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Operating Room Nurses' Understanding of Their Roles and Responsibilities for Patient Care and Safety Measures in Intraoperative Practice

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Bisma Chellam Singh, RN, BSN, MSN[1]
and Judie Arulappan, MSc (N), PhD, DNSc[2]

Abstract

Introduction: Surgical care has been a vital part of healthcare services worldwide. Several patient safety measures have been adopted universally in the operating room (OR) before, during, and following surgical procedures. Despite this, errors or near misses still occur. Nurses in the OR have a pivotal role in the identification of factors that may impact patient safety and quality of care. Therefore, exploring the OR nurses' understanding of their roles and responsibilities for patient care and safety in the intraoperative practice, which could lead to optimal patient safety, is essential.

Objective: This study explored the understanding of OR nurses regarding their roles and responsibilities for patient care and safety measures in the intraoperative practice.

Methods: The study was conducted in one of the tertiary care hospitals in the United Arab Emirates. Qualitative, descriptive, exploratory research design was utilized. The data were collected using semi-structured face to face interviews. Purposive sampling included eight nurses. Data analysis was performed following Colaizzi's seven-step strategy.

Results: Seven emerging themes were identified. The main themes are: patient safety, preoperative preparation, standardization of practice, time management, staffing appropriateness, staff education and communication, and support to the patient in the OR.

Conclusion: OR nurse leaders may take into consideration the current findings as a reference for quality improvement projects in the hospital, considering the specific characteristics of each local setting. Although the participants consider that the environment is safe and the quality of care is high in the study setting, there is still room for improvement on workflows and processes. OR workflow should be improved especially by addressing the potential patient safety issues.

Keywords

operating room, operating room nursing, patient safety, medical errors, intraoperative period, surgery

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Introduction/Background

Intraoperative practice is highly complex and challenging considering the vulnerability of the patient (Peate, 2015). The intraoperative period starts when the patient arrives at the operating room (OR) and ends when the patient gets transferred to the postoperative ward (Salazar Maya, 2022). The care in the OR involves high use of technology and is different than the care provided in other settings of the hospital. OR nurses play an instrumental role in preventing infection, maintaining asepsis, handling instruments, adopting medical techniques, preventing complications, and handling biological preparations. Additionally, nurses play an essential role in planning care and collaborating with the patient, surgical team, and other healthcare providers (Flaubert et al., 2021; Kelvered et al., 2012).

[1]Staff Nurse, Head and Neck Operation Theater, Manchester Royal Infirmary Hospital, Manchester, UK
[2]Department of Maternal and Child health, College of Nursing, Sultan Qaboos University, Muscat, Sultanate of Oman

Corresponding Author:
Judie Arulappan, Department of Maternal and Child Health, College of Nursing, Sultan Qaboos University, Al Khoudh, Muscat, Sultanate of Oman.
Email: judie@squ.edu.om

Patient safety during surgery is one of the major alarms for intraoperative teams as adverse events occurring during this period is the major cause of disability and death (Rodziewicz et al., 2022). Patient safety involves decreasing the danger of superfluous harm including anticipation of errors and avoidable adverse events to shield patients from injury (Ingvarsdottir & Halldorsdottir, 2018). Major complications emerge in 3%–22% of surgeries, and the mortality rate is reported as 0.4%–0.8%. As the issue of patient safety takes a major toll, the World Health Organization (WHO, 2017) calls for addressing the issue in the report "Safe Surgery Saves Lives." These complications might be avoided if patients are taken care of during this period (Ingvarsdottir & Halldorsdottir, 2018).

Review of Literature

Ugur et al. (2016) claim that errors occur more in OR as the staff come from various disciplines with various educational schemes and work as groups, which may cause surgical confusions. Therefore, the preventable mistakes can be lessened when OR staff are qualified in patient safety, clear systems are pursued step by step, and control structures are created and utilized. Likewise, effective communication among the OR staff reduces the surgical errors (Ingvarsdottir & Halldorsdottir, 2018) and effective communication between the patient and medical and nursing staff enhances patient satisfaction (Allison & George, 2014).

Ensuring patient safety in the OR includes prevention of all avoidable medical and surgical errors including preventing wrong person, site, procedure, and retained foreign objects. These errors can be prevented by structured communication with the patient, surgeon, and other healthcare team members (American College of Obstetricians and Gynecologists, 2010; Rodziewicz et al., 2018). Additionally, correct identification of patients who are at risk of high blood loss, anesthesia or airway issues, history of allergies, and prevention of surgical site infection is essential (Mcdowell & Mccomb, 2014; Woodman & Walker, 2016). In addition, the errors could be prevented during the preparation of surgical environment, instrumentation, sutures, and drugs (Taaffe et al., 2018; Williams & Hopper, 2015). Likewise, patient safety can be enhanced through proper scheduling of procedures, communicating with other colleagues, helping to ensure consistency with the surgical safety checklist, and screening the progress in the surgeries and reporting to the board (Rothrock, 2018).

Despite all safety checks, there is a risk for errors, which could cause adverse events to surgical patients (Rodziewicz et al., 2018). Hence, it is imperative that the nurses are knowledgeable about patient safety and do corrective actions as patient advocates. Considering the surgical risk for the patients, McGarry et al. (2018) and Brown-Brumfield and Deleon (2010) emphasize the role of nurses in intraoperative patient safety and Kelvered et al. (2012) and Blomberg et al. (2018) point out the vulnerability of patients undergoing surgery and the risks associated with the intraoperative environment. Moreover, Gutierres et al. (2018) recommend various measures to improve patient safety during intraoperative period. Furthermore, the International Council for Nurses (2013) asserts that each registered nurse has a moral and ethical duty to speak-up for the patient's best interest, show quietude, regard, secure patient autonomy, and self-esteem (Blomberg et al., 2018). Besides, accountability of nurses is essential for professional nursing practice and patient safety (Battié & Steelman, 2014).

At the author's department, there were few incidences, such as specimen rejection, hand hygiene issues, errors in needles, sponge counting, and skin tearing in 2017 and 2018. Similarly, there was one incidence of skin injury during this period. This urged the authors to conduct the study to explore the understanding of OR nurses' roles and responsibilities for patient care and safety in the intraoperative practice, which could lead to optimal patient safety using evidence-based practice.

Methods

Research Aim

The study explored the understanding of OR nurses regarding their roles and responsibilities for patient care and safety measures in the intraoperative practice.

Design

We adopted a qualitative, descriptive, exploratory research design. Nurse researchers who conduct qualitative studies are contributing important information to the nursing body of knowledge that cannot be obtained by any other research design (Burns & Grove, 2005, p. 52). The qualitative researchers have a preference for understanding events, actions, and processes within a specific context (Babbie & Mouton, 2001, p. 272). In addition, explorative research examines a phenomenon of interest, rather than simply observing and recording incidents of the phenomenon (Lobelo, 2004, p. 20). Likewise, qualitative descriptive approaches to nursing and healthcare research provide a broad insight into particular phenomena (Doyle et al., 2020). Similar research design has been utilized in a previous research (Sehularo et al., 2012). This design is utilized in the current study to explore and describe the understanding of OR nurses regarding their roles and responsibilities for patient care and safety measures in the intraoperative practice.

Setting

The study was conducted in one of the tertiary hospitals in the city of Abu Dhabi in the United Arab Emirates. All Interviews were taken place in a private room within the General Surgery OR department, which was quiet, private

and calm that helped the participants to feel relaxed and ready to open and share their views.

Population

Population comprised general surgery OR nurses.

Sample and Sampling Method

The sample comprised eight general surgery OR nurses working at a tertiary hospital. Purposive sampling was adopted.

Criteria for Sample Selection

Inclusion Criteria. The study included nurses with more than 2 years of experience in OR as they had extensive experience and in-depth knowledge to share their roles and responsibilities for patient care and safety measures in intraoperative practice.

Exclusion Criteria. Nurses in management positions were excluded in this study as they are not performing direct patient care in the OR.

Ethical Considerations. The study was approved by the Royal College of Surgeons in Ireland (RCSI) - Medical University of Bahrain (MUB) - Research Ethical Committee (REC). Further approval was granted from the organization involved in accessing and recruiting participants. All audio recordings were coded, password-protected, and stored in a double-locked cabinet in the primary investigator's office. Names, address, phone number, e-mail, and staff ID were not collected. Moreover, any information that may lead to the identification of the interviewees was deleted from the interview scripts. Likewise, the findings from the study were presented in ways that ensured that individuals cannot be identified.

Data Collection Method. The data were collected through a direct face-to-face individual interview with the participants using semi-structured probing questions. The data were collected in June 2019. The questionnaire comprised six central questions (Table 1). All interviews were done in English language and audio-recorded after obtaining consent and agreement from the study participants. Eight interviews were conducted individually. Each interview lasted approximately 27–55 min. The interviewer asked follow-up inquiries to clear up individual reactions and to support elaboration as deemed appropriate.

Positions and Roles in the Study

The research team had four members: the lead investigator, one researcher, one research team member with managerial responsibilities of supervision of nurses, and one research supervisor directly tied to the study organization. The research team members used online meetings to track the study's progress and conclusions. All members have experience in nursing research. No repeated interviews were conducted in this study, and it is noted that no relationship between researchers and participants might influence the responses.

Pilot of Interview

Two pilot interviews were conducted before commencing the actual interviews. The pilot interview helped the researcher to get familiar with the aptitudes in interviewing and the progression of conversation.

Statistical Analysis

The collected data were transcribed and analyzed using Colaizzi's (1978) seven-step framework. The steps are (i) transcribing all the subjects' descriptions, (ii) extracting significant statements, (iii) creating formulated meanings, (iv) aggregating formulated meanings into theme clusters, (v) developing an exhaustive description, (vi) identifying the fundamental structure of the phenomenon, and (vii) returning to participants for validation (Edward & Welch, 2011). The principal investigator performed the analysis. The supervisor and the corresponding author verified the coding and themes and cross-checked for the consistency of the information.

Table 1. Interview Questions.

Interview questions guide
1 As a theatre nurse what are your major responsibilities, i.e., your daily tasks?
2 What are the challenges you face in your work area that could compromise patient safety?
3 Do you think any process or work flow which you practice needs to be altered to attain optimal patient safety? Which of those are directly nursing-related and which are not?
4 Have you identified solutions to improve patient safety? Which are those?
5 Have you presented those solutions to your management? And, if so, did you get support from them?
6 Would you like to add more to the point we discussed?

Credibility, Dependability, Transferability, Rigor, and Trustworthiness

To ensure credibility of the data, the researcher strongly engaged with the interviews by means of observation, documentation, and taking notes. Dependability was achieved through reviews and comments on coding accuracy given by the supervisor who has full knowledge of the study design and methodology. To establish transferability, data collected from participants and the findings could be applicable to other contexts, situations, times, and populations and the study setting. The researcher adhered to rigor by carefully collecting data via audio recordings and by taking field notes. Each interview was transcribed immediately after the interview by the Principal investigator. The transcripts were given to the participants for cross-checking and approval (Forero et al., 2018; Lincoln & Guba, 1986). As described by Stahl and King (2020), trustworthiness was established by using an unbiased approach in selecting the participants and by participant's being honest, clearly recorded and accurately presented inputs. The samples were selected purely on the basis of inclusion and exclusion criteria. No selection bias was applicable in the study.

Results

Sample Characteristics

The demographic variables of the study participants are presented in Table 2. There were eight study participants. Six of them were females and two were males. Age ranged from 28 to 52 years. Nurses' OR experience varied between 8 and 23 years. All the participants had previous OR experience. The participants either had Higher Diploma in Nursing or BSN degree.

Research Question Results

There were a total of seven emergent themes developed from 20 theme clusters. The themes include patient safety, preoperative preparation, standardization of practice, time management, staffing appropriateness, staff education and communication, and support to the patient in the OR (Table 3).

Theme 1: Patient Safety. After comparing the statements from all the participants, patient safety was identified as the major role of all the OR nurses. Institute of Medicine defines patient safety as "the prevention of harm to patients." Emphasis is placed on the system of care delivery that (1) prevents errors, (2) learns from the errors that do occur, and (3) is built on a culture of safety that involves healthcare professionals, organizations, and patients (Aspden et al., 2004; Clancy et al., 2005).

Theme Cluster: Safety Checks, Pressure Over Staff, and Nursing Responsibility for Patient Safety. The participants mentioned that the nurses should check if the patient is adequately padded to prevent contact with metal surfaces and improper positioning that causes nerve damage. Also, patients should be identified correctly.

> The main thing is the skin of the patient, the skin integrity. When she wakes up, I don't want her to get blisters because of her positioning, so nurses should make sure to check from top to toe that they are properly padded, their skin is not attached to any metal especially if they are going to use diathermy, it will cause burn if any metal is attached

> rushing can lead specimen being labeled incorrectly (Participant 1)

> …if you are in a rush or if you are distracted, you miss out on vital information. That could have safety implication (Participant 3)

The participants suggested that patient safety should be the main goal for nurses and nurses are responsible for promoting safety and preventing injuries.

Table 2. Participants' Demographic Characteristics ($N = 8$).

Participant no.	Age	Gender	Years of experience in OR	Previous clinical experience	Highest educational level
P1	45	Female	22	OR	BSN
P2	28	Female	8	OR	BSN
P3	49	Female	22	OR	Higher Diploma in Nursing
P4	33	Male	10	OR	BSN
P5	31	Female	9	OR	BSN, CNOR (Certified Nurse Operating Room)
P6	46	Male	22	OR	BSN
P7	41	Female	12	OR	BSN, CNOR, RNFA (Registered Nurse First Assistant)
P8	52	Female	23	OR	BSN, CNOR, RNFA

OR = operating room.

Table 3. The List of the Final Theme Clusters and Emergent Themes.

Themes cluster	Emergent themes
• Safety checks, pressure over staff, and nursing responsibility for patient safety	Patient safety
• Total time patient spent under anesthesia	
• Adherence to universal protocol	
• Appropriate OR environment	
• Staff familiarization with holistic care of the patient	
• Patient advocacy	
• Hand hygiene	
• Materials and equipment readiness	Preoperative preparation
• Preoperative preparation prior to intraoperative phase	
• Uniformity of practice within the hospital	Standardization of practice
• Appropriate workflow for specimen handling	
• Turnaround time	Time management
• Teamwork	
• Instrument reprocessing	
• Adequacy of staffing	Staffing appropriateness
• Health status of staff	
• Surgeon availability	
• Staff training	Staff education
• Need to establish a better rapport and empathy with the patient	Communication with and support to the patients in the OR
• Proper communication with the patient	

OR = operating room.

> It's very important for the patient to have someone that is paying attention to them, then you can do your other works afterward, once they have gone to sleep. You must spend that time with the patient, it's only a short period before they go off to sleep, then you can proceed with the rest of your duties (Participant 3)

Another three participants also pointed out the nursing responsibilities for patient safety especially in protecting their confidentiality and prevention of falls.

Theme Cluster: Total Time Patient Spent Under Anesthesia and Appropriate Instrument Handling. The participants pointed out that if the patient spends more time under anesthesia, it can affect the safety of patient. Staff members have to prepare everything in advance so as to avoid waiting for equipment and instruments once the patient is under anesthesia.

> The more prolong the patient is under anesthesia more complication it is. So, it is also reflecting the patient safety during the intraoperative period (Participant 5)

Theme Cluster: Adherence to Universal Protocol. Majority of the participants talked about the importance of universal protocol in patient safety.

> The World Health Organization created the Sign-in, the Timeout, and the Sign-out, these are separate little checklists, but all for one procedure, including various aspects of care. So you pause when you do a little checklist, then you pause again before skin incision to ensure it is the right patient for the right surgery, check any allergies again and make sure the antibiotics have been given and then at the very end we do the Sign-out. This is what we do, was there any specimens, any blood loss, any issue to report, so it is checked, check all along the way. (Participant 3)

Theme Cluster: Appropriate OR Environment. The participants highlighted the importance of appropriate OR environment in patient safety. They mentioned that the OR should be illuminated adequately and the noise should be kept minimum in order to attend to the needs of the patient.

> in our laparoscopic case, it is dark inside in the OR. So, it is hard to move around to help

> If the music is playing, the surgeons are also teaching some of the interns, the residents, and another surgeon, so if they are talking all at the same time with the music, you wouldn't hear what they want at first. So, they have to repeat it again until they get mad and they will shout again so it can lead to one after the other because it is very noisy in the room (Participant 7)

Theme Cluster: Staff Familiarization With Holistic Care of Patient. Two of the participants discussed the staff familiarity with the holistic care of the patient. They described that the surgeons should not operate on patients whose health status is not familiar to them, even though it is a simple surgery.

> All the staff in the room, is to be aware of the patient's status (intraoperatively) at all times, for example, hemodynamic, looking at the anesthesia monitors, ECG, pulse oximeter, etc, so the second set of eyes is always a safe practice (Participant 8)

According to the participants, the same surgeon who is operating on the patient must be the one to provide care preoperatively, intraoperatively, and postoperatively to render continuity of care.

Theme Cluster: Patient Advocacy. The participants claimed that nurses are the patient's advocates and they must speak up for the patients.

> When the patient is inside the OR, we are their only advocate and we should look after them very well. Because they trusted their life to us, so have to do our best

> The patients are trusting us, and we have to do the best for the patient. Nurses must advocate for the patients as they cannot speak for themselves while under anesthesia and also, they are very anxious in the OR. (Participant 1)

Theme Cluster: Hand Hygiene. Most of the participants acknowledged that hand hygiene is the fundamental concept in the prevention of infection and in promoting patient safety.

> So if you don't have proper hygiene, the patient is getting infection or the disease that he didn't have when he came to the hospital. That means, he is getting his condition worsening if you don't have proper hand hygiene (Participant 5)

> It is like disciplining yourself to do hand hygiene because we have everything around us. We have the water, we have the sink all over, we have the solution, to do the hand hygiene. So, I think it is more on the discipline of the person on how to do it. (Participant 7)

Theme 2: Preoperative Preparation. The participants argued that the preoperative readiness of instruments, equipment, and supplies prior to wheeling the patient into OR can enhance patient safety in many ways. Preoperative preparation includes the psychologic and physiologic preparation of a patient before an operation. The preoperative period may be extremely short, as with an emergency operation, or it may encompass several weeks during which diagnostic tests, specific medications and treatments, and measures to improve the patient's general wellbeing are employed in preparation for surgery (Turner, 2006).

Theme Cluster: Materials and Equipment Readiness. Almost all the participants declared the importance of materials and equipment readiness prior to wheeling the patient into OR.

> Everything should be set up, the equipment in the room available, because we don't want to delay things when the patient is already on sleep, the surgeon needs this kind of equipment, as daily task, check that all the equipment available. I don't want to put the patient asleep without having the proper equipment. (Participant 1)

> The equipment-wise, make sure that it is working well, it is not malfunctioning, and then instrument wise, make sure that our instruments are not defective, working well (Participant 7)

Theme Cluster: Preoperative Preparation Prior to Intraoperative Phase. One participant mentioned about the thorough preparation of the patient in the preoperative department prior to wheeling inside OR. The assessment should be done thoroughly to prevent complications during intraoperative period.

> I don't know how the pre-op nurses do the assessment. I think the assessment should be more thorough like sometimes they miss the patient still goes to the OR with hair clips, still with jewelry. (Participant 7)

Theme 3: Standardization of Practice. Majority of the participants highlighted that the practices should be based on the policy and protocol of the hospital. In addition, it is crucial for the safety of patients and staff. Standardization of practice refers to the creation of standard clinical processes using process management in conjunction with robust, targeted measurement, and team-based care, in which measurement informs practice and practice informs evidence and further improvement (McGinnis et al., 2013).

Theme Cluster: Uniformity of Practice Within the Hospital. The participants said that everyone should practice patient care with proper understanding of the policies and procedure. The staff from different backgrounds should be trained to provide uniform care. Non-uniformity can lead to delayed treatments.

> We want to be safe; we want the patient to be safe, we want to provide the best care possible, that we can give, and we want to adhere to our standards and protocols. (Participant 3)

> We had a different understanding of the consent and then the consent in preparation they have different understanding too… So that will just delay the treatment, utility, and flow of services. (Participant 6)

The participants mentioned the importance of uniform practice to be legally safe and also in handling instruments and sharps.

Theme Cluster: Appropriate Workflow for Specimen Handling. One of the participants mentioned that the specimen workflow of lymphoma is confusing as it has many tests under one specimen.

> I think the practices are quite safe from our side except for technical issues like may be a lot of confusion regarding the lymphoma protocol, which the system can solve it for you. The Information technology (IT) can try and solve it.

> People are confused because the number of tests under the lymphoma protocol keeps on changing as per the surgeon and there is no lymphoma protocol built-in epic yet here. (Participant 5)

Theme 4: Time Management. The participants enumerated the importance of time management in the OR. They emphasized that time management should be done without compromising patient safety and staff injury. Time management involves the effective planning and balancing of activities in order to promote satisfaction and health (Turner, 2006).

Theme Cluster: Turnaround Time. Five out of eight participants talked about various aspects of turnaround time between two surgeries.

> We are after the turnaround time. We are missing something like connection between the nurses and the patients. That could affect the safety of the patient inside OR. (Participant 7)

> Another thing is time management because there are only 3 people in the OR we should be able to manage our time when to go for a break. When is a good time and it should not compromise the patient safety? (Participant 1)

Theme Cluster: Teamwork. According to the participants, teamwork is greatly encouraged as it plays a pivotal role in patient care.

> I think that everyone is willing to step out of their immediate role to help someone else. For instance, the circulator is willing to help the anesthesia team if needed and vice versa. (Participant 8)

> It would be helpful if the preparation nurse would bring the first patient to the room, then at least we can save time. We have more time to prepare the room instead of one person going out of the room getting this patient (Participant 6)

Theme Cluster: Instrument Reprocessing. The staff pointed the reprocessing of instruments, especially during busy days. This can prevent delays. The instruments should be fast-tracked during busy schedules.

> If your institution has a lot of volume of cases and all are laparoscopy imagine if you have three rooms running and all of this have just 10 cameras, how can you deal with it? You need to fast track it every now and then. So that it is one of the responsibilities of theatre nurse to make sure to fast track it (Participant 4)

Theme 5: Staffing Appropriateness. Majority of the participants mentioned about the staffing appropriateness. They affirmed that understaffing and rushing to accomplish tasks with the available staff can place the staff at risk of injuries. Staffing appropriateness is ensuring the effective match between patient needs and nurse competencies. Appropriate staffing is clearly linked to the health of the work environment. It affects everything in the unit, including nurse performance and retention, quality of care, patient outcomes, and hospital costs (Mitchell et al., 1989).

Theme Cluster: Adequacy of Staffing. The participants described, when the OR is understaffed, it can affect the overall care of patients such as it reduces the chance of nurses staying with the patient. When there are more things to accomplish, there should be additional staff provided for that OR.

> I think if we have more staff at night, it won't be a problem. We could have a thorough assessment of the patient, and we won't be in a hurry to finish the cases. We won't mind that case would extend little bit because there are staff doing that case at night. (Participant 7)

> The policy is 2.5 nurses in the room. That should be the nursing care. Not to do computer work or some other care. But, in our practice, ideally, we must be 3 nurses in the room as we don't have a technician to help the scrub nurse to open the stuff (Participant 5)

Although six out of eight participants talked about understaffing, just one nurse talked about organizing of booking of surgeries to save staff.

Theme Cluster: Surgeon Availability. One of the participants highlighted the presence of surgeon during preparation especially while positioning. He emphasized that they should take part in positioning the patient.

> For patient safety, the surgeon should also be there in positioning the patient because they are the one who knows what position will be needed for the case. So, I think they should be really part of the positioning of the patient. (Participant 7)

Theme Cluster: Health Status of Staff. The participants felt that nurses should be fit enough to carry outpatient care. They should get adequate rest and breaks so as to function well.

> First of all, I prepare myself. I go to work in good condition. So, if I am not feeling well, I will not go to work. Because I know that I can't compromise the safety of the patient. So, I make sure that I am well. I am in a condition to go then study the procedure, analyze it and give my 100%. (Participant 4)

> Research has proven that fatigue can impact patient safety, it can impact our reaction time or our concentration level. (Participant 3)

Half of the participants stressed the importance of staff fitness and rest. They said these two can affect patient safety in large proportion.

Theme 6: Staff Education. The participants urged that staff training and education can make the nurses more knowledgeable and enhance their performance. Staff education involves training to improve the performance or knowledge of the employees or workforce or a company (Turner, 2006).

Theme Cluster: Staff Training. Although the majority of them pointed the staff training, one participant talked about robotic training, which should be improved to avoid chaotic situations.

> I feel the Robotics area needs to be improved upon. We have some good robotically trained nurses here already, but I think the flow needs to be better, more consistent. Set up of the room should be more consistent and less chaotic (cords and equipment mismatched, etc) (Participant 8)

> We do the in-service every Thursday that gives us updates with the new technologies; at the same time updated in the practice of what we should do, what should not do (Participant 6)

Among the participants who mentioned about the staff training, one of them stressed the importance of training anesthesia technicians in patient handling and another one emphasized that staff should be rotated in all specialties in order for them to be familiar in all surgeries.

Theme 7: Communication With and Support to Patient in the OR. The participants talked about the patient's overall experience during the intraoperative period as it can impact patient safety. This has two subthemes: establish a better rapport and empathy with the patient, and proper communication with the patient. Communication involves imparting or exchanging of information by speaking, writing, or using some other medium (Merriam-Webster, 2018). Empathy is the action of understanding, being aware of, being sensitive to, and vicariously experiencing the feelings, thoughts, and experience of another (Merriam-Webster, 2018).

Theme Cluster: Establish a Better Rapport and Empathy With the Patient. The participants affirmed the importance of establishing a better rapport with the patient during intraoperative period.

> Try not to leave the patient unattended as much as possible (Participant 2)

> Make sure that the patient is well padded, comfortable, putting a blanket, making sure, not exposing the patient and putting the gel pad is very important. Just think that the patient is your own relative (Participant 7)

Four out of eight participants talked about rapport and empathetic care. They urged to stay with the patients as the environment itself is scary and they do not know what to expect.

Theme Cluster: Proper Communication With the Patient. The participants explained the importance of verbal and nonverbal communication as it relieves stress and anxiety.

> Try to talk to them and ask them how they are feeling, how the day is going. I think it can alleviate the anxiousness (Participant 2)

> You should be making the patient relaxed, make them feel at ease. Even if there is a language barrier, use your non-verbal skills, you can touch them, or you can even just look at them, eye contact. There are always ways, you can smile, you can smile through your eyes, even though you are wearing a mask (Participant 3)

Communication with the patient was emphasized by three of the participants. They said communication has the ability to alleviate the anxiety of the patient.

Discussion

Theme 1: Patient Safety

Patient safety was the major theme that emerged from this study, and it showed that OR nurses play a pivotal role in intraoperative patient safety. The OR nurses consider that the intraoperative safety of patients depend on the overall intraoperative nursing care as nurses are in close proximity to patients. Also, nurses can act as advocates when the patients cannot do for themselves. These findings coincide with the result of a previous study, which points out that intraoperative nursing care creates confidence-based relationship and event-related wellbeing. It ensures persistent wellbeing and safety by keeping a watchful eye. Thus, strategies should be designed to make a safe environment that enhances wound healing, recovery, and wellbeing (Kelvered et al., 2012). Moreover, frontline employees including nurses are in best position to watch and distinguish concealed preconditions that inadvertently advance from anticipated behaviors (Graling & Sanchez, 2017; Gutierres et al., 2018).

The findings of the present study also emphasize that in all aspects of intraoperative practice, nurses have to make sure that the patient safety is the main goal and nurses are responsible for preventing injuries and promoting patient safety.

Likewise, Cole et al. (2013) concluded that recognizing and correcting an inaccurate count is a basic segment of OR nurse's duty. The present study also affirmed that adherence to universal protocol is a crucial component of patient safety. Similarly, Collins et al. (2014) also declared that checklists alone cannot counteract all errors. In addition, effective comprehension of the nature of gaffes, perception of the intricate dynamic between frameworks and people, and making a just culture support a common vision of patient safety. Furthermore, the Association of periOperative Registered Nurses (AORN) recommends to articulate commitment to safety at all levels of the organization. Safety must be valued as the top priority in every healthcare organization and incentives and rewards must be provided to promote patient safety culture. In addition, AORN recognizes that the patient safety initiatives will fail in the absence of viable safety culture (Association of periOperative Registered Nurses, 2006).

Theme 2: Preoperative Preparation

In the current study, the participants mentioned that everything should be set up for the surgeries including the materials and equipment in order not to delay things. These study results are in line with previous study conducted by Rose (2010), which concluded that preoperative planning can improve surgical results and counteract unexpected issues; it improves correspondence with different individuals from the surgical team. Moreover, with insightful planning, suspensions and misperception can be effectively evaded. Additionally, Boggs et al. (2019) warrant that the hospitals are intricate frameworks and OR administration is centered on cost reduction to create efficiencies that offers value-based care, forms value control actions that support efficiencies, and improve patient access to core services. Likewise, the AORN emphasize the need for ongoing education about disinfection and sterilization techniques to improve the understanding of the improper instrument handling (Goss, 2012).

The participants in our study mentioned that the instruments and equipment should be available and ready according to the specified surgery before wheeling the patient to avoid harm. Weerakkody et al. (2013) confirm that there is clear advantage in the utilization of preoperative checklist-based frameworks, by which an enormous extent of equipment-related errors can be decreased. Our study highlights that the preoperative assessment prior to intraoperative phase is vital. Consistently, Malley et al. (2015) affirm that OR nurses continually watch out for the patient and the nurses assumes a significant role in distinguishing patients' needs and hazard factors that may influence the surgical outcome.

Theme 3: Standardization of Practice

In the current study, almost all the participants said that the staff from different backgrounds of practice must be trained to provide uniform care to the patient. The practices must be based on policy and protocol of the hospital, and it is vital for patient and staff safety. Having an institutionalized policy that speaks the best practices is an initial move towards accomplishing patient safety (Norton et al., 2012). Moreover, if the staff grasp and follow institutionalized and proficient procedures, they can counteract potential negative incidences and lead to clinical enhancements (Shirey & Perrego, 2015). Standardized care at the minimum in the healthcare facility can lessen or eradicate workarounds by reaching consensus among care providers (Gurses et al., 2012).

The current study suggested that uniform standards and protocol be followed by all the staff. Consistently, Brown-Brumfield and Deleon (2010) concluded that the surgical team members are in charge of utilizing every single sensible measure to secure the patient. Established guidelines, best practice proposals, and protocols are accessible and ought to be constantly pursued to diminish the probability of medication labeling mistakes and harm to the patients who depend on care provided by the nurses. Benze et al. (2021) very recently published 18 perioperative nursing scope and standards of practice that can be utilized by the nurses to follow the uniform standards of perioperative nursing practice.

The participants of the present study proclaimed that the appropriate workflow of specimen is essential and communication between surgical and laboratory team is vital for proper specimen handling. This finding is in line with the study conducted by Tracey Lee Rn (2015), which concluded that the specimen collection process depends on a human capacity, which makes it susceptible against human components and administrative impacts like time pressures. Institutionalizing a procedure, for instance, takes consistency into consideration and sets a standard by which desires for training are set.

Theme 4: Time Management

The OR nurses in this study reported that nurses should manage their time in the workplace without compromising patient safety. They also mentioned, rushing to have quick turnaround can be injurious to staff and patients. Those findings are corroborating with findings from the literature, which concluded that the perioperative environment is one of the most challenging environment for nurses because of patient acuity, high-stress environment, production pressures, and risk of physical harm (Morath et al., 2014). The participants in the study declared that complex cases cannot have 30 min of turnaround time. These findings were in line with previously described findings of Morgenegg et al. (2017), which concluded that OR turnaround times were essentially influenced by the time of the surgical procedure, age of the patient, staffing changes,

length of the surgery, and the utilization of equipment and materials requiring additional preparation time.

This study is consistent with the reviewed studies conducted on the surgical technologist's perception of teamwork and the culture of safety in the OR in Trident University International. The discoveries of the study demonstrated that teamwork had a noteworthy constructive outcome on the culture of safety. Teams with learning, specialized and non-specialized aptitudes, and safety attitudes are significant for the result of the culture of safety (Murphy, 2018).

The qualitative analysis in this current study suggested that during busy schedules, fast tracking of the instruments has to be made sure to avoid any delays. This coincides with the study conducted by Weart (2014), which concluded that the management of surgical instruments reduces the incidence of Immediate Use Steam Sterilization that is critical in the success of OR, which can positively impact patient safety goals. Improved communication and coordination between the OR and sterile processing unit must occur to bring the process under control. Understanding, managing, and improving the instrument reprocessing can have a positive impact on the safety of patients and prevents delays.

Prolonged work periods without adequate rest may contribute to diminished performance by perioperative personnel, placing both patients and workers at risk. AORN guidance statement of safe on-call practices in perioperative practice settings may assist managers and clinicians in developing policies and procedures for safe call practices (Association of Perioperative Registered Nurses, 2005a, 2005b).

Theme 5: Staffing Appropriateness

In the current study, the participants debated that adequacy of staffing is crucial. When the OR is understaffed and there is rushing, it can affect patient safety. These findings are in line with the findings of Tørring et al. (2019) who reported that, in surgical teams, healthcare experts are exceptionally reliant and work under time pressure. It is of specific significance that collaboration is well-working so as to accomplish quality treatment and patient safety. One study also affirmed that Extreme workloads may expand patient safety dangers, and patients are adversely influenced (Yu et al., 2019). The findings of Weart (2014) also affirmed that inadequate staffing can cause personnel to rush, make errors, and possibly curtail established hospital procedures. Therefore, AORN guidance statement on perioperative staffing warrants the perioperative nursing leaders to develop effective staffing plan relative to surgical patient's needs (Association of periOperative Registered Nurses, 2005a, 2005b).

Nurses involved in the research conveyed that the health status of the staff is vital. Nurses should be fit to work, and staff fatigue can harm the patient. This is similar to the findings of the study conducted by Seyman and Ayaz (2016). It states that the OR can cause numerous dangers to patient and staff safety. It is suggested that in-service training on patient and staff safety issues ought to be expanded, measures ought to be taken against dangers in the OR, and the quantity of OR nurses and assistants ought to be expanded. This study agrees with the findings of Pashley (2012) who highlighted that burnout can negatively affect an individual's relationships, health, and job. If registered nurses experience burnout, incidents of sentinel events or medical errors could occur and affect patient care.

Theme 6: Staff Education

Throughout the interviews, staff training was defined clearly by most of the participants. They agreed that nurses must have adequate training related to the nursing profession, which can enhance their performance and make them more knowledgeable. These findings are in coherence with the findings of Ugur et al. (2016), which depicts that surgical complexities on account of medical errors can be diminished when OR staff individuals are trained in patient safety. A previous quasi-experimental study conducted by Sousa et al. (2015) portray that it is the nurse's responsibility to be continuously up-to-date with scientific knowledge, and to disseminate this knowledge among their staff in order to upgrade the skills of the professionals, so that in this way, the patients can be assisted with excellence.

Theme 7: Communication With and Support to the Patient in the OR

The participants of this study explained that nurses have to communicate and establish better rapport and empathy with the patient. A study conducted by Norman et al. (2016) on "Creating healing environments through the theory of caring" declared that making a trusting association with patients enables nurses to better care for them when they are at their most susceptible condition. Building up a believing relationship can be troublesome in the perioperative care as the patient's emotional condition and nervousness levels before and after surgery vary.

Nevertheless, another study conducted on the Responsibility for patient care in perioperative practice by Blomberg et al. (2018) also declared that a typical duty in the surgical team is to take good care of and not relinquish the patient. In circumstances where patients show vulnerability about the sickness and have a need to talk before the operation, the members recounted a longing to make themselves accessible (Kelvered et al., 2012). More recently, the new AORN "Guideline for team communication" provides guidance on using standardized processes and tools to improve the quality of team communication: the key points address hand overs between phases of perioperative care; a briefing to share the surgical plan; a time out to verify the correct patient,

procedure, site, and side; and a debriefing to discuss what was learned and how to improve (Link, 2018).

Strengths of the Study

This is the only study conducted in the United Arab Emirates to explore the understanding of the OR nurses regarding their role and responsibilities for patient care and safety in the intraoperative practice. A qualitative descriptive exploratory approach was identified as more suitable to gain insight into the participant's understanding rather than testing research idea.

Semi-structured, exhaustive interviews helped the researcher to explore the OR nurses' understanding of their role and responsibilities for patient care and safety in intraoperative practice. The information obtained by the researcher from each nurse was of great value in terms of intraoperative patient safety. The author used several strategies to ensure methodological rigor and minimize bias such as pilot interviews, data saturation, and member checks. One of the biggest strengths of this study is the consistency of findings identified by the participants. The themes identified were mentioned by most of the participants. This gives a strong meaning to the findings.

Limitations of the Study

Being a small-scale qualitative study, this research has some limitations. The findings in the General Surgery OR may not be applicable to other OR such as Cardiology, Neurology, and Ophthalmology where the workflow varies slightly from the general surgery OR. The present study did not include surgeon, anesthesiologist, or anesthesia technicians as the aim was to explore the understanding of OR nurses regarding their role and responsibilities for intraoperative patient safety. However, these professionals could be included in studies in the future. As a novice qualitative researcher, the principal investigator had initial difficulty in the in-depth interviewing process and coding, which was guided and supported by the supervisor.

Implications for Practice

Based on these findings, as well a growing body of related literature, the nursing leadership should consider that in the study setting, despite the environment being safe and the quality of care is high, there is always room for improvement and processes. They should work on improving these aspects of care with more adaptive methods of patient safety. These study findings highlight the quality of speak-up culture of nurses when patient safety concerns arise. Speak-up culture could strengthen patient safety by guarding against mistakes and identifying and solving errors. It is imperative that nurses know and implement the most current evidence to prevent harm to patients and promote the best possible outcomes. The present study findings affirm various nursing skills for patient safety in intraoperative practice. Nurses have to possess the ability to be efficient in knowledge and skills to render safe patient care. Also, they have to work in harmony with the other members of the surgical team to deliver optimal patient safety. The findings of this study described some of the hurdles in intraoperative patient safety such as staff shortage and time pressure. If the nursing management reviews the finding, it could help to reduce the work overload and improve patient safety and quality of care.

Recommendations

The findings of this study could influence the clinical education, practice, and future research. The nursing leadership should encourage a safe environment for the patients and caregivers by establishing standardized, consistent, and measurable tools and processes to anticipate and prevent patient harm. The OR nurses should report any errors and near misses so that the OR department together with other team members could work on the aftermath of the unsafe incidences, near misses, and improve patient safety by identifying and preventing errors. Trust is the cornerstone for patient safety and quality care. Creating a culture of safety by encouraging raising concerns and being transparent is vital in intraoperative nursing care. For future research, it is recommended to apply and assess the great practices offered in this research through an intervention to improve a safe environment in the OR. Also, it is hoped that this study will provide a catalyst for future investigations and interventions that will maximize patient safety.

Conclusion

The issues identified by the participants in the study are directly linked to patient safety but not all are under nurse's responsibility. Also, some of the identified themes reflect the OR nurses' understanding over other issues mainly connected to patient experience. Therefore, the aim of this study is achieved as all the themes identified as nurses were able to express their thoughts on their roles and responsibilities towards patient safety in their practice. There are opportunities for improvement based on the study findings even in a safe and high quality of care OR department. As nurses are the ones with more proximity to patients, they are in a privileged position to identify issues related to patient safety and quality of care.

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ORCID iD

Judie Arulappan https://orcid.org/0000-0003-2788-2755

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