble to find the necessary items myself. It highlights the need for better communication and coordination in ensuring that the laboratory is fully equipped and ready for each session.” N.E.8.
Samira, a lecturer with 30 years of experience, expressed her frustration with the disorganised state of the simulation laboratories. She mentioned that she often faced challenges due to insufficient time to organise the laboratories properly, which, in turn, had a negative impact on her students’ learning experiences:

“I can manage if we don’t have a specific equipment or tool, but the main problem lies in the organisation of the simulation room. It’s not an occasional issue; it’s always disorganised. The drawers are cluttered and not arranged efficiently, which forces me to come in early and spend time preparing what I need for the session. And it’s not just me; many other educators also face the same challenge in the simulation room.” N.E.10.

As mentioned previously, the majority of participants were excited about the availability of the equipment, but many were frustrated with their first experiences due to disorganisation. The majority of students found this to be a challenge, as they were unfamiliar with the equipment and machines in the HFS laboratories and where they were located. Furthermore, this affected their performance in the HFS because they wasted time, for example, looking for equipment. The majority of students described how this had negatively affected their experiences by recalling how the lack of physical preparation and disorganisation.

“We have to act quickly, we don’t actually know where’s the equipment in a drawer like ‘Where’s the oxygen mask, where’s the source of the oxygen?’ That was stressful and we were not confident because we didn’t know where the equipment was.” Huda, fourth year (N.S.1.)

“Yeah, even the educators don’t comment on missing items. And, by the way, some equipment is missing. Not all the equipment we need is there. If we didn’t mention certain equipment and it’s not available, we will lose marks.” Hilama, third year (N.S.2.)

“It took a lot of our time, and we stressed about failing the scenario because we could not find a tool or a medicine and we know that if we give the wrong dose, we will lose the patient. They were on the table. But some things were just not there, like gloves. The sterile machine was there but clean gloves weren’t supplied. We had to look for our educator and ask if we needed gloves, when we got the order that we don’t need them, we would proceed. So, we didn’t know what we were missing. So, it’s best if we’re informed that we’re missing equipment.” Fatimah, fourth year (N.S.8.)
The nurse educators discussed how institutional support influenced their learning and teaching experiences, a subtheme that was solely explained by the educators. In this subtheme, the focus is on examining how institutional support, including a well-equipped laboratory, workshops, and training courses, influences learning and teaching outcomes. The support provided by the institution plays a crucial role in enhancing the educational process. However, alongside the benefits, there are also challenges related to administrative issues within the college that must be addressed.

With preparation and availability of resources already identified as key to the success of the HFS, the educators explained additional factors that helped them run the HFS more effectively. Some educators asserted that a supportive environment within the simulation centre had a positive influence on the teaching and learning process. Interestingly, the educators showed their gratitude for the simulation centre and the nursing college by offering different kinds of workshops to help them prepare for integrating HFS into their courses. Maha, with 4 years of experience in HFS teaching, explained the workshops that were provided for the educators:

“*These workshops included lectures and individual sessions tailored to educators’ needs. For example, they covered topics such as how to build scenarios, prepare every scenario, and select scenarios for HFS sessions. The simulation centre instructors were actively involved in these workshops, providing assistance and guidance during one, two, or three sessions as required.*” N.E.1.

The educators emphasised that the Senior Academic Manager played a major role in facilitating their educational experiences in the simulation centre. Kholoud, a lecturer from the Mediterranean region, had no prior simulation experience and described her experience of how the support from the Senior Manager had been beneficial:

“I mixed some courses together, and I think the outcome was really beneficial for me. So, when I came, and I was employed here, my academic managers asked me if I had any previous experience with simulation, and I told them I had not. They had really nice
In contrast, there were some negative opinions regarding the simulation and nursing college support. Several educators expressed that they had not received nearly enough support from their managers and felt that the college should do more to address this issue. Some educators were frustrated, and they credited their passion and experiences as supportive factors that helped them integrate the courses more effectively. Aisha, aged 44, an assistant professor for 6 years, explained:

“For the first semester, I had to be trained by my peers personally, and I did the simulation. I have previous experience with simulation training by myself and the simulation concept. But of course, the centre has its own policy, its own regulations. The university has its own regulations that I did not know about.” N.E.7.

As the participants previously illustrated the huge impact of the institution’s support, they described some administrative issues involving the hiring of new faculty members each semester. The nursing college hires and trains Saudi teaching assistants (TAs) each semester. Then, the TAs leave to pursue a master’s degree or even a PhD abroad. Samirah, aged 30, a lecturer, stated:

“Teaching assistants and lecturers are always on temporary grounds. They’re going to leave sooner or later. So, I think it’s difficult to invest the time and the effort in their training when they will leave, and others will come. We need to have stability and continuity to have an effective practice in stimulation.” N.E.10.

Another issue that was raised by educators is the time of year in which new faculty staff are employed. They may miss their opportunity to attend workshops or training sessions offered by the simulation centres if the timing does not align with their academic calendar. Khoulad, aged 35, a lecturer, elaborated on this:

“We have new staff each semester. It’s difficult to assign them to simulations or certain scenarios where they will not be properly prepared. The training all comes from the centre itself. So, at the centre, they run the training only once a year at the start of the academic year. So, if you were hired in the second semester, you have to wait to be trained in
simulation at the beginning of the next year. This was my issue also when I was first employed.” N.E.4.

In addition, the educators explained that the role of college simulation centres is to raise awareness to the faculty as to how conversant they are, or are not, with HFS and how it is influencing nursing teaching. One issue raised by the educators was that a small number of staff chose to retain traditional teaching methods preferring not to integrate HFS based on complex scenarios. Mashial, aged 33, a lecturer, said:

“Let me give you an example. To make it clear, we have now the pandemic COVID-19 issue. We would not involve this in our simulation and our teaching because most of the faculty are old. They will stick to the old books. No, we need to teach our students, we need to teach them based on what is happening in the country and in the world. We need to integrate culture; we need to integrate that. This is the situation for the country and the world.” N.E.8.

6.2.3 The Sociocultural Context

Within the sociocultural context theme, the participants explained the huge impact of social and cultural norms on their learning and teaching experiences through the subthemes of religious influence, gender sensitivity, and adherence to hierarchical norms (i.e. “do not wear a dress which is not your dress”). This study was conducted in Saudi Arabia, a country where the Muslim faith and its associated cultural norms play a dominant role in shaping daily life; this is described in detail in Chapter 2, Sections 2.5.2 and 2.5.3.

6.2.3.1 Religious Influences

Religious influence is the first sociocultural subtheme that emerged solely from the perspectives of educators in this study. Educators discussed how the religious background of nursing students significantly affected their decision-making, interventions, and communication skills in the HFS.
Saudi culture is deeply rooted in religious beliefs and practices, which inherently shape the learning process for students. The majority of decisions made by students are influenced by cultural and religious considerations, as previously detailed in sections 2.4.2 and 2.4.3. Participants in this study highlighted the impact of cultural and social norms on the learning and teaching process, emphasising the importance of incorporating Saudi culture into nursing education. Sara, aged 34 years, lecturer, shared an example of how students’ religious beliefs guided their actions during a simulation involving a dying patient (a mannequin).

“Most of the time, they try to make them survive. We don’t want a patient to die. We want to save them, but it’s not in our hands. There was only one instance that I remember in the past couple of years where we had a patient dying, and then they responded by reading the Quran. They opened the Quran for him and announced Jihad afterwards.” N.E.9.

However, Mashial, a 33-year-old lecturer, pointed out that students face challenges in providing culturally sensitive care when communicating with real patients in the hospital. She emphasised the need for students to receive education about culture and religious sensitivity, rather than solely focusing on their performance and simulation experiences. This is particularly important in healthcare in Saudi Arabia, where religious sensitivity plays a significant role.

“I’ve noticed that when students go to clinical settings, they struggle with providing culturally sensitive care. We’re not focusing enough on the simulation, especially concerning the Saudi patient. As we are in Saudi Arabia, our population is predominantly Saudi. We need to incorporate more elements from our religion and culture that we encounter with real patients in clinical settings. For instance, with stroke patients, we can include aspects of spirituality and religion in their care. I always emphasise this when I teach, and it should apply to all students. It’s crucial to integrate our culture and religious values because students truly face these situations during clinical settings. Unfortunately, our simulations often lack this cultural context. Even the names and scenarios used are not Saudi. We need to change that and remind students that they are Saudis, and they should understand the importance of our cultural values.” N.E.8.

Moreover, many educators emphasised that students frequently acted in alignment with their religious background, which sometimes conflicted with the Western-based scenarios used in the
simulation. This discrepancy posed challenges for learning in the Saudi context, as described by Khoulud, a 35-year-old lecturer with four years of experience in HFS and studies and work abroad. She noted that students often struggled with ethical dilemmas related to cultural and religious considerations:

“Usually, when we talk about culture, it’s often related to ethical dilemmas, and these dilemmas can remain unsolved forever [laughing]. No matter how hard you try, there’s no definitive solution to them. So, culture is usually linked to either education or ethical dilemmas. Education has a subdivision that involves communication. For instance, if the patient is not an Arabic speaker, or sometimes even the standardized patients (SPs) or facilitators are non-Saudi and don’t speak Arabic, there might be a momentary pause as they try to adapt to the situation. This is where the ethical dilemma comes into play.”

N.E.4.

In response to these ethical dilemmas, many educators highlighted the significance of the active discussion session during the debriefing phase. During these discussions, students engaged in open conversations, expressing diverse opinions and perspectives. Educators noted that students’ decisions were often influenced not only by their nursing degrees but also by their cultural backgrounds, including religious beliefs. One of the educators stated explicitly, “It is not their nursing degrees that determine their decisions, but their cultural backgrounds”. To further support this, one discussion where students were divided into two teams (one supporting the importance of religious influence, while the other expressing opposing views) created confusion and showcased the complexities that arise from cultural and religious considerations.

Furthermore, Hanadi, a 39-year-old assistant professor, emphasised how religion impacts the learning process, citing an example of how a student’s prayer practices could affect their performance. She called for awareness and consideration of different cultures, not limited to Saudi culture, as international patients seeking healthcare in Saudi Arabia also need culturally sensitive care.

“In case she wants to perform Salat, she cannot use water, and Tayammum is performed instead. So, all of us [Muslim] are familiar with that practice, but when it comes to other
cultures like the Christian Philippines or from India, such as Hindus who come from America or Britain, we know very little about their customs. These patients do not go to the Ministry of Health; instead, they seek treatment at other hospitals. We encounter them quite often.” N.E.5.

6.2.3.2 Gender Sensitivity

The second sociocultural issue raised by participants relates to gender sensitivity, which is perceived as having a substantial impact on learning and teaching experiences and is likely to influence future student practice. In this subtheme, the discussion revolved around how female students behaved in the presence of male educators, both in the simulation laboratory and clinical settings.

The educational environment in Saudi culture differs from that of Western cultures (discussed in section 2.4.2). Female students in Saudi Arabia have been educated in an environment that is entirely free of males, with female educators, students, and administrators. Thus, they are accustomed to learning, communicating, and interacting solely with peers of the same gender. However, when they started their simulation experiences, the presence of male educators, who were not peers, created stress for some of the female students, as they had not encountered this situation before. Fatimah, 23 years old and in her fourth year, described how some female students felt stressed and behaved differently during the sessions where a male educator was present:

“In one of the HFS sessions, a male educator was present during the procedure, and the girls performed worse than they usually do when we have a female educator. Some girls are shy, and some are not used to having men around. He was the educator grading us for the simulation, and he was accompanied by our female educator. That’s why some of the girls were stressed.” N.S.8.

Abeer, aged 21 years, in her third year, also described how students became anxious, leading them to ask for breaks during the session, and feeling unable to ask questions when the male educator provided feedback at the end:
“A male educator observed, commented on, and graded us, and I was with this group. When we started the scenarios with a timer, they got stressed because they knew someone was watching, and they were not used to it. They had to ask for several pauses to process the information, and they didn’t stand next to him when he was explaining. The girls were confused.” N.S.13.

Some female educators also expressed discomfort when male educators or technicians were part of the team. Suha, 40 years old and working as an assistant professor, explained that she, being conservative, also felt uneasy, and reminded the female students to keep their headscarves on in the presence of male educators.

“Sometimes it’s really weird, and even I, as an educator, feel uncomfortable because I’m a bit conservative. Sometimes the simulation technician is male. The students come in feeling a bit nervous and ask me about the technician, as they can’t see behind the glass. They know it’s a male technician for the day because the schedule changed, and they ask, ‘Will he watch us from outside?’ Then I tell them, ‘Yes, please keep your headscarf and everything. It’s not easy for them.’” N.E.11.

This issue also extends to how female students care for male patients or mannequins. In Saudi Arabia, a country heavily influenced by the Islamic faith, daily decisions are significantly guided by religious norms. Therefore, when female students have to care for male patients and intervene in certain situations, they find it confusing. Samirah, aged 30 years and a lecturer, elaborated:

“One must interact with male patients when going to a hospital. Female students spend most of their time in nursing with their female classmates. When I told them to go to the hospital and examine male patients physically, can they refuse? In college, we learned to apply skills to females, not males. I said that it is a mannequin, not a real patient, and I do not want the girls to have the impression that they must deal with only one gender. They are supposed to deal with both genders. So, if we have male students, male faculty, or even male patients, that would help” N.E.2.

Hanadi, 39 years old and an assistant professor, emphasised the need to include male patients in the learning process to prepare students for real-life scenarios:

“One of the important things is that we should introduce male patients. The students are already familiar with the environment, but since we are all females here, they may
encounter male patients in the hospital or male team members. We must expose them to such situations next year. This is our goal: to make girls accustomed to working with both genders.” N.E.5.

However, a few students have different opinions regarding the presence of males. Hilama, 20 years old and in her third year, does not have a problem with male presence and believes that male educators could even enhance the learning experience:

“In university, we’re all girls, so we get used to it. Even in the hospital, they usually assign a female nurse. But I think that male nurses are better. There was a male during the HFS, and I personally don’t have a problem with it. Some other girls get stressed by the fact that there is a male in the room.” N.S.2.

Educators and students found it challenging to adapt to gender differentiation and the presence of males in the educational environment. Therefore, the majority of female educators sought the inclusion of other genders in the learning process, as demanded by many students at this academic level. This request aligns with the Vision 2030 project that the Saudi Arabian government is working on to develop nursing practice in Saudi Arabia (explained in more detail in Section 2.2). Samirah, 30 years old and working as a lecturer, noted this:

“You can notice that everything is done with females only. However, in the future, both genders may be included, according to Vision 2030. It is not applied yet because they just started simulation.” N.E.10.

The use of a male voice by female educators during the HFS session negatively impacted student interaction, as it did not effectively simulate the experience of a real patient. The majority of students did not find the imitation convincing, leading them not to take the scenario seriously. This highlighted the importance of having a male presence, which is essential for achieving both long- and short-term educational objectives. Ghala, an assistant professor aged 45, and Mashial, a lecturer aged 33, explained the challenges they faced:

“It sounds very strange because I am a woman imitating a man’s voice, and this is weird. When students encounter this scenario, they get shocked, wondering why there is a man
in the house. The mannequin has emotions and characteristics that students need to respond to. Despite their efforts, the simulation didn’t fully capture the realism we intended.” Ghala (N.E.6.)

“I would act like Ahmed with my voice, but the students know that all the educators are female. Requesting a simple change like using ‘Madam Noora’ instead of ‘Ahmed’ was denied. It may seem like a small detail, but it confuses the students. They end up asking me questions meant for a female patient, leading to further confusion. As an educator performing the voice-over, it’s challenging to maintain the immersion while representing a male character.” Mashial (N.E.8.)

Thus, Ghala, an assistant professor, emphasised the importance of having male educators to enhance the authenticity of simulations, as female educators cannot effectively imitate male voices.

“It is difficult to imitate the male voice when I speak. However, if we have male team members and engage in discussions, it will be more effective. From interprofessional education (IPE), we got a male educator, but we also want male students.” N.E.6

6.2.3.3 “Do Not Wear a Dress Which is Not your Dress”\(^\text{16}\): Hierarchical Norms

The subtheme “Do not wear a dress which is not your dress” explores how students and educators faced challenges during the HFS session where the majority of participants were Arabic-speaking Muslims. Both educators and students struggled with the use of English sources from Western culture within the context of their different cultural backgrounds in Saudi Arabia. While they did attempt to adapt these sources to fit their environment, they acknowledged that achieving a perfect fit remained challenging. This subtheme draws its essence from the famous Arabian adage “Do not wear a dress which is not your dress”, which warns against adopting something that does not align with one’s values or traditions as it may cause one to struggle, especially when it was not designed for their specific purposes or objectives. This concept represents a significant subtheme

\(^{16}\) Arabian adage that has been adapted; this subtheme cautions against adopting simulation practices, scenarios, or educational strategies that do not fit with the local culture, norms, values, or the realities of Saudi nursing practice.
identified in the findings of this study and aids in providing a comprehensive description of the participants’ experiences.

The majority of students’ actions were based on their religious background, which posed difficulties when confronted with complex scenarios adopted from Western culture, as mentioned in the discussion of the previous subtheme. Another challenge highlighted by the students was how to interact with a mannequin who was incapable of speaking Arabic. Language became a barrier to communicating and providing necessary interventions appropriately. For instance, one student described the confusion of facing a patient with an Arabic name who then spoke English, adding to the complexity. This language barrier was not limited to students only; some international educators in the setting did not speak Arabic, which adversely impacted interactions with the students. The lack of understanding between educators and students caused by language barriers affected their overall interaction and learning outcomes during the HFS.

Interestingly, some educators shared an alternative perspective, explaining that while students may have initially struggled with language, they adapted quickly once the educator interacted with them. This adaptability suggests that students possess the capability to overcome language barriers when necessary, indicating their flexibility in learning scenarios. Khoulad, 35 years old, working as a lecturer for 4 years elucidated:

“Sometimes the patient or the mannequin is Western, and so when they come in, it’s really interesting to see how the students act, saying things like ‘Hi, how are you?’ in Arabic, even though they are not Arabic speakers. So, one of my tweaks would say, ‘Sorry, pardon, I can understand what you’re saying.’ Then, they immediately switch to the patient’s language, like ‘Okay, okay.’ I would give them a brief, introducing the patient as Mr Smith, for example. This is one of my favourite moments during the simulation [laughing]. They quickly adapt to the patient’s language.” N.E.4.

One important issue that has been raised pertains to the culture of not speaking up in the educational context. The majority of students reported that they face difficulty communicating with educators during the HFS sessions, which significantly impacted their interactions. This can
be attributed to the power distance that students have become accustomed to throughout their education. In the simulation, they are suddenly expected to ask questions and respond to enquiries; they are not used to this, and it makes them feel underprepared and lacking in confidence. Both educators and students are hopeful of adjusting the speaking culture to foster more effective communication and address this concern. Creating a safe environment for students to freely ask questions and participate in discussions is essential. As some educators emphasised, encouraging students to speak up and advocate for themselves is essential. It allows students to express their concerns and clarifications without hesitation, facilitating better learning experiences. For instance, Suha, an assistant professor, stated:

“We emphasise speaking up, advocating for yourself. It’s okay. It’s totally okay. So, I like these concepts for me personally, because we will teach them the skills and they will learn the skills no matter what. But these things like empathy and communication and how to make sure that you’re okay.” N.E.11.

Jamilah, a lecturer highlighted further:

“Each student has their own unique way of understanding information. As a result, some students, especially females, may feel hesitant to ask questions or participate actively in discussions, finding it difficult to engage and interact openly.” N.E.2.

Regarding the adopted scenarios, most educators requested modifications to reflect Saudi culture, given that all undergraduate students were Saudi. However, some educators expressed dissatisfaction with the adjustments, particularly when they only included superficial changes like the patient’s name or language. They had hoped for more comprehensive adaptations that truly integrate the patient’s culture, going beyond surface-level adjustments. Integrating Muslim culture, which is dominant in Saudi Arabia, into the learning and teaching in the HFS nursing study is critical. Educators stressed the significance of incorporating spiritual and cultural care aspects into the simulation to prepare students for patient care situations where religion and culture may play an important role.
“I have an issue with the scenarios because when I received them, the names of the scenarios are sometimes English or European, like Maggie or Michael. Then the standardized patient (SP) will come in, and they cannot change anything in the scenario. Even I cannot intervene at the same time.” N.E.8.

Educators have emphasised the significance of students’ actions being based on their religious background, especially in dealing with critical care patients during complex HFS scenarios. Integrating Muslim culture into the learning and teaching of HFS nursing is considered crucial: “We need to involve Muslim culture because it affects all aspects of nursing care.” (N.E.11). Numerous educators expressed a strong desire for the inclusion of this element, recognising its impact on students’ future patient care. One educator elaborated on the importance of incorporating spiritual and cultural care into simulations:

“Adding spiritual care and culture to the simulation would be beneficial for students. In Saudi community hospitals, most patients are Muslims, and they often ask questions related to their religion. If students don’t know how to respond in accordance with Islamic beliefs, it can lead to confusion. By including spiritual aspects in the simulation, students will become more aware of how to effectively intervene with patients in the future.” N.E.10.

Another educator emphasised that while this cultural integration is essential, it should encompass more than just surface-level changes:

“It’s important, but it’s simple things. It didn’t change the whole thing. The patient is Muslim. What should you do now? Announce Shahada and open some Quran next to him. I keep telling them that because we are not treating only a body. As I said before, we are treating emotions, we are treating the soul at the end of the day. You want this soul to reach God in a very peaceful way.” N.E.5.

One of the educators provided an interesting perspective on the influence of culture and religion in the scenarios. The educator argued that while some religions, like Islam, have restrictions on alcohol and drugs, they do not significantly affect the entire learning process. She believes that medical information and procedures are followed globally in a uniform manner, making cultural
differences less influential. This perspective contrasts with the views of other educators who emphasise the importance of integrating cultural and religious aspects into the simulation. Sara, a 34-year-old lecturer, described her viewpoint:

“We don’t have those differences in Saudi Arabia, compared to other countries. The exposure is the same in both cases. For example, in Europe, you might say ‘Mr. John’, and in Saudi Arabia, ‘Ahmad’, but the medical point of view remains the same. Cultural differences are minor, like when we note that ‘his wife is wearing an abaya, and she is doing this.’” N.E.9.

One social concern raised during the HFS sessions was regarding the restriction on recording students. This restriction prevents students from being able to evaluate themselves and engage in critical reflection on their performance and skills. The university’s regulations and religious considerations contribute to the prohibition of recording, creating a conservative learning environment. Moreover, there is an important cultural aspect to consider concerning the restriction. Some parents may have concerns about recording their daughters during the sessions, which is not directly related to religion but stems from cultural norms and expectations. Addressing this aspect is crucial in ensuring an inclusive and respectful learning environment. Quotes from educators Suha and Jamilah shed light on the reasons behind the prohibition:

“After that, there is an instruction or regulation. It’s not allowed to record, because we are only female. By the way, you know that the students, when they go to the simulation, there is a team of simulation, including the males. They are already fully dressed in their uniform and the hijab and everything, but it is not allowed.” Suha (N.E.11.)

“We have already the facilities in the venue. We have the cameras, and we have everything for it, but it is not allowed. It is not from us as a staff or from the student. It’s from the university itself. It’s not allowed to record anything related to the simulation report. They have a lot of confidentiality.” Jamilah (N.E.2.)
6.2.4 The Dynamic Interaction within HFS

The third theme identified in this study was the dynamic interaction within HFS, which focuses on how interaction plays a vital role in effective teaching and learning during HFS. The 'dynamic interaction' theme is different from 'interpersonal skills'. It is about how individuals communicate and work together during HFS. While 'interpersonal skills' are about how each person communicates and connects, the 'dynamic interaction within HFS' theme looks at how everyone interacts that include: educators and students, students and their learning environments, and students with each other. This theme shows how these different interactions help make teaching and learning better in HFS, going beyond just individual personal skills.

The participants of this study emphasised the importance of having quality interactions between educators and students, students and their learning environments, and students with their peers. They shared their experiences of how they engaged with the HFS environment, interacted with their peers, and collaborated with their educators to achieve effective learning outcomes. However, they also faced challenges in navigating these dynamic interactions. Within this theme, two subthemes emerged: the authenticity of the HFS environment and its level of realism. The first subtheme highlights the significance of creating an authentic environment in HFS to enhance the quality of interactions. The second subtheme examines how closely the HFS experience replicates real-life scenarios. Understanding the dynamic nature of interactions during HFS and the levels of authenticity and realism within the simulations is vital for optimizing the teaching and learning potential of this educational approach.

17 ‘dynamic’ refers to active, lively interactions during HFS. It involves constant exchanges, feedback, and engagement between educators, students, and peers, creating an immersive learning environment that promotes effective teaching and learning outcomes.
6.2.4.1 The Authenticity\(^{18}\) of the HFS Environment

Authenticity, defined as the attribute of being what is claimed to be, characterized by genuineness and trustworthiness (Oxford Dictionary, 2023), is a fundamental aspect of HFS. The learning environment in HFS should be authentic, fostering a sense of trust and belief in the simulation experience. However, it is crucial to recognise that authenticity and realism are interconnected, as a truly authentic learning experience must have a level of realism that reflects real-life situations, as this study confirms. This section explores the significance of authenticity in the HFS and its impact on the learning experiences of students, addressing two key aspects: establishing trust and building authenticity, and the importance of interaction and facilitation.

6.2.4.1.1 Establishing trust and building authenticity

Authenticity plays a crucial role in creating a safe learning environment for students, allowing them to make mistakes and learn from them without fear of negative consequences. The freedom to make mistakes during simulations helps students develop confidence and take initiative in their actions. For example, Maryam, a third-year student, highlighted the value of learning through mistakes during the simulation, which reduced her stress and fostered a culture of active learning:

“What is special about the simulation is that you are allowed to make mistakes and learn from them before having to work on real patients in the hospital. This is a major relief. For example, when my teammate applied the wrong medication, it would have been a disaster in real life. However, during the simulation, we had the opportunity to learn from that mistake without any critical consequences. Once we were done, we had a whole lecture on how this situation would have been handled in a real-life scenario. This makes the simulation less stressful for students, knowing that mistakes can be made for the sake of learning, and you won’t be critically judged. It encourages us to take initiative and learn from our experiences.” N.S.3.

\(^{18}\) In the context of HFS, ‘authenticity’ means creating a realistic and safe environment that fosters trust, collaboration, and experiential learning for students, closely resembling real-life clinical settings and experiences (Jeffries, 2016).
Samaher, 21 years in her fourth year, commented:

“It felt like you’re dealing with a real patient but without the consequences of you screwing up and accidentally killing the patient. It simulated that this is a real patient, but they won’t die, so do what you think is right without being scared of the consequences.” N.S.14.

The simulation experience appeared to be both nerve-wracking and exhilarating for some students. It highlighted the significance of thorough preparation and the need to double-check their actions. The students’ realization that every step counts in a real clinical setting and that mistakes can have serious consequences was evident. However, the simulation also provided a safe environment for them to practise and learn from their mistake without any harm to actual patients. Creating a safe environment for student-centred learning is essential, as explained by Huda, a fourth-year student, who acknowledged its benefits:

“I felt like it was a real situation when we had to deal with a patient who was not properly drugged. It forced us to think about how to start the surgery without harming the patient. It was a valuable learning experience.” N.S.1.

However, not all students were aware of this approach. Ohoud, who attended 5 sessions of HFS, expressed her lack of understanding about the purpose of vital sign changes during simulations:

“I expected the vital signs to change based on our interventions, but the educator did not do that, leaving me unsure if my interventions were correct or not. Unfortunately, I was not aware that my approach was incorrect, and I was waiting for the vital signs to change without taking any further action.” N.S.4.

The significance of maintaining a safe learning environment is not limited to reducing threats and allowing students to make mistakes; it also involves fostering and emphasising trust. The majority of students struggled to build trust with someone who was observing and evaluating them. Ghala, 45 years old, assistant professor, explained how these factors were the most stressful for students:

“The fear of failing or being graded adds stress, whereas a practice scenario feels less intimidating.” N.E.6.
To alleviate this stress, some students shared strategies to stay focused during evaluations. Noura, a third-year student, emphasised the importance of staying in the moment:

“I try not to think about the evaluation during the simulation. This helps me perform better and feel like I’m in a real situation where mistakes are expected.” N.S.10.

Students expressed the need to reconsider the focus on grading and instead prioritise an environment without constant evaluation. Afnan, a fourth-year student, believed that immersion in the simulation and rethinking evaluation would enhance learning:

“I would advise educators to focus on immersing students in the simulation rather than just evaluating them.” N.S.9.

Despite the importance of authentic learning, many students still worry about evaluations and grades, which can overshadow their experiential learning. Huda shared her concerns about marks and grades, which took precedence over the learning process:

“I was too focused on the grading and marks. I became fixated on finding the educator who deducted marks from me. It affected my experience in the HFS.” N.S.1.

However, most students valued feedback from educators, particularly those who had focused on the learning process rather than just their grades. Feedback provided students with insights into their performance and areas for improvement:

“I like that some educators don’t just give us the grade; they talk to us and provide comments about our performance. They encourage us to explain what we were thinking during the scenario, which helps us understand a lot of things.” Noura, third year (N.S.10.)

“Usually, we have three people with us from the university: our educator and two educators from the simulation centre. They give us general feedback about our performance, highlighting both the positives and negatives. They discuss our mistakes and guide us on how to avoid them in the future. In general, our performance is considered perfect.” Fatimah, fourth year (N.S.8.)
“The thing I gained the most is experiencing a real-life environment that focuses on developing various professional skills. It allows us to enhance cognitive thinking, decision-making, critical thinking, and psychomotor skills. Observing the progress we make during the session, particularly in decision-making and psychomotor skills, is truly valuable.” Maryam, third year (N.S.3.)

Educators also acknowledged the significance of feedback during debriefing sessions, reporting that it promoted critical thinking. Hanadi, an assistant professor, highlighted the process of giving comprehensive feedback:

“We discuss strong and weak points, provide all necessary information, and ask students how they would handle the scenario in a real hospital setting.” N.E.5.

The use of mannequins in simulations also played a crucial role in providing immediate responses to students. Ohoud found the experience exciting and realistic:

“You get immediate feedback on how your actions affect the patient. It’s fun, and it keeps you excited for the next session.” N.S.4.

Despite the positive aspects of HFS, students and educators recognised the challenges of establishing an authentic environment. Kholoud, a lecturer, emphasised the need to reassure students and create a fresh learning experience:

“Honestly, I’ve never encountered a student who has trouble with the mannequins. So, we always check, but I’ve never encountered one who has said, ‘Yes, I feel a little bit uncomfortable with it.’ I tell them to forget about whatever experiences they had with the laboratory, the mannequin, or anything else. Let’s start this day as a fresh day, a new experience.” N.E.4.

However, not all students felt reassured during the simulations. Some expressed stress from being observed and the fear of making mistakes:

“The stress from knowing that someone was watching me behind the glass window. That was one of the biggest causes of stress, I didn’t want to do something while someone is
watching me and waiting for me to make a mistake. Also, when we were asked to make calculations for medicine, and a patient is screaming, it was very nerve-wracking. Even if I made a mistake, I wouldn’t correct it.” N.S.10.

To ensure authenticity, students stated the importance of being provided with complete information about the scenarios to enhance their learning experiences. Samaher expressed her fear of dealing with unknown situations:

“We didn’t know what to expect, and that was terrifying. We should have been given the problem and solution beforehand to prepare better.” N.S.14.

These findings reveal the significance of authenticity in HFS and the need for emotional preparation for complex scenarios. However, some educators have successfully implemented strategies to achieve authenticity, such as orienting students and providing reassurance. Ahlam’s experience demonstrates how reassurance improved her confidence:

“After receiving encouragement from an educator, I gained the confidence to perform procedures. It made a difference in my performance.” N.S.5.

Yet, not all students received this reassurance, the lack of which led to anxiety during the sessions. Afnan highlighted the importance of educator support:

“During one session, a fellow student made a mistake, and the educator didn’t intervene, causing stress among the group.” N.S.9.

6.2.4.1.2 Importance of interaction and facilitation

Interaction and facilitation are integral to the teaching and learning process in HFS. Active engagement during HFS sessions enables students to reflect on their knowledge, and then reinforce what they have previously learned. The majority of participants confirmed the importance of involving all HFS members, including both students and educators, in the process. However, the
majority of students also requested more effective planning for the interaction, identifying that this is crucial for maximizing the benefits, and is especially needed in the context of Saudi Arabia.

Jamilah, a 33-year-old lecturer, shared her approach to preparing students before HFS sessions. By uploading scenarios on Blackboard (an online learning platform) and encouraging discussion, students felt more confident and open to sharing their ideas, ultimately enhancing their learning experience.

“We upload the scenarios on Blackboard so students can practice at home. We also have a discussion board where they can share their thoughts on the scenario and its purpose. This preparation helps build their confidence, encourages idea sharing, and reduces fear during the session.” N.E.2.

Similarly, only some of the students recognised the value of cognitive orientation. Noura, a third-year student, appreciated being notified about the scenario a day in advance, allowing her to prepare and research accordingly. This active approach contributed to better learning outcomes.

“First of all, the students participating in the HFS are notified a day before the session about the scenario’s topic. The educator writes it on the Blackboard, giving us a whole day to prepare, whether we want to look up information about the disease or the medication.” N.S.10.

Dynamic interactions between educators and students were identified as essential for building trust in HFS. Suha, a 40-year-old assistant professor, highlighted the significance of students responding to the situation, identifying signs and symptoms, and effectively practising the required steps. Such engagement added to the positive experience of the participants.

“You want the students to respond to what you are doing, to identify signs and symptoms, and act accordingly. The steps follow a checklist, such as identifying bleeding or high heart rate and low SPO2 in the patient. Students should be able to recognise these signs within a specific time frame, allowing them to move on smoothly without delays. This is my favourite part, seeing if they can catch up with the time.” N.E.11.
However, challenges with interaction were also noted. Some students struggled to engage effectively with mannequins, making it difficult for them to take the learning experiences seriously. Rahaf and Asrar, who attended multiple sessions, expressed difficulties in interpreting mannequin responses, which affected their overall engagement.

“They gave us three minutes to prepare ourselves. Sometimes, we acted as if the device wasn’t working, making a tireless effort. It was challenging to guess when the case started while we were not attentive, especially if the patient suffered from bradycardia. I’m not sure what they were trying to achieve with the extended waiting time.” Rahaf (N.S.12.)

“We don’t take it as seriously as a real hospital situation. It’s a learning experience without life-and-death decisions or strict accountability like in a hospital. Patients don’t actually die during simulations. In the hospital, there are supervisors watching every procedure, but in the simulation, we can still act seriously. The sequence starts with us visiting the patient before reaching a critical situation.” Asrar (N.S.6.)

Establishing trust through effective interaction extended beyond educators and students to include peers. Working collaboratively allowed some students to develop trust and teamwork. Observing and learning from colleagues with strong communication skills inspired others to handle challenging situations with confidence and supportiveness in achieving the session’s learning outcomes. For example:

“When I see a colleague with excellent communication skills dealing with patients and their companions, I learn from them. It makes challenges seem tangible and easy to handle. Observing how others interact with patients’ families gives me insight and encourages me to be more supportive in real hospital settings.” (N.S.9)

“We enter the room, and each student takes on their responsibility. Working in a group has been most helpful. We always have a partner during simulations, and going in as a team with specific roles has been beneficial. We support each other and ensure things are done properly.” (N.S.7.)
Authenticity in interactions was considered essential by educators. Maha aged 38-year, lecturer, emphasised the significance of trusting students and acknowledging their capabilities, creating a positive learning environment.

“I ask the students how they would deal with this situation. It’s real, and it has happened before, but all the students are excellent. I trust them, and it’s great to hear that. Our students are brilliant, and they have my trust.” N.E.1.

However, the lack of effective communication with educators resulted in stress and uncertainty among students. Some students sought guidance from previous participants without fully understanding the intended learning outcome, impacting their overall experience. Hilama, 20 years old, in her third year, described this:

“Most of the time, before we enter the simulation, there’s a previous group that shares their scenario with us. They can change the scenarios, but sometimes it remains the same for the whole semester. Each group tells the other what scenario they have, and we study it at home. However, we don’t find reading the scenario helpful.” N.S.2.

6.2.4.2 HFS and its Level of Realism

This subtheme explores the level of realism in the HFS environment and its impact on educators and students. Various factors contributing to realism include the appearance of mannequins, the use of moulage, and the suspension of disbelief.

6.2.4.2.1 Appearance and fidelity of the mannequins

The majority of participants were fascinated by the HFS environment’s realism, praising the lifelike appearance of the mannequins and the availability of resources. They found the laboratory to be remarkably similar to a real hospital, offering a unique and immersive learning experience. For example, many students enthusiastically stated:
“It is very wonderful! You can say you are in a real hospital.” N.S.12.

“You could even hear the heartbeat of the mannequin and its breath. In Adult II course, I felt like I was entering an operations room, matching the one I entered during my hospital training. I enjoy the HFS as I gain experience, especially since you work with a mannequin, not a real person, so you feel free, where can I put and find equipment without stress. Therefore, the simulation was a great experience.” N.S.5.

“For me, I took the simulation courses at my own expense. I feel that it’s a worthwhile experience. I remember that I took a course with them about basic airway management. The mannequin was very real, learning how to enter the tube in the patient’s larynx. The doll was so realistic that if you heard a broken thing that means you broke the patient’s tooth, and all tools were available.” N.S.11.

“All the supplements are there. So, it is very realistic, and I enjoy it very much. You can see the patients and their size, their injuries. What else [thinking deeply]? Even the drugs, whether it was Intravenous Therapy (IV) or tablets.” N.S.6.

A minority of participants remained uncertain about the realism, particularly regarding mannequins’ movements and psychological responses. Some educators and students preferred learning with real patients or standardized patients in clinical settings, feeling that it provided a more authentic experience. Noura, 21 years old, attended more than five HFS sessions and clarified:

“In cases when we have to give medication, we are asked to insert the needle but not inject the substance into the mannequin. Plus, the only mannequin that was moving was the one for the childbirth, otherwise, the hypovolemic shock one didn’t move, the mouth moved, but the sound was coming from somewhere else.” N.S.10.

Asrar, a third-year student, highlighted why students take these experiences seriously:

“Even though the HFS has advanced, it still feels like a simulation. It lacks the realism of interacting with real doctors, patients, and the actual hospital environment. In our rounds, we work with nurses and doctors, and the reviews we receive are from them. The doctor
instructs us and asks for the treatment, making the hospital experience more effective than the HFS.” N.S.6.

The educators and students have also mentioned the concept of ‘pretending the roles’. As the educators have been informed of how the lack of equipment forces the students to act as if this is real equipment, the next step of scenarios can be applied. Mashial, 33 years old, lecturer, have teaching experiences for eight years explained that:

“This is one part that we cannot achieve the realism because they will tell the students, "Please do act like you have the glucometer and act like you are picking the patient or breaking the patient." They will ask me, "Miss, we don't have that glucometer, how we can?" I would say, "Act like you have it." It's really frustrating.” N.E.8

6.2.4.2.2 The impact of moulage

Moulage (see Appendix 5), or special effects makeup, is a process where makeup and moulds are used to create realistic-looking lesions, skin findings, bleeding, and traumatized areas on the skin for a person or mannequin (Levine et al., 2013). The use of moulage received appreciation from students and educators for enhancing the realism of scenarios. Educators praised its use in preparing students for specific situations, such as burns. Samirah, 30 years old, a lecturer, explained:

“Another strategy I’d like to mention is moulage. We apply moulage to the mannequins so that students can experience realistic scenarios. When they enter the room and encounter a patient with burns, they initially think they won't see any signs of burns on the mannequin. However, when they check the burn, they start performing effective interventions, such as assisting the burned side, calculating the percentage of burns, and providing proper wound care for the case.” N.E.10.

In contrast, some educators expressed reservations about the practical effectiveness of moulage despite its convincing aesthetics. This viewpoint highlights the need for a closer examination of
the practical application of moulage in simulation scenarios, beyond its visual appeal. Jamilah, lecturer, elaborated on her concerns, stating,

“During the operation, it’s not entirely real. For instance, in a case of a burn, the wound vanished when they used alcohol for disinfection while applying the dressing. As a result, we felt that the students were not convinced much and didn’t take it seriously.” N.E.2.

However, a few educators expressed concerns about its effectiveness in practice, noting that some scenarios lacked depth and complexity, falling short of fully meeting learning objectives.

6.2.4.2.3 Suspension of disbelief and scenario complexity

Many participants acknowledged the need to suspend disbelief to interact effectively with the HFS environment. The educators’ ability to embrace the simulation as real significantly impacted students’ behaviour and the overall realism of the learning experience.

Some participants raised concerns about scenario complexity, with a few educators and students feeling that certain scenarios felt too basic and did not fully challenge them. Mashial, a 33-year-old lecturer, remarked:

“Regarding the stroke patient scenario, it’s a major disease and not something easy. In our scenario, we only checked insulin and high blood pressure, which I think is too basic for such a critical case. Dealing with a stroke patient requires a deeper understanding and preparation. In real life, there are more complexities, and the centre would ask more questions. We should focus more on comprehensive treatment and management, not just basic blood pressure checks.” N.E.8

To further enhance realism and authenticity, incorporating standard patients (SP) and increasing the number of scenarios could prove beneficial. Students expressed the desire for more simulation sessions, as they found the HFS environment to be a safe space for learning. Asrar, in her third year, said:
“Firstly, I feel that we need to have more sessions. As you probably noticed, throughout my three years as a nursing student, the times I entered the simulation are less than 25%, which is too few. So, I feel we need to maximize the number of scenarios students can practice through the HFS. If I gained this much from so few cases, I believe that with more sessions, the benefits would be huge. I believe Saudi nurses would be highly qualified if we did so.” (N.S.3, Maryam)

“I think that people should show more interest in HFS, especially since the laboratory can be very stressful for the students. We need more time, sessions, SPs, and procedures during simulation.” (N.S.8, Fatimah)

6.2.5 The Emotional States

The fifth theme identified from the interviews was the emotional state participants experienced during HFS. The students and educators described their emotional journey in HFS, which demanded preparation, psychological effort, and a safe environment. The emotional state encompassed feelings of stress and anxiety related to the simulation itself as well as the challenge of navigating through uncertainty or “muddling up”. This theme examines the insightful emotional impact of HFS experiences on students and educators, shedding light on its significance in nursing education.

6.2.5.1 Feeling Stress

The data produced from the interviews with students and educators revealed information about the emotions they experienced during HFS sessions. In this subtheme, participants discussed their feelings of anxiety and stress, exploring the reasons behind these emotions as they teach and learn in the simulation environment. This study defines stress as the external factors that impact participants emotionally, leading to confusion, disorientation, and difficulty concentrating on learning objectives. Many participants reported experiencing stress during HFS sessions, making this subtheme highly relevant in understanding how these emotions can influence participants both negatively and positively. Additionally, the subtheme explores how HFS can change emotions and identifies strategies to overcome stress while effectively integrating HFS into the learning process.
The following subsections provide a comprehensive analysis of the various factors related to stress in HFS.

The participants’ responses highlighted that many students experienced feelings of being lost and nervous during their initial HFS sessions. This is likely to be due to the novelty of the simulation environment, where they were faced with an unknown scenario and had to perform unfamiliar tasks. As undergraduate students, the responses suggest they were often inadequately prepared for the complexity of the simulation, leading to increased stress and confusion. Huda, a fourth-year student, described her initial experience as follows:

“When I began, it felt like, let me say it in Arabic, I was confused when I first went in, I felt like I was lost when I started because we entered as a group. We prepared first, then we divided the work between us.” N.S.1.

Interestingly, educators also faced challenges and stress during their initial experiences with HFS. They had to juggle multiple tasks, such as running the scenario, operating the simulation, and engaging with students. This caused them to feel stressed and overwhelmed, affecting their performance in managing the session effectively. Samirah, a lecturer, explained:

“As a faculty member, I initially found it challenging to juggle running the scenario, operating the simulation, and managing the students all at once. It took a significant amount of time and effort to focus on the monitor, adjust vital signs, simulate patient responses, and interact with the students effectively. However, with practice and experience, I have become much more proficient at it.” N.E.10.

One noteworthy finding was how stress could be transferred from educators to students during HFS sessions in that the educators’ stress and anxiety were sometimes inadvertently transmitted to students, affecting their performance and conduct in the simulation.

“It’s all about the educator. If they really care and make the simulation feel real and serious, it’s so much better for us. We learn a lot and feel more engaged. But when some
educators just go through the motions without putting in effort, it’s not as good. It definitely makes a big difference in our experience.” Manal, fourth year (N.S.11.)

6.2.5.1.1 Causes of student stress

The study identified several specific causes of stress among students during HFS sessions. One particular factor, already identified, was the fear of being evaluated and graded, especially when educators observed them from behind a glass window. Students felt pressured to perform well and worried about making mistakes during critical scenarios. This fear of evaluation affected their ability to focus and perform at their best.

“I felt stressed because I knew someone was watching me from behind a glass window. It was one of the biggest stressors for me.” Noura, third year (N.S.10.)

“I don’t know, I guess I got nervous when the educator told us that the patient was tough and that she wanted to see the doctor, not the nurses.” Ahlam, fourth year (N.S.5.)

“Yeah, I think the biggest factor is that students are really scared about their grades and the presence of the educator.” Afnan, fourth year (N.S.9.)

“No, but after the scenario, stress builds because of the educator’s feedback during the debriefing.” Asrar, third year (N.S.6.)

6.2.5.1.2 Impact of high level of understanding on the stress experienced

The data revealed that students with higher levels of understanding and awareness of the purpose and nature of the HFS tended to experience stress differently from their peers, though they still experienced stress. These students were the minority, while most struggled. Those students who grasped the significance of the simulation as a valuable learning tool were better able to manage their stress levels and approach the experience with a positive mindset. Understanding that the
HFS was not merely an examination, but an opportunity to learn and practice, allowed them to focus on their learning objectives and reduced the anxiety associated with performance evaluation.

“I don’t find simulation experiences at my university a good experience. It’s not fair. They don’t give us enough time and opportunities to learn and practice the skills properly. Instead, they just tell us that we’ll learn it during the clinical rotations. I don’t feel confident, and I’m afraid of making mistakes that could harm people.” Abrar, fourth year (N.S.2.)

“Later, I started seeing simulation as an educational experience where you can make mistakes and learn from them.” Huda, fourth year (N.S.1.)

“Honestly, I was encouraged by many things. For example, my communication skills were a bit blunt, and I was usually scared of being rude to patients. However, the HFS helped me improve. I feel more confident now when reading the assessment sheet, and I no longer fear misunderstanding it.” Afnan, fourth year (N.S.9.)

“Before doing the simulations, in the first weeks in the hospital, I doubted myself, even though I knew all the questions I had to ask the patient. When we started doing simulations and were given scenarios, we had to make quick decisions. That’s when I realized that I had the knowledge needed to handle patient interactions.” Noura, third year (N.S.10.)

A minority of students give credit to the educators in the HFS for playing a significant role in helping them overcome stress during the session. For instance, Manal, a 21-year-old fourth-year student, and Abeer, a third-year student, described how having a supportive educator in the HFS session alleviated their stress and enabled them to engage more effectively in the learning process:

“Overall, you’re going to come out of the simulation with good experiences and improved confidence, but you should just recall information beforehand, let God do his work, and not worry about the grading or the educator too much.” Manal (N.S.13.)

“In my point of view, I don’t really know, but coming back to Adult II, I feel like more complex and detailed situations with a precise and encouraging educator make us feel
“more immersed in the experiences and make it a more fun and positive experience.” Abeer (N.S.11.)

6.2.5.1.3 Physical symptoms of stress

The impact of stress during HFS sessions was not limited to emotional responses; many students experienced physical symptoms as well. These physical symptoms included increased heart rate, sweating, trembling, and even physical exhaustion. The combination of stress and pressure during the simulation sessions took a toll on the students’ bodies and overall well-being.

“Some students go like blind when they enter the room which gets them nervous, so we start calming them down and remind them of what they are supposed to do.” (Abrar) N.S.7.

“At first, we didn’t know the mannequin could blink, so that was a very surprising moment. As they were showing us the room, one of the students noticed that it was blinking, and that scared them, making them want to leave the room. I was also taken aback by the blinking mannequin.” N.S.8.

“We feel stressed all the time, and the scenarios are not related to reality. It’s not an enjoyable experience; it’s just based on the educator’s imagination, and that’s not enjoyable at all.” N.S.2.

6.2.5.2 Simulation Anxiety

Many participants in the study expressed their emotional responses to the complexity and realism of HFS, which often manifested as feelings of anxiety. Anxiety, in general, refers to the subjective feeling associated with an uncertain future event that has cognitive and behavioural consequences for students and educators (Beesdo, Knappe and Pine, 2009). Although some participants struggled to explain why they felt anxious, it is evident that the level of realism presented in HFS impacted them significantly. This gives rise to an ongoing emotional reaction known as ‘the anxiety of simulation’ or ‘simulation phobia’ Simulation anxiety specifically pertains to the unique emotional response triggered by the realism and prolonged exposure to HFS, as experienced by the participants.
The HFS scenarios, designed to closely mirror real-life patient care situations, can evoke strong emotions among students, as presented in Section 6.2.4.2. While some appreciate the lifelike features and the opportunity to practise without risking harm to real patients, others find it unsettling. For instance, students have reported feeling nervous and even scared when they witness the mannequins blinking and breathing during simulations.

“I got phobia from any talks that include all the mannequins. I saw many mannequins start to blink, creating a feeling of anxiety. I couldn’t stay at the simulation, and I left many times. Every time I go to the simulation, I try to manage my anxiety, but I still find it intimidating.” (N.S.14.)

This simulation anxiety stems from the uncertainty and pressure associated with realistic scenarios. Students worry about making mistakes or feeling unprepared to handle complex medical situations. As a result, their performance might be hindered, and they may even feel tempted to give up altogether. Students struggled in the HFS due to their high levels of anxiety, which hindered their performance, rendered them inactive, or caused them to give up and leave the room. Several students were initially controlled by their anxiety, which caused them to lose confidence and perform poorly, even if they had the necessary knowledge for the simulation. In some cases, students gave up and began to cry because they did not know how to overcome the anxiety.

Intriguingly, only a minority of educators were aware of and able to manage the simulation anxiety in the students. Most of the educators were unaware of it, possibly because they did not immerse themselves in the HFS. However, Kholoud, a 35-year-old lecturer, explained how she checked her students before they participated in HFS because she was aware of the students’ phobias regarding the HFS.

“And we ask them, are you comfortable with the mannequins? Because some people have certain phobias. Also, we ask them, please don’t discuss it with the other students who will rotate to the Simulation Centre. So, each student experiences it as a new thing. They are really mature that way.” N.E.4.
Notably, this study observed that nurse educators also experienced anxiety, although their manifestations differed from those of their students. Several educators had extensive exposure to HFS, leading them to gradually interpret the mannequin’s features as if they were real, giving rise to perceived expressions on the mannequin’s face. Some educators even reported seeing worry or perceiving the mannequin as smiling at them. This prolonged exposure to HFS seems to induce psychological effects, such as these human-like interpretations of the mannequins. For example, Mashial, a lecturer, shared an amusing experience:

“I know this might sound funny, but sometimes, I catch myself thinking that the mannequins are smiling or winking at me. It’s become a little joke with my colleague; we always check together [laughing].” N.E.8.

6.2.5.3 “Muddling Up”

“Muddling up”, or ‘تدیر أمرها’ which can be loosely translated as ‘to keep going even when you are confused’, emerged as a significant subtheme from the participants in this study. This subtheme sheds light on instances where participants experienced feelings of being lost and perplexed within the HFS environment. Despite the lack of proper guidance or explanation, they had no choice but to continue and take action. The English equivalent of this phrase is ‘muddling through’ which aptly captures the experience of students during HFS. The simulations require them to navigate through confusion and persist in their actions despite facing uncertainties. This term became significant as some participants specifically expressed their anticipation of such situations by saying, “It is muddled up there” while others mentioned “feeling lost”.

The “Muddling up” subtheme sheds light on participants’ experiences of feeling lost and confused during HFS sessions. Despite the HFS environment’s high level of realism and advanced technology, students expressed disbelief in its authenticity, leading to a sense of disconnection.

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19 This looks to capture the participants’ intended meaning of ‘muddling through’ the challenges and uncertainties they faced during the simulation. This subtheme was named from the term “muddling up”, as was expressed in Arabic and translated into English.
This lack of belief impacted their engagement in the simulation and hindered their ability to fully immerse themselves in the experience.

One key factor contributing to the participants’ confusion was the insufficient cognitive orientation they received before the simulation. Some students mentioned that they were unsure about the intended function of the equipment and facilities in the HFS environment. The lack of clear guidance and direction left them aimless during the simulation. As a result, valuable learning opportunities were missed, and the students’ belief in the Authenticity of the experience was further challenged. For instance, Noura, a 21-year-old third-year student, shared her experience:

“Hopefully. It’s true that the mannequins act very real and life-like. But at some point, we have to use our imagination. It’s true that the mannequin blinks and moves, but the sound is missing. After you do it a few times, you wouldn’t learn anything new if you didn’t use your imagination.” N.S.10.

Additionally, having missed or unavailable tools during the simulation added to the participants’ confusion. Students reported feeling frustrated when they could not access essential equipment needed to perform specific procedures. This hindered their ability to fully engage in the simulation and led to feelings of disappointment and disbelief. Abrar, a fourth-year student, expressed her frustration:

“Sometimes, some tools were missing during the simulation. At the beginning, we didn’t have certain tools, so we had to imagine performing the steps that required those tools without actually using them. This resulted in me performing some procedures for the first time in a real hospital setting. It was a minor setback, but other than that, there were no other difficulties.” N.S.7.

Moreover, the educators’ role in the HFS environment was key to the students’ experiences. Some educators appeared unprepared or lacked effective strategies to guide students through the simulation effectively. This lack of proper educator engagement and support contributed to the students’ muddled experience, leaving them without clear direction on how to proceed during the simulation.

Chapter 6: Findings
In contrast, students who coped more effectively with the equipment shortages and confusion demonstrated adaptability. They used their problem-solving skills and creativity to navigate through the simulation despite the challenges they faced. These students were able to adjust to the situation and find alternative ways to learn and interact within the HFS environment and the quintessential nature of nursing care is that of uncertainty. Afnan, a 21-year-old fourth-year student, emphasised the importance of educator preparation:

“*But I do hope that in the future, the educator tries to make the experience feel more real and immersive, rather than just making us feel like we’re taking an exam. From my perspective, I would prefer if the educator put more effort into trying to immerse the students in the simulation.*” N.S.9.

When students encounter the absence of necessary tools during procedures, they feel lost and uncertain. For instance, Huda and Afnan, both in their fourth year of undergraduate programmes, described a scenario where the educator failed to provide clear guidance and intervention during the simulation. The educator’s approach of singling out individual students for answers without proper collective action left the students feeling frustrated. This situation leads to a sense of confusion, as they struggled to navigate the scenario without the essential resources. Huda, 21 years old, explained,

“The educator was asking one of us, so she didn’t give us a chance to act as a group. She asked the anaesthesia nurse, but she didn’t answer. Then the educator said, ‘Girls, who will answer?’ Once we answered, she just said ‘Okay, go on’ as if we could proceed without taking any action, [sighs], without increasing the dose.” N.S.1.

Additionally, the level of realism in HFS creates a unique challenge for both students and educators. While the HFS environment is designed to mirror real-life scenarios, it can fall short of this, leading to a sense of disbelief among participants. Educators, too, experience a form of disbelief and sometimes have difficulty suspending their doubt about the simulation’s authenticity. This raises questions about the effectiveness of HFS at fully immersing students in a realistic learning experience. Moreover, the lack of preparation and cognitive orientation regarding the
simulation further compounds the students’ feelings of confusion and disengagement. Some students struggle with finding the necessary equipment in the simulation centre, wasting valuable time during the session. This lack of preparation also highlights the need for both physical and psychological readiness to enhance the HFS experience. Noura, 21 years old and in her third year, elaborated:

“One of the students gets so nervous that she loses consciousness. As a result, she had to participate voluntarily, not with the group during the simulation. After a while, she gained confidence and was comfortable being on her own in the hospital. Sometimes, we couldn’t find her as she was busy.” N.S.10.

Psychological preparation can help students overcome nervousness and self-doubt, enabling them to engage more actively in the simulation. Conversely, students who lack this psychological readiness may struggle to immerse themselves fully in the HFS scenario.

### 6.3 A ‘Mixed Blessing’\(^{20}\) or ‘Curate's Egg’\(^{21}\)

This study's examination of integrating HFS into nursing education within Saudi Arabia prompts the question as to whether HFS constitutes a “Curate's Egg” or a ‘Mixed Blessing’ to best represents the outcomes? Initially relevant, the “Curate's Egg” phrase illustrates a HFS with both positive and negative aspects, leaning more towards negativity than positivity. However, upon closer analysis, it becomes clear that this phrase inadequately includes the complex dynamics of HFS in nursing education and the incorporation of the present dataset. In contrast, the analysis of this study points towards a different interpretation. The analysis shows that the positive impacts of HFS significantly balance the challenges encountered.

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\(^{20}\) The term ‘mixed blessing’ refers to the idea that the HFS being studied has both positive and negative aspects. It represents a comprehensive understanding of the complexities involved and shows that I have considered both the advantages and disadvantages of integrating the HFS in such a wealth country.

\(^{21}\) The term "Curate's Egg" is a “British phrase from a British satirical magazine in the late 19th century, a way of describing something that mixes good and bad parts. It is like when you have an egg that's partly good and partly not so good” (Oxford Dictionary, 2023). In the current study often used to describe something that may have some positive elements but also significant drawbacks.
Analysing the findings emphasises the prevalence of positive elements tied to HFS. The findings underscore the potential benefits of this teaching approach, leading to promising outcomes. Alongside, recognition is given to specific challenges demanding attention and improvement to optimise HFS's potential. Thus, the 'Mixed Blessing' phrase is more fitting. This term concisely captures the prevalent positive effects while concurrently recognising the existing challenges (as both advantages and disadvantages). The collective findings indicate that HFS yields substantial advantages, supporting its role as a practical educational approach. While challenges endure, they contribute to the 'mixed' characterisation of the outcomes, embodying both positive and negative dimensions.

As the exploration of the preparation process deepens, the spotlight shifts to an interesting concept ‘Mixed Blessing’. This concept has gradually unfolded through the previous themes and subthemes and now captures a central role. The term ‘Mixed Blessing’ briefly captures the interplay of positive and less favourable aspects that characterise the preparation journey and the outcome of integration of the HFS. In the earlier subthemes, educators faced challenges when assessing student readiness and adapting scenarios and when they interact with each other. Additionally, there were identified limitations in institutional support and resource allocation. At the heart of the ‘Mixed Blessing’ is the acknowledgment of both favourable and challenging aspects. On the one hand, some of educators demonstrated their expertise in preparing students cognitively and conducting effective debriefing sessions. On the other hand, challenges emerged, including scenarios not aligned with students' needs and their reality, limited institutional support, and lack of suboptimal resource management.

The utilisation of the term ‘Mixed Blessing’ highlights the central idea that while HFS offers valuable resources, inadequate preparation can undermine its ultimate effectiveness. This culminating term explores into these factors, with the overarching aim of refining nursing education in Saudi Arabia. Furthermore, ‘Mixed Blessing’ critically examines how briefings and debriefings influence HFS experiences for Saudi nursing students and educators. While these sessions enhance learning, challenges are experienced by specific students, ultimately resulting in less-than-ideal outcomes.
In this culminating term, the concept of ‘briefing’ in the context of HFS is explored, focusing on its positive impact on educators’ and students’ experiences (Lioce et al., 2020). Participants in this study emphasised teaching methods through the pre-briefing/briefing as essential to preceding a simulation scenario; a phase during which students can receive vital information about the simulation, roles, objectives, and expectations. Consistent with the subtheme of a ‘Mixed Blessing’, it is evident that not all educators are equally prepared for HFS sessions. Some educators demonstrate thorough preparation, while others fall short, leading to varying outcomes and experiences for the students. Huda, a fourth-year student, shares her experience:

“Before we go to the patient’s room, we’re having a meeting to read the scenario and discuss any unclear points. Then we assign roles like ‘you will give the medication, you will read the labs, you will identify the patient, you will talk to the family, if there was a family member coming with the patient.’” N.S.1.

One participant gave insight into the vital role of the briefing in enhancing students’ performance and overall experience in HFS, particularly for those new to simulations. The briefing lays the groundwork for successful engagement and learning throughout the simulation sessions, benefiting both students and educators involved. By providing students with clear expectations and guiding them in organising their thoughts, the briefing enables more effective decision-making and communication during the session. Khoulad, a 35-year-old lecturer, elaborated:

“The brief is very important. The debrief is more important, but the briefing is also crucial because it sets the mood. It informs the students about what to expect and how to arrange their thoughts. They are naturally curious. So, it’s essential to be somewhat strict, stick to your time, and adhere to your objectives. At the same time, showing compassion for the students, as they often feel anxious, especially the first-year students during simulations.” N.E.4.

“OK! Let’s say a patient is newly admitted in shock. They can see this patient in shock still talking but simple words. They are so confused that they do not know how to start. So, we tell them that this is a newly admitted patient, and from the beginning you can start using the management approach, using the ABCD approach. As long as I referred to the

22The ABCDE approach, which stands for Airway, Breathing, Circulation, Disability, Exposure, is a crucial method used to assess and treat patients during emergencies (Thim et al., 2012).
Huda’s account highlights the importance of briefing, where essential information about the simulation, roles, objectives, and expectations are shared. Some educators overlook this crucial step, leading to confusion and suboptimal experiences for students. Conversely, other educators prioritise the briefing process, positively impacting student performance. Abrar, a fourth-year student, further emphasised the impact of inadequate preparation on their HFS experiences:

“Sometimes, some of the tools are missing. Initially, we lacked certain tools, and we had to imagine performing certain steps without actually doing them. This led to some challenges when we had to perform these tasks at the hospital for the first time. However, apart from that, there weren’t any other difficulties.” N.S.7.

This lack of preparation and cognitive orientation, despite the presence of extensive resources in the simulation centres, poses a challenge for the participants, leaving them feeling frustrated and unprepared for real-world healthcare settings.

Regarding the positive aspects, in this study, the wealth of Saudi Arabia as a country is evident; its simulation facilities are vast and equipped with everything needed for effective learning. Many students expressed how impressed they are with the extensive resources available. However, despite the abundance of equipment and facilities, some students experienced challenges during their simulations. These difficulties were attributed to the lack of adequate preparation by educators rather than any shortcomings in the resources themselves. This highlights the importance of proper preparation to fully benefit from the available equipment and facilities. Hilama, a third-year student, discovered this:

“By the way, I was then curious, and I checked the storage room. I was shocked that we have three huge storage rooms in the simulation centre. And they were full of nasal cannulas, nasal masks, the oxygen supplies. There was everything, even boxes of gloves. There were tons of it in storage. Why don’t they provide all the appropriate equipment for
us? So yeah, the educators we have, why didn’t they bring it to our simulation and let us learn and use this equipment for learning? Why keep it in storage without using it?” N.S.2.

While the facilities and equipment are abundant, the challenge lies in how well they are prepared and utilised for effective learning experiences. It is evident that students have had different experiences across various courses. A notable comparison arises between medical-surgical courses and other courses like paediatrics and maternity. Students express satisfaction with their experiences in paediatrics and maternity, attributing it to the educators’ thorough preparation and dedication. Fatimah, a student, shared her observation:

“Some of the tools that we learned about theoretically were not there during the scenario, some medicine also. I expected, since it was a HFS, that it would be exactly like reality. But some things were missing. I never did a scenario before, so I had to take note of these things. Because we don’t know where the equipment is, it takes longer to find and get there. So, the procedure doesn’t really suit the place.” N.S.8.

Furthermore, students compare their experiences between the Adult I course and other courses like paediatrics. In the Adult I course, students felt disconnected, merely discussing vital signs without much interaction. In contrast, in paediatrics, they felt fully immersed in the scenario, with the educator’s guidance making it feel like a real situation. One is tempted to reconsider a ‘Mixed Blessing’:

“Adult I - I didn’t feel very into the scenario, even though the vital signs were increasing and decreasing, we were just talking, we weren’t moving or doing much. For example, we were just saying ‘Temperature’s rising’ or ‘Temperature’s decreasing’, and that’s it, scenario’s finished, we didn’t do anything. But in paediatrics, it was different. We thought this is a real situation, especially when the child passed away, and the mother was screaming. It was like you need to save them; it was more real, and we got into it because I think the educator, she knows what she’s doing.” N.S.9.

The debriefing also allows the students to express their feelings and learn more about how the simulation is proceeding, while the educators receive feedback from the students on how to
improve future simulations. The educators use various strategies to provoke critical thinking in the students during the debriefing sessions.

“Asking basic standard questions, like, how did this feel? What was your favourite part? What was your least favourite part? Mostly if it was a critical or stressful environment, they will state this as their favourite part. The least favourite part usually has to do with equipment arrangement.” (N.E.4., Khoulad, lecturer)

“We explain to them what they have done wrong. For example, if they had an agitated patient who is crying, the nurse can’t just tell him she’ll provide him with medications; we need to make a thorough examination of the patient and make sure everything is okay.” (N.E.2., Jamilah, lecturer)

As both educators and students explained, the debriefing assists students in evaluating their performance, recognising mistakes, and learning how to avoid them in the future. In addition, students were occasionally given the chance to repeat particular scenarios or procedures to better understand the effects of such as stress in the HFS laboratory. After completing a session, most students repeated the procedures accurately for a second time, without evaluation affecting their performance. Students found this repetition and clarification invaluable before hospital training. Fatimah, 23 years old in her fourth year, and Ohoud, 21 years old in her third year, provided insight:

“No, never. But one of the simulations was interesting, and we made a fundamental mistake; one of the simulation centre’s staff stopped the entire simulation so that we don’t make such a big mistake again. I can remember that very well.” (N.S.8., Fatimah).

“When I made a mistake, the educator immediately told me to fix it. The same thing happened in Adult II during the post-procedure discussion; we were asked some questions, and then the staff members took us back to the simulation room and explained the whole procedure to us once more after we received our marks. I find this extremely critical and important before hospital training.” (N.S.4, Ohoud).
6.4 Summary of Findings

The conclusion of this chapter summarises findings related to the incorporation of HFS in the Saudi nursing curriculum. Figure 18 presents a comprehensive overview of the shared experiences and perspectives of both educators and students concerning the integration of this teaching technique. The study reveals the effectiveness of HFS as a teaching and learning tool in the Saudi nursing context, shedding light on which factors contribute to its success and which ones pose challenges. The NLN Jeffries Simulation Theory (NJST) (2016), discussed in Chapter 4, plays a crucial role in shaping this study's direction. Throughout this analysis, the NJST framework has demonstrated its practical value, with numerous concepts aiding in the interpretation of the study's data. Significantly, much of the data interpretation aligns with the NJST, and many of its concepts have served as a strong basis for establishing themes and subthemes. However, it is important to note that a specific aspect of the theory, centred on contextual and cultural factors, has not been extensively explored. While the theory acknowledges the importance of these factors, their impact on the learning process has not been as thoroughly investigated, as what this study has shown.

One of the main findings emphasises the significance of interaction during the learning process within the HFS environment. The dynamic exchange between educators, students, and peers plays a vital role in facilitating effective teaching and learning outcomes. Moreover, this study highlights the importance of adequately preparing both students and educators to navigate the potential psychological effects of HFS, with awareness of social and cultural factors that may influence their experiences. Interestingly, despite the high level of realism and advanced features of HFS, some participants expressed that it did not sufficiently emulate a real patient or situation, particularly when certain crucial elements were absent. This finding reveals that while HFS is recognised as an effective teaching method, there are essential limitations that must be addressed before its implementation.

In the next chapter (Chapter 7), the data will be scrutinised in greater depth and mapped against the NJST framework presented in Chapter 4. By doing so, the author aims to gain a comprehensive and interpretive understanding of the findings and their implication for education, optimal nursing
practice and further research. Specifically, the findings offer essential insights into the use and efficacy of HFS and how better to integrate HFS into the Saudi nursing curriculum.
Chapter 7: Discussion
7.1 Introduction

This chapter explores the key findings of the experiences of third and fourth-year nursing students and their educators who used complex scenarios based on high-fidelity simulation (HFS). These findings are discussed in relation to the NLN Jeffries Simulation Theory (NJST) (2016), as explained in Chapter 4. The focus is on the contextual factors and simulation experiences, which highlight the study's contribution to existing literature and address the research gap. These findings are comprehensively interpreted within the context of the NJST (2016), as shown in Figure 19. The NJST (2016) is explained in the following subsection. This analysis compares the study with existing literature, emphasising its role in filling the identified research gap. By taking this approach, the chapter provides a comprehensive exploration of the research outcomes, enhancing the understanding of the study's implications and significance.

7.2 Mapping the Findings to the NJST (2016)

Figure 19 has been created to demonstrate how the study's findings align with the NJST (2016), which is the theory presented in Chapter 4, Section 4.3, p. 90. By visually illustrating the relationships among the different components of HFS, the figure effectively links the key findings with the theoretical framework. The understanding of both context and experiences is crucial for comprehending the implementation and effects of HFS in the educational context of Saudi Arabia. This figure aids in connecting our key findings with the existing theory, with a particular focus on the application of HFS in Saudi Arabia's educational context.

7.2.1 Context

The study divides context into two main areas: ‘Education and Curriculum’ and ‘Saudi’s Cultural Factors’. The Education and Curriculum section examines factors such as location, design, and outcomes, which define the educational setting for HFS. Meanwhile, Saudi’s Cultural Factors section addresses elements like religious beliefs and gender sensitivity, emphasising their influence on HFS implementation.
Figure 19: Mapping the research findings to the NJST. The peach-coloured blocks indicate factors that will serve as a foundation for the upcoming conceptual framework, shaping the experiences of educators and students. The red-coloured blocks indicate the main element for effective teaching and learning in the HFS.
7.2.2 Experience and Interpersonal Skills

Experiences are essential in HFS for both educators and students. Educators derive positive experiences from enthusiasm, while negative ones stem from stress and confusion. For students, positive experiences are associated with feedback and skill improvement, while negative ones entail fear and communication barriers. This dynamic interaction of experiences highlights the central role of interaction as a vital element connecting educators and students, greatly influencing the facilitation of learning and teaching within the HFS framework, as confirmed by NJST (2016).

Interpersonal skills are crucial in these simulations. Successful simulations are defined by communication and collaboration between educators and students. This is vital for the simulation's perceived realism and authenticity. Shared feelings of confusion or “Muddling up” in HFS interactions highlight the importance of these skills.

7.2.3 Figure Analysis

Figure 19 showcases the shared experiences of educators and students in HFS. It is worth noting how contextual factors are intertwined with their respective experiences. Each of these components influences the others. A significant portion of these experiences involves 'modelling', which justifies the interaction between educators and students being shown in a larger circle, with two smaller circles integrated into the centre to symbolize their connection. Common feelings of stress and confusion emphasise the necessity for improved preparation and understanding of the context.

The Figure results illustrate the correlation between contextual factors and the experiences of both educators and students in simulations. The diagram represents how interactions work to achieve authenticity and enhance the level of realism in the simulation environment. This central process emerges due to the collaborative interplay between two main components: contextual factors and experiences. This illustration provides insight into how these components collectively influence the levels of realism and authenticity within the HFS environment.
The term ‘Mixed Blessing’ is used to describe the outcome, implying that although HFS has advantages, there are also challenges. These challenges can occur due to insufficient preparation or the complexities of interaction. Key elements in Figure 19 are emphasised in yellow. These elements are crucial and will be further discussed in Chapter 8, providing a more in-depth analysis of the study's findings.

This study presents a comprehensive analysis of the dynamics of the interaction in HFS within Saudi nursing education. It underscores the significance of comprehending both the context and experiences involved. Given the intricate nature of nursing education, the recommendations aim to enhance the HFS process by focusing on the highlighted factors, specifically taking into account Saudi Arabia's unique cultural context. This study provides a detailed examination of the utilisation of HFS in Saudi nursing education. Figure 19 illustrates the intersections and overlaps between various themes, which should be viewed as a reflection of the intricate nature of simulation learning, rather than a flaw. In HFS, numerous elements are closely interconnected and cannot be easily disentangled. Taking the reality of simulation learning into account, it is important to recognise that this overlap is not a problem. Instead, it reflects the actual challenges of incorporating advanced simulations into teaching. Given that nursing education encompasses various components and is influenced by cultural factors, particularly in Saudi Arabia, it is crucial to comprehensively consider these aspects when utilising tools such as HFS.
7.3 The Context

According to the NJST (Jeffries, 2016; 2020), ‘context’ refers to the setting where the simulation takes place and its intended purpose is achieved. It encompasses elements such as the simulation's location, design, anticipated outcomes, and the specific conditions under which HFS operates. Moreover, Jeffries (2020) highlights the importance of taking into account the programme's level at which the simulation is implemented. It is also crucial to acknowledge the hierarchy, norms, and cultural influences prevalent in the deployment setting of the HFS. This study's findings are divided into two main components, aligning with the definition presented by the NJST: education and curriculum, and Saudi cultural factors. Both have been identified as influential in the implementation of HFS in Saudi Arabia. The following subsections will explore these components in more detail.

7.3.1 Education and the Curriculum

Education and curriculum are the first components within the context. The implementation and experiences of educators and students with HFS in Saudi Arabia are influenced by two elements: i) location and outcomes and ii) design. Both elements contribute to the success or malfunction of the HFS implementation.

7.3.1.1 Location and Outcomes

Location and outcomes represent the first components of education and curriculum. This includes simulation centres and support from nursing colleges, which are the organisation's resources and assistance in achieving educational goals. The data indicates that institutional support is a factor that influences the effectiveness of Saudi Arabia's education and curriculum.
7.3.1.1 Simulation centres and nursing college support

Based on NJST, the environment, including tools, materials, and setup, is crucial for learning outcomes. In the context of HFS, ‘environment’ refers to the locations where simulations occur, and the support received from the institution. Many nurse educators praised the extensive laboratory and its abundant equipment. This highlights the importance of tools and their organisation, which aligns with NJST's emphasis. Unlike other studies that have raised issues such as equipment shortages Powell, Scrooby and van Graan (2020), training facilities in Saudi Arabia appear to be well-equipped. This suggests that the conditions in Saudi Arabia may be more conducive to the integration of HFS.

However, the training resources and workshops, referred to as ‘materials’ in this context, have been a point of contention. While some educators, who are presumably more receptive to technology, have found value in the existing workshops, many have voiced a need for more frequent and flexible training sessions. Offering training only once a year does not seem sufficient. NJST asserts that every aspect of the learning environment should be in harmony to achieve optimal results. Even though Saudi Arabian institutions have excelled in providing excellent tools and structures, such as laboratories and equipment, there is a need to reassess the workshop materials for educators to ensure comprehensive support. This aligns with the literature's emphasis on providing workshops and the necessity of training educators in contexts outside of Saudi Arabia (Davis, Kimble and Gunby, 2014; Powell, Scrooby and van Graan, 2020). Saudi Arabia has impressive HFS facilities, but the training practices for educators need to be reconsidered to optimise the HFS experience.

7.3.1.2 Design

The NJST (2016) has considered the simulation elements that must be considered before integrating the simulation. The design elements include the learning objectives that guide the development of simulation activities and scenarios. These elements influence the appropriate content and problem-solving components, the complexity of the scenario, and the physical and
conceptual fidelity elements. Additionally, they consider the scenario's equipment, physical moulage, decision points, and the facilitator's predefined responses to the participants. The current data analysis echoes the NJST’s findings and illustrates how these design elements affect the learning and teaching process in the context of Saudi Arabia, including: i) the background of students and educators, and ii) the element of 'Missing-in-action' in preparation. This element significantly impacts learning and teaching in healthcare simulation in Saudi Arabia.

7.3.1.2.1 Background factors of students and educators

This study highlights the centrality of background factors in shaping HFS experiences. Background includes theoretical knowledge, past experiences, students' academic levels, and educators' preparation. This aligns with the NJST (2016), which emphasises the need for a clear understanding of objectives, complexity, and essential resources for successful HFS design and implementation. Considering these elements, HFS has the potential to improve learning outcomes in Saudi Arabia. This study addresses a recognised gap by shifting focus to the crucial role of educators' and students' backgrounds in shaping HFS content.

Nurse educators and students in the study agreed that the theoretical background, along with the academic level of students, primes them for better learning experiences in HFS. It is interesting to note that existing literature has mostly overlooked this aspect, often prioritising HFS outcomes without recognising the significance of students' preparatory theoretical background (Aqel and Ahmad, 2014; Alkhalaf and Wazqar, 2022). This study's findings indicate that it is important for HFS designs to accommodate students' learning styles and preferences, which are influenced by their theoretical backgrounds. This helps students apply their practical and theoretical knowledge and perform actions based on their previous knowledge to achieve desired learning outcomes. To improve the Saudi nursing education framework, key findings must be recognised and acted upon. Firstly, the significance of students' theoretical backgrounds and academic levels cannot be underestimated, as they deeply impact their experiences during HFS. Secondly, educators' preparation and technical experience are crucial, as well-equipped educators can effectively run
HFS sessions. Implementing the 'dry run' method in the curriculum is a promising approach, ensuring educators are proficient in HFS scenarios based on real-time student interactions. Additionally, consistent workshops should be provided for educators, focusing on effective HFS administration, to equip them with the necessary tools to meet diverse student needs and situations. Lastly, the curriculum should empower educators with the flexibility and skills to dynamically adjust HFS scenarios in response to student actions, fostering a more engaging learning environment.

However, the focus is not solely on students. The study explains that educators' background, including their experience, has played a crucial role in developing their pedagogical strategies in HFS. The literature recognises the importance of understanding educators' needs (Davis, Kimble and Gunby, 2014), but it fails to sufficiently explain how educators' backgrounds reflect the significance of student backgrounds. The present study shows that educators with technical backgrounds are more capable of leading HFS sessions, improving student engagement and learning. However, if educators are underprepared or lack relevant background knowledge, it can negatively impact the effectiveness of HFS scenarios. As some educators have proposed, a solution is to use the 'dry run' approach to minimise disruptions during student interactions. It is advisable for nursing college committees to include early preparation, specifically incorporating the 'dry run' approach, in their HFS integration policies. Additionally, they could introduce consecutive workshops that provide educators with the necessary tools and knowledge to effectively deliver HFS sessions.

7.3.1.2.2 ‘Missing-in-action’ preparation

The study's findings closely support the NJST. However, certain gaps have been identified in the implementation of HFS in Saudi nursing education. These gaps highlight the importance of cultural and educational values in shaping instructional experiences and preparing students. The study's findings indicate a misalignment, as both educators and students encounter inconsistencies in HFS preparation. Specifically, the simulation content fails to adequately reflect the unique cultural and

23 allowing educators to pre-run scenarios.
educational aspects of Saudi Arabia. This gap is further magnified when Western-based teaching scenarios are used in a Saudi setting. Therefore, it is crucial to refine the alignment with NJST guidelines to optimise HFS for the Saudi context.

This study shows that both educators and students are not adequately prepared for the unique challenges of HFS. The main issue arises from a lack of compatibility between educators' teaching approaches and students’ cultural and educational expectations. Although the literature review did not highlight this challenge, the current research identifies it as a pivotal concern. To effectively address this issue, it is crucial to develop teaching scenarios that align with the Saudi nursing curriculum and cater to the specific needs of Saudi students. To provide quality education, it is important to comprehend the broader healthcare perspectives in Saudi Arabia. Failure to address these concerns may lead to confusion among students, hindering their academic progress and potentially impacting the quality of patient care. Therefore, it is essential to thoroughly consider these aspects before integrating HFS into Saudi nursing education. Currently, there seems to be an unquestioning adoption of a Western HFS model without the necessary modifications for the Saudi educational context.

The study participants acknowledged the abundance of resources available but criticised the lack of realism in the HFS laboratory. This observation resonates with established literature (Najjar, Lyman and Miehl, 2015; Watson et al., 2021), underscoring that achieving complete realism in HFS involves more than just replicating physical aspects accurately. True realism requires the complete involvement of educators and students in HFS, enabling them to make full use of its diverse features. The current study demonstrated that focusing solely on physical aspects, particularly by novice educators in this field, can unintentionally compromise student psychological well-being and hinder the achievement of learning goals. Drawing on the principles of the NJST, successful learning demands a carefully constructed environment where students are not passive observers but active and knowledgeable participants. Although elements like moulage contribute to the authenticity of the simulation, they alone are not enough if students are not adequately prepared from a holistic perspective.
Bridging this gap requires a preparation model for HFS in nursing education that considers the potential range of student reactions in various scenarios. The model should incorporate cognitive orientations, briefings, and debriefings to ensure structured learning. This approach promotes not only the mental well-being of students but also maximises their learning outcomes, particularly in the context of Saudi Arabia. Therefore, it is crucial to establish an environment where students have a clear understanding of their roles. Introducing students to the HFS setting early, familiarising them with the tools, and providing clarity on their expected roles are essential. This approach enhances their psychological readiness and lays the groundwork for enriched learning experiences. Additionally, offering support during scenarios, clarifying student roles, and providing opportunities for scenario repetition further strengthen the learning process in the HFS.

Participants recognised the value of resources in the HFS environment. However, many expressed disappointments regarding the underutilisation of these resources. Those who had undergone the ‘dry run’ exhibited a clearer understanding, indicating a positive correlation between familiarity with resources and optimism. Considering the significant investment in HFS, the primary focus should be on practical utilisation rather than mere possession of resources. The success of HFS relies not only on the quality of mannequins but also on the educator's competence in utilising them. In light of the NJST, the role of well-trained educators becomes even more critical. For Saudi Arabia's investment in HFS to be worthwhile, nurse educators require comprehensive training. This will ensure improved resource utilisation and a more effective learning experience for students.

7.3.2 Saudi’s Cultural Factors

The NJST (2016), while initially highlighting the importance of cultural aspects, did not thoroughly examine the intricacies of different cultural environments. However, in its 2020 revision, the theory deepened its analysis of the 'Cultural Contexts in Which Simulation Occurs'. It highlights the importance for educators worldwide to understand the distinct cultural and hierarchical norms of the region or country where healthcare and simulation take place (Jeffries, 2020). The updated perspective helped in establishing a foundational understanding. However,
there remain gaps in our knowledge regarding how these cultural elements manifest in real-world settings, especially in unique contexts like Saudi Arabia.

This study bridges this knowledge gap by providing in-depth insights into how cultural factors affect nursing education in Saudi Arabia. It does not merely emphasise the importance of these cultural factors but also explains their significant implications. By investigating religious influences, gender sensitivity, and hierarchical norms unique to Saudi Arabia, this research offers a more comprehensive understanding. This understanding can help educators and practitioners to better adapt to a culturally sensitive and effective approach within the HFS setting.

7.3.2.1 Religious Influences

This study examines how cultural and religious beliefs impact the teaching and learning processes within Saudi Arabia's educational context. In particular, the behaviour of students in HFS scenarios involving mannequins reflects these deeply ingrained beliefs. Educators have observed that students often turn to religious practices, such as reciting prayers or reading verses from the Holy Quran, especially when faced with a scenario involving a dying mannequin. The existing literature lacks a discussion on integrating religious practices in HFS. Therefore, this study is ground-breaking in its exploration of the interplay between religious practices and HFS, making a valuable contribution to our understanding of this important aspect. Although the effects of religious practices on nurses working in hospitals have been well-researched, as demonstrated by Wardaningsih and Junita's (2021) study in Indonesia, there is a scarcity of studies exploring its influence on nursing students, especially within the context of a simulation environment.

The results of this study indicate that they engage with HFS scenarios not only academically but also through the lens of their religious upbringing. In Saudi Arabia, where religious beliefs and practices are embedded in daily life, they have a significant impact on education and healthcare. This highlights the significance of taking into account the cultural contexts in which simulations occur, as emphasised by NJST (2016). Considering the central role of religious beliefs in the lives of Muslim Arab students, incorporating these practices into HFS scenarios is paramount.
Recognising and understanding these spiritual influences will improve the effectiveness of simulations and better prepare students for real-life situations, where their religious beliefs and professional responsibilities intersect.

Adopting HFS in Saudi Arabia, which originated from Western practices, has raised concerns related to culture and religion. It appears that the senior decision-makers did not fully consider the deep-rooted religious and cultural values of Saudi Arabia when introducing this American pedagogical tool. This oversight is particularly surprising given the significant religious and cultural differences between the two regions. In the present study, educators observed that the exclusion of religious practices during HFS sessions affects the way students interact with mannequins and, ultimately, real patients. While students are aware of their religious obligations, they rarely actively engage in religious practices during HFS sessions. This observation aligns with Chiang et al. (2020), who found that even passive spiritual practices can impact professional attitudes in the field rather than the simulation in Taiwan. Considering the significant role of Islam in the lives of Saudi Arabians, it is critical to comprehend its influence on healthcare providers. With these conclusions in mind, it is evident that education in Saudi Arabia needs to better integrate religion and spirituality. Failing to do so could result in an academic environment that does not adequately equip students to deliver inclusive and culturally sensitive care.

In the Saudi context, daily religious practices hold strong significance. As nursing students, it is crucial to understand the importance of incorporating spiritual care when tending to patient needs. This approach involves more than just acknowledging these practices; it requires comprehending their significance, as exemplified by obligations such as the five daily prayers and specific cleansing rituals (Sastra et al., 2021). A significant challenge emerges when students, regardless of their religious background, encounter patients' religious concerns. In this scenario, their education, particularly their exposure to real-life situations in HFS learning, becomes crucial. If students are not exposed to spiritual and Islamic care during their HFS training, there is a genuine risk of failing to provide holistic and culturally sensitive care in the future. Therefore, incorporating religious practices into the nursing curriculum is not merely a cultural obligation but an educational imperative to guarantee comprehensive patient care in the Saudi context.
There is a noticeable disparity when it comes to integrating spiritual care into HFS, particularly within the cultural context of Saudi Arabia, which follows a conservative Muslim culture. Numerous educators have emphasised the distinction between Western HFS scenarios, and the profound spiritual convictions held by Saudi students. Despite the absence of direct evidence linking spiritual care with HFS outcomes, Musa (2017) revealed that Arab Muslim nurses often prioritise spiritual care when it aligns with their shared cultural and religious values. Interestingly, only a minority of educators have addressed the overarching topic of cultural competence, but they have not specifically emphasised the religious aspects. This could be attributed to the difficulties of integrating the inherently Western approach of HFS into the diverse Saudi environment. These challenges are even more noticeable when considering the findings of Gallison et al. (2013), which suggest that nurses, particularly in the US, struggle to meet the spiritual needs of their patients because of cultural or religious differences.

Saudi Arabia's culture is undeniably distinct, even though it has been influenced by Western practices. Consequently, a contentious issue has arisen regarding the applicability of implementing direct Western changes to their model (Graham and Atz, 2015; Foronda et al., 2020). Given Saudi Arabia's deep-rooted Islamic principles and heavy reliance on the Quran (Halligan, 2006), the current study advocates for a more prominent Islamic representation in HFS. Therefore, it is crucial to adapt HFS scenarios by incorporating Islamic spiritual aspects. This is essential in developing nursing students' skills to provide culturally sensitive care. Such an approach highlights that the purpose of HFS goes beyond assessing competence alone. For HFS to truly flourish and offer substantial educational benefits, it is necessary to recreate the Saudi context in the learning environment, enabling students to both comprehend and apply the concepts effectively.

7.3.2.2 Gender Sensitivity

The participants in this study, including educators and students, exhibited some gender sensitivity within the educational environment in Saudi Arabia. As mentioned, Saudi society is conservative, and education is segregated by gender. However, the simulation centre at this university can be utilised by both male and female educators, although female students are the main users.
Furthermore, in Saudi culture, each gender is raised in separate environments since childhood. As most third- and fourth-year nursing students indicated, the presence of a male educator during the HFS session was stressful and induced anxiety, which militated against optimal and effective learning. Additionally, the presence of a male can influence their behaviour and interactions within the environment. One student, Fatima, expressed this concern: “During one of the HFS sessions, a male educator was present during the procedure and the girls performed worse than usual compared to when we have a female educator”. Unfortunately, the existing literature on this topic does not provide sufficient information about the training of female nursing students in Middle Eastern countries to provide care for male patients in the future (Yaseen et al., 2021). In Western regions, research has explored the impact of gender sensitivity on male nurses in both academic and clinical settings (McLaughlin, Muldoon and Moutray, 2010).

In light of the findings from the present study, it is noteworthy that female students encountered challenges in their interactions with male educators. Interestingly, only a minority of educators shared the same concern. The observation was made that both educators and students gradually adapted to the presence of the male in their educational environment, a crucial aspect in their readiness to engage with male patients in their future careers. Hanadi, an assistant professor, elaborated on this point, stating, “One of the important things is that we should introduce male patients. The students are already familiar with the environment, but since we are all females here, they may encounter male patients in the hospital or male team members. We must expose them to such situations next year. This is our goal: to make girls accustomed to working with both genders”. Drawing on the NJST (2016), the value of simulations replicating real-world scenarios becomes evident. Nursing educators and students need to be equipped to interact confidently with individuals of diverse genders right from the beginning of their education. This preparation is particularly vital in professions like nursing, where practitioners frequently engage with patients from various gender backgrounds. Recognising this necessity, nurse educators can design HFS and other pedagogical exercises that immerse students in scenarios emphasising gender sensitivity. This approach empowers student learners to provide more effective and empathetic nursing care.
The study's findings shed light on a concerning trend in the behaviour of nursing students when faced with male educators during HFS. A student named Abeer noted, “They had to ask for several pauses to process the information, and they didn't stand next to him when he was explaining. The girls were confused”. This observation points towards a potential discomfort and unease displayed by the female students in this context. It is evident that their response can be attributed to their limited exposure and inadequate preparation for such scenarios. Notably, this significant detail was not included in the literature review. This finding was corroborated in a study by Chan, Chan and Tse (2014), which involved male nursing students who preferred to work with their peers of the same gender. This impacted their behaviour and communication in the HFS sessions, as well as their future patient care. The need for simulation training to prepare students for professional engagement with all genders is evident. Maguire and White (2021) emphasize the role of repeated practice in boosting self-efficacy, knowledge, and attitudes, while Nachiappan et al. (2020) discuss how repeated practice and increased exposure to simulation can help manage stress in medical and nursing students. In the Saudi context, female students were not previously exposed to mixed-gender education, which affected not only their actions in HFS sessions but also how they would later communicate, interact, and provide care to patients. Given the cultural and religious significance of gender sensitivity, it is crucial for nursing colleges in Saudi Arabia to collaborate with the Ministry of Education (MOE). The goal should be to introduce mixed-gender courses that incorporate repeated practice, adequately preparing female nurses to work with individuals of other genders. To ensure that this recommendation is effective, it needs to align with the established systems and hierarchical culture of Saudi Arabia.

The nurse educators described how the absence of exposure to different genders in the educational setting has impacted nursing students' ability to provide care for male patients. In certain instances, they have even refused to provide care. Regrettably, the literature review fails to address this issue in the context of HFS, making the present study the first to investigate the influence of gender sensitivity on learning in HFS. Interestingly, gender inequality has been observed in Western society, with male nurses encountering difficulties in caring for female patients (McLaughlin,

24 The names of the participants in this chapter are not their real names. I had used pseudonyms to protect the participant identities.
Muldoon and Moutray, 2010). When considering the numerous religious restrictions that Muslims have regarding interactions between males and females, such as personal space, physical touch, and the wearing of the hijab in the presence of males, it is possible that this could influence the care provided to male patients. However, it is crucial to remember that nursing is a profession that is open to individuals of all genders, and it requires a high level of expertise and professionalism. As a result, it is important to adequately prepare Muslim female nursing students to provide care for patients of both genders. Initially, Muslim female students may find it challenging to work with male patients, but this issue can be addressed through specialised training and support within the undergraduate nursing curriculum. Additionally, it is important to acknowledge that gender segregation is a cultural norm in Saudi Arabia, and any adjustments to the education system must be made thoughtfully and respectfully. There may be concerns about maintaining patients' privacy, and it is essential to address these concerns while ensuring that female students receive the necessary training to become proficient healthcare providers.

Developing gender-sensitive nursing education in Saudi Arabia necessitates the meticulous examination of religious convictions and observances. As part of the Saudi Vision 2030 initiative (Alsufyani et al., 2020), it is crucial to address this issue and explore ways to promote gender equity in healthcare. Unfortunately, there is limited research on this topic, particularly in the Gulf countries and Saudi Arabia. Although there are some international strategies for providing care to Muslim patients, there is a dearth of studies that specifically address the requirements of female Muslim nursing students in a hospital environment, where their interactions with male patients may be necessary. By conducting this study, I sought to enhance nursing education in Saudi Arabia and make a positive impact on healthcare outcomes not just locally but also on a global scale.
According to NJST (2016), this study emphasises the significance of recognising cultural and hierarchical nuances in education. The concept of power distance in Saudi Arabia differs significantly from that in Western settings. This difference has an impact on how HFS education is delivered and received. While Western contexts generally encourage reducing power imbalances in educational settings, this may not be universally applicable. For instance, Ulmer et al. (2018) found that some students may passively wait for feedback from instructors due to cultural norms. Although there is a growing practice in the US to utilise simulations to foster cultural competence (Jeffries, 2020), there is still a lack of truly integrating diverse professional and cultural perspectives. This study sought to bridge this gap by shedding light on the deeply entrenched hierarchical norms in Saudi educational settings, promoting a more context-sensitive adaptation of educational tools.

Based on the findings of this study, there is a serious concern about the adoption of complex scenarios in HFS. Most of the scenarios used in HFS are from Western cultures, which may not be as effective for Saudi participants when they are required to work in a different context. Unfortunately, the literature review did not adequately address this issue in simulation learning, leaving a significant gap in the existing literature. This study is the first to confirm the influence of hierarchical norms in Saudi Arabia, which are influenced by a combination of cultural, religious, and traditional values. These norms greatly impact how healthcare professionals interact and behave in the workplace. Using Western scenarios without considering these local norms may not lead to the desired learning outcomes. Although the literature review did identify a study that adopted Western scenarios in the Middle East, specifically Lebanon (Fawaz and Hamdan-Mansour, 2016), it failed to discuss the influence of the Muslim culture. The main focus of that study was on the importance of clinical judgement in Lebanon (Fawaz and Hamdan-Mansour, 2016). Nevertheless, the current study in Saudi Arabia has addressed this knowledge gap in the literature review. The findings revealed that the adopted scenarios would not be appropriate

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The Arabian adage that has been adapted; this subtheme cautions against adopting simulation practices, scenarios, or educational strategies that do not fit with the local culture, norms, values, or the realities of Saudi nursing practice.
without significant modification to suit the reality of Saudi female students. This is partly because these scenarios lack a Muslim Saudi cultural background.

Evidently, the current scenarios employed in HFS fail to align with the students' real-life experiences. Consequently, when tasked with interacting with and caring for mannequins in the HFS, a sense of uncertainty permeates among the students. This stems from the disparity between the guidelines and scenarios rooted in Western culture and the absence of culturally relevant guidance for Muslim patients. Particularly within the conservative Saudi society, the content derived from US-based scenarios lacks applicability. This incongruity leaves students perplexed and struggling to find comfort in their HFS learning environment, as their actions and decisions are divorced from their own societal and cultural norms. Khoulud, a lecturer, aptly noted, “Usually, when we talk about culture, it's often related to ethical dilemmas, and these dilemmas can remain unsolved forever [laughing]. No matter how hard you try, there's no definitive solution to them. So, culture is usually linked to either education or ethical dilemmas”. In addition, the language employed in HFS poses a formidable challenge, given that most students speak English as a second language. Hence, it becomes imperative to prioritise providing students with a thorough preparation that mitigates any confusion and insecurity stemming from what might be perceived as unfamiliar simulations. A critical necessity emerges to design scenarios that authentically encapsulate Saudi social and cultural elements within the realm of health and nursing care. Failing to address this requirement would perpetuate confusion and discomfort among students during their learning experience. To mitigate this, rehearsals of culturally aligned scenarios should be incorporated. This allows students to practise and refine their skills within a familiar context. Such rehearsals not only reinforce knowledge but also builds the confidence needed to engage with broader context (Ignacio et al., 2017). Moreover, Cheng et al. (2021) have argued that rehearsals are crucial for improving content retention and enhancing communicative skills required to effectively address complex tasks, particularly for those in demanding roles such as neonatal care. What holds significance is for students to encounter scenarios tailored to their unique cultural, linguistic, and contextual backgrounds—an essential step to optimise their learning experience. Only upon achieving this alignment could students be adequately primed to explore Western cultures and diverse learning scenarios.
7.3.2.3.1 Effective communication

A successful HFS necessitates not only culturally modified scenarios but also effective communication between educators and students during its operation. One significant concern identified is the prevailing culture in Saudi educational contexts, where students tend to refrain from speaking up. This behaviour can be traced back to the concept of power distance, which becomes deeply ingrained in students throughout their educational journey. When introduced to HFS, students are suddenly expected to actively participate, asking questions and responding to queries. This shift often leaves them feeling unprepared and lacking confidence. Although the literature review did not explicitly address the influence of power distance on student interactions, it did highlight potential miscommunication stemming from differing expectations between educators and students, underlining the need for increased awareness. It is worth noting that active interactions between educators and students, like the ones in HFS, are more commonly seen in Western contexts such as the USA and Canada (Jeffers et al., 2022; Mulli et al., 2022). Addressing barriers such as students' reluctance to ask questions can greatly enrich the HFS training experience. However, altering deeply rooted cultural norms is a difficult undertaking. Although it is important to acknowledge and address these barriers, expecting sweeping changes might be unrealistic. Educators should consider this as just one aspect to take into account, while also being cautious about expecting wholesale transformations in the short term. The key priority is to make sure that students feel confident and empowered to actively engage in HFS settings.

Another issue identified in this study is the cultural prohibition against recording female students during HFS sessions, especially within an educational setting where all participants are female. This limitation has several repercussions: it hinders students’ self-evaluation and a critical reflection of their performance and negatively affects the depth and quality of feedback provided during debriefing sessions. While university regulations and religious norms in Saudi Arabia contribute to this restriction, there are also broader cultural factors at play. For example, many parents and stakeholders have concerns about recordings due to prevailing cultural norms, social roles, and individual sensitivities. Consequently, educators encounter challenges in accurately documenting students' actions during HFS sessions, which in turn hampers their ability to offer
comprehensive feedback. Current literature offers limited insights into how these unique cultural dynamics impact feedback in HFS. Zhang et al. (2019) proposed the utilisation of video-assisted debriefing to enhance feedback quality. However, given the conservative nature of education in Saudi educational settings, implementing such methods may not be practical.

To address these challenges in a culturally sensitive manner, one practical suggestion is to adapt the nursing curriculum guidelines that incorporate repeated practice. Rather than relying solely on recordings, students can be allowed to engage in repeated simulations, enabling them to learn through repetition and practice. This approach, as suggested by Scherer et al. (2016), Nachiappan et al. (2020), and Al Gharibi et al. (2021), is believed to improve self-efficacy and mastery of scenarios in medical and nursing professions. Similarly, Maguire and White (2021) support the concept of using repeated simulations for enhanced learning outcomes. This alternative approach not only respects cultural sensitivities but also guarantees an enriched learning experience for students, focusing on iterative feedback and hands-on practice.

7.4 Simulation Experiences of Educators and Students²⁶

The importance of creating an immersive, experiential, interactive, and collaborative environment in healthcare education simulation, focused on student-centred learning, is underscored by the NJST (2016). Building trust and mutual understanding between the facilitator and participants is crucial. Both parties should share the responsibility of establishing and maintaining an effective learning environment. A critical component of the NJST framework is the concept of ‘suspending disbelief’. Accepting the scenario's realism enhances the quality and immersion of the simulation experience. This acceptance is rooted in psychological foundations that drive student engagement

²⁶ The decision to include the experiences of both educators and students in the present study was based on recognising the importance of their interaction and shared experiences in HFS in nursing education. It became clear through the present study’s literature review and data analysis that focusing solely on educators or students’ experiences alone would not provide a complete understanding of the simulation process. By examining their shared experiences and interactions, this study aimed to capture the dynamics, challenges, and successes that resulted from their collaboration. This comprehensive approach allowed for a more thorough analysis and provided valuable insights into the factors that influenced learning outcomes in HFS. It was important to highlight the significance of studying the experiences of both educators and students together, as their interaction and shared experiences were fundamental to the overall effectiveness of HFS, as confirmed by the findings of this study.
(Tennant, 2019). It requires them to engage their thoughts within the simulated situation. This level of deep involvement is crucial, as it helps students react the way they would in a real-life scenario, despite being in a simulated environment. Authenticity and realism within the simulation setting are vital, serving as catalysts for genuine participant engagement and promoting psychological fidelity throughout the activity.

The current study's findings support these theoretical perspectives, showing that a well-executed HFS session with an appropriate level of realism significantly impacts students' experiences. When realism is effectively incorporated, both students and educators can engage meaningfully. This type of engagement fosters a conducive learning environment where participants can comfortably learn and make mistakes without fear. However, a lack of authenticity and realism can negatively impact educational outcomes. The study delineated specific factors driving the effectiveness of simulation interactions, including i) interpersonal skills; ii) experiencing stress; iii) “Muddling up”; iv) the authenticity of the HFS environment; and v) HFS and its level of realism, which is crucial for both students and educators.

Additionally, shared experiences, where both educators and students feel moments of confusion or stress, often lead to a more effective learning environment. In general, the learning outcome from these simulations can be described as a ‘Mixed Blessing’, a combination of positive and less optimal elements.

7.4.1 Interpersonal Skills

The participants in this study pointed out the significance of interpersonal skills, which cover personal characteristics, personal skills, and personalities, in shaping their HFS learning and teaching experiences in nursing education. Existing studies have confirmed the influence of students' personalities on their learning outcomes in HFS (Lee, Kim and Park, 2015; Boostel et al., 2018), and some even suggest tailoring HFS scenarios based on student personalities (Li et al., 2020). However, there is currently a noticeable gap in research on the personalities of educators in this context. This study highlights an overlooked aspect, emphasising that educators' personalities
and interpersonal skills significantly influence the dynamics within HFS. This observation offers a fresh perspective on the importance of considering both students' and educators' personalities in the context of HFS. Additionally, the cultural backdrop of Saudi Arabia, where all study participants were females, brought forth nuances in how cultural and religious factors mould their personalities. These factors limited their interactions with instructors, peers, and patients. The existing power dynamics, accentuated by the region's hierarchical norms, further influenced student behaviours. Given the distinct socio-cultural elements at play, particularly gender roles and power hierarchies, understanding and accounting for them becomes vital. Consequently, educators in Saudi Arabia need to improve their interpersonal skills before utilising HFS in nursing education in Saudi Arabia, given its direct bearing on student engagement and performance. As the simulation-based learning experience is deeply entrenched in the interaction between educators and students, prioritising interpersonal skills becomes imperative when integrating HFS into nursing education in Saudi Arabia.

**7.4.2 Stress During HFS Sessions**

This study found that stress was a prevalent and significant issue for both educators and students during HFS sessions. Stress became a collective experience. This section illustrates how this psychological response could be detrimental or beneficial, or even both. Additionally, the section explores how their emotions have changed because of implementing HFS and the coping mechanisms that aided them manage stress while implementing the HFS.

Nurse educators reported feeling stressed and confused while implementing HFS, owing to their inadequate preparation and overwhelming responsibilities. This was confirmed by Samirah, a lecturer, who stated, “*As a faculty member, I initially found it challenging to juggle running the scenario, operating the simulation, and managing the students all at once. It took a significant amount of time and effort to focus on the monitor, adjust vital signs, simulate patient responses, and interact with the students effectively*.”. These findings align with previous research that reveals how educators also experience stress arising from insufficient equipment and technical skill (Powell, Scrooby and van Graan, 2020). However, it is important to note that the literature review
did not discuss the impact of this stress on both students' experiences and the educators themselves. Based on the findings of this study, it is evident that educators are aware that their stress can negatively impact their students. This is because when educators have lower self-efficacy and struggle with managing scenarios, it can affect the students negatively. As a result, the students may perceive the educator as lacking confidence and knowledge, leading to a negative learning experience. Therefore, it is crucial for nurse educators to be adequately prepared and trained to address these challenges in HFS. This training has to include both theoretical and practical components, allowing students to practise scenarios before they are introduced to a real HFS setting. The success of HFS integration depends on the educators' preparation and skills, which have a considerable impact on the quality of interaction between nursing students and their learning outcomes.

During HFS sessions, most students reported feeling stressed, likening it to the perception often associated with a written examination. This stress negatively affected their academic performance and resulted in physical symptoms. For example, one student stated that their vision was affected solely due to stress. It is worth noting that this research, conducted in Saudi Arabia, is the first of its kind to demonstrate the importance of addressing stress as a significant issue in HFS. While a few studies have suggested that HFS may induce some stress, Boostel et al. (2018) and Czekirda et al. (2022) have contended that this elevated stress level would not necessarily have a detrimental impact on students. This contradicts the findings of the current study which show that stress has far-reaching effects on students. These findings suggest that the majority of students were negatively affected by stress, while a minority had high adaptive skills but still experienced stress (as presented in Section 6.2.5.1). The students in this study lacked an understanding of how HFS works and how active learning occurs. They felt passive in their learning, required only to follow instructions and be evaluated by educators. However, some students leveraged stress as a motivational catalyst. The students' response to stress was influenced by how the educator prepared the students and provided orientation for HFS. To effectively teach HFS, educators need to explain to students what HFS is, how to use it for acquiring knowledge, and the importance of making mistakes and receiving feedback to reduce stress and enhance cognitive preparedness for learning in HFS. A student named Abeer, in her third year, expressed the following: “From my point of view,
I don’t really know, but coming back to Adult II, I feel that more complex and detailed situations, [along] with a precise and encouraging educator, make us feel more immersed in the experiences and make it a more enjoyable and positive experience”. As a result of this cognitive orientation, the students were mentally prepared for HFS and understood that it was a learning session, not an evaluation.

Students expressed feeling stressed due to the need to display genuine emotions during HFS, which differed from other teaching approaches that did not involve these emotional obligations. This observation is consistent with the literature, specifically the study by Al-Ghareeb, McKenna and Cooper (2019), which emphasises the importance of psychological preparation before integrating HFS, to mitigate student anxiety. To enhance this psychological preparation, it is vital for students to feel safe. This allows them to fully engage without the fear of judgement or failure. Stephen, Kostovich, and O’Rourke (2020) found that students achieved a psychologically safe environment when their facilitator created a supportive, non-judgmental atmosphere, while also engaging in positive conversations with them. When students feel safe, they are more likely to take risks and make mistakes, which are essential for deep learning and building resilience. The results of the current study show that this stress has a substantial impact. Some students experienced intense emotional distress, and a few even presented with physical symptoms. These findings suggest that when students are properly prepared psychologically, they can engage more effectively with both the mannequin and their educators. This preparation fosters a conducive learning environment where students can navigate the emotional demands of HFS. It is important not only to equip students to handle the simulation itself but also to enrich their learning experiences, so they more closely resemble real-life situations. In the context of Saudi Arabia, it is essential to provide this psychological foundation to ensure that HFS is effective in teaching and learning.

As part of HFS learning in the context of Saudi Arabia, stress does not necessarily represent a negative aspect. In fact, it can be seen as an important factor in preparing students for working in challenging and potentially distressing environments. This finding aligns with Yerkes and Dodson Curve, which suggests that an optimal level of anxiety can lead to the best performance. It also suggests that the level of stress should be determined by the complexity of the task at hand. For
complex tasks, the stress level should be kept low, while for simpler tasks, it should be moderate (Nickerson, 2021). The current study validates the importance of having a suitable level of stress for achieving favourable learning outcomes in HFS in nursing education. However, this finding only applies to a minority of individuals. Although stress cannot be eliminated entirely from the HFS learning environment, an appropriate amount of distress can promote student learning. It is important to recognise that students do not need either a low or high level of stress, but rather a moderate level that can motivate them to work and excel in their future endeavours. Additionally, it is necessary for students to feel psychologically safe and be thoroughly oriented to the simulation (Park and Kim, 2021).

The results of this study provide insights into how the integration of HFS affects educators and students in Saudi Arabia. A notable finding was that students initially perceived HFS as an assessment rather than a learning opportunity, which resulted in heightened levels of anxiety. However, once they understood that HFS was a valuable tool for learning, their anxiety levels decreased.

Additionally, this study stresses the need to factor in the viewpoints of both educators and students when using HFS in nursing education. This consideration can ultimately guide and strengthen the effectiveness of HFS as a tool for nursing education in Saudi Arabia. It is imperative to also address the emotional aspect of students' involvement in HFS. Students should perceive this as a safe environment where they can make mistakes, stay motivated, and strive to excel in order to attain positive results during the simulation sessions (Fawaz and Hamdan-Mansour, 2016). It is important to acknowledge that initial excitement may diminish if the simulation experience does not meet expectations, resulting in disappointment and stress. These emotions are not isolated but are influenced by various factors, including the learning environment and the overall context of the simulation. As the current understanding of the relationship between emotions, physical responses, and the environment has progressed, there is more awareness of the complexities involved in interpreting and managing these emotional experiences. Although stress can have both positive and negative effects, it is essential to establish a supportive environment that assists students in effectively interpreting and coping with their emotional responses during simulation-based
learning. These insights are invaluable for advancing our understanding of HFS and its potential impact on nursing education. Furthermore, they can inform the development of more effective approaches to nursing education that use HFS.

7.4.3 “Muddling Up” [تدبر أمرها]

The study sheds light on participants' experiences with HFS. Many participants expressed confusion upon entering the HFS laboratory, often attributing this to a lack of adequate preparation and a poorly planned introduction. Not receiving proper orientation to the equipment and the laboratory's purpose resulted in wasted learning opportunities for the students. Although the students acknowledged the HFS's high level of realism, they found it difficult to fully immerse themselves in the simulation, which negatively affected their interaction with the HFS environments. These negative effects have been discussed in previous literature, specifically related to the Korean context (Park and Kim, 2021), rather than the Saudi Arabian context. Based on the current study findings, the study underscores the importance of adequately preparing students with the cognitive orientation that enables them to understand the equipment and maximise their learning objectives. In order to learn effectively in the HFS laboratory, students require cognitive orientation, effective communication, and psychological preparation, regardless of whether the laboratory possesses a state-of-art facility or has a high level of realism. As mentioned earlier, having a strong psychological foundation not only helps students to fully engage with the HFS but also aids in suspending disbelief. Therefore, the nursing committee and senior managers at the Saudi nursing colleges could provide clear guidance for both educators and students. This guidance might assist them to resolve any doubts about the HFS's authenticity and realism, enabling a deeper immersion. This study uniquely contributes to the literature by underscoring the need for preparing both educators and students psychologically and promoting effective interactions to achieve the benefits of integrating HFS into their learning experiences.

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27 This looks to capture the participants’ intended meaning of ‘muddling through’ the challenges and uncertainties they faced during the simulation. This subtheme was named from the term “muddling up”, as was expressed in Arabic and translated into English.
7.4.4 Authenticity of the HFS Environment

In this study, participants highlighted the significance of interactions within the HFS environment, especially between educators and students, as well as among student peers. However, they also encountered difficulties in effectively navigating these interactions. Through these discussions, two key concepts were identified: the authenticity and realism of the HFS environment.

Drawing on the NJST (2016), the foundation of this study, this study captures the significance of interactions in improving the realism of the learning environment. Different studies have various interpretations of authenticity and realism, often using them interchangeably under the term 'fidelity'. For instance, Paige and Morin (2013) view fidelity as multi-dimensional, whereas for Hotchkiss, Biddle and Fallacaro (2002), it refers to ‘authenticity’. Given these diverse perspectives and the insights from this study, it is essential to incorporate the concepts of authenticity and realism. By doing so, and using the framework provided by the NJST (2016), the HFS environment can be further optimised for learning.

The study underscores that elevated stress and confusion among nurse educators and students can undermine the perceived authenticity of the learning environment. This reduction in the perceived authenticity compromises trust, diminishes the sense of safety, and hinders the potential for collaboration, which ultimately impacts the quality of experiential learning. This is further influenced by their emotions, experiences, and the impact of Saudi cultural factors, coupled with inadequate preparation. However, both educators and students have reinforced the importance of authenticity in creating a safe learning environment for nursing students. Authenticity allows students to make and learn from their mistakes, while encouraging interaction and collaboration with peers. This becomes particularly challenging in the absence of authenticity. Throughout the study, the importance of interaction between educators and students, as well as that of the overall learning environment, was stressed. In contrast, existing literature focuses more on the level of

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28 In the context of HFS, ‘authenticity’ means creating a realistic and safe environment that fosters trust, collaboration, and experiential learning for students, closely resembling real-life clinical settings and experiences (Jeffries, 2016).
realism through interaction with educators or peers (Najjar, Lyman and Miehl, 2015; Watson et al., 2021), overlooking other factors and how authenticity can be achieved. Therefore, this study contributes to the understanding of how promoting authenticity can promote students' ability to interact, build trust, and collaborate, which are vital for the successful integration of HFS. If students cannot trust their educators, peers, or the environment, they cannot communicate or intervene in patient care effectively. Consequently, this study clarifies the significance of authenticity in facilitating learning and teaching in HFS, specifically in Saudi Arabia. It offers a unique perspective on authenticity, which comprises realism, active interaction, trust-building, engagement, effective communication, and feedback provision. By promoting these factors, a positive learning environment can be created, where students feel safe, are encouraged to believe in themselves, learn effectively, and achieve their learning objectives.

During the course of this study, it was observed that many nursing students faced challenges in communication and their interactions with educators. However, some students did not encounter these difficulties. The students expressed difficulty in establishing trust with the simulated environment, educators, patients, and their peers, influencing their interactions within the HFS simulation. Mulli et al. (2022) have also reported this finding, stating that communication is indispensable for increasing the level of realism. Meanwhile, others, such as Jeffers et al. (2022), contend that while communication is crucial between educators and students in HFS, it does not primarily heighten realism. Instead, it facilitates interactions. Nevertheless, the current study showed the importance of building a cooperative environment that facilitates interaction and helps students feel safe to learn bedside communication skills. Creating a safe environment is about being able to make ‘learning’ mistakes without consequences and fostering a supportive learning process that recognises the significance of HFS simulation in acquiring realistic knowledge and skills. To achieve optimal outcomes in simulation experiences, it is essential to foster environments that prioritise collaboration, trust-building, and learner-centred approaches. These environments are likely to boost student confidence and efficacy in accomplishing their learning objectives within the HFS framework in Saudi Arabia.
While students struggled to build trust, they valued the immediate responses from the mannequins and the feedback from educators. This is a positive indication as it contributes to the improvement of student learning outcomes. It should be noted that educators should function as facilitators rather than just instructors. This viewpoint is supported by Watson et al. (2021) who emphasised that the level of realism in HFS increases based on how students perceive the role of educators as ‘facilitators’. Considering the findings of the current study, the 'facilitator' plays an essential role in the simulation experience in HFS. The educator needs to build trust with the students and communicate effectively to enhance interaction and achieve robust learning outcomes. This study was conducted in a Saudi Arabian context with cultural limitations, specifically 'power distance' between the students and the educators. The educators were not confident in the specific role of 'facilitator' and only knew the role of an instructor. Saudi students feel hesitant to ask questions, while educators expect the students to initiate communication. To address this, it is necessary to educate both students and educators about the reality of HFS and how to work collaboratively in HFS environments. This will reassure the students to speak their native language, Arabic, as it is easiest for them. Only a small number of students have a high level of English language skills (Alghamdi et al., 2019). To achieve effective learning outcomes in Saudi Arabia, it is necessary to address this socio-cultural barrier. Additionally, it is important to align with Saudi Arabia's Vision 2030, specifically Section 2.2, which focuses on importing nursing education and nursing practice. This will help increase the number of Saudi nurses providing quality care within the country.

Most students valued educators who comprehended their needs and offered reassurance to aid their learning. Ahlam's students expressed this sentiment, stating, “After receiving encouragement from an educator, I gained the confidence to perform procedures. It made a difference in my performance”. This illustrates the importance of the dynamic interaction between students and educators and the influence the facilitator holds in shaping this interaction. Despite the literature review demonstrating the importance of student-teacher interactions (Watson et al., 2021), Najjar, Lyman and Miehl (2015) reported the significance of peer interaction for achieving realism. However, Park and Kim (2021) argued that peers often caused stress, thereby hindering the learning experience. Conversely, the findings of the current study underscore the significance of interaction among students, educators, and peers, as well as with SPs in role-playing scenarios and
responding to mannequins, within the broader environmental context. Ideally, such outcomes can be attained by adequately priming students prior to the simulation session. This preparation equips them with the capacity to engage in effective communication, cooperation, and the suspension of disbelief. This notion finds resonance with a previous finding (Dean, Williams and Balnaves, 2015). Both educators and students need preparation in working collaboratively and suspending disbelief concerning the actual reality of simulations. The aim is to improve the uniqueness and dynamic interaction between educators and students within the HFS environment in Saudi Arabia.

To achieve authenticity in the HFS education setting in Saudi Arabia, robust strategies are required to promote interaction among educators, students, and the entire environment. This will create a trust-based collaborative environment that facilitates their interaction. Additionally, it is crucial to eliminate cultural limitations between educators and students as they influence how students communicate, ask questions, and interact with each other. Communication significantly affects the dynamic interaction between educators and students, so it is important to determine the appropriate language for communication. Social and cultural factors also greatly impact how students perceive their experiences; therefore, it is essential to be mindful of these factors and encourage students to express and discuss their experiences. Lastly, fostering collaboration and familiarising students with real-life cases and environments is vital in preparing female nursing students for future patient care. To achieve optimal student learning, it is fundamental to construct scenarios that reflect the students' background readiness to learn and incorporate socioeconomic and cultural factors.

In summary, authenticity and realism are crucial in HFS for effective learning. It is not only about factual accuracy but also about trust and genuine actions. Trust in HFS is established through realistic simulations and the expertise of educators. Clear communication, constructive feedback, and realistic settings facilitate engagement. Moreover, simulations need to include cultural sensitivity. Ultimately, a true-to-life HFS environment promotes deeper learning and enables students to apply their skills in real healthcare situations.
7.4.5 HFS and its Level of Realism

Based on the NJST (2016), this subtheme examines the realism of the HFS environment. Influencing factors such as the appearance of mannequins, immersive simulation, moulage use, and suspending disbelief are pivotal. The study's findings align with those of Jeffries, suggesting how these elements collectively bolster the educational experience.

Nurse educators and students viewed the possible level of realism in the HFS favourably. They were surprised to find high-fidelity resources in the laboratory that closely resembled a hospital setting. One student commented, “All the supplements are there. So, it is very realistic, and I enjoy it very much. You can see the patients and their size, their injuries”. However, not all students found the level of realism convincing, considering it to be overly contrived. The literature review presents a debate on the level of realism in HFS settings. While it has been argued that realism can be achieved through promoting interaction with peers or educators (Najjar, Lyman and Miehl, 2015; Watson et al., 2021) or employing strong pedagogy to facilitate communication skills with mannequins (Dean, Williams and Balnaves, 2015), little is known about effectively achieving this level of realism. However, the current study indicates that other factors, not mentioned in the literature, may have influenced the students' perceptions of realism. Among these factors is the lack of physical movement and emotional facial expressions on the mannequins in the HFS. The students could not recognise, identify, or empathise with the patient's situation, or feel that the mannequins represented actual patients due to the absence of these features. This poses a problem since nursing students must be sensitive and person-centred during patient assessment and subsequent interventions, as they will be caring for real patients in the future (Dean, Williams and Balnaves, 2015). It may be difficult for students to provide appropriate care if they do not receive emotional or physical cues from the patient (mannequin). Thus, according to Dean, Williams and Balnaves (2015), HFS can achieve greater realism and authenticity by integrating SPs, different modalities, flexibility, increasing the number of scenarios, and incorporating inter-professional simulation. This current study has highlighted other important factors for ensuring authenticity in simulation laboratories, which should be considered when designing simulation scenarios and training nursing students in Saudi Arabia.
According to participants in the study, the 'moulage' concept would not enhance simulation realism. Jamilah, a lecturer, elaborates on the reason: “During the operation, it’s not entirely real. For instance, in a case of a burn, the wound vanished when they used alcohol for disinfection while applying the dressing. As a result, we felt that the students were not convinced much and didn’t take it seriously”. However, they noted that this approach was impractical because 'moulage' was easy to remove and that the realism diminished when interventions were applied. A review of the relevant literature did not mention the effectiveness of 'moulage' in increasing realism. The current study contributes to the understanding of the effectiveness of 'moulage'. It identified several factors that are crucial for improving authenticity in the HFS, rather than relying solely on 'moulage'. To achieve the learning objectives, thorough preparation is essential, including addressing physical, emotional, psychological, conceptual, and interactive aspects. This approach helps students learn more effectively and achieve their educational goals. It is a serious concern for nursing education globally if these factors are not taken into account, as students may leave the HFS laboratory with limited learning.

7.5 A ‘Mixed Blessing’

The term ‘Mixed Blessing’ represents the mixed outcomes observed when implementing HFS in nursing education in Saudi Arabia. While HFS offers real benefits, such as enabling students to practise skills in a risk-free setting, it also presents challenges. These setbacks often arise from insufficient design and planning of HFS scenarios, as well as a lack of institutional support, resulting in underutilised resources.

The nurse educators and students engaged in multifaceted discussions about the benefits and obstacles of using HFS in nursing education within the Saudi Arabian context. They explained how HFS can enhance nursing learning outcomes, although this was not always the case. They also mentioned the lack of certain components in the HFS learning experiences. The literature review reported differing opinions on the effectiveness of integrating HFS and the possibility of

29 There are various types of moulage, such as cosmetics, body art, scents, wigs, rashes, and injuries. These engage all sensory perceptions and, as a result, promote critical thinking in learners (Mills et al., 2018).
substituting it with practice placement-based learning (Badir et al., 2015; Au et al., 2016; Brien, Charette and Goudreau, 2017). The findings of the current study show that most educators and students understand that learning is a continuous process that needs to be addressed before, during, and after HFS sessions. To effectively implement HFS, it is important to prepare from the beginning, starting from the design phase and continuing until the debriefing phase, which marks the end of the session (see Appendix 23 for the definition). Many factors influence how students are prepared and how they can maximise their HFS learning outcomes and experiences, specifically through briefing and debriefing.

These factors need to be considered when integrating the HFS, as they are equally important to other factors like realism, authenticity, and psychological readiness. Pre-briefing and briefing sessions are necessary to facilitate the connection between theory and the scenario and refresh students' knowledge to help them interact and intervene based on their knowledge. This is essential for transferring theoretical knowledge to practice. Another critical factor is the primacy of debriefing after the HFS session, which has been extensively discussed in the literature review. While the current study showed that participants understood the importance of debriefing, there was a perceived need to increase the debriefing duration and ensure ongoing feedback to make it more effective. Owing to cultural limitations inherent to the specific setting, which exclusively involved female participants and restricted the use of video recording or filming, the opportunity to fully address mistakes during the HFS session was unavailable. It becomes imperative to repeat the scenario, given that students cannot review recordings for reflective learning because of the cultural limitation described in Section 7.3.2. This practice should follow the debriefing session, ensuring participants can achieve their learning objectives and identify mistakes before entering the clinical environment.

The findings of this study reveal that while Saudi Arabia's simulation facilities are state-of-the-art, disparities in student experiences primarily stem from varying levels of educator preparation. Some students have mentioned the presence of unused equipment in storage, implying that budget is not a major issue in Saudi Arabia compared to other contexts. Distinct disparities are evident in students' simulation experiences across various courses. Notably, students deemed the simulations...
in paediatrics and maternity more authentic, attributing this to educators’ meticulous preparation. In contrast, the Adult I course appeared deficient, with students pointing out missing equipment and a more passive learning environment. The overarching message underscores that, even with advanced facilities, the efficacy of learning outcomes is predominantly anchored on the preparedness of educators and students, as well as the adaptability of the HFS approach within a specific context.

In light of Saudi Arabia's abundant resources, this study assessed the effectiveness of HFS in education. Specifically, it investigated how HFS can enrich learning environments, support hands-on group learning, and link theory to real-world practice. However, relying solely on HFS is not enough; it is vital to integrate HFS with students' real-life experiences to prepare them for challenges in patient care. To ensure the effectiveness of educational strategies in Saudi Arabia, these strategies need to be culturally relevant, especially when using tools like HFS. Currently, use of HFS in Saudi nursing education has both positive and negative aspects, resembling a ‘Mixed Blessing’. Nevertheless, with appropriate adjustments to align with Saudi’s culture and needs, HFS can offer significant learning opportunities. The next step should involve refining the usage of HFS, ensuring it is suitable for the Saudi context and maximising its advantages. To support this, the following chapter will present the conceptual framework, which considers these factors during the implementation of HFS.

*This finding aligns with and supports the perspective of Gaba, often referred to as the 'godfather of simulation in healthcare', who famously stated that “Simulation is a technique, not a technology” (Gaba, 2004, p. 12). This implies that the successful implementation of HFS depends not solely on the technology itself. The interpretation of the findings in this chapter has elucidated this notion by demonstrating that the effectiveness of HFS extends beyond its technological aspects.*
7.6 Core Insights from my Research

The following text box summarises the key message from the discussion chapter as it is important to highlight these points before moving to the next chapter.

Box 1: Key message from my study.

**Educator and Student Backgrounds:** Tailoring HFS content requires an understanding of the diverse backgrounds of educators and students.

**Cultural Alignment:** It is crucial to incorporate Saudi Arabia’s cultural and educational specifics into simulations for impactful learning.

**Physical, Conceptual, and Psychological Readiness:** Authenticity and realism in HFS are grounded in comprehensive readiness.

**Cultural Sensitivity in Nursing Education:** Integration of culturally sensitive care in simulations acknowledges the impact of religious, gender, and hierarchical norms.

**Safe Learning Environment:** Establishing a safe space is key to encouraging communication, learning from mistakes, and building confidence.

**Authenticity and Realism:** Effective HFS learning hinges on authentic simulations that mirror educators’ and students’ real-world experiences.

**Simulation as a Tool:** Simulation complements various teaching methods, enhancing the curriculum without replacing clinical settings.

**Preparedness Challenges:** Addressing the preparedness gap in HFS is essential, considering mismatches in teaching approaches and student expectations.

**Institutional and Educator Support:** Institutions and educators play a critical role in preparing for HFS beyond traditional teaching.

**Educator as Facilitator:** Educators should facilitate, not just teach, to support student-centered learning in HFS.

**Dynamic Interaction Between Students and Educators:** Effective interaction requires both educators and students to play a role and take responsibility, fostering trust and collaborative work.
7.7 Conclusion

This discussion evaluated the use of HFS in Saudi nursing education. What stands out is that there is tremendous potential in HFS, but the outcomes are mixed. Students believe HFS can offer valuable experiences, but its success hinges on various factors of preparation. Currently, the sentiment is that not all educators are equipped to maximise HFS's potential, which affects the quality of learning. One of the main contributions of this study is identifying and addressing gaps previously overlooked in the literature and theories. We thoroughly examined the dynamics of educator-student interactions, bearing in mind cultural and societal influences. The importance of robust preparation is also stressed.

By aligning with the NJST (2016) theory, this study addresses identified gaps and provides novel perspectives for nursing education research in Saudi Arabia. It yields valuable implications for future research and practice by constructing a conceptual framework based on key findings and, for the first time, using the NJST underpinnings (see Figure 20). Chapter 8 will further explore these findings, providing a deeper understanding and putting forth recommendations to advance HFS practices in the Saudi context.
Chapter 8: Implications and Conclusions
8.1 Introduction

This chapter summarises the significant findings and conclusions concerning the research questions outlined in Chapter 5. Furthermore, it presents the conceptual framework developed from the insights of this study, supported by the study’s theoretical framework—the NLN Jeffries Simulation Theory (NJST) (2016). The study's implications, which draw heavily on NJST (2016), are also explored. Given that this theory illuminates the experiences of educators and students, accentuating the importance of interaction and preparation before integrating HFS, it holds a central role in the research implications expounded in this chapter. This elucidation will clarify the novel contribution to knowledge by spotlighting the factors that influenced the learning and teaching process in the context of HFS, particularly within the complex scenarios of the Saudi context. Lastly, this chapter elaborates on the study's implications, encompassing its impact on education and practice, as well as its limitations, recommendations for future research, and concluding remarks.

8.2 Research Questions

This section discusses the significance of the study's findings as they pertain to addressing the research questions that guided the investigation, while also addressing gaps in the existing literature and presenting key contributions.

The research questions that guided the study are as follows:

1) What are the experiences of nurse educators and third- and fourth-year undergraduate nursing students regarding the integration of complex scenario-based HFS into the curriculum in the Saudi Arabian context?

2) How do educators and third- and fourth-year undergraduate nursing students perceive and experience complex scenario-based HFS in the undergraduate curriculum within the Saudi Arabian context?
3) How do educators and students perceive their respective roles in the learning process, particularly as influenced by the utilisation of HFS?

The study acknowledges the prevailing belief that HFS stands as a promising pedagogical approach capable of bringing about positive learning outcomes. Nonetheless, it is crucial to critically examine the effect of HFS on learning outcomes in specific contextual settings. Therefore, to comprehensively grasp HFS's complexities and potential effects on learning outcomes, the study examined the experiences of both nurse educators and students with HFS. By addressing this gap in the literature, the study draws attention to the multifaceted nature of HFS and its potential influence on learning outcomes. The research establishes that successful HFS implementation transcends mere fidelity and realism, necessitating thorough preparation, thoughtful design, and consideration of socio-cultural factors. These factors together contribute to achieving desired learning outcomes and fostering reflective practices related to student performance and clinical competencies for future practice in Saudi Arabia.

This study aims to identify effective educational strategies for integrating HFS in the Saudi Arabian context. It examines the guidelines and policies associated with various teaching methods and their integration within the HFS context. The study underscores the significance of adapting educational strategies to Saudi culture, emphasising the need for a comprehensive educational approach that takes into account religious considerations, gender sensitivity, and Saudi hierarchical influences.

The findings of this study suggest that both nurse educators and students play a critical role in ensuring the effective integration of HFS. The study addresses the identified gap in the literature review by placing significant emphasis on understanding the expectations and responsibilities of both educators and students. Furthermore, the study highlights the essential nature of fostering trust and cultivating a learning environment that promotes meaningful interaction between educators and students. Additionally, this study tackles another gap in the existing literature by addressing the barriers and societal constraints that influence their interaction. The study explains the significance of the educator-student relationship and its contribution to establishing an
authentic learning environment, as well as the level of realism experienced within the context of HFS.

As a result of these findings, a conceptual framework is developed emphasising active involvement and interaction of both educators and students within the learning process. This framework aligns with NJST (2016), expounded in Chapter 4, Section 4.3, which acknowledges the significance of their interaction. The conceptual framework strives to enhance the authenticity and realism of HFS, ultimately culminating in better learning outcomes within the Saudi Arabian context.

8.3 Contribution to Existing Knowledge

The conceptual framework encompasses five primary elements that exemplify the interplay and influence of these elements throughout the trajectory of the learning process. These elements are i) socio-cultural factors (encompassing religious influences, gender sensitivity, and hierarchical norms); ii) optimal preparation process; iii) the dynamics of interaction between educators and students; iv) authenticity; and v) the level of realism, to achieve the optimal learning and teaching outcomes.

Based on the gathered evidence, this stands as the first qualitative exploration into the experiences of both educators and students within the context of Saudi Arabia regarding the use of complex scenarios in HFS. The distinct contribution of the current study lies in its comprehensive examination of the integration of HFS into education, with a specific focus on learning outcome achievement, the influence of Saudi socio-cultural factors, and the levels of authenticity and realism perceived by participants. A unique perspective is presented by this study, which addresses an untapped aspect in the literature (Section 3.6). Using a qualitative approach through focused ethnography (Chapter 5, section 5.4.3, p. 107), the study assessed the collaborative environment and dynamic interactions occurring during HFS sessions. It scrutinised the complexities of using sophisticated scenarios and HFS, going beyond surface-level interpretations of fidelity and realism. The study presents the significance of encouraging a collaborative environment that
nurtures active engagement, ultimately augmenting authenticity and realism within the learning process.

An additional contribution of this study emerges from its exploration of the impact of socio-cultural factors on learning outcomes and the authenticity of HFS, particularly within the Saudi Arabian context. Through an analysis of religious influences, gender sensitivity, and hierarchical norms, this study accentuates the necessity for simulation-based education to align with cultural sensitivities. These factors influence the authenticity and effectiveness of HFS, which, in turn, influences the achievement of desired learning outcomes and the level of realism experienced by students and educators.

The flexibility of the proposed conceptual framework is integral to its application across various educational levels. At the scenario level, it can be customised for specific disciplines, including medical-surgical, psychiatric, paediatric, and maternal health education. It also takes into account socio-cultural factors—religion, gender sensitivity, and hierarchical norms—to ensure contextual relevance. The framework’s design allows for seamless integration into curricula, expanding its utility beyond the Saudi context. However, it is essential to critically assess and modify cultural elements of the framework to ensure its effectiveness on a global scale. This adaptability to different cultures and settings calls for rigorous evaluation in various educational landscapes, highlighting a direction for future research in validating the framework’s universal applicability and impact.

The study yields theoretical implications and practical insights for educators and researchers involved in designing and implementing HFS sessions in Saudi Arabia. By recognising the intricacies inherent in educator-student interactions, considering the influence of socio-cultural factors, and prioritising authenticity and realism, educators can develop simulation experiences that encompass broader context and relevance. Students, in turn, can cultivate culturally competent-sensitive care, enhance their critical thinking skills, and improve their learning outcomes through the establishment of an immersive and authentic learning environment in Saudi
Arabia. To accomplish this, a conceptual framework was developed based on the principal findings of the study and the foundations of NJST (2016).

### 8.3.1 A New Conceptual Framework

I formulated a conceptual framework (Figure 20) that elucidates the theoretical foundations of HFS and its relationship with the levels of realism and authenticity. Anchored in the primary findings described in Chapter 7 and grounded in the NJST (2016) theory, along with other pertinent learning theory underpinnings, this study's conceptual framework aims to illustrate the key elements and relationships within the HFS process. Central to its essence, the framework stresses the interaction between socio-cultural factors and preparation, the dynamic interaction between educators and students, and the desired performance at a high level of realism and authenticity. The framework's design is a result of weaving together diverse theoretical foundations that underscore the balance between educational methodologies and cultural influences.
Figure 20: A conceptual framework for the trajectory process of the integration of the HFS in Saudi Arabia
8.3.1.1 Pre-Simulation Phase

Positioned at the inception of the framework, the pre-Simulation phase is supported by socio-cultural determinants central to the Saudi context (Jeffries, 2020). This comprises religious values, gender sensitivity, and hierarchical norms. These determinants are not just passive background elements; they actively shape the preparation and configuration of HFS. The theoretical significance lies in recognising that effective educational simulations extend beyond mere transference of techniques and methods from one context to another. Rather, their accomplishment necessitates a process of adaptation—one that ensures cultural and practical relevance. In the Saudi setting, this phase highlights the need for thorough and culturally sensitive preparation, an aspect underscored by the study's findings on inadequate preparatory planning. Given this, in the Saudi context, this phase needs to incorporate a holistic educator preparation process and consider the students' requirements, including optimal briefing sessions for educators and students and an environment conducive to such preparation and fostering an understanding of their roles. All essential elements are introducing students early to the HFS setting, familiarising them with the tools, and clarifying their expected roles.

8.3.1.2 Simulation Phase

Transitioning to the Simulation phase, the framework amplifies educator-student interaction. Theoretically, this mirrors the constructivist pedagogical stance, wherein knowledge is both imparted and collaboratively constructed through simulation interactions (Jeffries, 2020). Within the controlled confines of a simulation, this educator-student dynamic is pivotal, placing the student at the heart of their learning experience. This not only influences the quality of the simulation but also ensures its alignment with the distinct cultural sensitivities of Saudi Arabia. The focal point here is on the 'experience', shifting from a mere technical exercise to a holistic learning environment that seamlessly incorporates both academic and cultural facets of the participants. Given this, the process should prioritise disseminating expert knowledge, emphasizing robust and clear communication among participants. Additionally, it is imperative to
foster a non-judgmental and supportive environment. This allows students to feel safe, make mistakes, and learn from them.

Additionally, in the simulation phase, the framework places greater emphasis on realism and authenticity, as these two aspects are inherently intertwined. Simulations, by design, strive to replicate real-world clinical scenarios, offering students not only knowledge but also fostering critical thinking and the ability to navigate uncertainties while making informed decisions—an in-depth comprehension that integrates theory with practice. By interlinking components specific to Saudi context and realism, along with active interaction, trust-building, engagement, effective communication, feedback provision, learner-centred approaches, and cultural elements, into the learning outcomes aligned with the curriculum, the framework ensures that this simulation goes beyond simple description. It transforms into an authentic and culturally pertinent learning environment that facilitates the acquisition of skills and cultural competence.

8.3.1.3 Post-Simulation Phase

In the Post-Simulation phase, the focus is on reflective practice, debriefing, and refining cultural proficiency (Jeffries, 2020). Data-driven recommendations include adapting the nursing curriculum for cultural sensitivity. A proposed shift from sole reliance on recorded simulations to repetitive hands-on simulations ensures students learn through iterative feedback and direct experience. This approach aims to meld real-world clinical scenarios with Saudi-specific cultural aspects, fostering technical and cultural adeptness. Thus, students are equipped with foundational knowledge and practical skills tailored to Saudi healthcare. It is imperative to guarantee participants' satisfaction and well-being, ensuring educators and students derive value from the simulation and meet their respective learning and teaching objectives. Additionally, insights from the debrief should serve as a roadmap for continuous improvement in subsequent simulations.
Lastly, the framework's cyclical arrow represents the iterative learning and teaching process. Anchored in experiential learning theory, it underscores that learning, especially in complex fields such as nursing, is not a linear path. Reflections following post-evaluation inform subsequent pre-simulation preparations, ensuring an ongoing refinement process that increases the effectiveness and relevance of simulations with each iteration.

8.4 Implications of this research

8.4.1 Educational Implications

The findings of this study emphasise the significance of establishing an inclusive and culturally sensitive learning environment, particularly for female students and educators within the HFS. To effectively engage and support students from diverse backgrounds, educators need to undergo training in gender sensitivity, cultural competence, and effective communication strategies. Furthermore, the findings indicate the necessity for adapting the curriculum to align with Saudi Arabia's cultural norms and expectations. Implementing these recommendations holds the potential to enhance the educational experience and outcomes for both students and educators in Saudi Arabia.

Preparation emerges as a fundamental cornerstone for achieving success within the HFS context in Saudi Arabia. Thus, it is imperative to emphasise psychological and cultural readiness among students and educators, aside from the essential physical readiness. Moreover, students and educators should be familiarised with simulation expectations, procedures, and learning objectives through comprehensive cognitive orientation sessions. By ensuring that educators and students are adequately prepared, the quality of simulation experiences can be elevated significantly.

The study includes only female students and educators owing to cultural constraints in Saudi and the nature of the particular context.
It is argued that to create a simulation environment that embodies authenticity and realism, it is crucial to integrate social-cultural factors that mirror the cultural reality of both educators and students. This can be exemplified by acknowledging patients' language, beliefs, customs, and demographics. The incorporation of these elements not only increases engagement but also promotes a more profound and meaningful learning experience for nursing students. Furthermore, the introduction of 'dry run' sessions, akin to the concept of a 'pilot,' serves to refine and fine-tune scenarios. This enables both educators and students to acquaint themselves with simulation scenarios, equipment, and procedures, thereby making them more comfortable and confident during simulation sessions.

In the context of Saudi Arabia, recognising the distinct needs and viewpoints of both female and male patients can help improve the quality of patient care. A recommended approach involves incorporating various modalities and fidelity levels within HFS sessions. Moreover, employing diverse simulation techniques, such as standardised patients and task trainers, tailored to different genders, accommodates various learning styles and ensures a comprehensive grasp of nursing practice and the delivery of patient-centred care.

Providing a secure and supportive environment empowers both students and educators to explore, learn, and even make mistakes without the fear of criticism. This approach shifts the focus from mere assessment to a genuine emphasis on the learning process itself. It also directs our attention beyond the sole determination of whether students have achieved predefined outcomes, leading us to a better comprehension of the learning process. This change in perspective promotes a student-centred approach. Rather than merely checking accomplished outcomes off a list, the focus is on nurturing the holistic development of each student. This method ensures not only the achievement of outcomes but also encourages wholehearted student engagement and the realisation of their maximum learning potential. By emphasising the learning journey, educators ensure that students not only meet the learning outcomes but also cultivate a richer understanding and appreciation of the subject matter. This approach empowers students to be fully engaged and to maximise their utmost learning capabilities. With timely implementation of these recommendations within nursing education, it is possible to improve Saudi Arabian students’ education experiences and
learning outcomes. This, in turn, can contribute to their development as proficient nursing professionals, aligning with the broader objective of addressing the unique healthcare requirements of the general population in Saudi Arabia.

8.4.2 Implication in Practice

In nursing practice, ideally, educators seek to implement strategies that cultivate a collaborative and all-encompassing learning environment, promoting effective interaction between students and educators. This involves creating avenues for open communication, feedback, and reflective practices. The study underscores the importance of addressing power dynamics and hierarchies within the educational context in Saudi Arabia, echoing the sentiments of NJST (2016). As students must experience a sense of empowerment and comfort to engage actively in simulation activities, educators must also consider the influence of cultural factors on the formulation and execution of simulation scenarios, adapting them to cater to the needs of Muslim patients.

Educators must thoughtfully design complex scenarios that are in keeping with the experiences and cultural norms of Saudi female students. This entails incorporating gender-related beliefs, values, and practices into the design process to guarantee the pertinence, significance, and sensitivity of the scenarios. Consequently, educators can cultivate a more captivating and conducive learning environment for female students by tailoring the scenarios to the Saudi cultural context.

Furthermore, nursing students must be prepared to function within a healthcare environment that involves interactions with individuals from various genders and cultures. The Saudization of healthcare services aims to increase the presence of Saudi nurses as a component of the Saudi Vision 2030 initiative in Saudi Arabia, as elucidated in the background chapter, Section 2.2. This necessitates those nurses possess the ability to collaborate efficiently with individuals from diverse genders and cultural backgrounds, employing the HFS scenario. Saudi nursing organisations hold the ability to ensure the provision of proficient and culturally sensitive care to the Saudi populace.
by promoting cultural competence and providing training and support to students, thereby equipping them for work in clinical settings.

Nursing colleges and institutions assume a vital role in addressing the implications of this study. It rests upon them to revise and adapt their curricula to encompass religious and cultural considerations. This approach ensures that nursing students acquire an education attuned to the religious and cultural nuances of Saudi Arabia. Furthermore, nursing colleges and institutions should offer comprehensive training and resources to educators, enabling them to effectively incorporate these considerations into their teaching methodologies. This concerted effort will contribute to establishing an immersive learning environment that closely reflects the healthcare reality in Saudi Arabia.

Similarly, healthcare and educational policymakers play a crucial role in responding to the implications of the study by utilising the Plan-Do-Study-Act (PDSA) cycle (Figure 21). They need to consider the study's findings when formulating policies concerning nursing education, simulation-based learning, and cultural competence. It is imperative for policymakers to acknowledge the importance of religious and cultural factors within the nursing curriculum and ensure their appropriate integration. Through advocating for the incorporation of HFS into healthcare practices, policymakers can contribute to the enhancement of cultural competence among healthcare professionals, consequently improving patient care outcomes.

In addition, addressing power dynamics is vital in implementing HFS within the Saudi Arabian context. Nursing colleges and institutions can establish a safe and supportive learning environment by recognising the concept of 'power distance' and the inherent power differentials within

31 Given the sensitivity of this concept, particularly within Arabic cultures, it is important to note that 'distance power' is one of the key concepts explored in this study. Within Arabic contexts, it signifies the innate respect accorded to elders, teachers, managers, and individuals in higher positions. In the context of this research, 'power distance' pertains specifically to the manner in which students engage, their ease in posing questions, and the dynamics of their interactions, particularly in educational settings. This clarity ensures accurate comprehension of the term's intended meaning.
educational settings. Such an environment cultivates active participation, open communication, and a sense of psychological safety for students.

This study highlights important lessons for nursing education, with implications extending into clinical practice. The findings emphasise the importance of cultural competence and sensitivity to gender and hierarchical norms, pointing to the need for curricula that transcend theoretical knowledge to prepare students for real-world patient care. Advocating for an integrated curriculum—one that combines critical thinking and communication skills with cultural awareness—ensures that students are well-prepared for diverse clinical interactions. This approach readies students to provide skilled and culturally responsive care. Nursing institutions are urged to incorporate these strategies into their educational offerings in order to foster the development of proficient nurses equipped to navigate the complexities of clinical practice. By doing so, graduates are shaped into professionals capable of providing high-quality care and meeting the cultural needs of patients in a dynamic healthcare landscape.

8.4.2.1 Enhancing HFS in Saudi Nursing education through the PDSA cycle

The PDSA cycle was initially conceptualised as the Plan, Do, Check, Act sequence by Walter Shewart in the 1920s, for his organisational development and leadership strategies (NHS England and NHS Improvement, 2021). This improvement model provides a structured approach for formulating, assessing, and implementing changes that promote enhancement. Anchored in the scientific method, the model balances the impulse for immediate action with the wisdom of comprehensive investigation (Langley et al., 2009; Nanji et al., 2013; Knudsen et al., 2019).
Research within this domain aims to enhance the effectiveness of HFS in nursing education by offering practical recommendations for meaningful change. To achieve this, the introduction of a model into nursing education was imperative—one that has demonstrated its effectiveness in enhancing quality in diverse areas such as leadership and healthcare settings like the National Health Service (NHS England and NHS Improvement, 2021). The decision to apply this model was not arbitrary or driven solely by convenience. As a result, the PDSA cycle (Figure 21) was identified as a key tool. The PDSA cycle is adaptable and suitable for the specific needs of Saudi nursing education. It offers a framework for integrating global best practices in a culturally relevant manner. Furthermore, the PDSA cycle was a fitting choice owing to the need for iterative development and continuous improvement in a rapidly changing healthcare landscape. Additionally, it was essential to select a model with proven effectiveness in other contexts.

Figure 21: PDSA cycle\textsuperscript{32} (NHS England and NHS Improvement, 2021, p. 4).

\textsuperscript{32} This figure is adapted from the following source: NHS England and NHS Improvement, 2021, [p. 4]
Therefore, I utilized and adapted the model to suit the Saudi context, as demonstrated in Table 18. Furthermore, the rationale behind choosing this particular model is explained below.

1. The PDSA cycle has the potential to elevate the quality of HFS utilisation, having displayed efficacy across various sectors, including leadership and healthcare (Knudsen et al., 2019; NHS England and NHS Improvement, 2021). This track record establishes its suitability for this research.

2. Beyond theoretical considerations, the goal is to offer effective recommendations that equip Saudi nursing educators with strategies to harness the full potential of HFS in their teaching.

3. The iterative nature of the PDSA cycle aligns with the demands of nursing simulation, enabling consistent refinements and improvements (Langley et al., 2009). Advancing simulation learning necessitates a gradual, evidence-based approach, and the PDSA cycle provides a framework for this purpose (Langley et al., 2009; Nanji et al., 2013; Taylor et al., 2014). The model's significance goes beyond global practices; it can be tailored to the specific context of Saudi Arabia.

4. Table 18 presents how the components of the PDSA model correspond to the data and unique requirements of Saudi nursing education.

5. Fostering Teamwork in Saudi Nursing Education with the PDSA Cycle (Table 19): This cycle extends beyond procedural enhancements, emphasising collaborative efforts:

<table>
<thead>
<tr>
<th>PDSA cycle component</th>
<th>How to apply the PDSA cycle to simulated learning in Saudi</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plan</strong></td>
<td><strong>Identification of Weak Areas:</strong> Begin by identifying the shortcomings in simulated learning. A prevalent issue is the absence of a comprehensive integration plan for simulations. Possessing simulation equipment and</td>
</tr>
</tbody>
</table>

33 Since the current study specifically targeted the department of medical-surgical courses, these suggestions are formulated within that specific context. Nevertheless, it is worth noting that they possess the potential for application in other course settings as well.
<table>
<thead>
<tr>
<th>PDSA cycle component</th>
<th>How to apply the PDSA cycle to simulated learning in Saudi Arabia</th>
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<tbody>
<tr>
<td></td>
<td>laboratories, without aligning them with educational objectives and Saudi nursing requirements, proves inadequate. The cultural appropriateness of simulation tools, as highlighted in the study, demands attention. Educational institutions should proactively address these findings. Develop a well-defined plan with explicit goals, objectives, and strategies.</td>
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<tr>
<td></td>
<td><strong>Inclusion of HFS:</strong> Clearly outline the goals for incorporating HFS into medical-surgical courses. When adapting scenarios from Western contexts, clarify the intended outcomes, the approach for implementation, and any necessary cultural adaptations. If original scenarios are employed, detail the method for ensuring their relevance and integration with other teaching approaches.</td>
</tr>
<tr>
<td></td>
<td><strong>Determining the target population:</strong> Define the specific target population, including educators and students. Additionally, specify the timeline for implementing the plan, which could span from a single semester to multiple years, contingent upon the institution's capacity to adjust syllabi and curricula.</td>
</tr>
<tr>
<td></td>
<td><strong>Promoting Student Participation:</strong> In accordance with co-construction principles, engage students in decision-making processes (Bovill, 2017). Considering the Saudi context, student engagement in planning can yield improved outcomes. While complete control should not be relinquished, incorporating students’ perspectives can prove invaluable (Bovill, 2017).</td>
</tr>
<tr>
<td><strong>Do</strong></td>
<td><strong>Trial with Changes:</strong> Initiate modifications by implementing them with a subset of students and educators. Monitor the immediate effects of these changes.</td>
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<tr>
<td></td>
<td><strong>Continuous Feedback Mechanism:</strong> Establish a feedback loop. The recognised need for continuous feedback necessitates a system that allows for real-time refinements.</td>
</tr>
<tr>
<td><strong>Study</strong></td>
<td><strong>Result Analysis:</strong> Following the 'Do' phase, evaluate the outcomes in comparison to the benchmarks set during the 'Plan' phase.</td>
</tr>
<tr>
<td></td>
<td><strong>Integration of Feedback and Analysis:</strong> Gather qualitative feedback from diverse stakeholders. Identify successful strategies and those requiring refinement, ensuring a comprehensive understanding.</td>
</tr>
</tbody>
</table>
Table 19: Promoting teamwork in Saudi nursing.

<table>
<thead>
<tr>
<th>PDSA Cycle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>The PDSA model naturally promotes collaboration, ensuring a holistic learning process (Langley et al., 2009).</td>
</tr>
<tr>
<td>Stakeholder Engagement</td>
<td>The framework of the PDSA cycle encompasses all stakeholders in nursing education, from educators to students and administrative staff. This inclusive approach enables a comprehensive learning experience.</td>
</tr>
<tr>
<td>Customised Recommendations</td>
<td>The adaptability of the PDSA cycle allows for customisation (Langley et al., 2009) based on different simulation scenarios. Within the context of Saudi nursing education, this adaptability ensures that recommendations specifically address the needs of both educators and students to achieve intended learning outcomes.</td>
</tr>
</tbody>
</table>

8.4.2.1.1 Applying the PDSA cycle to simulated learning in Saudi

The PDSA cycle is widely recognised in both healthcare and education due to its evidence-based approach (Nanji et al., 2013; Taylor et al., 2014). A key feature of the PDSA is its promotion of reflective practice, especially in the 'Study' phase, which allows practitioners to evaluate results before moving forward (Reed and Card, 2016). It is flexible structure is another advantage, making it applicable across various domains (Knudsen et al., 2019). However, it is not without criticisms. Taylor et al. (2014) and Reed and Card (2016) argue that the PDSA's design can oversimplify
complex issues, while its steps appear straightforward, each requires meticulous attention. The cycle's iterative nature can be time-consuming, and rapid applications can lead to misuse (Taylor et al., 2014; Knudsen et al., 2019). Reed and Card (2017) highlighted occasional failures in PDSA's application within healthcare, attributing these shortcomings to a lack of thorough preparation. This leads to ineffective outcomes because the preparation, funding, time, and expertise are often undervalued. In response to these concerns, this study has detailed recommendations (Table 18) for each step of the PDSA cycle to potentially diminish these issues in the future. Table 18 shows the application of the components and elements of the PDSA cycle, as depicted in Figure 21. This adaptation is customised for the Saudi context, incorporating insights derived from the challenges identified in this research. Thus, to truly employ the benefits of the PDSA cycle in the context of education in Saudi Arabia, especially in fields like nursing education, it is imperative for stakeholders, including policymakers and educators, to allocate sufficient time, financial resources, and expertise. Sustained commitment is crucial, ensuring not only its proper implementation but also its meaningful and effective application (Reed and Card, 2016).

8.5 Limitations of the Study

While this research offers novel insights and significant contributions to HFS in Saudi Arabia, several limitations should be acknowledged. First, the study was exclusively conducted within a single university in Saudi Arabia, which may restrict the generalisability of the findings. Replicating the study across multiple universities or sites would enhance the applicability of the findings. Second, cultural constraints within Saudi Arabia led to the inclusion of only female educators and students in the study. Conducting similar research with a different gender composition or within mixed-gender environments could yield additional perspectives. The third limitation is related to the sampling technique employed in this study. Future studies could enhance the rigour of the research by employing a larger sample size, improving the representativeness of the data. Fourth, despite my native Saudi Arabian background, the Arabic-to-English translation process carries the potential for misinterpretation or loss of meaning. Variations in accents and cultural nuances within the Saudi culture may further complicate accurate translation. Lastly, while the study focused on identifying and defining ‘simulation anxiety’, a phenomenon encompassing
mental and physical symptoms, the existing literature on this topic was limited. This underscores the need for further research to gain a more comprehensive understanding of and address this syndrome.

8.6 Recommendations for Further Research

Expanding upon NJST (2016), this study underscored the significance of preparation and interaction processes, along with highlighting the importance of integrating contextual and cultural factors. While this research offered insights at an individual level, future investigations should examine other dimensions of NJST. It is imperative to explore its implications across diverse contexts, examining both system-level and patient-level effects to understand its broader influence on outcomes. Although the current study identified aspects of the theory resonating within Saudi Arabia, there is potential for integrating supplementary frameworks to augment learning and iterative processes, further enriching the NJST.

For future research, it is recommended that the conceptual framework developed in this study be validated through replication studies in varied settings, including other universities or educational institutions within and beyond Saudi Arabia, to evaluate the framework's generalisability and applicability. It is also crucial to incorporate repeated practice and rehearsal strategies to assess their effectiveness over time. These strategies should be extended to thoroughly investigating how a psychologically safe learning environment, as a foundational concept, can enhance educational outcomes. Furthermore, exploring diverse gender perspectives by including participants from various genders, while being sensitive to gender-related considerations, would offer a more comprehensive insight into the impact of gender on HFS education.

Expanding the research scope to include other nursing domains beyond medical and surgical fields, such as mental health, maternity, and paediatric nursing, will contribute to a more comprehensive understanding of the effectiveness and applicability of HFS across diverse nursing specialisations. Additionally, investigating the effects of HFS in hospital settings and probing its influence on
nurses and patient safety will provide valuable insights into its potential for enhancing nursing practice and improving patient outcomes. Conducting comparative studies in other regions of Saudi Arabia or similar Middle Eastern contexts will provide a better understanding of the transferability of findings while shedding light on the cultural and contextual factors influencing the effectiveness of high-fidelity simulation in healthcare education.

8.7 Pre-conclusion Reflexivity

In Chapter 5 Section 5.10.1, I explored my self-awareness journey. With the conclusion of this research, I am reflecting on those insights gained from this research. As a Saudi lecturer, much like the participants, I was struck by how their culture affects student interaction and learning. This realisation made me appreciate the nuances of being both an insider and an outsider in this research.

The findings of this study have resolved many questions I initially had. This newly gained knowledge helped in developing a framework and providing suggestions tailored to participants’ cultural context within nursing education. The process was challenging, pushing me to deepen my understanding and recognise the importance of having a solid foundation for each idea. A significant realisation was the importance of simulation in general. It is essential, especially when real-time patient interaction is not an option. Simulations equip students for such scenarios, ensuring they are prepared to manage unforeseen challenges. Teaching and learning are experiential. My experiences, or reflexivity, as often termed, have been a guiding light. Reflecting on this, I recognise that my research journey has reshaped my educational perspectives. This research has transformed how I views my future role as an educator. This transformation was not just about data and findings; it was about personal growth and deepened understanding, all while being cautious not to let this introspection become too self-focused. Instead, I have strived to maintain an intellectual reflection on my journey, emphasising the balance between personal insights and research rigour. It is thinking that is grounded in academic or theoretical understanding, rather than simply personal feelings or experiences. It involves examining topics,
ideas, or experiences through a critical and analytical lens, often drawing upon scholarly resources, theoretical frameworks, or established knowledge.

While considering against my own personal experiences (reflexivity), I am also analysing and interpreting these experiences within the broader scholarly context, applying theories, prior research, and other academic resources to give depth, context, and rigour to my reflections.

**8.8 Conclusions**

This study has systematically examined the HFS implementation within the distinct context of nurse education in Saudi Arabia. By employing a focused ethnographic approach, the experiences of both female nurse educators and students were explored, revealing the intricate interplay of social factors that shape the landscape of simulation encounters in the Saudi milieu.

The investigation centred on the highpoint of high-fidelity learning during the final two years of undergraduate nursing programmes. Drawing from a specialised clinical skills and simulation centre within a prominent Saudi university, this study has highlighted the indispensable role that preparedness plays for both educators and students, underscoring its paramount significance in extracting optimal benefits from HFS.

On a broader scholarly context, this research serves as an important link that bridges existing gaps in the literature, offering insights that reverberate not only within Saudi Arabia's educational boundaries but also extend to analogous settings. The undeniable influence of socio-cultural elements on the learning journey is apparent, as evidenced by the intricate dynamic between educators and students.

Furthermore, the theoretical landscape gains new dimensions as a conceptual framework that harmonises with established simulation theories is introduced, thereby advancing the scholarly conversation. Moreover, through practical recommendations grounded in the PDSA model, this
study contributes pragmatic insights aimed at elevating the standards of nursing education in Saudi Arabia.

In conclusion, the trajectory of this research has illuminated a pathway that acknowledges the profound impact of socio-cultural dynamics on education, emphasises preparedness as the essential of successful HFS experiences, and reinforces the symbiotic cooperation between educators and students. As the final pages of this thesis turn, it invites nursing education stakeholders to extend and implement these findings, collectively enriching the landscape of nursing education in Saudi Arabia.
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## Appendices

### Appendix 1: The Different Classifications of Simulation in Healthcare Based on Bangar, Venegas-Borsellino, and Eisen (2016)

<table>
<thead>
<tr>
<th>Classification of the simulation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Standardized Patient Simulator (SP). Patient</td>
<td>The individuals who are acting as patients provide their history and symptoms to the students and answer the questions related to their physical examination. This protocol has been used since early times for medical students to create different scenarios using their clinical skills. It has also been used to train students about mobilization in end life care in the ICU along with developing their communication skills. The students can perform the physical exam.</td>
</tr>
<tr>
<td>Part Task Trainers.</td>
<td>This is the model of the body part that is used to develop the procedural skills for students. The chest tube insertions and the line change as well as intubation are examples of the part task simulators.</td>
</tr>
<tr>
<td>Hybrid Simulators</td>
<td>The part of simulator’s body which are connected to the acting patient. According to Kneebone (2003) the hybrid simulation the part of the simulator body that is connected to the real physical body is often used to connect the mannequins with computers in case there is a gap between them.</td>
</tr>
<tr>
<td>Advanced Task Trainer</td>
<td>This is the body part that is attached to the computer and displays the internal anatomy of the body part on the screen when the trainer has inserted the instrument into the body part. The bronchoscopy procedure in the clinical lab an example of the advanced task trainer.</td>
</tr>
<tr>
<td>Simulator Type</td>
<td>Description</td>
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<tr>
<td><strong>High-Fidelity Simulator</strong></td>
<td>o This provides an environment that simulates the real environment which includes a mannequin that can talk, breathe, and psychologically respond to the students’ intervention. The student uses the real equipment that is similar to the one in the clinical setting during the practice.</td>
</tr>
<tr>
<td><strong>Screen-Based Computer Simulator</strong></td>
<td>o This type is displaying the vital signs, the medication, and responses to students’ intervention on the computer screen.</td>
</tr>
<tr>
<td><strong>Virtual Reality Simulators</strong></td>
<td>o This type commonly used in most the clinical simulations in medicine during surgical training, for pain management, psychological disease therapy and rehabilitation, which employ the 3D dimension technique.</td>
</tr>
</tbody>
</table>
## Appendix 2: A Summary of the Characteristics of Quantitative Studies of the Studies Selected for the Review

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Country</th>
<th>Method</th>
<th>Sample size</th>
<th>Participants</th>
<th>Aim</th>
<th>Data Analysis and limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkhalaf and Wazqar (2022)</td>
<td>The effect of high-fidelity simulation technology on the competency of nursing students in managing chemotherapy extravasation in patients with cancer.</td>
<td>Saudi Arabia</td>
<td>A quasi-experimental study. Using e Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) checklist</td>
<td>(n = 68)</td>
<td>Third-year students from a nursing programme. Not mentioned if include male or female.</td>
<td>To investigate the effects of high-fidelity simulation (HFS) technology on the competency of nursing students in the management of chemotherapy extravasation and the transfer of this skill from traditional learning labs to clinical settings.</td>
<td>Descriptive statistical analysis. 1. not possible to check group comparability. 2. not generalizable to other populations of nursing students, particularly those from earlier semesters (first and second years).</td>
</tr>
<tr>
<td>Czekirda et al. (2022)</td>
<td>Objective and Subjective Stress Parameters in Response to High and Low-Fidelity Simulation Activities.</td>
<td>Poland</td>
<td>The study used two research methods (a) laboratory analysis of serum cortisol levels and (b) questionnaire assessment of perceived stress (Stress Appraisal)</td>
<td>(n=146)</td>
<td>Nursing students participated in the study, including 124 women and 22 men aged between 19 and 50 years.</td>
<td>To assess the differences in the level of stress assessed objectively (cortisol level) and subjectively (Stress Assessment Questionnaire, KOS-B), under simulation conditions using low and high-fidelity education methods.</td>
<td>The Alinity and Cortisol kit is a Chemiluminescent Microparticle Immunoassay (CMIA) for the quantitative determination of cortisol in human serum, plasma or urine using the Alinity analyser.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Method</td>
<td>Sample size</td>
<td>Participants</td>
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<td>Data Analysis and limitations.</td>
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<tr>
<td>Powell et al.,(2020).</td>
<td>Nurse educators’ use and experiences with high-fidelity simulation in nursing programmes at a South African private higher education institution</td>
<td>South Africa.</td>
<td>Descriptive quantitative research design. The data were collected by means of an electronic teaching-learning feedback questionnaire developed by Jones (2005).</td>
<td>(n= 69)</td>
<td>Nurse educators permanently employed at the setting’s six learning centres.</td>
<td>To describe nurse educators’ current use and experiences with high fidelity simulation in nursing programmes at a South African private higher education institution.</td>
<td>Descriptive statistics The SPSS Programme™ was used to analyse the data. Limiting the Findings to this one institution in South Africa.</td>
</tr>
<tr>
<td>Bates et al.,(2019).</td>
<td>Comparing Outcomes of Active Student and Observer Roles in Nursing Simulation</td>
<td>USA</td>
<td>A quasi-experimental study.</td>
<td>(n=32)</td>
<td>Prelicensure baccalaureate students.</td>
<td>Educators need to determine if anxiety levels, and student learning outcomes are comparable for students in active and observer roles.</td>
<td>Descriptive analysis. 1. A convenience sample with nonrandomized groups was used, and thus, the</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Method</td>
<td>Sample size</td>
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<tr>
<td>Boostel <em>et al.</em>, (2018)</td>
<td>Stress of nursing students in clinical simulation: a randomized clinical trial.</td>
<td>Brazil</td>
<td>Randomized clinical trial - experimental group took part in a high-fidelity simulation scenario. Stressors were evaluated before and after class, with the application of KEZKAK questionnaire.</td>
<td>(n=52)</td>
<td>The population of this research consisted of students from the undergraduate programme in nursing, comprising men and women over 18 years old who agreed to voluntarily participate</td>
<td>To evaluate and compare the perception of stressors by nursing students before and after a high-fidelity clinical simulation or conventional laboratory practice class.</td>
<td>1. The generalization of the results of this research. 2. The students had not yet had experiences with high-fidelity clinical simulation, and only one simulation session was offered.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Method</td>
<td>Sample size</td>
<td>Participants</td>
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<tr>
<td>Scherer, et al., (2016)</td>
<td>Evaluating Simulation Methodologies to Determine Best Strategies to Maximize Student Learning</td>
<td>USA</td>
<td>Quasi-experimental study.</td>
<td>(n=80)</td>
<td>Junior nursing students from a university-based baccalaureate programme.</td>
<td>To investigate 2 different strategies repeated versus 1 exposure and participation versus observation on student outcomes following exposure to a high-fidelity acute asthma exacerbation of asthma scenario.</td>
<td>Comparative analysis pre and post-test. 1. Sample size of 80 junior nursing students. A larger sample size of junior and senior nursing students and the use of randomly selected multisite schools of nursing would increase the generalizability of findings. 2. The scenario for this study was designed for beginning nursing students.</td>
</tr>
<tr>
<td>Fawaz et al., (2016)</td>
<td>Impact of high-fidelity simulation on the development of clinical judgment and motivation among Lebanese nursing students</td>
<td>Lebanon</td>
<td>Data were collected using the Lasater Clinical Judgment Rubric and the Motivated Strategies for Learning questionnaires.</td>
<td>(n=56)</td>
<td>Nursing students from two private universities in Lebanon.</td>
<td>To examine the impact of using high-fidelity simulation on the development of clinical judgment and motivation among Lebanese nursing students.</td>
<td>Descriptive Statistics per Group.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Method</td>
<td>Sample size</td>
<td>Participants</td>
<td>Aim</td>
<td>Data Analysis and limitations.</td>
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<tr>
<td>Aqel &amp; Ahmad (2014)</td>
<td>High-Fidelity Simulation Effects on CPR Knowledge, Skills, Acquisition, and Retention in Nursing Students.</td>
<td>Jorden</td>
<td>A post-test, quasi-experimental design.</td>
<td>90.</td>
<td>Female more than male</td>
<td>To examine the effect of using high-fidelity simulators on knowledge and skills acquisition and retention with university students. Data coding and analyses were carried out using the Statistical Package for Social Sciences for Windows (IBM Corporation, 2012). The researchers used descriptive statistics (mean, median, standard deviation, percentage, and frequency).</td>
<td></td>
</tr>
<tr>
<td>Shinnick &amp; Woo (2013)</td>
<td>The effect of human patient simulation on critical thinking and its predictors in prelicensure nursing students.</td>
<td>USA</td>
<td>Randomized two-arm trial using two different educational approaches</td>
<td>(n=154)</td>
<td>Prelicensure nursing students (age 25.7±6.7; gender=87.7% female) from 3 schools were studied at the same point in their curriculum using a high-fidelity simulation.</td>
<td>Studied knowledge and critical thinking before and after HPS in prelicensure nursing students and attempted to identify the predictors of higher critical thinking scores.</td>
<td>Statistical analysis was done using paired t-tests for the pre- and post-test Knowledge and HSRT scores.</td>
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Appendix 3: A Summary of the Characteristics of Mixed Methods Studies Selected for the Review

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Country</th>
<th>Methods</th>
<th>Sample size</th>
<th>Participants</th>
<th>Aim</th>
<th>Data analysis and limitations.</th>
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<tbody>
<tr>
<td>Carrero-Planells et al., (2021)</td>
<td>Students and teachers' satisfaction and perspectives on high-fidelity simulation for learning fundamental nursing procedures: A mixed-method study</td>
<td>Spain</td>
<td>A mixed-method study. Using simulation scale, including an open-ended question for students, was used. A focus group session was also held with teachers.</td>
<td>(n=91)</td>
<td>Second-year nursing students and staff teaching practical classes on basic patient assessment and monitoring of vital signs. The teacher who had experiences in the HFS and the clinical (Two women and one man).</td>
<td>To assess the implementation of high-fidelity simulation as a teaching tool for fundamental nursing procedures from the perspectives of students and teachers.</td>
<td>A cross-sectional, descriptive study. For the qualitative phase (An inductive/ deductive content analysis.).</td>
</tr>
<tr>
<td>Li et al., (2020)</td>
<td>The Learning Effectiveness of High-Fidelity Simulation Teaching Among Chinese Nursing Students: A Mixed-</td>
<td>China</td>
<td>Convergent parallel mixed-methods research.</td>
<td>(n=533)</td>
<td>Third-year under-graduate nursing students completed the Simulation Learning Effectiveness Inventory. Semi structured interviews were</td>
<td>To examine the learning effectiveness score in HFS, its influencing factors, and the learning experience of nursing students.</td>
<td>SPSS 16.0 software was used to analyse the quantitative data. The qualitative data were entered into ATLAS.ti software for content analysis.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Methods</td>
<td>Sample size</td>
<td>Participants</td>
<td>Aim</td>
<td>Data analysis and limitations.</td>
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<tr>
<td>Al-Ghareeb et al., (2019).</td>
<td>The influence of anxiety on student nurse performance in a simulated clinical setting.</td>
<td>Australia</td>
<td>Mixed methods design.</td>
<td>(n=33).</td>
<td>Second- and third-year undergraduate nursing students attended a two-hour simulation session and completed a demographic questionnaire plus pre-simulation self-reported psychological anxiety scale.</td>
<td>To investigate physiological and psychological anxiety during emergency scenarios in high-fidelity simulation and understand the effect of anxiety on clinical performance.</td>
<td>Data from HRV records were entered into Kubios™ software. Raw data was inspected for any artefacts.</td>
</tr>
<tr>
<td>Brien et al., (2017).</td>
<td>Nursing Students’ Perceptions of the Contribution of High-Fidelity Simulation and Clinical Placement in Canada</td>
<td></td>
<td>Questionnaires were completed (n=314), and focus groups were held (n=23).</td>
<td>(n= 314)</td>
<td>A total of 314 students (70% response rate) answered the two questions, and 23 students participated in the focus groups.</td>
<td>To compare undergraduate nursing students’ perceptions of learning in HFS and clinical placement during a critical care course.</td>
<td>A partial verbatim of the focus groups was transcribed in QDA- Miner for coding as well, and a content analysis.</td>
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<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country/Methods</td>
<td>Sample size</td>
<td>Participants</td>
<td>Aim</td>
<td>Data analysis and limitations.</td>
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<tr>
<td>Suk Jeong et al., (2015)</td>
<td>First experiences of high-fidelity simulation training in junior nursing students in Korea.</td>
<td>Korea</td>
<td>Using both qualitative and quantitative methods, data were collected from reflective journals and questionnaires of simulation effectiveness after simulation training.</td>
<td>Junior nursing students participated in high-fidelity simulation training for the first time.</td>
<td>To explore first experiences of high-fidelity simulation training in Korean nursing students, in order to develop and establish more effective guidelines for future simulation training in Korea.</td>
<td>Descriptive statistics were used to analyse simulation effectiveness and content analysis was performed with the reflective journal data.</td>
<td></td>
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<tr>
<td>Davis et al., (2014)</td>
<td>Nursing faculty use of high-fidelity human patient simulation in undergraduate nursing education: A mixed-methods study.</td>
<td>USA</td>
<td>Convergent, parallel mixed-methods study.</td>
<td>Undergraduate faculty use of HFHPS.</td>
<td>To interplay among faculty and teacher factors, student factors, and educational practices influences the outcomes of the HFHPS experience, including its use</td>
<td>Quantitative data were imported into the SPSS software, Qualitative Descriptive coding was used to analyse the basic topics within the narratives.</td>
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<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Methods</td>
<td>Sample size</td>
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<td>and faculty satisfaction.</td>
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Appendix 4: A Summary of the Characteristics of Qualitative Studies Selected for the Review

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Country</th>
<th>Methods</th>
<th>Sample size</th>
<th>Participants</th>
<th>Aim</th>
<th>Data Analysis</th>
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</thead>
<tbody>
<tr>
<td>Jeffers et al., (2022)</td>
<td>Nursing Student Perceptions of End-of-Life Communication Competence</td>
<td>United States of America</td>
<td>Qualitative Descriptive Study Using semi-structured interview.</td>
<td>(n=117)</td>
<td>All students were enrolled in a senior-level medical-surgical nursing course.</td>
<td>To explore nursing students' perceptions of their verbal and nonverbal communication competence when providing end-of-life care.</td>
<td>Colaizzi's method guided thematic analysis.</td>
</tr>
<tr>
<td>Watson et al., (2021)</td>
<td>Nursing students first experience on high fidelity simulation: A phenomenological research study</td>
<td>Spain</td>
<td>Qualitative descriptive phenomenological approach, semi-structured, qualitative one-on-one interviews.</td>
<td>(n=16)</td>
<td>Second-year undergraduate nursing students who had completed a scheduled HFS</td>
<td>To explore the perceptions of nursing students towards their first experience with high-fidelity</td>
<td>Colaizzi’s phenomenological method.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Methods</td>
<td>Sample size</td>
<td>Participants</td>
<td>Aim</td>
<td>Data Analysis</td>
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<tr>
<td>Zhang et al., (2019).</td>
<td>Prelicensure nursing students' perspectives on video-assisted debriefing following high fidelity simulation: A qualitative study.</td>
<td>Singapore</td>
<td>Exploratory qualitative approach using focus group</td>
<td>(n=27)</td>
<td>Prelicensure nursing students.</td>
<td>To explore prelicensure nursing students' experiences and perspectives on video-assisted debriefing following a high-fidelity simulation.</td>
<td>Thematic analysis.</td>
</tr>
<tr>
<td>Au et al., (2016).</td>
<td>Nursing students' perception of high-fidelity simulation activity instead of clinical placement: A qualitative study.</td>
<td>Macau</td>
<td>Qualitative study using open-ended questionnaire.</td>
<td>(n=80)</td>
<td>Undergraduate nursing students who participated in the clinical study course. 'Female more than male).</td>
<td>To explore undergraduate nursing students' perception of using high-fidelity simulation as part of their clinical study course in Macau.</td>
<td>Qualitative content analysis.</td>
</tr>
<tr>
<td>Najjar et al., (2015).</td>
<td>Nursing students' experiences with high-fidelity simulation.</td>
<td>USA</td>
<td>Grounded theory study using focus group interviews.</td>
<td>(n=3 focus group)</td>
<td>Students enrolled in a baccalaureate nursing</td>
<td>To describe the experience of nursing students in high-fidelity simulation.</td>
<td>Transcribed verbatim. Each investigator independently engaged in open</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Country</td>
<td>Methods</td>
<td>Sample size</td>
<td>Participants</td>
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<tr>
<td>Dean et al., (2015)</td>
<td>Practising on plastic people: Can I really care?</td>
<td>Australia</td>
<td>An exploratory case-study method using focus groups.</td>
<td>(n=8)</td>
<td>Third-year undergraduate nursing students.</td>
<td>Evaluated the experiences of undergraduate student nurses with high fidelity Human Patient Simulation Mannequins (HPSMs) and their perceptions of empathy.</td>
<td>Transcribed verbatim. Students have been assigned pseudonyms to protect their privacy.</td>
</tr>
<tr>
<td>Badir et al., (2015).</td>
<td>Using high-fidelity simulation as a learning strategy in an undergraduate intensive care course.</td>
<td>Turkey</td>
<td>This case study used focus groups and semi structured interview.</td>
<td>(n=36)</td>
<td>Senior nursing students taking the intensive care course in the 2014 academic year participated in the study. (Female more than male)</td>
<td>To understand students’ perceptions of the use of high-fidelity simulation as a learning strategy in an undergraduate intensive care course.</td>
<td>Data analysis followed the coding process suggested by Corbin and Strauss.</td>
</tr>
</tbody>
</table>
Appendix 5: An Example of Moulage Applied on Mannequin

This figure was taken from (Hull University Teaching Hospitals NHS Trust (2017)).
Appendix 6: Approval from SHSS

Ref: NURS045

Sahar Alshahrani
PhD Researcher
University of Edinburgh
Medical School
Teviot Place
Edinburgh
EH8 9AG

05/02/2020

Dear Sahar,

APPLICATION FOR LEVEL 2 APPROVAL

PROJECT TITLE: NURSE EDUCATORS’ AND STUDENTS’ EXPERIENCES OF THE INTEGRATION COMPLEX SCENARIO-BASED, HIGH-FIDELITY SIMULATIONS WITHIN THE 3RD AND 4TH YEARS OF THE UNDERGRADUATE NURSING CURRICULUM IN SAUDI ARABIA.

Thank you for submitting the above research project for review by the Section of Nursing Studies Ethics Research Panel.

I can confirm that the submission has been independently reviewed and was approved on 27 January 2020.

Should there be any change to the research protocol, it is important that you alert us to this as this may necessitate further review.

Yours sincerely

Dr Steph Grohmann
Leverhulme Early Career Fellow
Nursing Studies

The University of Edinburgh is a charitable body, registered in Scotland, with registration number SC005336
Appendix 7: Approval Letter from the Setting

Kingdom of Saudi Arabia
Ministry of Education
Anonymized University
Graduate Studies and Scientific Research Vice- Rectorate

IRB Registration Number with KACST, KSA: H-01-R-059

April 13, 2020
IRB Log Number: 20-0141
Project Title: Nurse Educators' and Students' Experiences of the Integration Complex Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia
Category of Approval: EXEMPT

Dear Sahar Rafdan Alshahrani,

Thank you for submitting your proposal to the anonymized Institutional Review Board. Your proposal was evaluated considering the national regulations that govern the protection of human subjects. The IRB has determined that your proposed project poses no more than minimal risk to the participants. Therefore, your proposal has been deemed EXEMPT from IRB review. Please note that this approval is from the research ethics perspective only. You will still need to get permission from the head of the department in anonymized or an external institution to commence data collection.

Please note that the research must be conducted according to the proposal submitted to the anonymized IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit a Request for Modification form to the IRB. Please be aware that changes to the research protocol may prevent the research from qualifying for exempt review and require submission of a new IRB application or other materials to the anonymized IRB. In addition, if an unexpected situation or adverse event happens during your investigation, please notify the anonymized IRB as soon as possible. If notified, we will ask for a complete explanation of the event and your response.

Please be advised that regulations require that you submit a progress report on your research every 6 months. Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. You are also required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

For statistical services you are advised to contact the Data Clinic at the Health Sciences Research Center (Anonymized details) or the Scientific Research Center at the Deanship of Scientific Research (Anonymized details).

We wish you well as you proceed with the study. Should you have additional questions or require clarification of the contents of this letter, please contact me.

Sincerely Yours,
(Anonymized details) | Institutional Chairman, Institutional Review Board | Review Board (IRB)
Appendix 8: Consent Form for Nurse Educators

Consent Form for the Nurse Educators.

Study title: Nurse Educators’ and Students’ Experiences of the Integration of Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia.

1. I confirm that I have read and understood the Participant Information Sheet for the above study.

2. I have been given the opportunity to consider the information provided, ask questions and have had these questions answered to my satisfaction.

3. I understand that my participation is voluntary and that I can ask to withdraw at any time without giving a reason and without my medical care or legal rights being affected. (Participant Number*: ………)

4. I understand that my anonymised data will be stored for a minimum of 5 years and may be used in future ethically approved research.

5. I agree to take part in this study.

Name of person giving consent (Contact details) Date Signature

Name of person taking consent Date Signature

* The number you will provide it to the researcher in case if you like to withdraw from the study.
Appendix 9: Consent Form for Nursing Students

Consent Form for the Nursing Students.

Study title: Nurse Educators’ and Students’ Experiences of the Integration of Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia.

1. I confirm that I have read and understood the Participant Information Sheet for the above study.

2. I have been given the opportunity to consider the information provided, ask questions and have had these questions answered to my satisfaction.

3. I understand that my participation is voluntary and that I can ask to withdraw at any time without giving a reason and without my medical care or legal rights being affected. (Participant Number*: ........)

4. I understand that my anonymised data will be stored for a minimum of 5 years and may be used in future ethically approved research.

5. I agree to take part in this study.

Name of person giving consent (Contact details) | Date | Signature

________________________  ___________  ______________

Name of person taking consent  Date  Signature

________________________  ___________  ______________

* The number you will provide it to the researcher in case if you like to withdraw from the study.
Appendix 10: Information Sheet for Nurse Educators

Information Sheet for Nurse Educators.

You are being invited to take part in a research study on Nurse Educators’ and Students’ Experiences with Integrating Complex Scenario-Based, High-Fidelity Simulations in the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia. High-Fidelity Simulation (HFS) is used in relation to a wide range of full-body mannequins that are able to imitate functions of the human body to a very realistic degree. Sahar Alshahran is a PhD candidate in Nursing Studies in the School of Health in Social Science at The University of Edinburgh and is leading this research. Before you decide to take part, it is important you understand why the research is being conducted and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study?

The purpose of the study is to understand the nurse educators’ and the students’ experiences and perceptions of integrating complex scenario based HFS in the undergraduate nursing curriculum (Third and Fourth/Final years) in the Saudi Arabian context.

Why have I been invited to take part?

You are invited to participate in this study because you are one of the educators in nursing involved in the teaching of complex scenarios based-HFS in the 3rd and 4th year undergraduate nursing curriculum.

Do I have to take part?

No – it is entirely up to you. If you do decide to take part, please keep this Information Sheet and complete the Informed Consent Form to show that you understand your rights in relation to the research, and that you are happy to participate. If you do decide to take part, you are still free to withdraw at any time and without giving a reason. Please note down your participant number (which is on the Consent Form) and provide this to the lead researcher (Sahar Alshahran) if you seek to withdraw from the study at a later date. Deciding not to take part or withdrawing from the study will not affect your employment status or education status.

What will happen if I decide to take part?

As a nurse educator, you will take part in an interview that will involve being asked about your teaching experiences of integrating complex scenarios based on HFS in your course. The interview will take place in a safe environment at a time that is convenient to you. Ideally, we would like to audio record your responses (and will require your consent for this), so the location should be in a fairly quiet area. The interview should take around 45 minutes to complete.
What are the possible benefits of taking part?

By sharing your experiences with us, you will be helping the researcher and the University to provide nursing educators and students with the valuable knowledge necessary to improve their skills pertinent to their use of scenario based HFS laboratories in Saudi universities’ nursing curricula.

Are there any risks associated with taking part?

There are no significant risks associated with participation.

What if I want to withdraw from the study?

Agreeing to participate in this project does not oblige you to remain in the study nor have any further obligation to this study. If, at any stage, you no longer want to be part of the study, please inform the lead of project Sahar Alshahrani’s email: S.R.S.Alshahrani@sms.ed.ac.uk or contact me on (0500992428).
You should note that your data may be used in the production of formal research outputs (e.g. journal articles, conference papers, theses and reports) prior to your withdrawal and so you are advised to contact the research team at the earliest opportunity should you wish to withdraw from the study. On specific request we will destroy all your identifiable answers, but we will need to use the data collected prior to your withdrawal, and to maintain our records of your consenting participation.

Data protection and confidentiality.

Your data will be processed in accordance with Data Protection Law. All information collected about you will be kept strictly confidential. Unless they are anonymised in our records, your data will be referred to by a unique participant code rather than by name. If you consent to being audio recorded, all recordings will be destroyed once they have been transcribed. Your data will only be viewed by the researcher/research team. All electronic data will be stored on a password-protected computer file and all paper records will be stored in encrypted file after scanning. Your consent information will be kept separately from your responses in order to minimise risk.

What will happen with the results of this study?

The results of this study may be summarised in published articles, reports and presentations. Quotes or key findings will always be made anonymous in any formal outputs unless we have your prior and explicit written permission to attribute them to you by name.

Who can I contact?

If you have any further questions about the study, please contact the lead researcher, or if you want to take part in the study at:

Sahar Alshahrani.
Email: S.R.S.Alshahrani@sms.ed.ac.uk
Mobile phone: +966 500992428 (Saudi), Or +44 7427633444 (United Kingdom).
If you wish to make a complaint about the study, please contact:

Prof. Ruth Jepson  
Director of Research, School of Health and Social Sciences, University of Edinburgh.  
ruth.jepson@ed.ac.uk

Dr. Steph Grohmann  
Ethics and Integrity Lead in Nursing Studies, School of Health and Social Sciences,  
University of Edinburgh.  
steph.grohmann@ed.ac.uk

For general information about how we use your data go to:

https://www.ed.ac.uk/records-management/privacy-notice-research
Appendix 11: Information Sheet for Nursing Students

Information Sheet for Nursing Students.

You are being invited to take part in a research study on Nurse Educators’ and Students’ Experiences with Integrating Complex Scenario-Based, High-Fidelity Simulations in the 3rd and 4th Years of Undergraduate Nursing Curriculum in Saudi Arabia. High-Fidelity Simulation (HFS) is used in relation to a wide range of full-body mannequins that are able to imitate functions of the human body to a very realistic degree. Sahar Alshahrani who is a PhD candidate in Nursing Studies in the School of Health in Social Science at The University of Edinburgh is leading this research. Before you decide to take part, it is important you understand why the research is being conducted and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study?

The purpose of the study is to understand the nurse educators’ and the students’ experiences and perceptions of integrating complex scenario-based HFS in the undergraduate nursing curriculum (Third and Fourth/Final years) in the Saudi Arabian context.

Why have I been invited to take part?

You are invited to participate in this study because you are one of the nursing students in either the 3rd or 4th year who has a learning experience in complex scenarios based- HFS in undergraduate nursing curriculum.

Do I have to take part?

No – it is entirely up to you. If you do decide to take part, please keep this Information Sheet and complete the Informed Consent Form to show that you understand your rights in relation to the research, and that you are happy to participate. If you do decide to take part, you are still free to withdraw at any time and without giving a reason. Please note down your participant number (which is on the Consent Form) and provide this to the lead researcher (Sahar Alshahrani) if you seek to withdraw from the study at a later date. Deciding not to take part or withdrawing from the study will not affect your academic status or education status.

What will happen if I decide to take part?

As a nursing student, you will take part in an interview that will involve being asked about your learning experiences of integrating complex scenarios based on HFS in your course. The interview will take place in a safe environment at a time that is convenient to you. Ideally, we would like to audio record your responses (and will require your consent for this), so the
location should be in a fairly quiet area. The interview should take around 45 minutes to complete.

**What are the possible benefits of taking part?**

By sharing your experiences with us, you will be helping the researcher and the University to provide nursing educators and students with the valuable knowledge necessary to improve their skills pertinent to their use of scenario based HFS labs in Saudi universities' nursing curricula.

**Are there any risks associated with taking part?**

There are no significant risks associated with participation.

**What if I want to withdraw from the study?**

Agreeing to participate in this project does not oblige you to remain in the study nor have any further obligation to this study. If, at any stage, you no longer want to be part of the study, please inform the lead of project Sahar Alshahrani's email: S.R.S.Alshahrani@sms.ed.ac.uk or contact me on (0500992428).

You should note that your data may be used in the production of formal research outputs (e.g. journal articles, conference papers, theses and reports) prior to your withdrawal and so you are advised to contact the research team at the earliest opportunity should you wish to withdraw from the study. On specific request we will destroy all your identifiable answers, but we will need to use the data collected prior to your withdrawal, and to maintain our records of your consenting participation.

**Data protection and confidentiality.**

Your data will be processed in accordance with Data Protection Law. All information collected about you will be kept strictly confidential. Unless they are anonymised in our records, your data will be referred to by a unique participant code rather than by name. If you consent to being audio recorded, all recordings will be destroyed once they have been transcribed. Your data will only be viewed by the researcher/research team. All electronic data will be stored on a password-protected computer file and all paper records will be stored in encrypted file after scanning. Your consent information will be kept separately from your responses in order to minimise risk.

**What will happen with the results of this study?**

The results of this study may be summarised in published articles, reports and presentations. Quotes or key findings will always be made anonymous in any formal outputs unless we have your prior and explicit written permission to attribute them to you by name.

**Who can I contact?**

If you have any further questions about the study, please contact the lead researcher, or if you want to take part in the study at:
Sabar Alshahrani.
Email: S.R.S.Alshahrani@sms.ed.ac.uk
Mobile phone: +966 50992428 (Saudi), Or +44 7427633444 (United Kingdom).

If you wish to make a complaint about the study, please contact:

Prof. Ruth Jepson
Director of Research, School of Health and Social Sciences, University of Edinburgh.
ruth.jepson@ed.ac.uk

Dr. Steph Grohmann
Ethics and Integrity Lead in Nursing Studies, School of Health and Social Sciences,
University of Edinburgh.
steph.grohmann@ed.ac.uk

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https://www.ed.ac.uk/records-management/privacy-notice-research
Appendix 12: Demographic Information for Nurse Educators

Nurse Educators’ and Students’ Experiences of the Integration Complex
Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the
Undergraduate Nursing Curriculum in Saudi Arabia.

**Demographic Information for Female Nurse Educators.**

<table>
<thead>
<tr>
<th>Participant Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Only researcher will use).</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Age:</th>
<th></th>
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</table>

<table>
<thead>
<tr>
<th>Nationality:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(You will determine your region(s) instead of your nationality for confidentiality reasons) (Optional).</td>
<td></td>
</tr>
<tr>
<td>□ African regions (AFRO)</td>
<td></td>
</tr>
<tr>
<td>□ Regions of the Americas (PAHO)</td>
<td></td>
</tr>
<tr>
<td>□ Southeast Asia regions (SEARO)</td>
<td></td>
</tr>
<tr>
<td>□ European regions (EURO)</td>
<td></td>
</tr>
<tr>
<td>□ Western Mediterranean regions (EMRO)</td>
<td></td>
</tr>
<tr>
<td>□ Western Pacific regions (WPRO)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Qualifications:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Master’s degree or equivalent</td>
<td></td>
</tr>
<tr>
<td>□ Doctoral degree</td>
<td></td>
</tr>
<tr>
<td>□ Other ………………………..</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job title:</th>
<th></th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Academic department:</th>
<th></th>
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<table>
<thead>
<tr>
<th>Course:</th>
<th></th>
</tr>
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<table>
<thead>
<tr>
<th>Preferred language for interview:</th>
<th></th>
</tr>
</thead>
</table>
How many years have you been working as an educator in nursing?
........................................................................................................................................

What is the nature of your role as an educator in nursing?
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

Number of years experience in teaching complex scenarios-based high-fidelity simulation in the Saudi context:
........................................................................................................................................

The following section to be completed if participant is an international educator:

Other than Saudi what other countries have you worked as an educator in Nursing?
........................................................................................................................................
........................................................................................................................................

How many years have you worked in each country? (you have mentioned above)
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

Language:

(Mother tongue).
Appendix 13: Demographic Information for Nursing Students in English

Nurse Educators’ and Students’ Experiences of the Integration Complex Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia.

**Demographic Information for Female Nursing Students.** *

<table>
<thead>
<tr>
<th>Participant Name: *¹</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Only researcher will use).</td>
<td></td>
</tr>
<tr>
<td>Age:</td>
<td></td>
</tr>
<tr>
<td>Name of course:</td>
<td></td>
</tr>
<tr>
<td>Name of educator:</td>
<td></td>
</tr>
<tr>
<td>(optional)</td>
<td></td>
</tr>
<tr>
<td>What is your level in the nursing program?</td>
<td></td>
</tr>
<tr>
<td>☐ Third year.</td>
<td></td>
</tr>
<tr>
<td>☐ Fourth year.</td>
<td></td>
</tr>
<tr>
<td>Do you have any existing nursing qualifications?</td>
<td></td>
</tr>
<tr>
<td>☐ Yes.</td>
<td></td>
</tr>
<tr>
<td>☐ No.</td>
<td></td>
</tr>
<tr>
<td>If yes, what is it? …………………………</td>
<td></td>
</tr>
<tr>
<td>In total, how many sessions of HFS learning have you attended?</td>
<td></td>
</tr>
<tr>
<td>Preferred language for Interview:</td>
<td></td>
</tr>
</tbody>
</table>

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¹ The code will be in separate sheet
Appendix 14: Interview Guide for the Nurse Educators in English

Nurse Educators’ and Students’ Experiences of the Integration Complex Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia.


Introduction:

- First of all, thank you for taking part in my study. I truly appreciate your time. My name is Sahar Alshahran. I am a PhD researcher in Nursing Studies at the University of Edinburgh. Presently, I am conducting a study that aims to understand nurse educators’ and students’ experiences and perceptions of the integration of complex scenario-based high-fidelity simulations (HFS) in the undergraduate nursing curriculum (third and fourth/final years) in the Saudi Arabian context.

- I would like to explain to you what HFS is?

- HFS is a term can be used for any type of simulation, including those for humans, mannequins, task trainers, and virtual realities. From that term, ‘fidelity’ is used in relation to the level of realism provided by the simulation system and, should reflect how closely the appearance and behaviour experienced inside the simulation resemble that of the actual situation being simulated (Kinney and Henderson, 2008). Furthermore, HFS is used in relation to a wide range of full-body mannequins that are able to simulate functions of the human body to a high degree (Lopreiato, 2016).

- This study will focus on complex scenarios-based HFS, which are:
  - Complex scenarios undertaken in the medical-surgical department which includes the adult care, critical and intensive care courses.
  - 3G SimMan mannequins, that focus on non-technical skills, develop critical thinking and decision making.
  - No standardized patients (SPs) are included.

- I will be providing a written definition of HFS and the scenarios for recall during interviews.

---

1 Note: questions in this guide might change based on the educators’ responses.
• I will explain to the participants the interviews will ask many open-end questions, for which there are no right or wrong answers, just state what they think, not what they believe I want to hear. In addition, I will let them know that if something is unclear, they can let me know, and I will explain further. Again, I will reassure them which no one will be identified by name and their participation is voluntary. Also, so I will not do miss any part of their response, I will record the conversations. At the end of introduction, I will be mentioned that “feel free to let me know if you have any concerns about this”. Finally, I will ask the participants if are they ready?

The interview guide questions: *2

1. Describe to me what is the most favourite part of the teaching in the simulation?
2. Can you describe to me your experience within the HFS as a teaching strategy?
3. Tell me about your role as a nurse educator in the HFS simulation lab?
4. Tell me about the course where you use complex scenarios based HFS as a teaching strategy?
5. Can you explain in further what kind of complex scenarios have you used/do you use in your current course?
6. Share with me how do you manage the simulation tool during scenarios to fit with different student’s learning styles? Is this easy to do? Is it challenging? What makes this work?
7. Can you describe to me the best teaching strategy (Methods) you think is most effective to integrate the complex scenarios-based HFS? Why is it important?
8. What the best method you have used do think is most effective?
9. Can you tell me more about are the students’ learning outcomes that you think they achieve them at the end of the complex scenarios-based HFS experiences?
10. What are/have been the challenges that you have faced (if any) through running complex scenarios-based HFS?
11. What are/have been the facilitators to optimise the student learning process during HFS?

---

*I have modified them based on my supervisors’ feedback and I have tested out with 1 of my colleagues.

10.1.2020/ Version no.3
12. Tell me about the kinds of professional development you perceive would help support you to use complex scenario-based HFS more effectively?

13. Can you share with me what are your own perceptions of how helpful you are in creating an effective teaching experience for the nursing students in the HFS environment?

Concluding Questions:

14. Please share any additional experiences that might be beneficial for other nurse educators.

14. Is there anything else you would like to add or tell me about that you feel is relevant and we have not covered in the interview?

The Probes: *3

- When/where that happens?
- Can you share with me?
- Can you explain/tell me more about that?
- What do you mean by?
- You said the session is “...” What do you mean by “......”?
- Why exactly do you feel/think in that way?
- Why is it important?

*3 I will use them along with initial questions to probe the interviewee and get more details.
Appendix 15: Interview Guide for the Nursing Students in English

Nurse Educators’ and Students’ Experiences of the Integration Complex
Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the
Undergraduate Nursing Curriculum in Saudi Arabia.

Semi-Structured Interview Guide for Nursing Students. ¹ ²

Introduction:

• First of all, thank you for taking part in my study. I truly appreciate your time. My name is Sahar Alshahbani. I am a PhD researcher in Nursing Studies at the University of Edinburgh. Presently, I am conducting a study that aims to understand nurse educators’ and students’ experiences and perceptions of the integration of complex scenario-based high-fidelity simulations (HFS) in the undergraduate nursing curriculum (third and fourth/final years) in the Saudi Arabian context.

• I would like to explain to you what HFS is?

• HFS is a term can be used for any type of simulation, including those for humans, mannequins, task trainers, and virtual realities. From that term, ‘fidelity’ is used in relation to the level of realism provided by the simulation system and, should reflect how closely the appearance and behaviour experienced inside the simulation resemble that of the actual situation being simulated (Kimney and Henderson, 2008). Furthermore, HFS is used in relation to a wide range of full-body mannequins that are able to simulate functions of the human body to a high degree (Lorelato, 2016).

• This study will focus on complex scenarios-based HFS, which are:
  ▪ Complex scenarios undertaken in the medical-surgical department which includes the adult care, critical and intensive care courses.
  ▪ 3G SimMan mannequins, that focus on non-technical skills, develop critical thinking and decisions making.
  ▪ No standardized patients (SPs) are included.

• I will be providing a written definition of HFS and the scenarios for recall during interviews.

¹ Note: questions in this guide might change based on the students’ responses.
² The Arabic version is available when the student request interviewing in Arabic.
• I will explain to the participants the interviews will ask many open-end questions which there are no right or wrong answers, just state what they think, not what they believe I want to hear. In addition, I will let them know that if something is unclear, they can let me know, and I will explain further. Again, I will reassure them which no one will be identified by name, especially to their educators and their participation is voluntary. Also, so I will not do miss any part of their response, I will record the conversations. At the end of introduction, I will be mentioned that “feel free to let me know if you have any concerns about this”. Finally, I will ask the participants if are they ready?

The interview guide questions: *

1. Can you told me about what do you enjoy about the learning in the simulation?
2. How do describe the HFS to someone who never done HFS learning before?
3. Can you share with me what were you feeling when you began?
4. Tell me more about your experience of undertaken courses that involved complex scenarios-based HFS?
5. Can you tell me a little bit about what do you think you have learned? Why do you think this is the case?
6. Tell me more about how did you like to learn? Is it help you to learn and match the way of your learning style? What do you like most?
7. Looking back to your sessions, tell me about how do the HFS makes you feel now? Why exactly do you feel in that way?
8. Can you share with me how the learning outcomes of the complex scenarios-based HFS are relevant to your previous learning?
9. Can you please explain what challenges you have faced (if any) during your learning in complex scenario-based HFS sessions?
10. Share with me what were the strategies you found helpful to learn during complex scenario-based HFS sessions?

* I have modified them based on my supervisors’ feedback and I have tested out with 2 of my colleagues.
11. Can you share with me what do you think you might take away from your complex scenario-based HFS sessions?

12. Tell me about what you feel when you complete many sessions?

Concluding Questions:

13. Please share any additional experiences that might be beneficial for other nursing students.

14. Is there anything else you would like to add or tell me about that you feel is relevant and that we have not covered in the interview?

The Probes: *4

- Can you explain/ tell me more about that?
- What do you mean by?
- Why exactly do you feel in that way? Can you tell me a bit more about the reasons behind feeling in this way?
- You said the session is “...” What do you mean by “......”?
- Can you please explain it further?
- When/where did this happen

---

*I will use them along with initial questions to probe the interviewee and get more details.*
Appendix 16: Recruitment Email for the Nurse Educators

Nurse Educators’ and Students’ Experiences of the Integration of Complex Scenario-Based, High-Fidelity Simulations within the 3rd and 4th Years of the Undergraduate Nursing Curriculum in Saudi Arabia.

Recruitment Email for the Nurse Educators.

Dear Potential Participant,

My name is Sahar Alshahrani, and I am studying for a PhD in Nursing Studies in the School of Health in Social Science at The University of Edinburgh. I am carrying out a research study that focuses on nursing simulation in Saudi Arabia. The study’s aim is to understand nurse educators’ and the students’ experiences and perceptions of integration of complex scenario-based high-fidelity simulations (HFS) in the undergraduate nursing curricula (Third and Fourth/final years) in the Saudi Arabian context. I am therefore inviting nurse educators and students to participate in this study.

If you speak fluent English or Arabic, have at least one-year’s experience as a nurse educator in the Saudi context, have in full master’s degree qualification or above (lecturer or above), and have had involvement in the complex scenarios-based HFS teaching for 3rd or 4th year, you are eligible to participate.

If you are interested in participating in this project, it will involve an interview on your teaching experiences of integrating complex scenarios-based HFS as teaching pedagogy. The interview will last approximately 45 minutes.

If you are interested in participating, or if you would like additional information to assist you in reaching a decision about participation, please email me at: S.R.S.Alshahrani@sms.ed.ac.uk by 13th of Sep 2020.

If you have any questions or concerns about the research, please feel free to contact me at + 966 50092428 (Saudi), or +44 7427634444 (United Kingdom). Or Prof. Ruth Jepson (Director of Research, School of Health and Social Sciences, University of Edinburgh) at ruth.jepson@ed.ac.uk.
I would be very grateful if you would be willing to take part in my study.

Sincerely,
Sahar Alishahrami.
PhD student in Nursing Studies.
School of Health in Social Science.
The University of Edinburgh.
Appendix 17: Flyer for the Nursing Students

“Your Experiences are Important for us”

My name is Sahar Alshahrani, and I am studying for a PhD in Nursing Studies in the School of Health in Social Science at The University of Edinburgh. I am carrying out a research study that focuses on nursing simulation in Saudi Arabia.

The study’s aim is to understand nurse educators’ and the students’ experiences and perceptions of integration of complex scenario-based high-fidelity simulations (HFS) in the undergraduate nursing curriculum (Third and Fourth/Final years) in the Saudi Arabian context.

If you are: undergraduate Saudi nursing student in the 3rd or 4th year who have a learning experience with complex scenario-based HFS; at least 3 Sessions; speak English or Arabic, you are eligible to participate.

Do not worry

• Your participation is voluntary, and you can withdraw from study at any time.
• No one will know your personal information except the researcher.

I would be very grateful if you would be willing to take part in my study.

If you are interested in participating, please email me at: S.R.S.Alshahrani@sms.ed.ac.uk or call me on + 966 500992428 by 13th of March 2020.

If you have any questions or concerns about the research, please feel free to contact: Dr. Steph Grohmann (Ethics and Integrity Lead in Nursing Studies) at: steph.grohmann@ed.ac.uk
Appendix 18: A Sample of Transcript

**N.E.2:** I did not hear you.

**Interviewer:** Hello, hello. Do you hear me?

[Silence]

**N.E.2:** [the poor connection/hard to hear] Yes, as I am telling you, we explain and then observe and then give them our feedback.

**Interviewer:** Okay, can tell me about the course where you use complex scenarios based on high fidelity simulations as a teaching strategy.

**N.E.2:** Can you repeat *[crosstalk]*.

**Interviewer:** So now you are giving and teach Adult 1 or 2, right?

**N.E.2:** Adults 1 and 2. Both of them.

**Interviewer:** Okay, tell me about the course where you use complex scenarios generally, and what are complex scenarios do you use and how you run them.

**N.E.2:** Well. We use specific scenarios of things the students usually encounter in hospitals so that we get to assess their skills, this is the way that our course coordinators use in our college. We apply most of scenarios that students cannot see in the hospital. So, we have learning outcomes that by the end of the course the students meet them. For example, adult 1 is classified into post-operative and pre-operative, can you hear me Sahar?

**Interviewer:** Yes, I can hear you, can you hear me?

**N.E.2:** Yes, in regard to Adults 2, we have stroke which they don't usually see...

**Interviewer:** Hello...the line is breaking.

**N.E.2:** I have a problem with my internet connection.

**Interviewer:** Do you want to go back to a normal phone call? I don't know what to do. Hello?

[The call disconnected again/then reconnected].

**N.E.2:** They don't see it in the hospital, so we provide it in the complex. In Adult 2, we have strokes and burns. In Adult 1 we have post-operative and pre-operative care and care during the procedure. We also have the same thing in the psychiatric department.
Appendix 19: A Sample of Initial Coding

**Initial Coding of Transcript N.S.4.**

20 years old, third year, attended eight scenarios of complex scenario based HFS in Adult 1, Adult 2, Maternity, Paediatric and Health Assessment courses.

<table>
<thead>
<tr>
<th>Narrative Data</th>
<th>Initial code</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: First question, can you tell me what you enjoy during learning through simulation in general?</td>
<td>Unique and exciting experience.</td>
</tr>
<tr>
<td><strong>N.S.4:</strong> Following the labs and assessment and fundamentals courses, the simulation was a very unique and exciting experience. It was also a new experience, especially if you didn't try the clinical practice. I, for example, was one of the people who had my simulation after trying the clinical training once, so I didn't get the chance to encounter many cases. It was a very nice experience because the models and mannequins we work with are like nothing we have seen before, not even during the skill labs. They could breathe, talk, and they even had their body temperature which made it a really enjoyable experience. What made it enjoyable for me is that it was a new experience that reflects real-life situations.</td>
<td>Preferring having simulation prior to clinical. Feeling surprising about HFS labs. Feature of mannequins. Reflecting real cases.</td>
</tr>
<tr>
<td>I: Can you tell me more about what makes it a unique experience as you said? What makes it different than the other methods and if you could give me examples as well?</td>
<td>Liking interaction of mannequin in HFS. Comparing to limited features for skills lab.</td>
</tr>
<tr>
<td><strong>N.S.4:</strong> what makes it different is that the mannequins themselves are interactive while the dolls used previously during the skill labs didn't move, you just apply what you learn on them. Like injection without getting feedback from the doll itself.</td>
<td>Making a decision based on responses. Communicating with a mannequin. Feeling boring in the skills lab. Not living a real situation.</td>
</tr>
</tbody>
</table>

N.E.4: Initial Coding

23
Appendix 20: A Sample of Using NVivo 12 for Coding

I can. So, As I am telling you I can measure only when I check their assessment sheets to make sure they understood the scenario and get the correct results. I also join them during the scenarios to make sure they have the skills and know what should be done, and then they do all the skills in my presence. For example, in the simulation itself, I measure some specific skills like hand washing and some other stuff, but I can’t measure the understanding of the students which I believe is a challenge for us in the simulation. But through my observation, I can just make sure they understand the scenario, the case, how to deal with the patient and so on. So, it isn’t something that can be calculated but rather what is important is that the student does all the required skills which is something I know the students will achieve from the beginning.
### Appendix 21: A Sample of Open Coding

#### N.E.2: Maybe for example that during the operation is not real. For example, in a case of a burn, a case I was face, they want to apply the dressing, while applying the dressing the wound vanished when they used alcohol for disinfection so we felt that the students were not convinced much and didn’t take it seriously.

**Interviewer:** Do you use moulage?

**N.E.2:** Yes, we do.

**Interviewer:** Great. What are the things that helped as facilitators / crosstalk?

**N.E.2:** The moulage for sure.

---

#### N.E.2: We as teaching staff members had cooperation courses in our simulation centre where we were taught how to build a scenario, how to write your objective, and so on so our centre prepares the staff members and trains them. So, I believe that is one of the things that helped us. Secondly, there was a program where they gathered faculty members and students from all colleges and made us build scenarios from all medical colleges and made the students apply those scenarios. For example, if the scenario was on strokes, what is the roles of the nurse in it, and what is the role of the doctor in it, and what is the role of the physical and occupational therapist in it, and what is the role of health education in it, and what is the role of psychology in it, that is a big annual program at our university, and sometimes it is held.

**N.E.2:** The importance of interprofessional programs

**Interviewer:** Yes, meant in regards to the challenges, what are the facilities that made it easier for you?

**N.E.2:** Monthly meeting for interprofessional scenarios.

---

#### The realism of scenario.

#### The realism of the wound.
Appendix 22: Initial Framework Themes

1. High Fidelity Simulation Preparation

1.1 Background for students and educators
1.2 Physical preparation
1.3 Psychological preparation
1.4 Simulation environment orientation (Environmental preparation)
1.5 Preparation for students and educators
1.6 Briefing
1.7 Social and cultural norms
1.8 Debriefing
1.9 Institutional support
1.10 Resources
1.11 Design (Curriculum)
1.12 Others

2. High Fidelity Simulation and Realism

2.1 High level of realism
2.2 The level of complexity
2.3 Absence of realism
2.4 Others

3. Learning and Teaching in High Fidelity Simulation

3.1 Learning and teaching process in HFS
3.2 Experiential learning in HFS
3.3 Teaching Strategies
3.4 Internal feedback.
3.5 Evaluations and feedback
3.7 Build trust environment
3.9 High fidelity simulation concept
3.10 Others

4. Learning and Teaching Through Interaction in HFS

4.1 Educators’ – students’ interaction.
4.2 Mannequin
4.3 Peers
4.4 Others

5. Learning Styles and High Fidelity Simulated Learning

5.1 Learning styles in HFS
5.2 Preferences learning for the students.
5.3 Others

6. Transitional Experiences in Simulated Learning

6.1 First experiences
6.2 How the experiences have change
6.3 Others

7. Facilitators in Simulated Learning

7.1 Resource
7.2 Preparation
7.3 Regular feedback
7.4 Strategies were helpful
7.5 Using Internal feedback.
7.6 Others
8. Barriers in Simulated Learning

8.1 Challenge of evaluation
8.2 language barriers
8.3 Students’ learning issues
8.4 Environmental issue
8.5 Technical issue.
8.6 Challenges of meet learning styles
8.7 Others

9. Perception about High Fidelity Simulation Experiences

9.1 Positives perception of HFS
9.2 Negative perception of HFS
9.3 Prejudice about HFS.
9.4 Comparison HFS with other teaching methods.
9.5 Others

10. The Impact of

10.1 Prepared environment
10.2 Educators’- students’ interaction
10.3 Stress on educators and students
10.4 Others

11. The Importance Element in High Fidelity Simulation

11.1 Importance of preparation
11.2 The importance of orientation
11.3 The most important components in HFS.
11.4 Importance of interaction
11.5 Importance of Gender Equality

11.6 Others

12. Outcomes of HFS

12.1 The skills improvement in short term

12.2 In near future
Appendix 23: Educational and Cultural Terminology Employed in High-Fidelity Simulation Learning in Saudi Arabia Nurse Education

This appendix serves as an introduction to three essential aspects related to the integration of HFS in nurse education in Saudi Arabia. The aim is to provide readers with a comprehensive understanding of these aspects before reading the findings and discussion chapters. The three essential aspects cover the following areas: global terminology and practices, cultural and religious practices in Saudi Arabia, and the status of educators in the nursing educational system in Saudi Arabia.

1. Global Terminology and Practices

1.1 Authenticity

According to Bland, Topping and Tobbell (2014), “the concept of authenticity is understood differently by individuals. In simulated learning, authenticity is connected to the sense of realism, and fidelity is a factor that contributes to it.” (p.1113). However, “even in a learning environment with lower fidelity, authenticity can still be present, allowing participants to experience a sense of realism despite some limitations in the simulation” (Bland, Topping and Tobbell, 2014, p.1115). However, my findings suggest this Authenticity in the HFS environment refers to creating a realistic and genuine setting that closely resembles real-life healthcare situations. It involves ensuring that the simulation scenarios, equipment, and interactions replicate actual clinical experiences as closely as possible, providing participants with a sense of immersion.

1.2 Briefing and Pre-Briefing

The process begins with a well-structured pre-briefing just before the case scenario, fostering an atmosphere of trust, respect, and integrity. Participants are introduced to the simulation environment, tools, simulator, evaluation methods, their roles, allocated time, broad objectives, patient situation, and any limitations. This step sets the foundation for the briefing, where...
participants receive critical information about the simulation scenario (Lioce et al., 2020; Watts et al., 2021).

1.3 Cognitive Orientation/Preparation

The act of providing participants with information before a simulation event, e.g. via a PowerPoint presentation. This information helps them become familiar with the simulation activity and the environment. It includes details about centre rules, timing, and how the simulation works. The main purpose of this preparation is to get the participants ready for the simulation experience (Lioce et al., 2020).

1.4 Cueing

Refers to the provision of guiding information that assists the participant in navigating through a clinical scenario to accomplish predefined objectives (Meakim et al., 2013).

1.5 Culturally Sensitive Care

To provide healthcare in a way that respects and considers the different cultural backgrounds, beliefs, and practices of patients. It is about adapting care to match each individual’s cultural needs and preferences. In Saudi Arabia, this approach is essential for nurse educators and students during High-Fidelity Simulation (HFS) scenarios, as it impacts how they learn and teach in healthcare settings while considering cultural differences (Claeys et al., 2021)

1.6 Debriefing

A post-simulation activity that involves students exploring their feelings and thoughts, reflecting on their experiences, and providing feedback to each other in a critical manner. This process is facilitated by educators (Lioce et al., 2020).
1.7 The ‘Dry Run’

The dry run is a planning meeting where standardized learners come together to identify any unintended issues or errors in the simulation scenario. It is a dedicated time to carefully explore the possibility of problems that might occur during the simulation. By finding and addressing these concerns beforehand, the dry run helps improve the overall quality and effectiveness simulation (Boillat et al., 2012).

1.8 Educational Strategies

Throughout the simulation, the facilitator adapts to the evolving needs of the participants by modifying educational strategies. Such changes can involve adjusting the sequence and timing of activities, offering feedback through cues during the session, and conducting a debrief at the end of the simulation (Jeffries, 2016).

1.9 Ethical Dilemma

An ethical dilemma arises when nursing students or healthcare professionals are faced with a complex situation involving conflicting ethical principles, values, or responsibilities. These dilemmas emerge because no clear-cut or straightforward solution fully aligns with all ethical considerations. Simulations utilized in nursing education can encompass a wide range of ethical dilemmas, encompassing scenarios related to patient autonomy, confidentiality, cultural or religious considerations, resource allocation, and conflicts of interest (Haddad and Geiger, 2018).

1.10 Evaluation Criteria

A comprehensive term for assessing or evaluating information collected through one or more metrics. It includes making judgments that incorporate both strengths and weaknesses. The evaluation measures the quality and effectiveness in relation to a performance benchmark (Hallmark et al., 2021). These criteria are used to evaluate both students and educators during the
simulation sessions, aiming to measure their proficiency, knowledge, and skills in managing complex scenarios. The evaluation criteria play a critical role in providing feedback and identifying areas of improvement for participants, ensuring that HFS is utilized effectively as a valuable learning tool in the Saudi Arabian context (Lioce et al., 2020).

1.11 Interpersonal Skills

Interpersonal skills are important skills that involve communication, leadership, teamwork, decision-making, and situation-awareness (Pires et al., 2017). They are not just about performing technical tasks and procedures, but also about enhancing how you do them. These are described as social, cognitive, and personal skills that, when developed, can allow workers in safety-critical roles to better handle a variety of situations (Pires et al., 2017).

1.12 Interprofessional

This is a modern expression that refers to a collaborative approach in healthcare involving two or more professions. In this model, members of different professions work together, learn from each other, and share knowledge to enhance health outcomes (Lioce et al., 2020).

1.13 Learning Style

Refers to how an individual shapes their cognitive capacities and influences their interactions in learning scenarios. It is important to note that nursing students exhibit a diverse range of learning styles, which can impact their responses within a simulated environment (Cassidy*, 2004).

1.14 Needs Assessment

A needs assessment evaluates individuals’ knowledge, skills, and attitudes, along with organisational programs and patient safety goals. The assessment’s outcomes inform the
development of a primary simulation goal, which guides the formation of more specific objectives (Hallmark et al., 2021).

1.15 Physical Preparation

Physical preparations involve having the right resources, facilities, and equipment for HFS sessions. The data showed that Saudi Arabia’s simulation centres have impressive facilities and a lot of equipment. Nevertheless, it is essential to make sure everything is prepared and ready for effective learning. Educators and team members in the simulation centre should ensure that all necessary equipment is available during the simulation to make it more realistic and efficient.

1.16 Psychological Preparation

Psychological preparation means getting mentally and emotionally ready for HFS experiences. It refers to how students and educators feel and think before starting the simulation. The data showed that briefing sessions are important to set the right mood and expectations for students. Educators must be understanding and kind to students, especially those who feel anxious, such as those experiencing their first time in the HFS.

1.17 Psychological Safety

This includes creating a safe environment where students can freely express their thoughts and perceptions without fear of judgment or negative consequences. This encourages them to speak up and share their perspectives without being hindered by concerns about their reputation or the reaction of educators (Higgins et al., 2012).

1.18 Realism

It is “means making something look like it is real, like a person, thing, or situation, so it feels like you're really experiencing it. This helps participants act as if they are dealing with a genuine
situation or problem” (Lioce et al., 2020, p. 39). However, my findings suggest that there might be some differences in how participants saw or felt realism during the study.

1.19 Safe Learning Environment

This refers to the positive emotional context established by the interaction of facilitators and participants in a learning setting. In such an environment, participants are encouraged to take risks, make errors, and push themselves beyond their usual boundaries. To construct such an environment effectively, facilitators need a comprehensive understanding of the psychological elements of learning, the influence of unconscious bias, and cultural variances, and they must also be conscious of their mental condition (Meakim et al., 2013).

1.20 Simulation Anxiety

“A personal feeling of discomfort or fear related to an undefined future threat. It can originate from internal or external threats and is distinct from stress, although the two terms are sometimes used interchangeably” (Yockey and Henry, 2019, p. 2). Anxiety, in general, is defined as the subjective feeling associated with an uncertain future event that has cognitive and behavioural consequences for students and educators (Beesdo, Knappe and Pine, 2009). Simulation anxiety is a unique emotional response to the reality of HFS or prolonged exposure to it.

1.21 Standard Patients

These are individuals who are trained to consistently act out the role of a patient or another person in a predefined scenario. The primary purpose of standard patients is for instruction, practice, or evaluation in simulation settings (Meakim et al., 2013).
1.22 Stress

This term refers to the result of perceived external pressures (Lazarus and Folkman, 1984). Stress in this study is defined as external factors that emotionally affect the participants, causing them to be confused, disoriented, and unable to concentrate on their learning objectives.

1.23 Student Readiness to Learn

Student readiness to learn describes how well-prepared and capable students are for HFS scenarios. The data revealed that some students faced challenges when essential tools were missing, which affected their ability to fully participate. Being ready also means knowing what to do in the simulation and being familiar with how HFS works.

2. Cultural and Religious Practices in Saudi Arabia

2.1 Headscarf/Hijab

Another significant aspect of Islam for women is wearing the hijab; women should wear it to cover their heads in the presence of males that are not relative to them. The hijab covers the head and chest, and in certain countries and Islamic traditions, it may also cover the face (Sheen, Aman Key Yekani and Jordan, 2018).

2.2 Hierarchical Norms

These are the norms, rules, and expectations about how people should behave and communicate within hierarchical structures like schools or workplaces. They often involve respecting authority, following the proper way of communication, and following established rules and procedures (Towns, 2012).
2.3 Pilgrimage/Hajj

“One of the Five Pillars of Islam is the Hajj, a pilgrimage to Mecca that is mandatory for adult Muslims to perform at least once in their lifetime“ (Benkouiten et al., 2019, p.2). This pilgrimage occurs at the end of the Islamic year and involves a series of rituals. It brings together large groups of Muslims from around the world to participate in this sacred journey (Benkouiten et al., 2019).

2.4 Power Distance

Refers to the big difference in status and authority between educators (who are in charge) and students (who are in lower positions) within the educational setting in Saudi Arabia (Weick, 2002). This can affect how they communicate with each other. Students may hesitate to speak up or share their thoughts openly, while educators may expect more respect and deference from students because of their higher position. It is important to understand power distance as it can influence how they interact and make decisions in the learning environment.

2.5 Quran

The Quran is the holy book of Islam, serving as a guide for Muslims in every aspect of their lives. It guides religious practices, ethics, morals, and all aspects of life, shaping the beliefs and behaviours of Muslims. The Quran is considered a sacred scripture and holds great significance in the Islamic faith and teachings (Ebrahimi, 2017).

2.6 Salat

Salat is an Arabic word that refers to the Islamic prayers. It is considered one of the five pillars of Islam and is obligatory for all practising Muslims. Salat is performed five times a day and includes specific movements, words, and spiritual communication with God. It encompasses both physical movements and spiritual connections. Before performing the prayer, Muslims are required to perform a ritual cleansing known as wudu, which involves washing certain parts of the body.
2.7 Speaking Up

This means sharing thoughts openly and assertively in Saudi Arabia, vital for effective communication and collaboration (Lainidi et al., 2023).

2.8 Tayammum

Tayammum is a symbolic purification ritual in Islam for preparing oneself to pray, done by using clean soil when water is not available.

3. Status of Educators in the Nursing Educational System in Saudi Arabia

3.1 Assistant Professor

Holds a doctoral degree (PhD) and has advanced from the position of lecturer. They have increased responsibilities in teaching, research, and academic administration. They contribute to curriculum development, engage in scholarly activities, and may supervise students.

3.2 Associate Professor

Continues to advance in their career after serving as an assistant professor. They have a higher level of responsibility in teaching, research, and academic administration. They may mentor and supervise other faculty members, contribute to research projects, and engage in academic leadership roles.

3.3 Lecturer

Holds a master’s degree and is responsible for teaching undergraduate courses, guiding students, and may be involved in laboratory work and practical and theoretical aspects of education.
3.4 Teaching Assistant

Teaching assistants are usually bachelor’s degree holders and work with students in laboratory settings under the supervision of faculty members. They are not authorized to teach theoretical courses in the undergraduate track. However, they are encouraged to pursue a master’s degree during their temporary teaching assistant role, which typically lasts for one to two years.
Glossary of Arabic Terms

**Abaya:** A garment that is worn by Muslim women. It is designed to cover the entire body except for the face and hands. Usually made from black fabric, it should not be too tight but rather loose-fitting to provide comfort and modesty. Muslim women typically wear it, especially in the presence of unrelated men, to adhere to religious and cultural practices.

**Alhamdulillah’s:** Praise to be Allah in Arabic

**Allah:** The name of God in Islam.

**Announce Shahada:** An important aspect of the Islamic faith. It is a declaration that affirms the belief that “There is no god but Allah, and Muhammad is his messenger”. When someone converts to Islam or confirms their faith, they may choose to publicly announce their Shahada as a way of expressing their commitment to the Islamic faith.

**Awrah:** It typically includes the intimate areas of the body that are considered private and should be kept covered according to Islamic modesty guidelines.

**Insh Allah:** God willing.

**Quran:** The holy book of Islam.