SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR VÅRDVETENSKAP OCH HÄLSA

SIMULATION TRAINING: FROM THE STUDENTS' POINT OF VIEW

Alexandra Jernstedt

Sandra Hygrell

Preface

We would like to give thanks to the students at FH JOANNEUM for participating in our thesis and sharing their experience of the simulation training. We are grateful for your thoughts and insight which hopefully leads to a greater understanding of simulation training from the students' point of view. We also want to give thanks to the university FH JOANNEUM who welcomed us and helped us make this study the best it could be. We want to thank the university of Gothenburg, Camilla and Inger for giving us the chance to travel to Graz. Ultimately, we want to thank our supervisors Camilla and Markus for all their time, support and input.

Abstract

Background: Simulation training is a well-grounded concept that is used to increase and maintain safety in various industries such as aviation, military, and health care. Simulation training is today an integrated part of the Bachelor programme in nursing. Simulation training makes it possible for the nursing students to combine their theoretical knowledge with practical training. **Purpose**: The purpose of this Bachelor thesis was to examine nursing students' own experience of simulation training based on human factors such as emotions and the concept of Crisis recourse management. **Method:** The study used a descriptive quantitative analysis with a deductive approach. An online questionnaire was used and answered by 169 out of 172 students with a response rate of 98%. The responses of the completed questionnaire were analyzed using descriptive statistics and a qualitative content analysis. **Results:** Regarding human factors the students agreed feeling most excited (88%) before simulation training. The confidence for all the participants was highest after simulation training (86,8%). Stress was a dominant feeling before (81,9%) and during (55,9%) the simulation training but not after (19,6%). The debriefing contributed to excitement (75,3%) and confidence (83,4%). Most students experienced the simulation as educational, but some others experienced the simulation training as unpleasant. **Conclusion:** The thesis demonstrated important findings showing that the students experienced emotions such as confidence before, during and after simulation training. The students did not agree with feeling exposed. The students found the CRM key points useful in regards to simulation training. The students believe they had enough theoretical practice but reported a lack of practical preparation before simulation training. **Implementation:** This study can be implemented by both students and educators within simulation training. **Future research:** More research regarding live streaming, confidence and factors impacting undergraduate nursing students' experience of simulation training is suggested.

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Introduction

Simulation training plays a big part in preparing students for clinical placements as well as for their future workplace. Munday (2022) states that simulation training provides a realistic scenario for learning within a safe environment. Simulation training is considered a good learning opportunity since theoretical knowledge can be applied in practical training (Munday, 2022). The authors of this thesis got the chance to travel to an Austrian university and examine how first semester nursing students experienced their second simulation training. The authors decided to focus on the human factors, emotions affecting the students and the concept of Crisis resource management (CRM) when participating in a simulation training session.

Background

History of simulation

Simulation is a teaching method that has been used for a long time in areas such as aviation, military as well as health care to improve safety in the different areas. The evolution of medical simulation in the field of nursing was described by Aebersold (2016), where the first mannequin for simulation in nursing, built in 1911, was used to educate the nurses in dressing, turning and transferring patients. As the evolution continued simulation was used to manifest skills in injections, emergent rescue situations and cardiopulmonary resuscitation (CPR). Medical simulation is today an elaborate part of nursing education and is used to improve patient safety by training communication, skills and teamwork (Aebersold, 2016). A debriefing session allows for reflection within the simulation training. This will be further explained below.

Debriefing

Zigmont et al. (2011) states the importance of room for reflection. The reflection is where the knowledge sinks in and the learning occurs rather than during the simulation training. Simulation training combined with debriefing allows participants to acquire knowledge, comprehension, application and analysis which hopefully leads to more long-term knowledge (Zigmont et al., 2011).

Skills training and simulation at FH JOANNEUM

The curriculum for the first semester nursing students in Graz, Austria includes courses in first aid, general pathology, medical fundamentals 1, communication, English 1, people as social individuals, healthcare and nursing 1, hygiene, nursing basics, wound dressing 1, ergonomics in nursing, internship 1, internship reflection 1, skills training and simulation 1. The skill training and simulation is explained by the university's website as a way to refine manual skills and abilities. To transfer theoretical knowledge into practice they use realistic, practical and complex simulation scenarios. The scenarios used are adapted to the content of the curriculum of the semester. To create a link between all the individual courses in the curriculum the simulation enables skills in communication, organization, interdisciplinarity and the ability to reflect (JOANNEUM, 2022a).

The skills and simulation lab at FH JOANNEUM is state of the art equipped with high level technology. It contains patient skills labs for simulating nursing activities. The simulation center also has a recording and debriefing system that allows the simulation trainings to be recorded and live streamed. This is used for the debriefing after simulation. The center has patient models from infants to adults for simulating real life situations as well as emergencies. For practicing nursing interventions, the center has equipment for blood samples and handling of central venous catheters. By using different technology such as age simulations suits, tremor simulator, back pain simulator, obesity suit, tinnitus suit and visual impairment glasses the students get to experience the patient's reality and enhance their empathy. During simulation the students need to find solutions and plan a course of action based on knowledge. To support

the students the teachers are specially trained in the area of simulation training (JOANNEUM, 2022b).

At FH JOANNEUM the lectures and classes for healthcare and nursing are modeled on the approach of the circle of learning (JOANNEUM, 2022b). Circle of learning is explained by Van De Mortel et al. (2021) as a way for students to process their experience in a supported environment through social interaction with others. At FH JOANNEUM (2022b) the circle of learning is used through briefing, acting and debriefing. Briefing is the before part where the students get introduced to the clinical scenario. Acting is the active part where the simulation training is executed. Debriefing is the final part where the experience is discussed with the class and the teachers to process the experience and reflect upon weaknesses and strengths (JOANNEUM, 2022b).

Previous research regarding emotions experienced in simulation training

Psychological factors, both positive and negative can affect performances both in a clinical setting and during simulation training according to Yu et al. (2021).Students that are facing their first clinical placement often lack experience with patient communication and practical skills which leads to anxiety and lack of confidence. However, after performing a simulation exercise the students feel less anxious and more confident. Results show that after participating in only one simulation training students' self-confidence is significantly higher compared to students who have not been through simulation training before (Yu et al., 2021).

Al Gharibi Msn & Arulappan (2020) investigate if undergraduate health professionals (medical students and nursing students) experience anxiety during medical simulation training, as well as if anxiety has any impact on the students' performance. The conclusion of the study shows that medical simulation training causes both physiological and psychological impact on the students' performance. This indicates simulation training is stressful and demanding for the students (Al Gharibi Msn & Arulappan, 2020).

Furthermore, Thomas & Mackey (2012) examine if a medical simulation training has any impact on undergraduate nursing students' self-confidence. The authors conclude that the students show low confidence in their ability to perform clinical skills that were practiced during the medical simulation training. However, at the end of the semester the students' confidence regarding practicing clinical skills increased significantly. Thomas & Mackey (2012) believe that the students' increase in confidence is associated with the provision of a safe learning environment. However, it is unsure if the increased confidence is maintained during real clinical scenarios with actual patients. The study therefore indicates that medical simulation training only increases students' confidence regarding clinical abilities in higher level classes since these students have more comprehension concerning the understanding of both theory and practice, which they can use for making well-based clinical judgements. On the other hand, Kaddoura et al. (2016) underlines that simulation training does not always increase students' self-confidence. For example, some students experience unpleasant emotions such as humiliation, embarrassment and feelings of being exposed during bad performance. The study

emphasizes that it is important to consider the students' past experiences before entering a simulation exercise since it otherwise can result in a destructive learning experience for the student.

Labrague et al. (2018) also indicates that medical simulation training increases nursing students' self-confidence as well as reduces anxiety levels. The study emphasizes the importance of simulation-based activities since it brings together students' theoretical understanding with actual clinical nursing practice. Furthermore, Dieckmann et al. (2007) underlines the essentiality for the participating students' to go through the equipment before simulation training. The preparation of the participant should also include information about the aim and purpose of the simulation training.

Moreover, previous research written by Thomas & Mackey (2012) indicate that debriefing can support and develop students' self-confidence by supporting their decision-making. Students can observe the performance of other students in a simulation scenario and see them succeed. Their self-esteem can thereafter be improved through social interaction. When a simulation exercise does not go as planned and it results in negative consequences for the student, support, constructive and positive feedback from other students and teachers can increase one's confidence and help understand what to do next time.

Lindon-Morris & Laidlaw (2014) list anxiety, self-awareness and self-focus as limiting factors in social interactions. Self-awareness is divided into two categories where one is public, explained as stress over how we are perceived by others. The other category is private self-awareness such as our own self-confidence. The public self-awareness is associated with stress which can lead to doubt in oneself, that can later affect the level of focus. The debriefing gave a feeling of relief and allowed students to ease up. By getting feedback from peers the students felt more confident. The ability to compare performances was seen as beneficial for readjusting and improving.

LeBlanc & Posner (2022) clarify that it is very common that simulation based training can be related to emotional situations. These experienced emotional responses may influence what the students will remember from the simulation scenarios. These emotional responses can also affect problem solving, judgments perspectives and learning behaviors of the students. Emotions can expand the understanding of the world around us, but they can also impair it. With that being said, LeBlanc and Posner (2022) state that it is important for simulation educators to understand how students' emotions play a huge part in how they interact with their surroundings.

Theoretical framework

Human factors such as emotions and Crisis resource management (CRM) are the chosen theoretical framework for this thesis.

Human factors

According to The World Health Organization (WHO) human factors include three main categories which are cognitive, physical and organizational functions. This thesis will focus on the cognitive category. The cognitive human factor defines how our psychological procedures, for example emotions, decision making and information processing interact with other elements in our surroundings (WHO, 2009). The human factor is described as a term for human errors and is shown to be a crucial cause of errors within health care (Gilfoyle & Gottesman, 2016). Svanvik (2001) claims that mistakes are made in hospital care every day because of human errors. To avoid mistakes the importance of human factors needs to be understood. Additionally contributing factors influencing a situation need to be identified (Svanvik, 2001).

Wisecup et al. (2008) states that there are several characteristics to emotions including a cognitive assessment of a situation that can generate a physiological response. Furthermore, Wisecup et al. (2008) states that negative emotions can affect the ability to act like oneself and act rationally. Pruden et al. (2022) claim by identifying human factors in a situation does not aim to eliminate human errors rather than realizing weaknesses in systems, which can be modified and become more resilient through training.

Emotions are described as a cognitive human factor that can influence the individual's interactions with its surroundings (WHO, 2009). Emotions experienced by students during a simulation scenario can both contribute and influence their motivation and eagerness for further learning but can also have a negative impact on their excitement to learn. Scenarios that can generate negative effects regarding the students' emotional reactions can for example be the perception of being exposed and evaluated. Emotions that might be associated with simulation training are excitement, confidence, stress, feeling of being exposed and feeling of being unprepared (LeBlanc & Posner, 2022). Therefore, the definition of the emotions excitement, confidence, stress, exposed and unprepared will be explained below.

Excitement: Is defined as a feeling of extensive enthusiasm, ambition and eagerness (Stevenson & Lindberg, 2015).

Confidence: Is defined as a reliance and self- assurance in his/her own abilities. Confidence can also be expressed as an expectation of having success and can be described as situation specific, which means it can differ on the basis of various scenarios (Kent, 2016).

Stress: Is defined as a physical and psychological burden or pressure caused by physical, sentimental, incidents or experiences that are difficult to handle and tolerate (Colman, 2015). During a normal division of labor people can act calmly and rationally. When stress increases people can become less rational and more irritated. This can lead to a lack of communication with the surroundings and a possible risk of impaired patient safety in a health care situation. When the stress increases, one reacts without consideration for others and completely reflexively. To avoid these stressful behaviors it is important to be aware of how the stress affects us and be responsive to stressed behaviors by others (Sharp, 2012).

Exposed: Is defined as a feeling of being undressed and unsafe. The term is also used to indicate an association which group members have been chosen and exposed to a certain situation (Porta, 2016).

Unprepared: Is defined as not being prepared for a situation that might lead to improvisation and not be able to take action or deal with a situation (Stevenson & Lindberg, 2015). Situation awareness can be the opposite to unprepared and can be defined as perception or attention. Awareness and understanding of the situation can further be explained by CRM (WHO, 2009).

Crisis resource management (CRM)

CRM originates from the term *Crew resource management*. Crew resource management was developed from the aviation industry back in the 1970's when the aircraft crew performed teamwork exercises to prevent and maintain safety (Franco et al., 2020). This thesis will refer to CRM as Crisis resource management, as this term is often used in healthcare.

CRM is based on 15 key points. This study has chosen to focus on three of these key points which include: Be familiar with the environment, call for help in an early stage and usage of cognitive aids (Rall & Dieckmann, 2005).

The first CRM key point this study will focus on is knowing the environment (Lei & Palm, 2022). Knowing the environment is to know what resources are available to you in the moment of crisis. Those resources could be in the form of personnel or equipment. When it comes to equipment you need to know what is available but also where it is and how to operate it (Lei & Palm, 2022). If one's aware of human and technological resources, stress could be reduced in a crisis and impact whether a patient lives or dies (Rall & Dieckmann, 2005).

The second CRM key point is called call for help in an early stage. It is proven that health care teams often hesitate to ask for assistance during acute scenarios. This can in turn result in a dangerous situation for the patient since its condition can become critical in a few minutes (Fanning et al., 2013). The final key point this study focuses on is usage of cognitive aids. This key point addresses the importance of using emergency manuals and checklists among other things. This can in turn improve lifesaving procedures since it enhances patient safety and it can also result in a more effective teamwork (Franco et al., 2020).

Problem statement

Simulation training is today an established subject to practice within the Bachelor program of nursing. It is shown that simulation training affects the students both physically and psychologically. It is also proven that simulation training improves students' confidence but may also deflate it. The emotions excitement, confidence, stress, exposed and unprepared are proven by previous research affect the students when participating in simulation training. Although it is not demonstrated in what degree these emotions affect the students and if the emotions change during the simulation training. It is also not shown if undergraduate nursing students find the CRM key points useful during the simulation training. It is therefore an

important subject to investigate since it can result in a better understanding of how undergraduate nursing students experience simulation training.

Purpose

The purpose of this Bachelor thesis is to examine nursing students' own experience of simulation training.

Following research questions will be addressed:

- Which human factors affect the students before, during and after simulation training?
- How do the students experience the simulation training?
- How do the students perceive the CRM key points in regard to the simulation training?
- How do the students reflect upon their own experience?

Method

Design

A cross-sectional questionnaire was used to answer the aim. The cross-sectional method is explained by Billhult (2017b) as a way to investigate how a group is at a certain point in time. To answer the research questions an online questionnaire was used (Appendix 1). Creating a questionnaire allows for formulating specific questions to answer the research aim. For the questions 1-19, quantitative data was used and analyzed descriptively. For the last research question, question number 20 this thesis used a qualitative content analysis to analyze the result. (Graneheim & Lundman, 2004).

Setting

The data collection of this thesis was performed on site at FH JOANNEUM in Austria from 25.10.2022 to 28.10.2022. The authors of the thesis were present during the students first and second simulation training. During the second simulation training the authors introduced themselves and their Bachelor thesis to each group within the class. The questionnaire was handed out after the second simulation training was completed. Below is a description from the authors auditing the classes of how the first and second simulation training were performed at FH JOANNEUM.

During the first semester the nursing students at FH JOANNEUM had simulation training within the first weeks of school where they were divided into groups of approximately 20 students. The simulation training began with a presentation where the teacher talked about the definition of simulation, the background and theories such as human factors and CRM. The students got to mention their own knowledge of simulation. A presentation of the simulation room, its content and the control room where the teacher sits was also presented for the students in the beginning of the class. The teacher emphasized that it was a safe learning environment and what happened during the simulation training stayed within the classroom. The simulation training began with a briefing of the care situation that two to three students were going to simulate. The simulation was live streamed to the remaining students who were still in the

classroom. After the simulation training was done the actively participating students came back to the classroom where a debriefing session took place. There was plenty of time in the end reserved for debriefing of the simulation scenario. During the debriefing the students got to reflect upon their own performance while hearing both positive and constructive input from their classmates.

The second simulation training took place two weeks after the first one. The students simulate caring interventions such as mobilizing and washing. The students were divided into smaller groups of two to three students to perform the simulation while the rest of the class got to watch the simulation on a live stream. Before going into the actual day of simulation the students got the opportunity to practice the clinical tasks at a training center. The scenario of the simulation training as well as the assigned roles was revealed to the students the day of the simulation training.

The first scenario in the second simulation training presented an eighty-seven-year-old woman who needed help washing her genital area. Two students from the group were selected to complete the task as student nurses whilst considering her autonomy as well as hygiene and ergonomics. During the second scenario one student had to take the role of the patient. The patient in this scenario had reduced hearing and sight as well as difficulties walking. To make the simulation training as real as possible the student in the role of the patient was wearing an age simulation suit, visual impairment glasses and hearing protection. Two other students were given the role as student nurses helping this patient with mobilization to get to the washroom. The focus of this scenario was patient safety, ergonomics and communication.

Sample
The sample for this thesis was 172 first semester nursing students at the university of FH JOANNEUM. This thesis used convenience sampling because the semester one students were the ones simulating during the time of this study. The first semester students at FH JOANNEUM were a well-qualified group suitable for this thesis since FH JOANNEUM has a state-of-the-art simulation center as well as multiple simulations during the first semester.

Description of data collection methods
The material in this thesis was collected through an electronic questionnaire. The questionnaire was available via a QR code displayed in the debriefing room, following completion of the simulation training. The students were able to scan the QR code and answer the questionnaire with their electronic phone devices.

Analysis methods
The electronic questionnaire was created through Surveymoneky.com and contained 19 closed questions with multiple choice options and one open question at the end. The opening section of the questionnaire addressed demographic status including age, gender and previous experience. The following three sections contained questions about the students' experience

before, during and after the simulation training. This approach allowed to see a change over time in the students' feelings.

Nominal scales were chosen for the background questions regarding age, gender and previous experience working within health care. Nominal scales categorize variables without a mutual order. Nominal scales are often used when describing demographic data and allows the selection of multiple answers (Billhult, 2017c). Concerning the remaining multiple-choice questions an ordinal scale is used for the variables *fully agree*, *agree*, *disagree* and *completely disagree (Questions 6-19)*. A descriptive quantitative analysis was chosen to analyze the result from the research questions with a deductive approach. In the open question at the end of the questionnaire, the students had the opportunity to describe in their own words how they experienced the simulation training. Regarding the students' own description, a qualitative content analysis was used to examine how the students reflected upon their own experience. Graneheim & Lundman (2004) state a qualitative content analysis contributes to finding connections, similarities and dissimilarities between decomposed answers (Graneheim & Lundman, 2004).

Ethical consideration
Prior to the study an Ethics application was sent to the head of the institute of Health care and Nursing at FH JOANNEUM University (Appendix 2). Following ethics approval, the students were sent a participant information letter regarding the study three days before the simulation training. On the day of simulation, the authors introduced themselves, the faculty they come from, the thesis and its purpose, as well as information regarding the questionnaire. The authors did also inform the students that participation in the questionnaire does not affect the students' results of the actual simulation exercise and that it was completely optional to participate. During this time, the participants had the chance to ask questions directly to the authors regarding the questionnaire and the thesis. Only the authors had access to the data collected from the questionnaire which will be deleted after the Bachelor thesis is approved. This study was conducted with an ethical approval from the head of the institute of Health Care and Nursing at FH JOANNEUM. This study did also get an approval from the ethical committee at the institute of Health and Care Sciences at University of Gothenburg concerning storage of data.

Results

Result summary

The result show that the students felt excited during the whole simulation training. The students felt confident throughout the simulation training and the confidence increased as the simulation training went on. Stress levels were high before and during the simulation training and decreased after the simulation training. The students did not feel unprepared but reported not having had enough practical preparation before the simulation training. The students did not perceive the livestreaming during the simulation as being exposed, however the students reported feelings of stress and excitement at the same time. The students think that the CRM key points mentioned are important and useful. Regarding their own experience about the simulation training, most of the students felt positive about their performance and the setup of the simulation training. Some students left some negative comments regarding their own experience of the simulation training.

In total 169 questionnaires were answered which results in a response rate of 98%.
Figure 1.

Flowchart over participants.
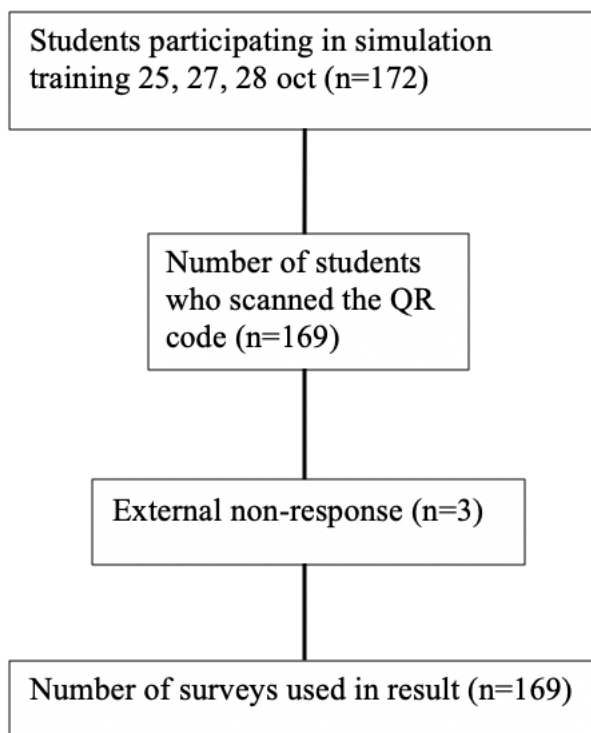
The questionnaire consisted of 20 questions; 3 students chose not to participate in the questionnaire leading to a response rate of 98% (n=169). The questions regarding demographics (age, gender, previous healthcare experience and previous simulation training experience) were answered by 169 students. 13 questions out of 20 had an internal non-response that is shown below in table 1.

Table 1.
Questions with internal non-response.

Questions	Non-response rate (n=)
Which role did you get assigned during the simulation training? The simulation training exercise is useful for my upcoming clinical placement	n=2
Before knowing what role I was assigned, I felt…	n=9
During the simulation training I felt…. After the simulation training I primarily felt…	n=8
Being livestreamed made me primarily feel…. The debriefing session primarily made me feel…	n=6
The simulation training improved my practical skills I felt familiar with the environment in the simulation room I was satisfied with my performance during today's simulation training	n=5
Getting help, when required was uncomplicated	n=4
The debriefing session allowed me to reflect upon factors affecting performance	n=3
How would you in your own words describe your experience of today´s simulation training?	n=18

Data demographics

The majority of the participating students 87,6 %, (n=148) were between 18- 23 years old and 10,1%, (n=17) were between the age of 24-29 years old. Two of the students reported being between the ages of 30-34 (1,2%) and two students also reported being between the ages of 35-50 years (1,2%). None of the respondents were over 40 years old.

A total of 18,3% (n=31) defined themselves as males while 81,7% (n=138) defined themselves as females. None of the respondents chose the answer alternative "non-binary" or "rather not say".

Regarding previous experience working within health care 24,3% (n=41) answered they had an experience of 0-1 year, while 13,0% (n=22) answered they had 1-2 years of experience, 9,5% (n=16) answered they had a minimum of 3 years of experience while the majority of 53,3% (n=90) of the students answered they had no experience working within health care.

Concerning previous participation in simulation training 36,1% (n=61) of the students answered they had earlier been participating as a participant, while 20,8% (n=35) answered they had participated as an observer and 43,2% (n=73) answered they had not participated in simulation training before. All the students have participated in simulation training before (the first simulation training of the semester) as either a participant or observer. The students that have not taken part in the first simulation training would have been absent that day. That makes these percentages inconclusive.

The question "What role did you get assigned during the simulation training" was answered by 98% (n=167). The answer options were "student nurse", "relative", "patient" and "observer". 49,7% (n=83) answered that they got the role as student nurse, 1,2% (n=2) filled in relative, 13,8% (n=23) filled in patient and 35,3% (n=59) filled the box of observer.

- Which human factors affect the students before, during and after simulation training?

The results will be presented in charts and tables. The response options *fully agree* and *agree* will be merged and described in text. The same goes for the response options *disagree* and *fully disagree.*

Figure 2.
Overview of which human factors affect the students before, during and after simulation training.
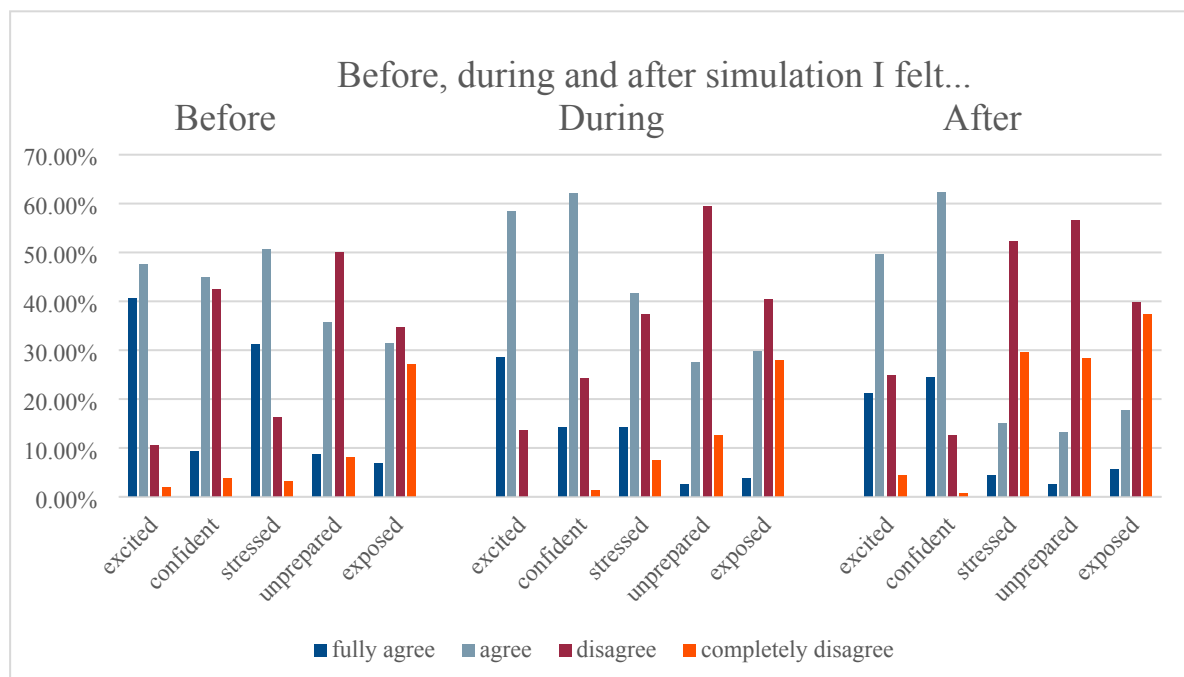
Excited
Before simulation training the students *agreed* feeling excited 88,1%, (n=141), while 12,5% (n= 20) disagreed they felt excited. **During** simulation training 87% (n=140) *agreed* they felt excited and 13,7% (n=22) *disagreed* they felt excited. **After** simulation training 70,8% (n=114) *agreed* they felt excited and 29,2% (n=47) *disagreed* they felt excited. (Figure 2.)

Confident
Before simulation training 54,4% (n=87) *agreed* they felt confident and 46,3% (n=74) *disagreed* they felt confident. **During** simulation training 76,4% (n=123) of the students *agreed* they felt confident and 25,4% (n=41) *disagreed* they felt confident. **After** simulation training 86,8% (n=138) of the students *agreed* they felt confident and 13,2% (n=21) *disagreed* they felt confident. (Figure 2.)

Stressed

Before simulation training 81,9% (n=138) *agreed* they felt stressed and 19,4% (n=21) *disagreed* they felt stressed. **During** simulation training 55,9% (n=90) *agreed* they felt stressed and 44,7% (n=72) *disagreed* they felt stressed. **After** simulation training 19,6% (n=31) *agreed* they felt stressed and 81,8% (n=130) *disagreed* they felt stressed. (Figure 2.)

Unprepared

Before simulation training 44,4% (n=71) *agreed* they felt unprepared and 58,1% (n=93) *disagreed* they felt unprepared. **During** the simulation training 30% (n=48) *agreed* they felt unprepared and 71,9% (n=115) *disagreed* they felt unprepared. **After** the simulation training 15,7% (n=25) *agreed* they felt unprepared and 84,9% (n=135) *disagreed* they felt unprepared. (Figure 2.)

Exposed

Before simulation training 38,4% (n=61) *agreed* they felt exposed and 61,6% (n=98) *disagreed* they felt exposed. **During** simulation training 33,6% (n=53) *agreed* they felt exposed and 68,4% (n=108) *disagreed* they felt exposed. **After** the simulation training 23,4% (n=37) *agreed* they felt exposed and 77,2% (n=117) *disagreed* they felt exposed. (Figure 2.)

- How do the students experience the simulation training?

Preparation

Figure 3.

Overview of the students' experience of their theoretical and practical preparation.
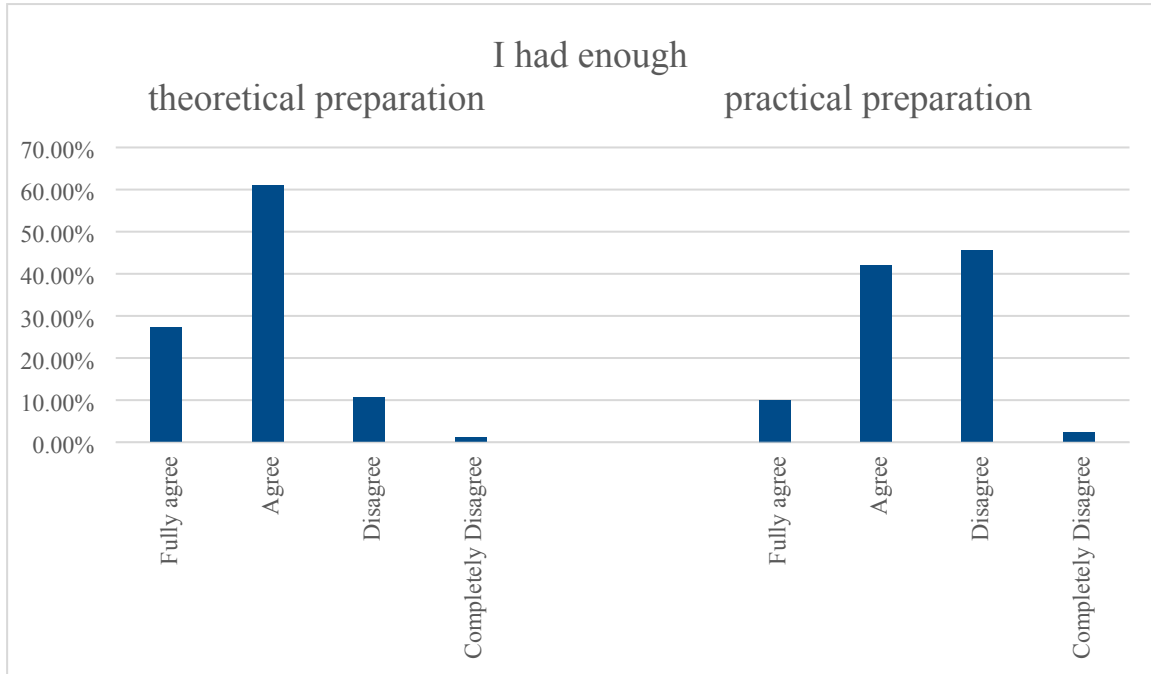
Regarding the question "I had enough theoretical preparation before simulation day, such as lectures and course literature" 88,2% (n=149) of the students *agreed* and 11,7% (n=20) *disagreed*. Regarding the question "I had enough practical preparation before simulation day such as skills training" 52,1%(n=88) of the students *agreed* and 47,9% (n=81) *disagreed*. (Figure 3.)

Livestreaming
Figure 4.
Overview of how the students experienced the live stream.
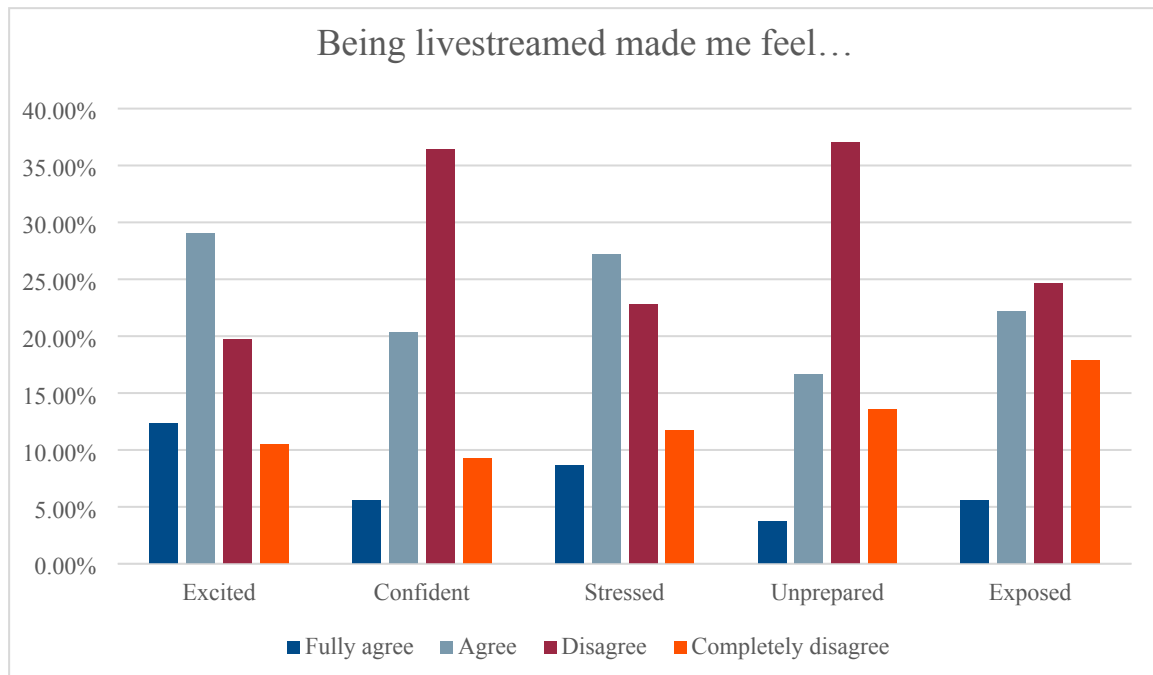
The answers on the question "Being live streamed made me feel..." show 41,4% (n=67) *agreed* feeling excited, 25,9% (n=42) *agreed* feeling confident, 35,8% (n=58) *agreed* feeling stressed, 20,4% (n=33) *agreed* feeling unprepared and 27,8% (n=45) *agreed* feeling exposed. A total of 30,2% (n=49) *disagreed* feeling excited, 45,7% (n=74) *disagreed* feeling confident, 34,6% (n=56) *disagreed* feeling stressed, 50,6% (n=82) *disagreed* feeling unprepared and 42,6% (n=69) *disagreed* feeling exposed. (Figure 4.)

Debriefing
Figure 5.
Overview of how the debriefing session made the students feel.

The debriefing session primarily made me feel…
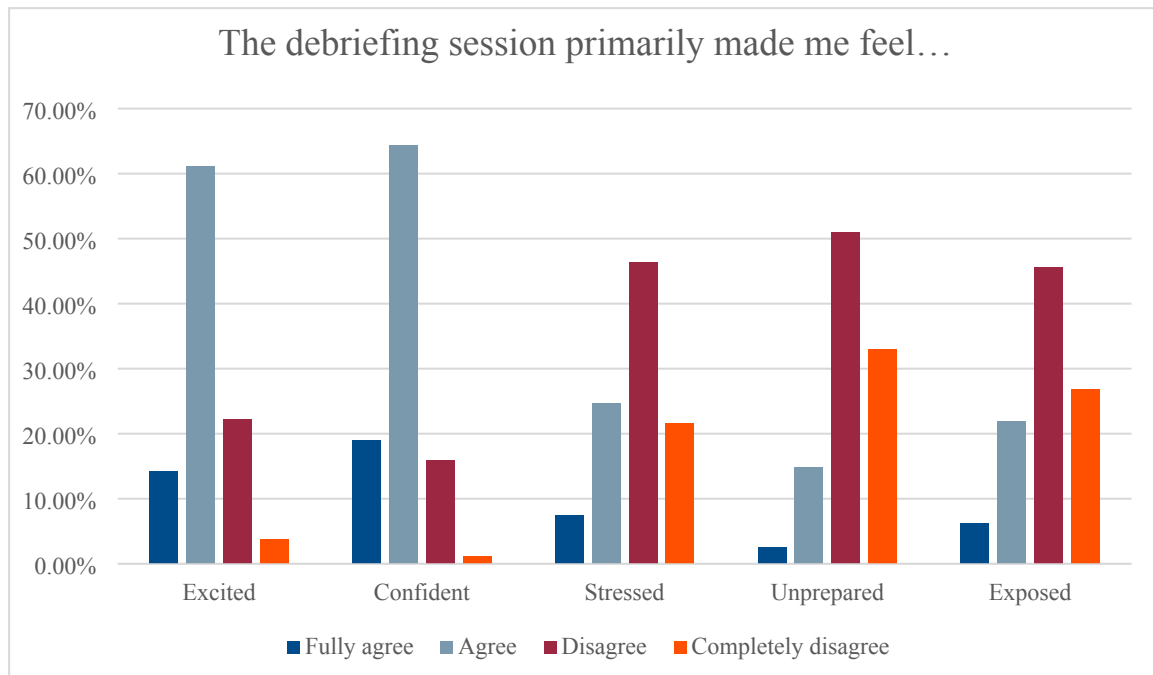
Regarding the question "The debriefing session primarily made me feel…" a total of 75,3% (n=122) students *agreed* it made them feel excited, 83,4% (n=136) *agreed* it made them feel confident, 32,1% (n=52) *agreed* it made them feel stressed, 17,4% (n=28) *agreed* it made them feel unprepared and 28,1% (n=45) *agreed* it made them feel exposed. A total of 25,9% (n=42) *disagreed* it made them feel excited, 17,2% (n=28) *disagreed* it made them feel confident, 67,9% (n=110) *disagreed* it made them feel stressed, 83,9% (n=135) *disagreed* it made them feel unprepared and 72,5% (n=116) *disagreed* it made them feel exposed. (Figure 5.)

Figure 6.
Overview of students' reflection on the simulation training.

The debriefing session allowed me to reflect upon factors influencing performance
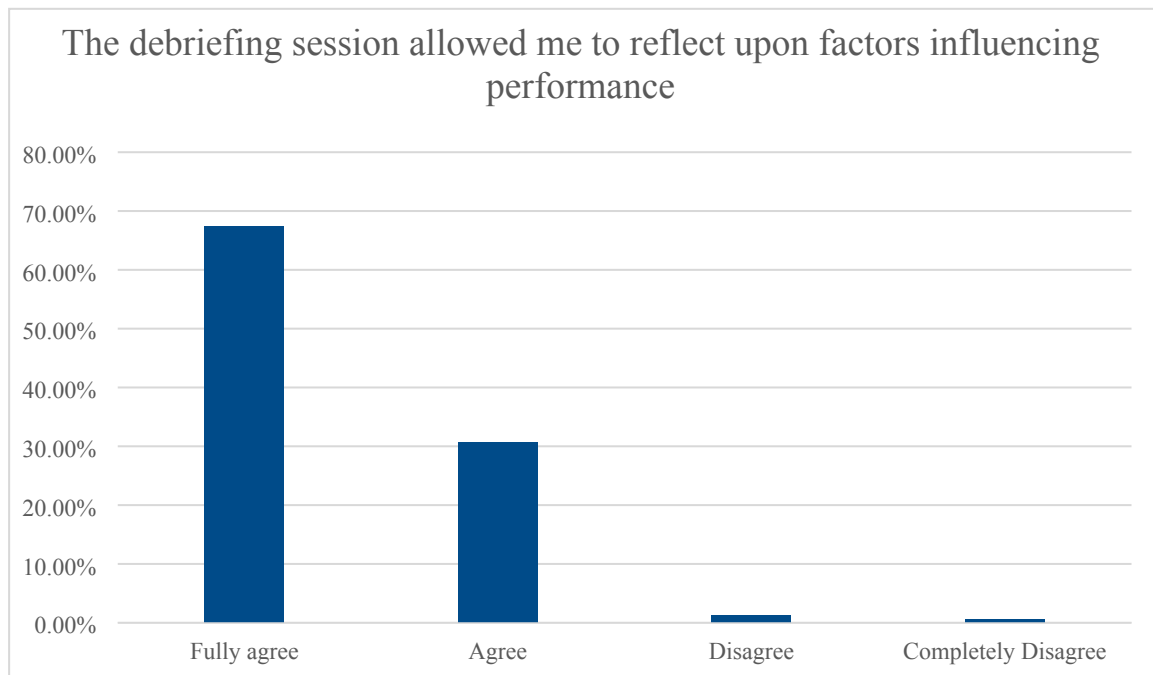
Regarding the question "The debriefing allowed me to reflect upon factors influencing performance" a total of 98,2% (n=163) *agreed* and 1,8% (n=3) of the students *disagreed.* (Figure 6.)

-   How do the students perceive the CRM key points in regard to the simulation training?

Figure 7.
Overview of students' perception of CRM key points.
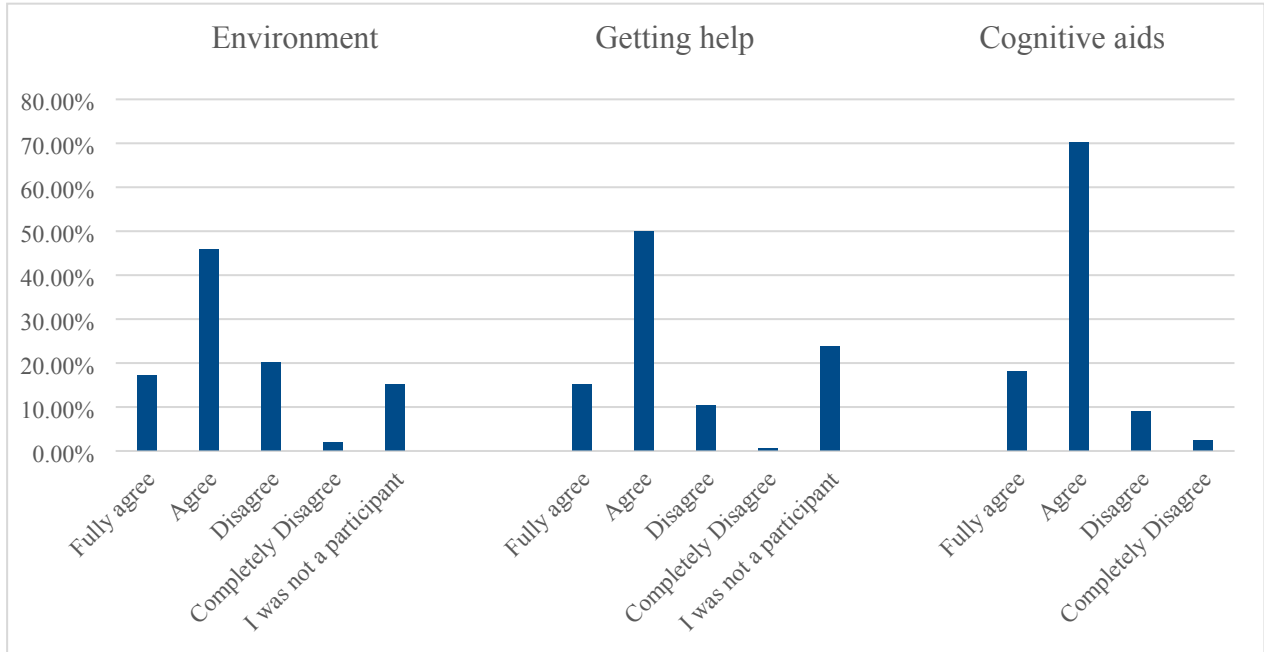
A total of 62,8% (n=103) *agreed* feeling familiar with the environment in the simulation room, while 22% (n=36) *disagreed*. If getting help when required was uncomplicated 65,2% (n=107) *agreed* while 11% (n=18) *disagreed*. Regarding usage of cognitive aids 88,5% (n=146) *agreed* it was beneficial while 11,5% (n=19) *disagreed* it was beneficial. (Figure 7.)

- How do the students reflect upon their own experience?

Figure 8.

Overview on the students' reflections of the simulation training.
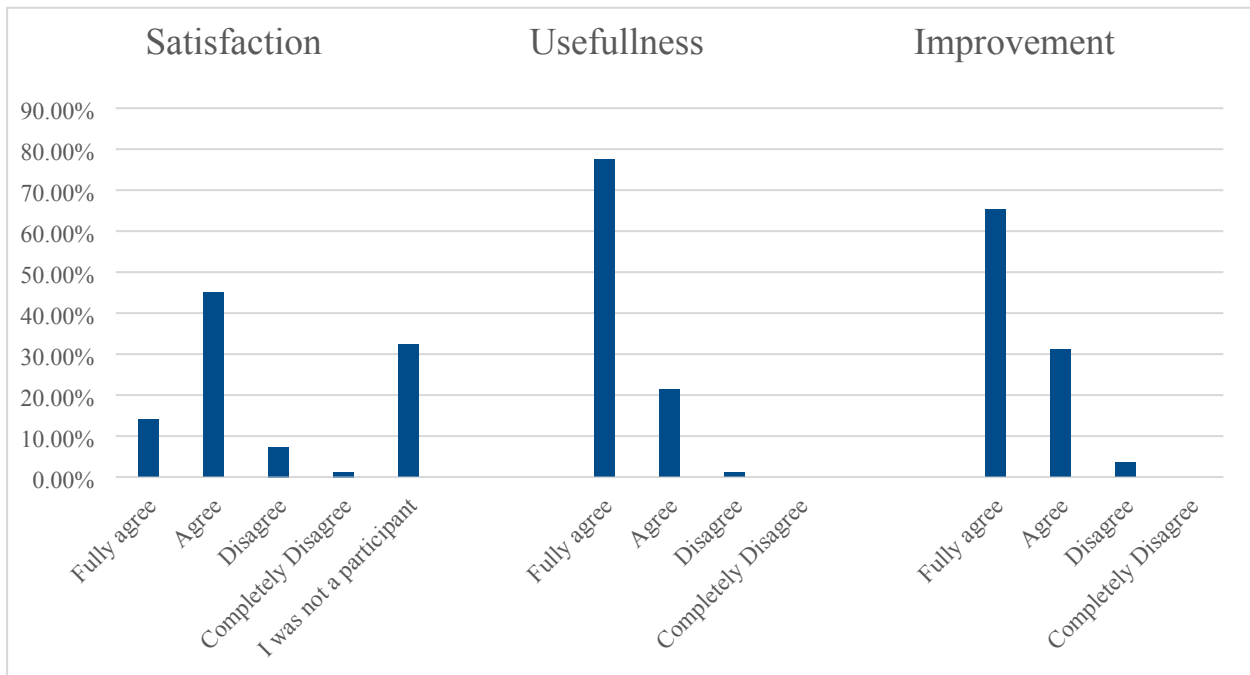
A total of 59,1% (n=97) *agreed* they were satisfied with their performance while 8,5% (n=14) *disagreed.* A total of 98,8% (n=167) *agreed* the simulation training was useful for upcoming clinical placement while 1,2% (n=2) *disagreed*. A total of 96,4% (n=161) *agreed* the simulation training improved their practical skills while 3,6% (n=6) *disagreed*. (Figure 8.)

Experience

The open question in the questionnaire asked the students to describe their experience of the simulation training with their own words. These comments were analyzed through a qualitative content analysis (Appendix 3). The meaning units of the content analysis were imported from the students' responses. The meaning units got transformed to condensed meaning units and thereafter structured through codes, subcategories and categories. The following table shows the identified codes, subcategories and categories that were found. (Table 2.)

Table 2.

Qualitative content analysis

Code	Sub-category	Category
Useful experience for the future	Preparation for future	The simulation training was educational
Good preparation for future working scenarios		
Obtaining knowledge by observing	Gaining knowledge	
Obtaining knowledge by doing		
Pleasant and safe environment	Safe space	
Stressful and pressuring	Demanding	The simulation training was unpleasant
Uncomfortable situation	Uncomfortable	
Difficulty to act		

Five sub-categories and two categories were found by the content analysis. The two categories divided the students' responses within an educational experience and an unpleasant experience.

The simulation training was an educational experience

Most of the responses left by the students indicated that the simulation training was an educational experience. There were three sub-categories found that indicated the simulation training was educational. These subcategories were: Preparation for future, gaining knowledge and safe space. Some citations from the questionnaire will be mentioned in the following text. Many students were positive towards the learning by doing approach *"Learning by doing, I'm surprised how effective the sim is"*. While other students emphasized the good experience simulation training generates for future clinical placements *"Very very useful for my first time in a hospital"*. The benefits of doing practical training in a safe environment was also mentioned *"It was nice to have this experience and you can train without consequences"*.

The simulation training was an unpleasant experience

Few responses from the students indicated they had an unpleasant experience while participating in the simulation training. There were two subcategories found that implied the simulation training was an unpleasant experience. These subcategories were: Demanding and

uncomfortable. Some citations from the questionnaire will be mentioned in the following text. One student did for an example claim he/she thought the simulation training was demanding *"For someone with social anxiety is this a horror scenario"*. While other students indicated the simulation training was uncomfortable *"A Little embarrassing"* and *"It's a little bit hard to act like the simulation-doll is a human"*.

Discussion of method

Design

The benefits of a cross-sectional study are that a database of facts is collected and can be analyzed over and over. The loss of participants is usually smaller in the cross-sectional studies compared to longitudinal studies. Since this study was based on a prospective data collection with a cross sectional perspective, meaning that the variable is only measured during one particular time period, there might occur limitations of the result. The data collection of a cross-sectional study usually takes a shorter amount of time since it only looks at one point in time (Billhult, 2017b).

Since this study used a self-constructed questionnaire for data collection, the disadvantages of creating a questionnaire have been taken into consideration. When creating a questionnaire yourself it is a possibility that the questions could be misunderstood, the answers can be difficult to interpret and the questions can mirror the author's point of view. The risk with this kind of research is that the result is only descriptive and does not lead to a greater understanding or explains a phenomenon (Billhult, 2017a).

A study can be based on two approaches, an inductive and a deductive approach. This study was based on a deductive approach which means to originate from an existing theory or logical reasoning. The study was formed with theoretical based questions to be answered (Henricson, 2017).

Sample

For the results of the questionnaire to be reliable, it is important to have as high a response rate as possible. A response rate of >70-75 percent is seen as acceptable. In this study 98% percent answered the questionnaire, indicating that the study has a high reliability rate and a low external non-response rate (Billhult, 2017a). The high response rate might in this case be explained by the fact that the participants met the authors of the study before the questionnaire was handed out. The participants then got a personal connection to those who were behind the study, at the same time as they had the opportunity to question the questionnaire and the purpose of the essay. The response rate was believed to have been lower if the questionnaire had been sent out by email (Billhult, 2017a).

The sample of this thesis consisted of 172 students where 169 answered the questionnaire. That leads to an external non-response of 2% (n=3). The internal non-response varied but was at most 11% (n=18). These are low percentages of non-response which makes the sample

saturated (Billhult, 2017a). Most of the sample was between 18-23 years old and female and reflect gender and age distribution of the students of the nursing programme at FH JOANNEUM. However, this gives a result primarily from the female perspective.

Non-response

When a person either refuses to participate or simply is unable to answer a questionnaire that is called non-response. The bigger the non-response is the bigger the risk of a bias in the generalization of the sample. The fact that the authors of the thesis participated in person when the students answered the questionnaire, was an important part in minimizing the non-response. The authors invitation for the students to participate may be perceived as pressure by some (Eljertsson, 2019). The authors emphasized that the questionnaire was optional and anonymous to the students before they answered, however the author´s also asked them kindly to answer it to get as much content for the result as possible. This was to reduce non-response as well as not putting too much pressure on the students, so the answers given were of quality. The questionnaire had an external non-response of three participants. The university of FH JOANNEUM could not provide us with information regarding the demographics concerning these students.

Description of data collection

Three days before the simulation training, the students were able to access an informative letter regarding information about the thesis and questionnaire. A participant information letter included information that the questionnaire was voluntary, anonymous and treated confidentially. The questionnaire was available from 25.10.2022 to 28.10.2022 via a QR code.

The authors had in mind that the students' native language is German and not English, it could therefore be difficult for the students to express themselves in English if the questionnaire had had more open questions. A conscious choice was made to use several closed questions with multiple choice options and only one open question, since the authors believed the response rate would increase by doing this.

A pilot test of the questionnaire containing 10 questions was sent out to a population of 13 fifth semester nursing students at FH JOANNEUM. This, to certify if the questions in the questionnaire were easy to understand and to avoid misunderstandings. Billhult (2017c) call this content validity, which means that the content is secured by reasoning with people in the same subject area. By testing the measuring instrument, the risk of misinterpretation of the questionnaire questions could be reduced and possibly increase the validity of the study. Reliability regarding random errors concerning the measuring instrument is established by using an instrument that is exact and does not present incorrectly measured data (Billhult, 2017c). Using SurveyMonkey, an established accredited site, minimized the risk of this.

The purpose of the pilot study was to see if the English questions were formulated so a non-native English speaker could understand and answer them. The pilot study also examined if the answer alternatives were usable regarding multiple choice and fill in boxes. The authors could

also see how the result would look when it was time to analyze. Out of the ten questions in the pilot study nine were taken from the original questionnaire and the last open question was adapted to show the students' thoughts about the questionnaire. For the first nine questions all thirteen participants answered each question once however, on the last open question ten out of thirteen chose to leave a comment. These comments did not give the authors any indication of difficulties understanding the questionnaire.

Analysis methods

The data material was collected by questionnaires with the program SurveyMonkey. Data of completed questionnaires were imported and analyzed in the program Excel.

It is beneficial to use a graphic form to present the content clearly (Eljertsson, 2019). Using both tables and charts can be complementary to each other. The starting point to a chart is to fill in the data in a table where the observations are systematically arranged (Eljertsson, 2019). It is important to make the table easy to read and adapted to the recipient. When creating a table with a qualitative variable it is beneficial to split the content into different categories. By using a larger number of categories, it gives the table more details but at the same time it generates a good overview (Eljertsson, 2019).

Making charts can be a complement or option to a table (Eljertsson, 2019). There are many ways to present data in chart form such as bars, circles or curves. By using bar charts it is easier for the reader to interpret the result by simply looking at the height of the bars (Eljertsson, 2019).

The authors chose to use a qualitative content analysis for the last question of the questionnaire where the students were able to express their experience in their own words. Friberg (2022) claims this method makes it possible to code the written responses and find connections through codes, themes and categories (Friberg, 2022). Danielsson (2020) states that the negative aspect of using a qualitative content analysis is the risk of failing to code and categorize all interesting data. This was taken under consideration since all the answers written by the students were double checked by both authors.

Ethical consideration

When using a questionnaire, it is important to have in mind how the questions are formulated and if they are sensitively designed. The sample of participants and informed consent are also important ethical factors (Kjellström, 2017). The questionnaire of this study was revised many times by the authors of this thesis and their supervisors to prevent misunderstandings and to prevent too personal questions. The participants received information regarding the thesis during two occasions. Eljertsson (2019) claims that the authors invitation for the students to participate might have been perceived as a pressure by some. Although, the authors considered that consent was granted when the students decided to answer the questionnaire. The majority of the sample reflected 18–23-year-old females. One can question whether this sample group was considered to be extra vulnerable to participate in this thesis due to their young age.

However, the sample group contained first semester nursing students which this thesis aimed to highlight, regardless of age or gender.

The live streaming element in the simulation training was considered as an ethical issue that might have influenced the students' autonomy. According to the Swedish Nurse Association (2021) the principle of autonomy is important to consider since it aims to ensure freedom regarding ethical choices that may arise. By taking the students' autonomy in concern during the live streaming element meant that the students self-determination and freedom was confirmed (The Swedish Nurse Association, 2021). This implies that the students had the opportunity to withdraw or chose to not participate in the simulation training that was live streamed.

Discussion of results

The discussion will highlight the students' experience of confidence and feeling of being exposed before, during and after simulation training. The discussion will also underline interesting findings regarding students' experience with simulation training such as preparation and live stream, experiences of CRM and the findings of the content analysis. These findings will be discussed, strengthened and questioned below.

- Which human factors affect the students before, during and after simulation training?

The high impact of confidence and the low impact of feeling exposed are the human factor emotions that gave the most interesting results from the questionnaire and will be discussed below.

Confidence

The first interesting aspect concerns the human factor confidence which had a high impact on the students before, during and after the simulation training. The theoretical framework of this thesis defines confidence as a reliance and self- assurance in your own abilities (Kent, 2016). Most of the students answered that they agreed that confidence affected them during the whole simulation training. Labrague et al. (2018) states that students' confidence increases after simulation training since they now can connect their theoretical knowledge with new practical abilities. Research by Kiernan (2018) states that nursing students who undergo simulation training will be competent and feel confident in the clinical skills that have been practiced during the simulation training (Kiernan, 2018).

An interesting finding this thesis presents is that the first semester students demonstrate they experience confidence throughout the whole simulation training. Thomas & Mackey (2012) states undergraduate nursing students often show a low confidence regarding simulation training in the beginning of the semester. Furthermore Thomas & Mackey (2012) claims that simulation training might just be useful for nursing students in higher level classes. Since these students have more comprehension concerning the understanding of both theory and practice

(Thomas & Mackey, 2012). Although it might seem like the students participating in this thesis do not support the statement that undergraduate nursing students present a low confidence when entering a simulation training. However, it might be interesting if the participating students in this thesis preserve their confidence when entering their first clinical placement.

The high confidence can however be seen as something positive for the students' learning outcome. Le Blanc & Posner (2022) states for example that emotional responses experienced by students during simulation training might influence the students' learning (LeBlanc & Posner, 2022). Pawar et al. (2018) also state students' learning environment is influenced by their emotional state and overall experience of the simulation training (Pawar et al., 2018). The high confidence the students present in this study can therefore be seen as something beneficial for their learning outcome.

Exposed
The other interesting aspect the authors want to highlight from the result is the low impact of the human factor of feeling exposed. Results of the current study show that the students were not impacted by feeling exposed before, during or after the simulation training. This results stands in contrast to LeBlanc & Posner (2022) who state simulation training can cause the students to feel evaluated in front of their classmates. Welman & Spies (2016) do also claim that live streaming can cause the students to feel unprotected which will increase their anxiety. However, Welman & Spies (2016) also state that students might not feel exposed if they experience the environment among their classmates as safe and confidential (Welman & Spies, 2016). Since this thesis represents a low impact of the human factor exposed, it can therefore be concluded that the students experienced the environment as secure. Further, research by Kaddoura et al. (2016) indicates the importance of evaluating the students previous experience before entering a simulation training. The students previous experience might have been taken into consideration when the simulation scenarios were created, since the students once again, presented a low percentage of the feeling of being exposed.

- How do the students experience the simulation training?
The elements preparation and live stream with in the simulation training gave important findings that will be discussed below.

Preparation
Regarding the preparation before simulation training the result showed that most of the students agreed to having had enough theoretical preparation, but disagreed they had enough practical preparation. Al Gharibi Msn & Arulappan (2020) point out that in nursing education theory and practice are very much intertwined. By doing simulation training the students use their theoretical knowledge while improving their practical skills (Al Gharibi Msn & Arulappan, 2020). This could explain why the students felt more theoretically prepared and felt a lack of practical knowledge since that was supposed to increase during the simulation training. However, Al Gharibi Msn & Arulappan (2020) also state that there is a decrease in opportunity to provide patient care in clinical situations within nursing education. This leads to less practice

and practical knowledge. This needs consideration when choosing which methods to use when teaching practical skills (Al Gharibi Msn & Arulappan, 2020).

Live-stream

When asked how the students felt about being live streamed, they agreed with feeling excited and stressed but disagreed with feeling exposed and confident. Kaddoura et al. (2016) discovered that the knowledge of being watched made the students feel extra pressure to perform. Another article found by Yoshie et al. (2016) investigates how the brain responds to the feeling of being watched and evaluated. Results show that individuals with more anxiety about getting a negative evaluation tense up during the test scenario. This is contradicted by Chib et al. (2018) showing that being watched trigger motivation to perform our best and affect the result positively (Chib et al., 2018). The findings of Chib et al. (2018) and Kaddoura et al. (2016) align with the findings of the current study showing both excitement, stress and exposure as well as confidence.

- ## How do the students perceive the CRM key points in regard to the simulation training?

Interesting findings about the students' thoughts on CRM will be discussed below.

The students agreed to feeling familiar with the environment in the simulation room. As mentioned in the background, knowing the environment means knowing what resources are available (Lei & Palm, 2022). When you find yourself in a medical crisis, knowing the environment helps to identify needs and respond accordingly. However, when you find yourself in a stressful situation, resources usually apparent could easily be missed. Preparing for crisis is therefore a hard task because of unexpected challenges and tunneled vision. Other key points can therefore be beneficial such as calling for help early and cognitive aids (Lei & Palm, 2022). This is agreed upon by the students in our result. Research by Rudy et al. (2007) also support that it is beneficial using CRM in healthcare environments. Their study show that repeated CRM training is positive for the healthcare workers and can improve their performance in critical events (Rudy et al., 2007).

- ## How do the students reflect upon their own experience?

It appears that most students experienced simulation training as an educational experience. While some students experienced the simulation training as an unpleasant experience.

Educational experience

The main finding in the students' responses was that the simulation training was an overall positive experience. The sub-categories that the discussion will highlight is: *Gaining knowledge* and *safe space.*

Gaining knowledge

Research by Sundler et al. (2015) states simulation training is a useful opportunity to develop new comprehension regarding the connection between skills training and theoretical

competence. Previous research by Labrague et al. (2018) also claims the benefits of combining theoretical and practical- based activities. This will in turn reduce the students' anxiety to exercise the clinical skills that were practiced during the simulation training.

Many students were also very positive towards observing their classmates perform the simulation training. This was seen as something educational and helpful since the students claim they learned from each other's mistakes. Previous research by Lindon-Morris and Laidlaw (2014) claims performance comparison as something beneficial for readjusting and improving one's own abilities. Welman and Spies (2016) state it is good that the students learn from each other's mistakes during simulation training. Furthermore, Welman and Spies (2016) claim the debriefing session as an important factor since the students then have the opportunity to both question and answer each other's performances. Thomas & Mackey (2012) also claim the importance of emphasizing each other's weaknesses and strengths. By doing so, the students receive constructive feedback that can result in an increase in the student's self-confidence.

Safe space

Some students also mentioned the benefits of practicing clinical skills in a safe environment. Although, research by Thomas & Mackey (2012) state the safe environment the students perform simulation training under is not always seen as positive (Thomas & Mackey, 2012). This because a real clinical setting is not always ensured to be experienced as a safe environment. This study indicates that the students appreciated practicing simulation training in a safe environment at the same time as they experienced the feeling of confidence.

Unpleasant experience

Although most responses from the students were positive, a few students left comments that indicated they had an unpleasant experience. The important findings that will be discussed below is the sub-categories: *Demanding and uncomfortable.*

Demanding and uncomfortable

Some comments included the human factor stress. One comment left by a student mentioned *"it's crazy how much you can forget in stress situations"*. Sharp (2012) states that stress impacts the way of thinking clearly and can result in one acting without consideration of its surroundings. Wisecup et al. (2008) does mention negative emotions affect the ability to act like oneself. It can therefore be shown that stress had a negative impact on some of the students during the simulation training. Some students did also comment they found the simulation training awkward and exposing. The theoretical framework of this study mentions exposure as a feeling of being undressed in front of a group (Porta, 2016). Welman & Spies (2016) state that students can experience emotional unpreparedness when entering a simulation training. This can for an example relate to the fact that the students are being live streamed and are afraid to embarrass themselves in front of their classmates. One student mentioned the fear of being judged by its classmates and the pressure of doing a good performance. Kaddoura et al. (2016) claims that the students can feel exposed and humiliated during bad performance which can result in a destructive learning experience for the student.

Overall the majority of students described their experience of simulation training as positive and educational, while a minority left comments that implied negative and unpleasant experiences. Previous research supports these findings, although an interesting factor this thesis highlights is the small number of negative experiences from the students' perspective.

Conclusion

This study aimed to get a better understanding of nursing students' own experience of simulation training based on human factors such as emotions and the concept of CRM. The students agreed that they felt confident throughout the simulation training but felt most confident afterwards. The students experienced a high level of confidence before the simulation training which is not supported by previous research. The result showed that the students did not feel exposed throughout the simulation training. This can be explained by a safe environment and consideration of previous experiences.

The students felt theoretically prepared for the simulation training but disagreed they had enough practical preparation. The discussion showed that these results could be explained by the practical skills being the object of development during the simulation training. The livestream made the students experience both positive and negative emotions such as excitement and stress. These emotional responses could be explained by the individual response a human brain has when put in a new situation. Both previous research and the students in this thesis agree that using CRM in a crisis situation is useful for performing at one's best. The qualitative content analysis resulted in two categories: "The simulation training was educational" and "The simulation training was unpleasant". However, most comments left by the students indicated that the simulation training was a positive and educational experience.

Implementation

By reading this thesis both students and educators can get a better insight of what can affect the students experience during simulation training.

For educators
By looking into the students' experience of simulation training, strengths and weaknesses of the setup can be recognized. These strengths and weaknesses can later be reviewed by educators to optimize the learning for the students. This study discusses which human factors and emotions that can be considered by educators and discussed before and after simulation training with the students. This could help the students feel they are in a safe environment where their emotions are considered.

For students
It may be beneficial for students to read this thesis to get a better understanding before simulation training. This is because they might get a better insight of what emotions can relate to simulation training. The students may also see that simulation training for the most part is a positive experience.

Further research

Further research regarding the impact of live streaming in simulation training may be beneficial. Since the result of this study found the students react differently to being livestreamed which is also supported by previous research. A comparison of benefits and limitations of live streaming should also be considered. Since this could make it possible to investigate what is optimal for simulation training. Our study also indicates that first semester students maintain a high level of confidence during the whole simulation training. Further research is suggested on whether the confidence is maintained when the students enter their first clinical placement. This study shows that the experience of simulation training can be both educational and unpleasant. Further research regarding how students can experience simulation training as more pleasant could be helpful.

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Appendix 1.

Questionnaire - Simulation training: from the students' point of view

1. How old are you?
   - o 18-23 years old
   - o 24-29 years old
   - o 30-34 years old
   - o 35-40 years old
   - o Over 40 years old

2. How do you define your gender?
   - o Male
   - o Female
   - o Non-Binary
   - o Rather not say

3. Do you have any previous experience with patient care in healthcare environment?
   - o yes 0-1 years
   - o yes 1-2 years
   - o yes 3+ years
   - o No

4. Have you participated in simulation training before?
   - o Yes, as a participant
   - o Yes, as an observer
   - o No

5. Which role did you get assigned during the simulation training?
   - o Student nurse
   - o Relative
   - o Patient
   - o Observer

BEFORE SIMULATION TRAINING
6. Before knowing what role I was assigned, I felt…
   - o Excited – Fully agree/agree/Disagree/Completely disagree
   - o Confident - Fully agree/agree/Disagree/Completely disagree
   - o Stressed - Fully agree/agree/Disagree/Completely disagree
   - o Unprepared - Fully agree/agree/Disagree/Completely disagree
   - o Exposed Fully agree/agree/Disagree/Completely disagree

7. I had enough theoretical preparation before simulation day such as lectures and course literature

o Fully agree
o Agree
o Disagree
o Completely Disagree

8. I had enough practical preparation before simulation day such as skills training
o Fully agree
o Agree
o Disagree
o Completely Disagree

DURING

9. During the simulation training I felt….
o Excited - Fully agree/agree/Disagree/Completely disagree
o Confident - Fully agree/agree/Disagree/Completely disagree
o Stressed - Fully agree/agree/Disagree/Completely disagree
o Unprepared - Fully agree/agree/Disagree/Completely disagree
o Exposed - Fully agree/agree/Disagree/Completely disagree

10. Being livestreamed made me primarily feel….
o Excited - Fully agree/agree/Disagree/Completely disagree /I was an observer and therefore not livestreamed
o Confident - Fully agree/agree/Disagree/Completely disagree / I was an observer and therefore not livestreamed
o Stressed - Fully agree/agree/Disagree/Completely disagree / I was an observer and therefore not livestreamed
o Unprepared - Fully agree/agree/Disagree/Completely disagree / I was an observer and therefore not livestreamed
o Exposed - Fully agree/agree/Disagree/Completely disagree / I was an observer and therefore not livestreamed

11. The simulation training improved my practical skills

o Fully agree
o Agree
o Disagree
o Completely Disagree

12. I felt familiar with the environment in the simulation room
o Fully agree

- o Agree
- o Disagree
- o Completely Disagree
- o I was not a participant

13. Getting help, when required was uncomplicated
- o Fully agree
- o Agree
- o Disagree
- o Completely Disagree
- o I was not a participant

AFTER

14. After the simulation training I primarily felt…
- o Excited - Fully agree/agree/Disagree/Completely disagree
- o Confident - Fully agree/agree/Disagree/Completely disagree
- o Stressed - Fully agree/agree/Disagree/Completely disagree
- o Unprepared - Fully agree/agree/Disagree/Completely disagree
- o Exposed - Fully agree/agree/Disagree/Completely disagree

15. I was satisfied with my performance during today's simulation training
- o Fully agree
- o Agree
- o Disagree
- o Completely Disagree
- o I was not a participant

16. Using cognitive aids such as SBAR and checklists are beneficial for me to provide safe patient care
- o Fully agree
- o Agree
- o Disagree
- o Completely Disagree

17. The simulation training exercise is useful for my upcoming clinical placement
- o Fully agree
- o Agree
- o Disagree
- o Completely Disagree

18. The debriefing session primarily made me feel…
- o Excited - Fully agree/agree/Disagree/Completely disagree
- o Confident - Fully agree/agree/Disagree/Completely disagree

- o Stressed - Fully agree/agree/Disagree/Completely disagree
- o Unprepared - Fully agree/agree/Disagree/Completely disagree
- o Exposed - Fully agree/agree/Disagree/Completely disagree

19. The debriefing session allowed me to reflect upon factors affecting performance

- o Fully agree
- o Agree
- o Disagree
- o Completely Disagree

20. How would you in your own words describe your experiences of today´s simulation training?

Appendix 2.

Ethics application to the head of the institute of Health care and Nursing at FH JOANNEUM University.

Purpose of the study:
The purpose of this Bachelor thesis is to examine nursing students' own experience of medical simulation.

Background of the study:
Medical simulation is today an established part of education within the Bachelor program in nursing. During the medical simulation the students get an assigned role and take part in a staged medical roleplay. Attending a medical simulation exercise as a student, can result in a rewarding situation but also a vulnerable situation. The vulnerable situation occurs according to previous research when the student experiences a lack of knowledge and provided preparation before the simulation exercise begin.

Problem statement:
We do not know if medical simulation can create a feeling of being exposed and if one's performance can be affected by nervousness. This is an important topic to investigate since the students may experience that their simulation assessment is unfairly graded based on poor provided preparation before the simulation exercise begin. The students can also feel that their performance is affected by their own emotions, such as anxiety and nervousness during the simulation exercise. This Bachelor thesis will explore student's experiences with the medical simulation in general as well as the design (lectures, theory, and clinical practice). This will clarify how students' emotions, nervousness and preparation affect their performance during the staged simulation exercise.

Method:
This Bachelor thesis will collect data from first semester students within the Bachelor programme of nursing at FH JOANNEUM University. Data will be collected by a questionnaire and handed out directly after the simulation exercise is completed. The questionnaire will include questions that concern the student´s own feelings of satisfaction as well as the student´s perception of the structure and benefits of the simulation.

Data management:
The collected data from the questionnaires will be processed so that unauthorized persons cannot take part of the information. The questionnaires will be disposed after the Bachelor thesis is approved.

Data and personal data in the study are handled in accordance with the EU Data Protection Regulation, the General Data Protection Regulation (GDPR) and the Regulation of the European Parliament and the Council (EU) 2016/679.

University of Gothenburg has a Data Protection Officer who can be reached by email: dataskyddsombud.gu.se

Information and consent

Before the simulation exercises begin, the study supervisors will introduce themselves, the faculty they are from, the Bachelor thesis and its purpose, as well as information about when the questionnaire will be available to answer. During this time, the participants can ask questions to the study supervisor regarding the questionnaire and the Bachelor thesis. The participants will then go through a full day of simulation exercises and after this day get access to a QR code where they can answer the questionnaire. The questionnaire is anonymous, and we will not be able to see who has answered. The questionnaire contains of 14 multiple choice questions, and one open question at the end.

Participation does not affect the students results of the actual simulation exercise and it is completely optional to participate.

If the students have any questions they would like to ask the study supervisors before participating, they can do so via email or in person on the actual simulation day.

Before data is collected, an approval is awaited from the institute of Health care and Nursing at FH JOANNEUM University and an information letter to all participants will be sent out via email.

Responsible for the study:
Alexandra Jernstedt, Sjuksköterskeprogrammet, gusjernal@student.gu.se, +46728743891
Sandra Hygrell, Sjuksköterskeprogrammet, gushygsa@student.gu.se +46730501366

Supervisors:
Camilla Eide, University lecturer at Sahlgrenska Academy at the University of Gothenburg.
camilla.eide@gu.se, 031-786 60 96

Inger Jansson, Deputy head of education at Sahlgrenska Academy at the University of Gothenburg.
inger.jansson@gu.se, 031-786 60 13

Markus Lang, University lecturer at FH JOANNEUM Universiy. markus.lang@fh-joanneum.at

Approval of the study:

The undersigned has reviewed and read the ethics application and approves that the study is carried out at our business.

Head of the institution

…………………………. …………………………. ………………………….
Date   Signature   Block letters

Appendix 3.

Meaning unit	Condensed meaning unit	Code	Sub-category	Category
"I think it is a good practice for in person care in the future, as well as for work. And it helps to be more prepared for tests. The reflection part is good to get new views and exchange ideas and experiences"	Good practice for the future, exchange ideas and obtain different perspectives from reflection	Useful experience for the future	Preparation for future	The simulation training was educational
"Very very useful for my first time in a hospital"	Useful for future clinical placement			
"It very exciting every time we have simulation, it is stressful, but in the end it prepares us for working"	Exciting but stressful scenario, good preparation for future working scenarios	Good preparation for future working scenarios		
"I love simulation training because I used to go to another nursing school before that did not have any simulation training and I feel like I am gaining much more experience and important lessons because of this real-life scenarios. I think you will also feel more prepared before going to your work place and you make less errors"	Simulation training is important for gaining experience and prepare for future working scenarios			
"I was not a participant, but watching my fellow classmates made me realize that we actually can already do quite a bit in our own. I also feel like even when not" *"actively participating in the simulation you can learn a lot by just thinking the tasks through and realizing what you might have done different or even seeing new and better ways of doing something"*	Observing the simulation training was useful and demonstrated new ways of thinking	Obtaining knowledge by observing	Gaining knowledge	

"I liked it because there were mistakes I would have done as well, and I know why they were not correct and which behavior is more suited"	Observing the simulation training was useful			
"Learning by doing, I'm surprised how effective the sim is"	Learning by doing is an effective learning method	Obtaining knowledge by doing		
"It was nice to have this experience and you can train without consequences"	Pleased with the experience and practical training in a safe environment	Pleasant and safe environment	Safe space	
"Nice and very informative"	Pleasant and educative			
"I was nervous before each scenario and was a bit anxious about failing or not being as good as I could be"	Feeling nervous and scared of not performing well	Stressful and pressuring	Demanding	The simulation training was unpleasant
"Its crazy how much you can forget in stress situations"	Forgetting knowledge due to stress			
"For someone with social anxiety is this a horror scenario"	Hard for someone with social anxiety	Uncomfortable situation		
"I myself didn't really enjoy being a participant because I felt really exposed, like I would silently get judged by everyone, so it was rather uncomfortable"	Feeling exposed and judged			
"It's a little bit hard to act like the simulation-doll is a human"	Hard to interact with the doll	Difficulty to act	Uncomfortable	
"A Little embarrassing"	Feeling embarrassed			