



Long Paper  
**Patient Safety Practices Among Nurses in the Operating Room**

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### **Abstract**

This study determined the patient safety practices among nurses in the operating room in selected public and private hospitals in Eastern Pangasinan. It dealt with the personal profile of the respondents which included their age, gender, civil status, highest educational attainment, number of years assigned in the operating room, relevant seminars attended for the last five years, membership in ORNAP, and type of hospital. A descriptive research design was utilized in the study using a survey questionnaire as the data gathering tool. Several statistical tools were used frequency and percentage, weighted mean, t-test, and Analysis of Variance (ANOVA). The respondents were young adults, female-dominated, not into marital relationships, did not pursue the master's program, had been in the OR for few years, attended few seminars related to OR, and most had membership in their OR organization. The respondents excelled in their field of specialization in the three periods of the peri-operative phase. No significant differences were noted in gender, civil status, highest educational attainment, number of years in service, number of relevant seminars, and category of the hospital except along ORNAP membership in the postoperative period. There is a significant relationship between post-operative safety practices with updated membership in ORNAP. Based on the conclusions, the following are hereby proposed; The OR nurses must pursue post-graduate studies and undergo related seminars or trainings to be abreast with the trends and updates in OR nursing. The OR nurses must continue to upgrade their patient safety practices for improved patient recovery. The OR nurses must continue to be members of the ORNAP to be updated on developments in OR nursing. The proposed enhanced surgical safety



checklist be endorsed for adaption in the different hospitals to maintain good outcomes for surgical patients.

Keywords – safety, practices, operating room, nurses

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## INTRODUCTION

Patient safety is an important concern in operating rooms (OR) due to the complex work environment, a high level of stress, and vulnerable patients. These factors can lead to the occurrence of errors and patient harm. Standard safety checks to prevent errors are sometimes omitted or not fully performed. Teamwork is a major component in the promotion of safety. Although they share the goal of providing safe and successful surgical care, they are susceptible to errors such as performing wrong-site surgery. Major errors in the OR such as wrong-site surgery and retained foreign items during surgery) are preventable, unjustifiable adverse events that should be reduced through quality improvement that involves better teamwork (Arad et al., 2022).

To ensure better outcomes of surgical procedures, appropriate measures must be taken to decrease the incidence of associated infections. The practices to be carried out for infection control include proper scrubbing procedures for both the patient and the operator, specific protocols to be followed by the operating personnel at the time of procedures, proper handling of the instruments, and maintaining an aseptic environment throughout the procedure. Lack of resources is the main reason behind this, particularly in developing countries. Good infection prevention and control are essential to ensure the safety of the patient undergoing any surgical procedure in the operating theater. The surgical site infections (SSIs) constitute 20% of the total hospital-acquired infections. These infections cause substantial patient mortality and morbidity and burden healthcare systems with massive costs. Since these infections are primarily acquired during the operative procedure when the wound is still open, stringent protocols need to be followed at this point to minimize their onset (Bonanthaya et al., 2020).

Improving patient safety is an increasing priority for hospitals since sentinel events can be catastrophic for patients, healthcare providers, and institutions. Patients who undergo a surgical or an invasive procedure are at increased risk of suffering an adverse event since the environment is complex and pressurized. Thus, unintentional adverse events may occur leading to serious harm to patients. Therefore, patient safety is recognized as an important approach to improve the quality and safety of care in operation theatre. At facilities where surgery and invasive procedures are performed, specific steps must be implemented to reduce the likelihood of incorrect surgeries (Mann, 2022).

Preoperative preparation begins as soon as the decision of surgical treatment is made and does not end until the transfer of the patient to the operating room. The period before an operation is mainly intended to examine the overall condition of the patient to ensure that the patient can tolerate the operation. The goal of preoperative preparation is to create suitable conditions for uncomplicated healing with subsequent convalescence. Preoperative preparation includes general elements that must be met during each surgical procedure. With knowledge of the operation, and its risks and outcome, the patient or his legal representative must sign an informed consent form. In addition to providing information, the overall general preparation is based on the creation of homeostasis by modifying body fluids, minerals, and nutrients, and initiating rehabilitation.

Pre-operation skin preparation involves maintaining the overall hygiene of the patient, the operating field (area to be operated on), and the washing of the hands of the surgical staff. Shaving of the skin (area to be operated on) to remove body hair before the operation is recommended; however, shaving a few hours before the operation increases the presence of bacterial flora. Before transporting the patient to the operating room, the nurse's task is to check the patient's consent to the procedure and anesthesia, hygienic measures, bandages, probes, coils, bandages, absence of dental prosthesis, and removal of jewelry and nail polish (Akutne, 2022).

Ensuring patient safety in the operating room starts before the patient enters the operating room and includes attention to all applicable types of preventable medical errors like medication errors, but surgical errors are unique to this environment. Steps to prevent wrong-site, wrong-person, wrong-procedure errors, or retained foreign objects have been recommended, with structured communication between the patient, the surgeon(s), and other members of the health care team. Prevention of surgical errors requires the attention of all personnel involved in the patient's care.

Because of the potential for serious harm from surgical errors, vigorous efforts are required to eliminate or reduce their occurrence. Preventing a surgical error appears to be amenable to a systems approach involving a team effort by all individuals participating in the surgical process. Although all members of the surgical team share this responsibility, the primary surgeon should oversee these efforts. Protocols and procedures to identify and manage stress and fatigue in surgical personnel may help to avoid surgical errors and patient injuries. The operating room is an appropriate educational environment, but the presence of observers at any level must not be allowed to compromise patient safety. Patient safety in surgery demands the full attention of skilled individuals using well-functioning equipment under adequate supervision (The American College of Obstetricians and Gynecologists, 2010). This study determined the patient safety practices among nurses in the operating room in selected public and private hospitals in Eastern Pangasinan. It dealt with the personal profile of the respondents which included their age, gender, civil status, highest educational

attainment, number of years assigned in the operating room, relevant seminars attended for the last five years, membership in ORNAP, and type of hospital.

## **LITERATURE REVIEW**

Ingvarsdottir, 2018 study on enhancing patient safety in the operating theatre found that enhancement of patient safety in the Operating Theater (OT) from the perspective of experienced OT nurses is a constant endeavor of managing risks and preventing patient harm it involves respecting the vulnerability of the patient in the OT by being attentive to the patient at each moment, making contact with the patient and recognizing how the patient loses all control by being anesthetized or sedated and is, therefore totally dependent on OT staff. It also involves the OTN navigating the patient as safely as possible through the perioperative process by careful preparation, the use of protocols and checklists, and taking measures to prevent complications and harm. Moreover, it involves contributing to a culture of safety by improving work conditions in the OT. Certain competencies of the OTN are essential for the enhancement of patient safety in the OT. These involve both nontechnical and technical competencies.

The study conducted by Gutierrez et al, 2018 on patient safety practices in the Operating room gave eight recommendations to improve the practices among nurses: (1) Involvement of the multi-professional team and the managers of the institution; (2) Establishment of a patient safety culture; (3) Use of the safe surgery checklist; (4) Improvement of interpersonal communication; (5) Expansion of nurses' performance; (6) Adequate availability of physical, material and human resources; (7) Individual search for professional updating; and (8) Development of continuing education actions.

Patient care must be delivered safely by utilizing safety guidelines based on scientific evidence. Constant revision of processes and guidelines is needed to optimize patient experience and safety. Current surgical safety guidelines and checklists are generic and address patient issues and risk factors in surgical subspecialties. Patient safety in surgical subspecialties should be templated on general patient safety guidelines, and specific processes dedicated to the care of the surgical patients. Safety systems must be in place to decrease errors in surgery. Different surgical subspecialties should develop a specific curriculum in patient safety addressing training in academic centers and application of these guidelines in all practices. Safety systems must be in place to decrease errors in surgery (Kim et al., 2015).

In Aouicha et al.'s (2022) study on patient safety culture in the OR, the highest score was found in 'teamwork within units and the lowest scores was for 'non-punitive response to error, followed by "frequency of adverse event reported and "communication openness. Participants provided a more detailed picture of patient safety issues such as underreporting, the absence of an effective reporting system, lack of freedom of expression, and an existing blame culture in operating rooms. The findings showed a lack of a patient safety culture in their operating rooms. It is essential to design,

implement, and evaluate strategies that promote a positive patient safety culture and obliterate punitive climate in operating rooms.

Avoidable complications for surgical patients still occur despite efforts to improve patient safety processes in operating rooms. Analysis of experiences of operating room nurses can contribute to a better understanding of perioperative processes and flow, and why avoidable complications still occur. The operating room nurses described experiences with patient safety hazards on an organizational, team, and individual level. Teamwork and collaboration were crucial at the team level, having shared goals and common expectations. On the individual level, professional knowledge, skills, and experience were needed to take corrective steps. The conditions to support patient safety, or limit complication risk, during surgery continue to be at times inconsistent and require steady performance attention. Operating room nurses adjust help solve problems as they arise, where there are obvious risks for patient complications. The organizational patient safety management process still seems to allow deviation from established practice standards at times and relies on individual-based corrective measures at the 'bedside' at times for good (Nyberg et al., 2021).

Just like any other working environment, working in an operating theatre comes with numerous occupational hazards. However, in an operating theatre, these hazards can mean life or death. Even the smallest accident could seriously jeopardize the patient's safety. Common hazards staff nurses face in operating theaters are accidents, including slips, trips, and falls, exposure to hazardous substances, and contamination and infection. Just like in any other workplace, operating theatre staff can slip on spilled fluids, or trip and fall on a loose wire or a misplaced bit of equipment. The guideline on good theater hygiene recommends regularly cleaning and maintaining the operating theatre environment. This is mainly for patient safety, and to reduce the risks of infection. But it can also contribute to staff safety. Promptly cleaning any fluids spilled on the floor makes it less likely that anyone will slip and fall (Bali, 2021; Cairn Tech, 2022).

Peñasales et al. (2017) mentioned that Operating room nurses explained that problems and difficulties they encounter preoperatively are about "*Anticipating the patient.*" Some of them mentioned the lack of needed preoperative preparation that created interruptions in providing preoperative nursing care. These incidents caused feelings of frustration, disappointment, and inconvenience on their part as OR nurses. Martinez stressed that it is a disappointment when professional nurses have not fully acquired skills that will allow them to provide effective nursing care. Since patients typically are dependent on their daily activities due to their medical conditions, nurses who attend to the patients before the operation should optimize the functions of the patients. When the patients before the operation are not trained to maximize their functions, the OR nurses are usually blamed. Overall, in the intraoperative phase, OR nurses are challenged, pressured, frustrated, and exhausted but they strive to end successful in these. Like what the respondents of the present study emphasized,

whenever problems take place, the surgical team is very much willing to help and impart knowledge that improves each other's performances for a positive surgical outcome.

## **METHODOLOGY**

### ***Research Design***

The study utilized the descriptive-correlational as the research design. It determined the profiles of the respondents and the patient safety practices of the nurses in the operating room.

### ***Population and Locale of the Study***

The subjects of the study were the operating room nurses in different public and private secondary hospitals in the sixth district of Pangasinan. They were the nurses who were assigned in the operating room of the different hospitals. Total enumeration was done composed of 31 operating room nurses.

### ***Validation of Instrument***

The questionnaire was utilized to gather data from the respondents. The items found in the questionnaire are taken from several articles and research studies related to perioperative nursing. However, it was subjected to validation from experts in the field of OR nursing namely: a faculty researcher, an instructor teaching surgical nursing, and operating room nurses. The combined rating was highly valid.

### ***Data Gathering Tool***

The tool used in gathering the data was a survey questionnaire adapted from different studies and literature related to the study. Part I dealt with the demographic profile of the respondents in terms of their age, gender, civil status, highest educational attainment, number of years assigned in the OR, number of relevant seminars related to perioperative nursing updated membership in ORNAP, and category of hospital. Part II tackled the patient safety practices of the nurses in the operating room during pre-operative, intra-operative, and post-operative periods. Parts III and IV focused on the significant difference and relationship between the patient safety practices and their profile variables. Before data gathering, the researcher prepared a letter of approval addressed to the Medical Director or Chief of the Hospital through the Chief Nurses for the administration of questionnaires. After approval, a questionnaire was administered to the respondents. Instructions were integrated for them to be accomplished clearly. Furthermore, the confidentiality of the personal information gathered from and given by the respondents, together with the anonymity of their identities, was strictly observed throughout the entire duration of the study. The data collected was subjected to

statistical treatment. The responses were tallied and computed using appropriate statistical treatment, interpreted, and analyzed accordingly.

### ***Ethical Considerations***

The researcher ensured that ethical precautions and procedures were met. In the whole process of this study, the researcher considered ethical precautions to follow: Principle of Respect, the researcher will treat the respondents as autonomous agents with the right to self-determination and the freedom to participate or not to participate in the research. Self-respect for persons indicated and should be regarded as autonomous, anonymous, and private as well as the right for self-preservation and the freedom to participate or not to participate in the research. Principle of Justice. The researcher will endeavor to fairly treat her subjects in terms of the benefits and the risks of the research. The principles of fair justice and transparency will be strictly observed by the researcher. The researcher will grant the respondents their right to privacy and use of free will to have the freedom to determine the time, extent, and general circumstances under which their private information will be shared with or without help from others. The respondent's right to exercise free will and right to privacy will be provided; any personal data and private information given were guarded by the researcher with utmost care and strict confidentiality.

## **RESULTS**

### ***Respondents' Profile***

Table 1 shows the profile of the respondents in terms of their personal information, namely: age, gender, civil status, highest educational attainment, number of years assigned in the operating room, number of relevant seminars for the last five years, updated membership in the Operating Room Nurses Association of the Philippines (ORNAP), and type of hospital with the corresponding frequency count (f), and percentage equivalent (%) of each bracket.

**Age.** It can be gleaned from the table that most of the respondents are in the age bracket of 31-40 years old, with a frequency of 20, or 64.5%, followed by the age bracket of 21-30 with a frequency of 6, or 19.4%, and those 51 and above with a frequency of 5 or 16.1%.

**Gender.** As shown in the table, the majority of the respondents were female with a frequency of 21 or 67.7%, followed by males with a frequency of 10 or 32.3%.

**Civil Status.** Most of the respondents were single, with a frequency of 21, or 67.7%, and married with a frequency of 10, or 32.3%.

**Highest educational attainment.** It revealed that the majority of the respondents are Bachelor's degree holders with a frequency of 21 or 67.7%, those with master units with a frequency of 5 or 16.1%, and master graduates with a frequency of 5 or 16.1%.

**Number of years assigned in the operating room (OR).** Most of the respondents had been in OR for 4-6 years with a frequency of 13 or 41.9%, 1-3 years with a frequency of 9 or 29%, followed by 7-10 years with a frequency of 5 or 16.1%, and 11 years and above with a frequency of 4 or 12.9%.

Table 1. Distribution of Respondents in terms of their Profile Variables (n=31)

<b>Profile Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age (in years)</b>		
21 – 30	6	19.4
31 – 40	20	64.5
51 and above	5	16.
<b>Gender</b>		
Male	10	32.3
Female	21	67.7
<b>Civil Status</b>		
Single	21	67.7
Married	10	32.3
<b>Highest Educational Attainment</b>		
Bachelor's Degree	21	67.7
With Masteral units	5	16.1
MAN/MS Degree	5	16.1
<b>Number of Years Assigned in the OR</b>		
1 – 3	9	29.0
4 – 6	13	41.9
7 – 10	5	16.1
11 and above	4	12.9
<b>Number of Relevant Seminars for the last 5 years</b>		
1 – 2	5	16.1
3 – 4	21	67.7
5 – 6	3	9.7
7 and above	2	6.5
<b>Updated Membership in ORNAP</b>		
Yes	19	61.3
No	12	38.7
<b>Type of Hospital</b>		
Public	22	71.0
Private	9	29.0

**Number of relevant seminars for the last five years.** As shown in the table, most of the OR nurses had undergone 3-4 seminars with a frequency of 21 or 67.7%, followed by 1-2 years with a frequency of 5 or 16.1%, 5-6 seminars with a frequency of 3 or 9.7% and 7 and above with a frequency of 2 or 6.5%.

**Update membership in ORNAP.** Many of the OR nurses are members of the OR Nurses Association with a frequency of 19 or 61.3%, followed by non-members with a frequency of 12 or 38.7%.

**Type of Hospital.** Most of the OR nurses are employed in public hospitals with a frequency of 22 or 71%, and those in private hospitals with a frequency of 9 or 29%.

***Patient Safety Practices Rendered by the Nurses in the OR Along Pre-Operative Stage***

Table 2 presents the patient safety practices rendered by the nurses in the Operating Room during the Pre-Operative Stage. As gleaned from the table, all indicators were rated “Highly Practiced,” and items 2, 3, and 8, “properly wear sterile surgical gowns and caps,” “secure consent from the patient or relatives,” and “make sure that medications, IV fluids and properly cross matched blood products are in place,” got a weighted mean of 5.0 or “Highly Practiced.”

Table 2. Patient Safety Practices Rendered by the Nurses in the Operating Room along Pre-Operative Stage (n=31)

Indicators	Weighted Mean	Descriptive Equivalent
<b>As an OR nurse, I.....</b>		
1. perform surgical hand preparation is done with soap and water, and chlorhexidine gluconate or Povidone iodine-containing soap (7.5%)	4.97	HP
2. properly wear sterile surgical gowns and caps	5.00	HP
3. check the availability of medical records or imaging studies, laboratory results, relevant medical history, and allergies in the chart	4.97	HP
4. secure consent from the patient or relatives	5.00	HP
5. The surgeon places the site marking visible with a permanent marker so that the mark is not removed during site preparation	4.32	HP
6. administer pre-operative medications based on doctors’ orders	4.94	HP
7. arrange sterile surgical instruments according to use in the mayo table	4.94	HP
8. make sure that medications, IV fluids, and	5.00	HP

properly cross-matched blood products are in place		
9. check if the equipment like cardiac monitor, oxygen, and other emergency equipment are in place	4.97	HP
10. check if the following are removed, the nail polish, dentures, contact lenses, and pieces of jewelry	4.94	HP
<b>Average Weighted Mean</b>	<b>4.90</b>	<b>HP</b>

Legend:

Statistical Range	Descriptive Equivalent
4.50 – 5.00	Highly Practiced (HP)
3.50 – 4.49	Practiced (P)
2.50 – 3.49	Moderately Practiced (MP)
1.50 – 2.49	Slightly Practiced (SP)
1.00 – 1.49	Not Practiced (NP)

The lowest item is number 5, “place site marking visible with a permanent marker so that the mark is not removed during site preparation,” with a frequency of 4.32 or “Highly Practiced.” It showed that the OR nurses still observe the placing of markings at the operative site as a protocol in every operation. This will guide them on what area would be incised because many cases of wrong-site incisions occur in the operating room.

### ***Patient Safety Practices Rendered by the Nurses in the Operating Room Along Intra-Operative Stage***

Table 3 presents the patient safety practices rendered by the nurses in the operating room during an intra-operative stage. As shown from the table, all the indicators were rated “Highly Practiced,” however the highest are items 6 and 10, “made sure that all objects that come in contact with patients including blood, secretions, and excreta are considered potentially contaminated,” and “check and count supplies used before the closure of the incision site,” with a weighted mean of 5.0 or “Highly Practiced.” It implies that the OR nurses followed the protocols in the OR during the intra-operative phase, thereby making the procedure and the patient safe from any untoward events that may arise.

The practices to be carried out for infection control include proper scrubbing procedures for both the patient and the operating team, specific protocols to be followed by the operating personnel at the time of procedures, proper handling of the instruments, and maintaining an aseptic environment throughout the procedure.

The lowest item is number 2, “and OR team is introduced in the operating room by name and role, even if team members are familiar with each other,” with a weighted mean of 4.52, or “Highly Practiced.” The OR nurses make sure that each member of the OR team is introduced to a protocol in operations.

Table 3. Patient Safety Practices Rendered by the Nurses in the Operating Room along Intra-Operative Stage (n=31)

Indicators	Weighted Mean	Descriptive Equivalent
<b>As an OR Nurse, I.....</b>		
1. And OR team conducts a final assessment that the correct patient, site, and procedure are identified	4.90	HP
2. Each member of the OR team is introduced in the operating room by name and role, even if team members are familiar with each other	4.52	HP
3. Check all necessary equipment and supplies to be used are in place during the operation.	4.94	HP
4. properly monitored the patient while the surgery is going on	4.97	HP
5. assists the physician attentively during the operation	4.97	HP
6. made sure that all objects that come in contact with patients including blood, secretions, and excreta are considered potentially contaminated	5.00	HP
7. The circulating nurse focuses the OR light in the operative site for better visualization of the operative site	4.90	HP
8. discard equipment when accidentally dropped on the floor	4.97	HP
9. place soiled instruments in double orange biohazard bags which are cable tied	4.77	HP
10. check and count supplies used before the closure of the incision site	5.00	HP
<b>Average Weighted Mean</b>	<b>4.89</b>	<b>HP</b>

**Patient Safety Practices Rendered by the Nurses in the Operating Room Along Post-Operative Stage**

Table 4 presents the patient safety practices rendered by the nurses in the OR during the post-operative stage. As gleaned from the table, all the indicators rated “Highly Practiced,” however, the highest is item 3, “properly label specimen and bring to the laboratory after the operation,” with a weighted mean of 5.0, or “Highly Practiced.” It revealed that the nurses are careful in preserving the specimens of patients undergoing surgery.

Table 4. Patient Safety Practices Rendered by the Nurses in the Operating Room along Post-Operative Stage (n=31)

Indicators	Weighted Mean	Descriptive Equivalent
<b>As an OR Nurse, I.....</b>		
1. remove the scrub suit, and caps and place them in a container immediately after the operation	4.81	HP
2. monitor vital signs, and oxygen levels, regulate IV fluids, and blood products before transfer to the recovery room	4.94	HP
3. properly label specimens and bring them to the laboratory after the operation	5.00	HP
4. complete all documentation before endorsement to the RR (recovery room)nurse	4.97	HP
5. take measures to prevent complications and harm	4.97	HP
6. clean and rinse used equipment before autoclaving	4.94	HP
7. properly document what has transpired during the operation	4.97	HP
8. properly clean and disinfect used equipment	4.94	HP
9. observe the standard handling of medical waste to prevent needle stick or cutting injury,	4.94	HP
10. transfer the post-operative patient to the recovery room and properly endorse to the recovery room nurse	4.97	HP
<b>Average Weighted Mean</b>	<b>4.94</b>	<b>HP</b>

The lowest indicator is item 1, “remove scrub suit, and caps and place in a container immediately after the operation,” with a weighted mean of 4.81 or “Highly Practiced.” It shows that the OR nurses properly dispose of used items after the operation for proper cleaning and autoclaving in preparation for the next cases for surgery.

### ***Patient Safety Practices Rendered by the Nurses in the Operating Room***

Table 5 presents the patient safety practices rendered by nurses in the operating room. As gleaned from the table, all the aspects are rated “Highly Practiced,” however, operating room nurses gave their priority to the post-operative aspect for the reason that possible untoward manifestations may be encountered particularly the effects of anesthesia, further bleeding, and in monitoring of vital signs until it becomes stable. It is followed by the pre-operative aspect with a weighted mean of 4.90, or Highly Practiced.” It revealed that this is the second important responsibility of the OR nurses to prepare the patient holistically for a smooth turnout in the intra-operative aspect.

Table 5. Patient Safety Practices Rendered by the Nurses in the OR (n=31)

Stage	Weighted Mean	Descriptive Equivalent
Pre-Operative	4.90	HP
Intra-Operative	4.89	HP
Post-Operative	4.94	HP
<b>Overall Weighted Mean</b>	<b>4.91</b>	<b>HP</b>

**ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Age**

Table 6 presents the difference in the patient safety practices rendered by nurses in the OR across ages. The computed F-values in Intra-operative and post-operative stages suggest significant results as indicated in the computed significance values which are lower than the set .05 level of significance. This implies that old and young nurses have comparable safety practices during the intra and post-operative stages. However, a significant difference exists during the pre-operative stage. The result of the Scheffe test is shown in the next table.

Table 6. ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Age (n=31)

	Source of Variation	Sum of Squares	df	Mean Squares	F-value	Sig	Remarks
Pre-Operative	Between Groups	.080	2	.040	5.312	.011	Significant
	Within Groups	.210	28	.008			
	<b>Total</b>	<b>.290</b>	<b>30</b>				
Intra-Operative	Between Groups	.120	2	.060	2.547	.096	Not Significant
	Within Groups	.659	28	.024			
	<b>Total</b>	<b>.779</b>	<b>30</b>				
Post-Operative	Between Groups	.122	2	.061	2.259	.123	Not Significant
	Within Groups	.754	28	.027			
	<b>Total</b>	<b>.875</b>	<b>30</b>				
Overall	Between Groups	.101	2	.051	3.156	.058	Not Significant
	Within Groups	.449	28	.016			
	<b>Total</b>	<b>.550</b>	<b>30</b>				

### ***Scheffe Test Results on the Significant Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Age***

Table 7 displays the results of the Scheffe test. The mean difference of -.130 is considered significant. This implies that the older age group 31-40 has better patient safety practices as compared to the younger age group of 21-30. Since they have more exposed to the OR for more years compared to the younger ones, it is a fact they have better patient safety practices because they have mastery of the activities in the operating room.

Table 7. Scheffe Test Results on the Significant Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Age (n=31)

<b>Stage</b>	<b>Compared Age Groups</b>	<b>Mean Difference</b>	<b>Sig</b>
Pre-Operative	21-30 vs 31-40	-.130	.012

### ***t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Gender***

Table 8 shows the difference in the patient safety practices rendered by the nurses in the OR across genders. The computed t-values generated significance values that are higher than the set .05 level of significance. Results suggest insignificant results. Gender does not cause any difference in the patient safety practices of the nurses along the different stages namely pre-operative, intra-operative, and post-operative.

Table 8. t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Gender (n=31)

<b>Aspect</b>	<b>Gender</b>	<b>n</b>	<b>Mean</b>	<b>Mean Difference</b>	<b>Standard Error Difference</b>	<b>Df</b>	<b>t-value</b>	<b>Sig</b>	<b>Remarks</b>																																
Pre-Operative	Male	10	4.89	-.020	.038	29	-.511	.613	Not Significant																																
	Female	21	4.91							Intra-Operative	Male	10	4.84	-.079	.061	29	-1.291	.207	Not Significant	Female	21	4.92	Post-Operative	Male	10	4.89	-.077	.065	29	-1.175	.249	Not Significant	Female	21	4.97	Overall	Male	10	4.88	-.056	.052
Intra-Operative	Male	10	4.84	-.079	.061	29	-1.291	.207	Not Significant																																
	Female	21	4.92							Post-Operative	Male	10	4.89	-.077	.065	29	-1.175	.249	Not Significant	Female	21	4.97	Overall	Male	10	4.88	-.056	.052	29	-1.088	.285	Not Significant	Female	21	4.93						
Post-Operative	Male	10	4.89	-.077	.065	29	-1.175	.249	Not Significant																																
	Female	21	4.97							Overall	Male	10	4.88	-.056	.052	29	-1.088	.285	Not Significant	Female	21	4.93																			
Overall	Male	10	4.88	-.056	.052	29	-1.088	.285	Not Significant																																
	Female	21	4.93																																						

**t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Civil Status**

Table 9 reveals the difference in the patient safety practices rendered by the nurses in the OR across civil status. The computed t-values have significance values that are all higher than the set .05 level of significance, hence, the acceptance of the null hypothesis. There exists no significant difference in the patient safety practices rendered by single and married nurses.

Table 9. t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Civil Status (n=31)

Aspect	Civil Status	n	Mean	Mean Difference	Standard Error Difference	df	t-value	Sig	Remarks
Pre-Operative	Single	21	4.90	.005	.038	29	.124	.902	Not Significant
	Married	10	4.90						
Intra-Operative	Single	21	4.88	-.054	.062	29	.866	.394	Not Significant
	Married	10	4.93						
Post-Operative	Single	21	4.93	-.041	.066	29	.625	.537	Not Significant
	Married	10	4.97						
Overall	Single	21	4.90	-.029	.053	29	.555	.583	Not Significant
	Married	10	4.93						

**ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Highest Educational Attainment**

Table 10 presents the difference in the patient safety practices rendered by the nurses in the OR across the highest educational attainment. The computed F-values in the three stages have generated significance values that are higher than the set .05 level of significance. This indicates that the nurses have comparable patient safety practices regardless of their educational background.

Table 10. ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Highest Educational Attainment (n=31)

	Source of Variation	Sum Squares	df	Mean Squares	F-value	Sig	Remarks
Pre-Operative	Between Groups	.020	2	.010	1.047	.364	Not Significant
	Within Groups	.270	28	.010			
	<b>Total</b>	.290	30				
Intra-Operative	Between Groups	.009	2	.005	.167	.847	Not Significant
	Within Groups	.770	28	.027			
	<b>Total</b>	.779	30				
Post-Operative	Between Groups	.003	2	.002	.050	.952	Not Significant
	Within Groups	.872	28	.031			
	<b>Total</b>	.875	30				
Overall	Between Groups	.007	2	.004	.188	.829	Not Significant
	Within Groups	.542	28	.019			
	<b>Total</b>	.550	30				

**ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Number of Years Assigned in the OR**

Table 11 shows the difference in the patient safety practices rendered by the nurses in the OR across the number of years assigned in the OR. The computed values indicate insignificant results. Data reveal that their length of assignment in the operating room does not cause any variation in the safety practices they have rendered to the patients.

Table 11. ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Number of Years Assigned in the OR (n=31)

	Source of Variation	Sum of Squares	df	Mean Squares	F-value	Sig	Remarks
Pre-Operative	Between Groups	.034	3	.011	1.214	.324	Not Significant
	Within Groups	.255	27	.009			
	<b>Total</b>	.290	30				
Intra-Operative	Between Groups	.078	3	.026	.995	.410	Not Significant
	Within Groups	.701	27	.026			
	<b>Total</b>	.779	30				
Post-Operative	Between Groups	.043	3	.014	.470	.705	Not Significant
	Within Groups	.832	27	.031			
	<b>Total</b>	.875	30				
Overall	Between Groups	.041	3	.014	.722	.548	Not Significant
	Within Groups	.509	27	.019			
	<b>Total</b>	.550	30				

***ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Number of Relevant Seminars for the last 5 Years***

Table 12 displays the difference in the patient safety practices rendered by the nurses in the OR across several relevant seminars for the last 5 years. The computed F-values generated significance values which are all higher than the set .05 level of significance. There is enough evidence to declare that there exists no significant difference in the pre-, intra-, and post-operative safety practices rendered by the nurses when they are grouped according to the number of seminars they have attended. It clearly showed that the OR nurses render patient safety practices to all patients undergoing surgery.

Table 12. ANOVA Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR Across Number of Relevant Seminars for the last 5 Years (n=31)

	Source of Variation	Sum of Squares	Df	Mean Squares	F-value	Sig	Remarks
Pre-Operative	Between Groups	.015	3	.005	.477	.701	Not Significant
	Within Groups	.275	27	.010			
	<b>Total</b>	.290	30				
Intra-Operative	Between Groups	.056	3	.019	.692	.565	Not Significant
	Within Groups	.723	27	.027			
	<b>Total</b>	.779	30				
Post-Operative	Between Groups	.122	3	.041	1.459	.248	Not Significant
	Within Groups	.753	27	.028			
	<b>Total</b>	.875	30				
Overall	Between Groups	.052	3	.017	.948	.431	Not Significant
	Within Groups	.497	27	.018			
	<b>Total</b>	.550	30				

**t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Updated Membership in ORNAP**

Table 13 shows the difference in the patient safety practices rendered by the nurses in the OR across updated membership in the ORNAP. As indicated in the computed values, no significant difference exists along the pre-operative and intra-operative stages. This means that the updated membership of the nurses in ORNAP causes no significant difference in the pre-operative and intra-operative safety practices they have rendered to the patients. Meanwhile, a significant difference exists during the post-operative stage. The positive mean difference between the Yes and No responses indicates that nurses with updated membership in ORNAP have significantly rendered better post-operative safety practices than the non-ORNAP members.

Table 13. t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Updated Membership in ORNAP (n=31)

Aspect	Membership	n	Mean	Mean Difference	Standard Error Difference	df	t-value	Sig	Remarks
Pre-Operative	Yes	19	4.92	.046	.036	29	1.285	.209	Not Significant
	No	12	4.88						
Intra-Operative	Yes	19	4.93	.098	.058	29	1.706	.099	Not Significant
	No	12	4.83						
Post-Operative	Yes	19	4.99	.136	.059	29	2.318	.028	Significant
	No	12	4.86						
Overall	Yes	19	4.95	.094	.048	29	1.963	.059	Not Significant
	No	12	4.86						

### ***t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Type of Hospital***

Table 14 presents the difference in the patient safety practices rendered by the nurses in the OR across types of hospitals. The computed t-values generated significance values which are all higher than the set .05 level of significance. This means that nurses in private and public hospitals have comparable safety practices rendered to the patients during the pre-, intra, and post-operative stages.

Table 14. t-Test Results on the Difference in the Patient Safety Practices Rendered by the Nurses in the OR across Type of Hospital (n=31)

Aspect	Type of Hospital	n	Mean	Mean Difference	Standard Error Difference	df	t-value	Sig	Remarks
Pre-Operative	Public	22	4.90	-.011	.039	29	-.281	.780	Not Significant
	Private	9	4.91						
Intra-Operative	Public	22	4.91	.069	.064	29	1.089	.285	Not Significant
	Private	9	4.84						
Post-Operative	Public	22	4.98	.122	.065	29	1.875	.071	Not Significant
	Private	9	4.86						
Overall	Public	22	4.93	.059	.053	29	1.112	.275	Not Significant
	Private	9	4.87						

### ***Relationship Between the Patient Safety Practices Rendered by the Nurses in the OR and their Profile Variables***

Table 15 reveals the relationship between the patient safety practices rendered by the nurses in the OR and their profile variables. Only the relationship between post-operative safety practices with updated membership in ORNAP is considered significant with an R-value of .395 and a significance value of .028.

Table 15. Relationship Between the Patient Safety Practices Rendered by the Nurses in the OR and their Profile Variables (n=31)

Profile Variable	Pre-Operative		Intra-Operative		Post-Operative		Overall	
	r-value	sig	r-value	sig	r-value	sig	r-value	sig
Age	.290	.114	.230	.213	.282	.124	.269	.143
Gender	.094	.613	.233	.207	.213	.249	.198	.285
Civil Status	-.023	.902	.159	.394	.115	.537	.102	.583
Highest Educational Attainment	.199	.283	.026	.889	-.033	.861	.042	.822
Number of Years Assigned in the OR	.030	.874	.131	.484	.065	.727	.084	.654
Number of Relevant Seminars Updated	.184	.323	.203	.274	.273	.138	.231	.210
Membership in ORNAP	.232	.209	.302	.099	<b>.395*</b>	.028	.343	.059
Type of Hospital	.052	.780	-.198	.285	-.329	.071	-.202	.275

\*Significant at .05 level

## DISCUSSIONS

It can be gleaned from the data that most of the respondents were young adults. Many of the respondents are female. It implies that up to the present time, the nursing profession is still female dominated. It revealed that the respondents were dominated by those without marital obligations and getting their experiences in their field. Most of the registered nurses did not pursue a higher degree of learning in nursing education. Most OR nurses had been there for a few years getting their experiences. It revealed that the OR nurses had relevant training for the past 5 years. Most of the OR nurses are active members of the ORNAP, and the rest will follow to become members too.

The purpose of this organization is to unite perioperative nurses of the Philippines, to promote the highest professional standards of perioperative nursing practice for the optimum care of the patients, to provide opportunities for continuous learning through diversified education activities. and to exchange information and disseminate research findings in the field of perioperative nursing. There were more OR nurses in the public hospital when the data gathering was done. It is a fact that there are more nurses in public hospitals due to the influx of indigent patients because services are often free of charge. OR nurses practiced getting the consent first before any operation

was conducted. Also, the wearing of a sterile OR suit is important, especially in preventing complications after the operation. The respondents strictly observe the different preparations of patients before surgery. These practices will make the operation smooth and untoward events are prevented.

According to McCutcheon and Doyle (2021), the operating room (OR) is a sterile, organized environment. Healthcare providers are required to enter the OR during a surgical procedure or to set up before a surgical procedure. It is important to understand the OR area, and how the OR area functions to maintain a sterile environment. Members of the surgical team work hard to coordinate their efforts to ensure the safety and care of their patients. The surgical team oversees the OR and makes decisions regarding patient care procedures. The OR environment has sterile and non-sterile areas, as well as sterile and non-sterile personnel. It is important to know who is sterile and who is not, and which areas in the OR are sterile or non-sterile. OR nurses rendered their intraoperative role diligently for the best patient care. Remember nurses are dealing with life, therefore extra care must be undertaken.

As cited in Wikipedia, activities during the operation include monitoring the patient's vital signs, blood oxygenation levels, fluid therapy, medication transfusion, anesthesia, radiography, and retrieving samples for laboratory tests. The OR nurses performed well in this period since they rated it to be highly performed. It clearly emphasized that the nurses perform their duties well after the operation like the proper cleaning, packing, and sterilization of instruments in preparation for the next operation. This is similar to the study of Bonanthaya et al. (2020) in which surgical instruments are an integral part of the surgical field and, being reusable, have greater chances of spreading the microorganisms if any of the reprocessing steps fail. Steps of reprocessing include cleaning, repackaging, disinfection or sterilization, and reusing. Cleaning, being the first step in the cycle of reprocessing, is the major step in the removal of any organic matter present on the surface of the instruments.

Any failure in the removal of the visible soil at the initial stage can create a discrepancy in the efficacy of the subsequent disinfection and sterilization procedures. OR nurses maintained patient safety practices during the pre-operative, intra-operative, and post-operative periods. It revealed that the OR nurses practiced the following interventions during the surgery of patients including monitoring vital signs, airway patency; neurologic status; managing pain; assessing the surgical site; assessing and maintaining fluid and electrolyte balance; and providing a thorough report of the patient's status to the receiving nurse in the unit. The older age group 31-40 has better patient safety practices as compared to the younger age group of 21-30. Since they have more exposed to the OR for more years compared to the younger ones, it is a fact they have better patient safety practices because they have mastery of the activities in the operating room.

They had been in the OR much longer, so they knew everything they did like being a scrub or a circulating nurse. Nurses promote the client's recovery after surgery by managing pain, supporting oxygenation and cardiovascular stability, maintaining fluid balance, providing wound care, monitoring bowel function, assisting with mobility, and preventing complications. It implies that both male and female OR nurses very well know the patient safety practices since they are equipped with the knowledge and the skills required of an OR nurse. OR nurses must be meticulous with hygiene when preparing the operating room and the surgical instruments. They must also be alert to patients' vitals during surgery and take detailed notes.

Surgeries are complex and fast-paced situations. Just like in the gender, both singles and married could give the best patient safety care to patients who underwent an operation in the OR. Their practices did not vary. Each member of the OR team performs a specific function in coordination with one another to create an atmosphere that best benefits the patient. Since having the license and membership in the ORNAP guarantees the nurse that they have undergone several trainings related to surgical nursing, then it is for sure they have the necessary skills in the OR.

An operating theatre nurse, also known as a theatre nurse or operating room nurse, acts as an assistant for the surgeon and medical team during surgeries. They may help with a wide variety of tasks before, during, and after the operation throughout the preoperative, anesthetic, surgical, and recovery phases (ornap.org). Nurses in private and public hospitals have comparable safety practices rendered to the patients during the pre-, intra, and post-operative stages. Both public and private hospitals render safe patient care which means nursing care that is provided appropriately, promptly, and meets the patient's health care needs. The Patient Safety Indicators (PSIs) are a set of measures that screen for adverse events that patients experience as a result of exposure to the healthcare system. These events are likely amenable to prevention by changes at the system or provider level.

The membership of the nurses in this organization(ORNAP) is very important to ensure safety practices during the post-operative stage. The Operating Room Nurse is responsible for keeping patients safe during surgery by providing care before, during, or after surgeries. They are tasked with ensuring operating rooms are clean and sterile while preparing. The Operating Room Nurse is responsible for keeping patients safe during surgery by providing care before, during, or after surgeries. They are tasked with ensuring operating rooms are clean and sterile while preparing for and following procedures.

## **CONCLUSIONS**

This study focused on the patient safety practices among nurses in the operating room. It determined the profile of the OR nurses in terms of their age, civil status, highest educational attainment, and number of years assigned in the operating room, relevant

seminars attended for the past five (5) years, membership in ORNAP, and type of hospital. The study adapted the Nursing Theory of Patient Safety which states that when primed for a goal of patient safety, nurses persistently pursue the goal of safety for their patient, adapting their actions to the unique needs of their patient and situation. Actions taken by nurses include both safety tasks and risk appraisal. Another theory adapted is the Theory of Goal attainment by Imogene King which states that the nurse is considered part of the patient's environment and the nurse-patient relationship is for meeting goals towards good health. The theory focuses on the attainment of certain life goals. It explains that the nurse and patient go hand-in-hand in communicating information, setting goals together, and then taking action to achieve those goals. The theory was adapted for the reason that the OR nurses with the other members of the OR team make sure that the patient will have a safe and uncomplicated surgery.

Based on the findings of the study, the following conclusions are drawn. The respondents were young adults, female-dominated, not into marital relationships, did not pursue the master's program, had been in the OR for few years, attended few seminars related to OR, and most had membership in their OR organization. The respondents excelled in their field of specialization in the three periods of the peri-operative phase. No significant differences were noted in gender, civil status, highest educational attainment, number of years in service, number of relevant seminars, and category of the hospital except along ORNAP membership in the postoperative period. There is a significant relationship between post-operative safety practices with updated membership in ORNAP. An enhanced Surgical Safety Checklist is proposed to improve patient safety practices in the operating room.

## **RECOMMENDATIONS**

Based on the conclusions, several recommendations are proposed. The OR nurses must pursue post-graduate studies and undergo related seminars or trainings to be abreast with the trends and updates in OR nursing. Training sessions and continuous development of all OR nurses are a guarantee that the highest quality is maintained at the OR. The OR nurses must continue to upgrade their patient safety practices for improved patient recovery. The OR nurses must continue to be members of the ORNAP to be updated on developments in OR nursing. The proposed enhanced surgical safety checklist be endorsed for adaption in the different hospitals to maintain good outcomes for surgical patients.

## **IMPLICATIONS**

An operating room is a complex and highly specialized surgical procedure that is performed in line with state-of-the-art procedures and applicable standards. This is why OR staff is required to constantly improve their qualifications and pursue personal growth. Patient safety should be given priority in all hospitals. Every patient has the right to

receive health services that correspond to current medical knowledge. Constant revision of processes and guidelines is needed to optimize patient experience and safety. The proposed enhanced surgical safety checklist be endorsed for adaption in the different hospitals to maintain good outcomes for surgical patients.

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## **DECLARATIONS**

### ***Conflict of Interest***

The author declares no potential conflicts of interest concerning this study's research, authorship, and/ or publication.

### ***Informed Consent***

Informed consent was obtained from all respondents involved in the study.

### ***Ethics Approval***

Approval to conduct the study was obtained.

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## Author's Biography

The author is currently working as an operating room nurse in Eastern Pangasinan District Hospital. She deals with patients during their pre-operative, intra-operative, and post-operative periods. This inspired the researcher to conduct this study.