

Exploring the Motivational Learning Impact of a Contextually Adapted High-Fidelity Simulation Scenario on Nursing Students in the College of Nursing, in Kuwait

Ghadeer Alharbi*, Olinda Santin, Billiejoan Rice, Janine Stockdale

School of Nursing and Midwifery, Queens University Belfast, Northern Ireland, UK

*Corresponding author: galharbi01@qub.ac.uk

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Abstract High-Fidelity Simulation, or Human Patient Simulation, is an educational strategy embedded within nursing and medical curricula throughout many healthcare educational institutions. With High-Fidelity Simulation, clinical situations can be created for students to practise clinical skills and apply theoretical knowledge in a simulated setting. Presently, nursing students in Kuwait rely on the allocation of clinical placements in order to test the skills and knowledge that they have acquired in the classroom. Therefore, nursing students in Kuwait did not have the opportunity to experience the benefits of High-Fidelity Simulation (HFS). In order to ensure that nurses in Kuwait receive the best standard of education, and thus patients receive the best standard of care, there is an urgent need to redesign nurse education. Given the known benefits of High-Fidelity Simulation in the development of nurse education and the need to introduce this approach for the first time in Kuwait, this study aims to explore if a scenario, can be culturally adapted for use in the education of nursing students in Kuwait, and the extent to which this scenario will enhance students' motivation to learn. This study will apply the ARCS-V model as one of the most widely used interactionism models. Applying a sequential approach that reflects the action research process associated with the model, phase one will explore educational stakeholders' perceived barriers and facilitators to High-Fidelity Simulation. Phase two will engage participants in the co-design of a United Kingdom nursing simulated scenario for implementation in College of Nursing, Kuwait. Phase three will pilot and evaluate the High-Fidelity Simulation scenario with undergraduate nursing students. Adaption of evidence based, authentic clinical High-Fidelity Simulation scenarios is a valued and unique step in redesigning nurse education.

Keywords: *high-fidelity simulation, human patient simulation, kuwait, nursing education, motivation, ARCS-V, co-design*

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1. Introduction

High-Fidelity Simulation (HFS) is a widespread, valued, teaching and learning strategy in nursing education, implemented to improve health-care quality and patient safety [1,2,3]. This teaching method affords healthcare students the opportunity to apply theory and knowledge by participating in carefully designed scenarios that mimic authentic, clinical situations in a variety of settings [4]. Simulation modalities, such as high fidelity, and more recently Simulated Participants (SP's), allow the learner to apply cognitive, affective, and psychomotor skills in a realistic environment without the threat of harming a real patient [5,6]. High-Fidelity Simulation scenarios therefore, require students to rely on their acquired knowledge and skills as they assume the role of a professional, for example, a registered nurse [7]; and in doing so provide

simulated care in a safe, open, honest and supported learning space.

Over the last decade, evidence has emerged of the impact of HFS education on students' learning. Accepted as being student-centred, HFS is associated with the development of students' technical and behavioural skills including their leadership, communication, decision-making, teamwork and professionalism [8,9,10]. Other areas of reported impact include an increase in nursing students' self-efficacy, knowledge acquisition, critical thinking, improved clinical skill performance and clinical judgement [11,12,13,14]. Similarly, in [15] noted that simulated learning enabled students to have a greater understanding of their professional role in a clinical situation, as well as teamwork, and the importance of clear, effective communication with patients and their team members. In addition, researchers reported how participating in HFS engaged students in meta-cognitive behaviours (reflection) related to their role, decision-making and the identification

of gaps in their own knowledge and connections with practice [16]. Extolling its benefits, in [17] also explains how high-fidelity simulation contributes to the patient safety agenda, through the provision of learning opportunities where mistakes become a low-stake, teachable moment. When transferring their acquired skills and knowledge to the clinical area, students reported feeling better prepared to face challenging situations [18].

While the benefits of high-fidelity simulation, as a teaching method in nurse education, are promising, in [19] highlight the need for educators to understand and design optimal simulated learning scenarios and activities. To achieve relevancy and effective HFS, in [15] recommends an interdisciplinary approach that includes educators and subject matter experts in the application of learning theories to the simulated design. There are a plethora of learning theories and design models that are available to stakeholders [20] however; they each share the commonly accepted approach of matching the learning design to the students' contextual and cultural needs, continuing with implementation and evaluation of the learning impact on students' performance.

Within healthcare education, application of interactive learning design models has developed over the last two decades. As one of the most widely used interactions models, the ARCS-V [21] demonstrates validity, reliability and impact in different contexts, such as technology-supported learning, e-learning, user-orientated design and healthcare education across multiple countries [22,23,24,25,26]. However, the renewed interest in simulated learning design within healthcare and its impact on both the learners' and the educators' motivation and performance [27] suggests there are more opportunities to apply and test an interactions design approach to HFS within and across cultures.

The documented benefits of HFS is clear, despite this, Kuwait has been slow to develop this method of teaching and learning within nursing programmes in Kuwait. This absence of HFS is in contrast to neighbouring countries such as Kingdom of Saudi Arabia (KSA) and Oman who established HFS and labs some time ago [28]. The lack of HFS in the education of nurses in Kuwait is attributed to fewer clinical sites, shortage of nurse educators, concerns regarding patient safety and medical error, lack of culturally specific of evidence, and existence of accreditation agencies to improve students and patients' outcome [29]. Presently, nursing students in Kuwait rely on the allocation of clinical placements in order to test the skills and knowledge that they have acquired in the classroom. Therefore, nursing students in Kuwait did not have the opportunity to experience the benefits of HFS. In order to ensure that nurses in Kuwait receive the best standard of education, and thus patients receive the best standard of care, there is an urgent need to redesign nursing education [30]. A number of co-produced simulation scenarios have been developed in the United Kingdom (UK) through collaboration and co-operation with relevant stakeholders. These scenarios have proved to be beneficial in motivation and performance [27]. Adaption of evidence based, authentic clinical HFS scenarios is a valued and unique step in redesigning nursing education.

Given the known benefits of HFS in the development of nurse education and the need to introduce this approach for the first time into nurse education in Kuwait, this study aims to explore if a scenario, can be culturally adapted for use in the education of nursing students in Kuwait, and the extent to which this scenario will enhance students' motivation to learn. This study is underpinned by the following research question and objectives:

What is the motivational learning impact of a contextually adapted HFS scenario on nursing students in Kuwait?

The objectives of this study are to

1. Explore the perceived facilitators and barriers to co-designing HFS scenarios in Kuwait.
2. Use a co-designed process for adapting a HFS from the UK, ensuring contextual and cultural application for undergraduate nurses in Kuwait.
3. Pilot the agreed HFS scenario with undergraduate nursing students; measuring their motivation to learn as a result.

Study Design

The study will apply a sequential approach that reflects the action research process associated with the ARCS-V model [21], as shown in Figure 1.

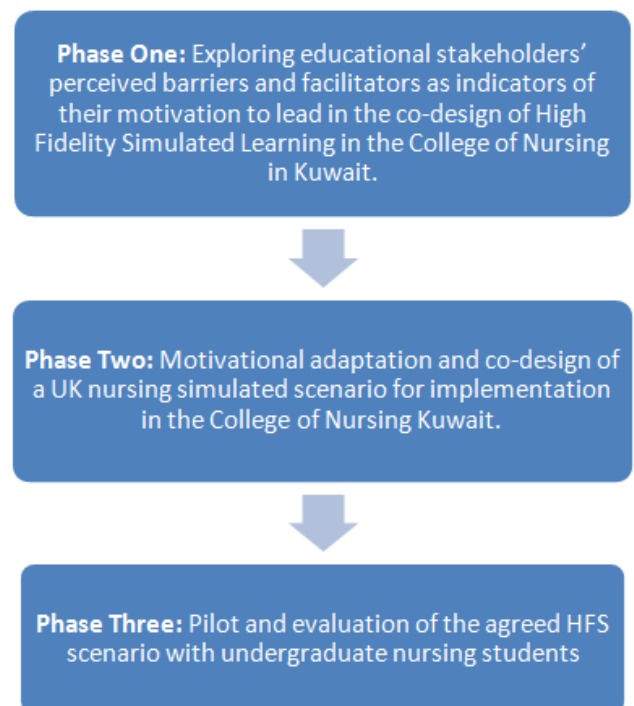


Figure 1. The Sequential Approach Reflecting an Action Research Process

2. Phase One: Exploring Educational Stakeholders' Perceived Barriers and Facilitators to Providing High-Fidelity Simulated Learning in the College of Nursing in Kuwait

As already highlighted, there is limited published research that reports on the implementation of HFS in nursing, within Kuwait. The aim of this phase of the study

is therefore, to develop an understanding of the perceived barriers and facilitators of key stakeholders in Kuwait, who are involved in the delivery of nurse education. A qualitative method in the form of semi-structured interviews, will therefore, be applied as a means of gaining understanding about participants' experiences and perspectives [31,32]. The following outlines the research process associated with this phase:

Recruitment and Sampling

Nursing faculty staff from the only College of Nursing in Kuwait will be invited to a semi-structured interview with the named researcher. The researcher will request the Dean of the College of Nursing to act as a gatekeeper in relation to recruiting faculty participants. The gatekeeper will have access to the study information sheet, the inclusion and exclusion criteria and the primary researcher's contact details. On approach by the gatekeeper, individuals who show interest in participating in semi-structured interviews will be asked to reply by email to the primary researcher, confirming agreement to be contacted by the researcher. The researcher will then forward participants the information sheet again, along with a consent form; which they will be asked to return by email before proceeding.

Data Collection

To explore the perceived barriers and facilitators of providing HFS learning, semi-structured interviews will be conducted. Semi-structured interviews are an appropriate method for qualitative data collection, as they provide holistic, thorough, and nuanced insight [33,34,35]. Three pilot interviews will be conducted to confirm the appropriateness of the interviewing schedule and to refine the researcher's interviewing skills [36]. Interviews will be approximately 20-60 minutes duration depending on the degree of data saturation and will take place in a location which is convenient for the study participants [37]. Interviews will be conducted in English, but if any participant needs to explain his/her ideas in Arabic, they can do so. Due to Covid19 restrictions, participants will be offered an online interview as an alternative to face-to-face. Permission to record using either a digital voice recorder or online recording facility will be sought from participants, and the data will be held securely and in accordance with the Data Protection Act (1998) and the General Data Protection Regulation (2018) in a QUB password-protected PC. The researcher will take written field notes immediately after each interview. Termination of the data collection will occur when no new themes emerge, and data saturation is achieved.

Data Analysis

Interview recordings will be interpreted using the thematic analysis model by Braun and Clarke, (2006) including data reduction, data display and conclusions. The purpose of thematic analysis is to classify and code key themes within qualitative data [38]. Interviews will be transcribed in English, if there are any Arabic phrases, the researcher will use a qualified bilingual translator to aid translation, who will sign a non-disclosure form. The final draft of each transcript will be reviewed by the researcher to ensure the reliability of translation. Each stage of thematic data analysis will be documented and verified by the research team. All data will be stored electronically for coding and analysis according to the data management

standard at Queen's University Belfast. NVivo Version 12 will be used to manage the data [39]. To ensure the robustness of the findings, transferability, dependability, and credibility of the qualitative phase, member checking and reflexivity will be used whenever applicable [40]. Following verification of the findings by the participants (member checking), the results from this phase of the study will inform phase two.

3. Phase Two: Application of the ARCS-V Model of Educational Design, to Guide the co-design in the Adaptation a HFS Nursing Scenario Developed in the UK, for Nurse Education in Kuwait

The ARCS-V model by Keller (2010) is an interactionist model that guides educators in the design of educational solutions by focusing on the theoretical influence of:

- Attention – gaining and holding students' attention
- Relevancy – communicating the relevancy of the learning goals
- Confidence – building students' confidence to apply their knowledge and skills
- Satisfaction – using feedback as a means of increasing students' satisfaction and self-regulated learning.

This phase of the study will use the ARCS-V approach, as a theoretical guide to enabling the nursing faculty in Kuwait, to engage in the adaptation of a UK HFS scenario for their nursing students.

Recruitment and Sampling:

Approximately nine participants (purposive sampling) will be invited to two co-production workshops, where they will be introduced to the ARCS-V model and facilitated to apply it in the adaptation of a HFS scenario. Participants will include nursing students, practising nurses and nurse educators (clinical instructors and lecturers).

We will invite stakeholders to participate in the co-design process in 3 steps:

1. The researcher will obtain consent from the College of Nursing to conduct the study.
2. An email will be sent to three gatekeepers (Dean of the College of Nursing / Head of Nursing / Students Director Office). Each gatekeeper will have access to the description of the study and the inclusion and exclusion criteria which will be used to recruit participants see appendix.
 - A. The Dean of the College of Nursing will request to recruit nursing faculty.
 - B. Nurses in practice, will receive an email from the Head of Nursing Office inviting them to participate in the study.
 - C. Second year nursing students will receive an email from the Students' Director Office.
3. Individuals will be asked to send a reply email to the researcher if they wish to participate in the study, and they will then receive a consent form by email. An electronic signature will be required (this

is due to the restriction imposed due to the COVID-19 pandemic.

Data collection

The design discussions will be recorded with permission using either a digital voice recorder or online recording facility. Permission to record will be sought from participants; and the researcher will take written field notes immediately after each workshop.

Workshop One: the discussions will be prompted by the following questions:

- What in the scenario fits the cultural needs of nursing in Kuwait? (attention and relevancy of the learning goals)
- Is the level of challenge appropriate for the learning needs of nursing students in Kuwait? (confidence)
- Does the post-scenario debrief need to be adapted to ensure student satisfaction? (satisfaction)

Following the discussion, workshop participants will be provided with:

- General feedback.
- A summary of the outcomes of the first workshop.
- Details of the date, location, and time of workshop two.

Workshop Two: is aimed to; report back to participants the key adaptations and themes which emerged from workshop one and providing the opportunity for member checking.

On confirmation of the findings a proposed adaptation of the scenario will be tabled, discussed, and agreed through consensus. At each point of the discussion participants will be challenged to think through how the scenario should be adapted. Phase three will offer students the opportunity to participate in one simulation using an adapted scenario.

Data analysis

Group discussions from the workshops will be recorded and transcribed verbatim. Transcription will be interpreted using the content analysis. Content analysis used to identify patterns in recorded communication and can be used in either an inductive or a deductive way [41]. Both inductive and deductive content analysis processes involve three main phases: preparation, organization, and reporting of results. The trustworthiness of content analysis results depends on the availability of rich, appropriate, and well-saturated data [42]. Therefore, data collection, analysis, and result reporting go sequentially. The researcher will share the process of data analysis with the supervisory teams, in order to verify the interpretations and reporting results. To ensure the robustness of the findings, transferability, dependability, and credibility of the qualitative data, member checking and reflexivity will be used whenever applicable [40]. Following reporting results, the adapted scenario will be applied and evaluated in phase three.

4. Phase Three: Pilot and Evaluation of the Agreed HFS Scenario with Undergraduate Nursing Students.

The pilot is the implementation and evaluation of the adapted scenario with nursing participants/students. During simulation academics and students will follow the recommendations of the College of Nursing regarding

safety during the COVID-19 pandemic. The HFS session will follow the recommended cycle of student pre-brief, implementation and student post-scenario debrief. On completion of the simulation cycle an evaluation will be conducted.

Study Setting

The study will be conducted in The College of Nursing, State of Kuwait. The HFS sessions will take place in June 2021 and in advance, the researcher will notify nursing students of the date and time of the HFS sessions. Clinical instructors from the Health Science Centre who competent in HFS, will provide assistance with the sessions and technical support will be provided.

Recruitment and Sampling

Students completing the nursing programme within the College of Nursing, will be invited to participate in the study via email. The College of Nursing in Kuwait has two sections: a male section and a female section. Each section is located in a different building within the same area of the College. To ensure that a representative sample of the population is selected, the researcher will sample potential study participants from both sections. All students enrolled on the second-year undergraduate programme who are studying the practice of nursing will be invited to participate in the study. A convenience sample of 40 students will be recruited (target population = 70).

A module co-ordinator will act as gatekeeper and will be involved in the recruitment of nursing students. The gatekeeper will be provided with a prepared description of the study, and the inclusion and exclusion criteria for participants. The gatekeeper will invite second year undergraduate nursing students to communicate via email and will forward them a study information sheet. Students will be required to return consent forms via email if they are willing to participate in the study. Due to COVID-19 requirements, participants will be required to provide electronic signatures.

Data collection

Data related to students' motivation to learn through the implemented simulation will be collected using Reduced Instructional Materials Motivation Survey (RIMMS) tool [39]. The RIMMS tool is a 12-item situational measure of people's reactions to instructional materials, as informed by the ARCS-V model (Keller 2010). Additional baseline data will also be taken on age, gender, previous experience of simulated learning and whether English is the participants first language. This is to identify variables that may affect students' reported motivation. The students will access the evaluation tool via a Survey Monkey. Students who do not complete the form within 24hrs will be sent an email to remind them.

Data analysis

As recommended in the application of the ARCS-V model [21], a composite score for the motivational data will be generated; that will indicate the degree of motivational Attention, Relevancy, Confidence and Satisfaction that the student groups report in relation to how they experienced the adapted simulated scenario. Descriptive statistics (Chi Square) will be used to compare between students age and if English is first language, and have they used this tool to learn before. The study is not powered to calculate statistical significance, although it will provide the basis for further work in the area.

Rigour, Validity and Reliability

This study applies a sequential approach that reflects the action research process associated with the ARCS-V model. The use of this theoretical model increases the validity and reliability of the study [44]. The qualitative components of this study will be underpinned by the COREQ checklist [45] for conducting qualitative research.

Study approvals

The study protocol has been approved by the Research Ethics Committees at Queen's University Belfast, UK, in October 2021, reference number MHLS 20_131. It has also been approved by College of Nursing, State of Kuwait, where the study will be conducted.

Ethical Considerations

Participants' names will be converted into a corresponding identification number. Participants will be provided with relevant information sheets according to the aim of the study and the phase. Consent will be obtained from all participants before they engage in any phase of the study, as outlined in the PIS of this proposal. PIS includes contact details for the research and research governance teams. Facilitators will conduct a pre-brief with the students before they commence, providing information on simulation and orientating the student to the simulator and surroundings. As this learning experience sits outside the regulated curriculum no negative effects on student learning or educational experience are anticipated. Participants can voluntarily withdraw from the study at any time without providing a reason. Data collection will not be undertaken by any facilitators of the simulated session to reduce the potential of response bias. The primary investigator will maintain the confidentiality and privacy of all personal information related to participants. The data will be held securely and in accordance with the Data Protection Act (1998) and the General Data Protection Regulation (2018) in a QUB password-protected PC.

Authors Contribution

All authors were involved in the development of the study protocol. The investigator is a PhD candidate [GA] and has personal experience of HFS during a MSc while studying in the USA. OS is an experienced researcher who has published widely in relation to healthcare, including co-design. BR is the Nursing Simulation Lead at QUB and is experienced in researching the how students learn about professionalism via simulation. JS is the Midwifery Simulation Lead at QUB and has expertise in application of Keller's ARCS model (2010).

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Abbreviation

HFS: High Fidelity Simulation; HPS: Human Patient Simulation; ARCS: Attention, Relevancy, Confidence and

satisfaction; PIS: Participant Information Sheet; RIMMS: Reduced Instructional Materials Motivation Survey.

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