INJ INTERNATIONAL NEUROUROLOGY JOURNAL

Effect of Self-learning Package on Nurses' Performance Regarding Patient Safety in Operating Room

Samar Nabil Mohamed1, Prof. Hanan Said Ali[2], Assist. Prof. Mona Nadr Ebraheim[3], Assist. Prof. Aziza Youniss Ahmed[4]

[1]Master Degree in Medical Surgical Nursing - Faculty of Nursing – Ain Shams University.
[2]Professor of Medical Surgical Nursing- Faculty of Nursing – Ain Shams University.
[3,4] Assistant Professor of Medial Surgical Nursing-Faculty of Nursing – Ain Shams University

Abstract

Background: Improving nurses' performance regarding patient safety is very essential that may be achieved through developing standards of intraoperative nursing interventions and increasing nurses' awareness regarding their vital role in saving patient life through safe practice. Aim: This study aimed to evaluate the effect of self-learning package on nurses' performance regarding patient safety in operating room Design: A quasi-experimental design study (pre/post approach) was utilized to meet the aim of the study. Setting: the study was carried out in the general operating rooms at Zagazig university hospital. The sample of the study: A convenient sample of (40) nurses who are working in the previous mentioned setting. Tools for Data collection: Tool (I) Nurses' Self-administered Questionnaire: it was concerned with assessment demographic data of the studied nurses and their knowledge regarding patient safety in operating room. Tool (II) Nurses' observational Checklist: It was concerned with assessment of nurses' level of practice regarding patient safety in operating room Tool (III) An attitude scale for nurses: It was concerned with assessment of nurses' attitude regarding patient safety in operating room. Results: there were highly statistically significant improvements regarding nurses' level of knowledge, and practice in post and follow up phase as compared to pre phase of self -learning package implementation at ($P<0.001$**), there was highly statistically significant improvement regarding nurses' level of attitude between pre/post phases at ($P<0.001$**), and there was a statistically significant improvement between pre/follow up phases of self -learning package implementation at ($P \leq 0.05$*). Conclusion: the self -learning package had positive effect on the studied nurses regarding patient safety in operating room with highly statistically significant improvements regarding nurses' level of knowledge, and practice throughout three phases (pre/post and follow-up) of self –learning package implementation, there was highly statistically significant improvement regarding nurses' level of attitude between pre/post phases, and there was a statistically significant improvement between pre/follow up phases of self -learning package implementation. Recommendations: Provision of studying self -learning package in the operating room to promote patient safety and enforce self- learning education.

Keywords: Self learning package (SLP), Nurses performance, patient safety, operating room

Introduction

The operating room (OR) is the unit of a hospital where surgical operations are carried out in a sterile aseptic environment. Surgical care is complex and prone to errors and subsequent adverse events. The operating room environment is a very critical and complex area so that, it requires close and careful team work attention. The reduction of perioperative harm is a major priority of healthcare and the reporting of incidents and their causes is an important source of information to improve perioperative patients' safety ***(Aktaş & Damar, 2022).***

Patient safety is a fundamental value of healthcare to avoid patient harm. Non-compliance with patient safety standards can result in permanent injury or even death. It considered the cornerstone of healthcare quality as providing safe patient care is one of the significant challenges in operating theatre because half of all surgery related iatrogenic events and complications are preventable. Therefore, ensuring patients' safety in operating theater is to be given the highest priority and includes attention to all applicable types of preventable medical errors (**Bahar & Önler, 2020).**

A hazard is a potential source of harm. It may cause loss of life, injury or other health impacts, property damage, or environmental damage. Hazards in the operating room are potentials sources of harm or adverse health effect that occur in the OR. Inadequate safety measures may cause many hazards that can affect the patient and the operating team as well. The operating room environment is charged with various hazards such as physical hazards, accidental hazards, chemical hazards and biological hazards. Each member of surgical team (consisting of the surgeon, anesthetist, and perioperative nurses) should act under the principle of no harm or errors **(Amin et al., 2023).**

ISSN:2093-4777 | E-ISSN:2093-6931
DOI: 10.5123/inj.2024.3.inj129
Vol. 28 Iss. 3 (2024)

The need for a safe environment is national, community, and individual concern. Safety and welfare of patients and personnel are of the primary consideration in every health care setting. Additionally, safety issues are of the main concern in the operating room OR setting. Because of the many hazards in the OR environment neither patient nor OR personnel are completely free from risks, however, it is possible to create a safe environment and minimize potential hazards identified if safe practices established **(Letvak et al., 2023).**

The role of operating room nurses to achieve national patient safety goals depends on following specific guidelines and polices such as identifying the surgical patient and site marked correctly, using anesthetic agents safely, specifying patient safety risks as blood loss and airway difficulty or aspiration, minimizing the risk for surgical site infection, proper diathermy grounding padding, accurate labeling of surgical specimen, accurate counting of surgical items (before, during, after operation), following principles of aseptic technique, control of environmental potential hazards , and improve interpersonal communication (**Bansal & Ray, 2021).**

The self-learning package (SLP) refers to self-instructional, self-explanatory, self-contained, self-directed, self-motivating and self-evaluating material to assess the achievement of the learner. It is essential in assisting nurses to meet the challenges presented in today's health care environment. Nurse educators have an important role to play in assisting nurses to acquire the skills for Self- learning package, and to do this they need to understand the concept of Self- learning package **(Mohamed & Ibrahim, 2021).**

The Self-Learning package as teaching strategy is effective at increasing the knowledge, practice and attitude regarding patient safety in operating room to prevent threats to the safety of patients undergoing surgery. Therefore, it is necessary to create a learning module that refers to a well-structured curriculum and adapted to national competencies. Nursing students need to improve their performance, especially in the implementation of patient safety in operating room. It is due to the risk of incidence against patient safety that can occur in daily practice **(Gunahariati et al., 2022).**

Significance of the study

Over 300 million surgical procedures are performed each year worldwide. Despite awareness of adverse effects, surgical errors continue to occur at a high rate and approximately 10% of preventable patient harm in health care was reported in surgical settings. The report states that unexpected, major complications arise in 3–22% of surgical procedures, that the death rate is estimated as 0.4–0.8% and that a large proportion of these complications may be prevented. Progress has been made regarding patient safety in the OR in recent decades, but the rates of complications and mortality remain too high **(WHO, 2023).**

According to annual statistical report of Zagazig university hospital, it was shown that total number of major surgeries performed was 10881 patients and its mortality rate was 4% of the total number of patients during the year 2022. Most of the complications were associated with surgical site infection has been estimated at 4–8% and few directly related to anesthesia complications has been estimated at 2-3% **(Zagazig university hospital statistical office, 2022).**

Moreover, a study which done in surgical departments at Zagazig university hospital by **Mohamed et al., 2019** revealed that the studied nurses had unsatisfactory level of knowledge, practice and attitude regarding patient safety in operating room. Hence, this study carried out to determine the effect of self-learning package on nurse's performance regarding patient safety in operating room and finally, the study may create an interest and motivation for conduction of further studies in to this area.

Aim Of The Study

This study aimed to evaluate the effect of self-learning package on nurses' performance regarding patient safety in operating room through the following;

- Assessing nurses' level of performance regarding patient safety in operating room.
- Developing and implementing self-learning package regarding patient safety measures in operating room.
- Evaluating the effect of self-learning package on nurses' performance regarding patient safety measures in operating room.

Research hypothesis:

There will be a significant positive change on nurses' performance regarding patient safety in operating room post implementation of self-learning package.

Subjects And Methods

The study was portrayed under the four main designs as follows:
I. Technical design.
II. Operational design.
III. Administrative design.
IV. Statistical design.

I. Technical design:
The technical design includes research design, setting, subjects and tools for data collection.

Research Design: A quasi-experimental design study (pre/ post approach) was utilized to meet the aim of the study pre, post and follow up implementation of self-learning package.

Setting of the Study: The study was carried out in the general operating rooms at Zagazig University Hospital. The selection of this hospital was based on the residence of the researcher as it was facilitated the data collection of the study.

Subject: A convenient sample of all available nurses (40 nurses), who are working in the previous mentioned setting and accepted to participate in the study from both gender with different qualifications, age, previous training courses and years of experience was recruited in this study.

Data Collection tools
Data were collected using the following tools:
1-Nurses'Self-administered Questionnaire:
Data was collected using the following tools:

I-Nurses' self-administered questionnaire:
It was developed by the researcher, based on reviewing of related literature; it was translated, retranslated and written in simple Arabic language and consists of the following parts:

The first part was concerned with demographic data that include (age, gender, marital status, educational level, years of experience, attendance of training courses regarding patient safety measures in operating room and availability of manual guide regarding patient safety measures in operating room).

The second part was used to assess nurses' knowledge regarding patient safety in operating room (pre, post and follow up implementation of self-learning package), it was developed by the researcher guided by **Sen and Sen, (2013); Fairchild et al., (2017); Mohammed et al., (2019); Mohammed et al. (2020); Wahr et al. (2022).** It included 56 questions in the form of multiple choice, matching and true and false questions. It was categorized into five sections as follows; assessment of nurses' knowledge regarding general concepts about surgery. It included **(6 questions);** assessment of nurses' knowledge about general concepts regarding patient safety measures in operating room. It included **(5 question);** assessment of nurses' knowledge about potential hazards that hinder patient safety in operating room. It included **(4question);** assessment of nurses' knowledge about patient's safety precaution measures to prevent hazards in operating room. It included **(17 question);** assessment of nurses' knowledge regarding the role of the nurses according to WHO surgical patient safety checklist. It included **(24 questions).**

Scoring system:
Answers were either correct or incorrect with total score 56 grades, one score was given when the response was correct and zero when it was incorrect. The level of knowledge was considered satisfactory if the percentage was ≥ 90% (≥ 50 grades) and the level of knowledge was considered unsatisfactory if the percentage was < 90% (<50 grades).

II. Nurses' observational Checklists:
It was concerned with assessment of nurses' practice regarding patient safety in operating room. It was adapted from **Alaa-Eldeen et al., (2012); Christensen and Kockrow, (2014); Phillips, (2016); WHO, (2017); Hanfy et al., (2021) and WHO, (2021).** It included 170 steps divided into (2) parts as the following:

The first part was concerned with checklist regarding environmental safety of operating room that included mechanical safety, thermal safety, electrical safety, chemical safety and biological safety **(16 steps).**

The second part was concerned with surgical patient safety checklist that included sections as the following: Phase I: Sign In **(**Before induction of anesthesia). It included **(64 steps);** Phase II: Time Out (Before skin incision)**.** It included **(32 steps);** Phase III: Sign Out **(**At the completion of the procedure). It included **(58 steps).**

Scoring system:
One grade was given to the step which was done correctly and zero was given to step which was done incorrectly or not done. The total scores were 170 grades, it was calculated and categorized as the following: the level of practice was considered competent if the percentage was ≥ 90% (≥ 153grades) and the level of practice was considered incompetent if the percentage was < 90% (<153grades).

III- An attitude scale for nurses regarding patient safety measures in operating room:
It was concerned with assessment of nurses' attitude regarding patient safety measures in operating room. It was translated, retranslated and written in Arabic language. It was adapted from **Brasaite et al., (2015); Norton et al., (2016); Matte et al., (2020) and Habahbeh & Alkhalaileh, (2020)**. It included (32) statements that reflect nurses' feelings and reactions toward patient safety measures in operating room and nurses' responses was grading according to likert scale (agree, neutral and disagree). It was categorized into six sections as follows; assessment of nurses' attitude regarding team cooperation. It included **(6 statements)**; assessment of nurses' attitude regarding safety climate. It included **(8 statements**); assessment of nurses' attitude regarding stress recognition. It included **(4 statements)**; assessment of nurses' attitude regarding job satisfaction. It included **(4 statements)**; assessment of nurses' attitude regarding management perception It included **(5 statements**); assessment of nurses' attitude regarding work condition. It included **(5 statements).**

Scoring system:
This likert scale part consisted of (32) statement, the 3 point likert scale responses were ranged as 2 for (agree), 1 for (neutral), and 0 for (disagree). The score of statements were summed up and given a total score for the nurses' attitude and categorized into two categories as the following; the level of attitude was considered positive if the percentage was ≥75% (≥ 24 grades) and the level of attitude was considered negative if the percentage was<75% (<24 grades).

Self-learning package (SLP) regarding patient safety measures in operating room:
It was designed in Arabic language and was developed by the researcher based on the results obtained from assessment of the nurses' knowledge, practice and attitude, as well as literature review. The designed SLP included the following (booklet- CD). The content of SLP was developed, translated and retranslated by the researcher guided by recent literature review **Abd El Hamid et al., (2018); Williams., (2018); Mohamed et al., (2019); Whitlock., (2019): WHO, 2019; Marshall & Touzell, (2020); Wæhle, et al. (2020); Mohamed., et al. (2020); Sutherland-Fraser et al., (2021); WHO, (2021); Bali., (2022); Elhadidy., (2022); Joint of commission (2022)**; **Mohabir & Coombs., (2022); Salvaraji et al., (2022)**: The SLP consists of pre-test, post -test, follow up test, an introduction, user guide and general& specific objectives of content, which is composed of two parts theoretical content and its practical application.

II. Operational design:
The operational design was included: preparatory phase, content validity, reliability of tools, ethical consideration, pilot study and field work.

Preparatory phase:
It included reviewing of the current and more recent relevant national and international literature reviews, and theoretical knowledge of the various aspects of the study using periodicals, magazines, articles, books and internet in order to develop the data collection tools.

Validity and reliability
Testing the validity: the validity of the developed tools was tested using (face and content validity). Face validity aimed to inspect the items to determine whether the tools measure was appropriate, while content validity was done to determine what it supposed to measure whether the tool achieve the study aim.

The validity was tested through a jury of seven experts (5 professors and 2 assistant professors) in the field of medical surgical nursing, faculty of nursing, Ain Shams University who reviewed the content of the tools for

comprehensiveness, accuracy, clarity and relevance and necessary modifications was done accordingly. The validity of the study for self- administered questionnaire was (90% to 100 %) and for nurses' observational checklist tool was (100%), and an attitude scale for nurses regarding patient safety in operating room was (90% to 100%).

Reliability of the study tools was tested statistically using Cronbach's Alpha / Coefficient test. They were for self-administered questionnaire, nurses' observational checklist and an attitude scale for nurses regarding patient safety in operating room (0.908, 0.888 and 0.879 respectively).

Pilot study

It was carried out on (10%) of the total sample of the studied nurses to test applicability, clarity and efficiency of the tool, and to estimate time need to fill in the study tools. According to the results obtained from analysis of pilot study, minimal modifications were done, so the nurses' who included in the pilot study were included in the sample.

The ethical research considerations

The ethical considerations in the current study were considered the research approval from the research ethical committee in the faculty of nursing Ain Shams University before starting the study. The researcher clarified the aim, objectives of the study to the nurses included in the study prior to data collection. Maintaining anonymity and confidentiality had been guaranteed. Nurses were informed that they allowed choosing to participate or not in the study and that, they had the right to withdraw from the study at any time. Ethics, values, culture, and beliefs were respected during study period.

Field work:

An approval was obtained from hospital directors and nursing directors. The aim of the study was explained to the nurses who agreed to participate in the study prior to data collection. The actual work of this study took about 8 months, started from the beginning of November 2022 to the end of June 2023. The data were collected by the researcher through 3 days/week (Monday, Wednesday and Thursday) during morning and afternoon shift in the previous mentioned setting.

The fieldwork included four phases: assessment phase, planning phase, implementation phase and evaluation phase.

Phase (I): Assessment phase

The first phase was concerned with assessment of nurses' performance (practice, knowledge and attitude) regarding patient safety in operating room by using the three previously mentioned tools (Nurses' observational checklist, Self-administered questionnaire and Nurses' attitude likert scale) to identify nurses' educational needs.

The researcher first observed the studied nurses using observational checklists to evaluate their practice regarding patient safety in operating room. Each nurse was observed by in direct observation according to the type and time of surgery to ensure the maximal realistic observations of nurses' practice and minimize the possibility of bias.

The researcher then explained the self-administered questionnaire and nurses' attitude scale (Tool I & Tool III). It was distributed it to all nurses individually to assess their knowledge and attitude regarding patient safety in operating room. The average time needed for the completion of it by each nurse took about 30- 40 minutes to be accomplished and usually it was assessed by the researcher in Thursday in the morning and afternoon shift as it was the day of inventory of surgical instruments. So, it was easy for data collection.

The study tools were assessed three times at pre- implementation phase, immediately after one month of studying SLP (Immediate post- implementation phase) and finally after 3 months (follow up phase) of immediate post implementation phase., this phase took about two months to be accomplished.

Phase (II): Planning phase

The self-learning package was developed by the researcher in simple Arabic language based on the nurses' need which identified from the pretest results of nurses' practice, knowledge and attitude at pre implementation phase of SLP and the most recent related literature, and then an illustrated booklet was developed. The booklet's color printing and picture illustrations improved its readability and made the material easier for nurses to comprehend.

Self-Learning Package (SLP):

The designed SLP included the following (booklet- CD including videos about nurses' performance regarding patient safety in operating room). The booklet was composed of two parts; theoretical part and practical part. The theoretical parts include general concepts about surgical operation, general concepts regarding patient safety measures in operating room, potential hazards regarding patient safety in operating room, patient safety precaution measures in operating room and the role of nurses regarding patient safety in operating room according to WHO surgical patient safety checklist.

As well as, the practical parts include practical procedures list for nurses' performance regarding patient safety in operating room including; environmental safety of operating room that included mechanical safety, thermal safety, electrical safety, chemical safety and biological safety and nurses' observational checklist according to WHO surgical patient safety checklist that included sections as the following: **Phase I:** Sign In (Before induction of anesthesia), **Phase II:** Time Out (Before skin incision), and **Phase III:** Sign Out (At the completion of the procedure).

Phase (III): Implementation phase:
The self-learning package was distributed by the researchers to each nurse. The researchers has clarified the purpose of the study and discussed the utility technique of the package as; each chapter should be read carefully any page in the package shouldn't be canceled; the questions following each chapter should be answered; it isn't permitted to move to another chapter unless the required score is obtained; if the required score can't be reached, the nurses should return again to the same chapter and they can return to the researchers for vague points' clarification.

The time allowed to study the SLP was one month for all nurses. The researcher should contacts with the nurses through the interviewing in the previous mentioned setting and through telephone to explain some difficult points of the SLP that faced them. The objective of this phase was to raise knowledge, enhance both practices and attitudes of the studied nurses. Motivation and reinforcement techniques as praise and recognition during implementation of SLP were used.

Phase (IV): Evaluation phase
This phase included evaluating the effect of self-learning package on the nurses' performance (practice, knowledge and attitude) immediately after one month of studying SLP (Immediate post- implementation phase) and after three months (follow up) of immediate post implementation phase by using the same data collection tools which used in pre-implementation of SLP assessment.

Evaluating the effect of SLP on nurses' performance regarding patient safety in operating room by comparing the results pre, post and follow-up self-learning package implementation.

Result

Table (1) this table shows that 40% of studied nurses were aged from 20 to less than 30 years old , 50% of studied nurses were aged from 30 to less than 40 years old with mean age 33.10 ± 6.83. Also, 95% of the studied nurses were females and 85% of them were married. Moreover, 45% of studied nurses were nursing diploma and 62.5% of them were had experience more than 10 years with mean = 13.95 ± 8.61. In addition, 67.5% of the studied nurses didn't attend any training courses regarding patient safety measures in operating room and all of them 100% didn't have manual guide regarding nurses' performance related to patient safety in operating room.

Figure (1) this figure shows that 45%, 92.5% and 90% of the studied nurses had total satisfactory level of nurses' knowledge regarding patient safety in operating room at pre , post and follow up phases respectively with highly statistically significant differences between pre/post and pre/follow up phases of the SLP implementation at ($X^2 1=21.004$ and $X^2 2=18.479$ at $P \leq 0.001$**).

Figure (2) this figure shows that 57.5%, 95.0% and 90.0% of the studied nurses had total competent level of nurses' practice regarding patient safety in operating at pre, post and follow up phases with highly statistically significant differences between pre/post and pre/follow up phases of the SLP implementation at ($X^2 1=13.067$ and $X^2 2=11.279$ respectively at $P \leq 0.001$ **).

Figure (3) this figure shows that, 72.5%, 90.0% and .85% of the studied nurses had positive total scores of nurses' level of attitude regarding patient safety in operating room at pre, post and follow up phases respectively with highly statistically significant differences between pre/post phases of the SLP implementation at ($X^2 1=12.019$

respectively at P<0.001**). Moreover, there is statistically significant differences between pre/follow up phases of the SLP implementation at ($X^2$2=6.995 respectively at P ≤ 0. 05*).

Table (2) shows that, there was no statistical significant correlation between nurses' level of knowledge and their level of attitude at pre implementation phase of SLP (r=0.053 respectively at p> 0.05). As well, there was statistical significant correlation between nurses' level of knowledge and their level of practice at pre implementation phase of SLP (r=0.371 respectively at p≤0.05*). While, there was no statistical significant correlation between nurses' level of practice and their level of attitude at pre implementation phase of SLP (r=0.019 respectively at p> 0.05).

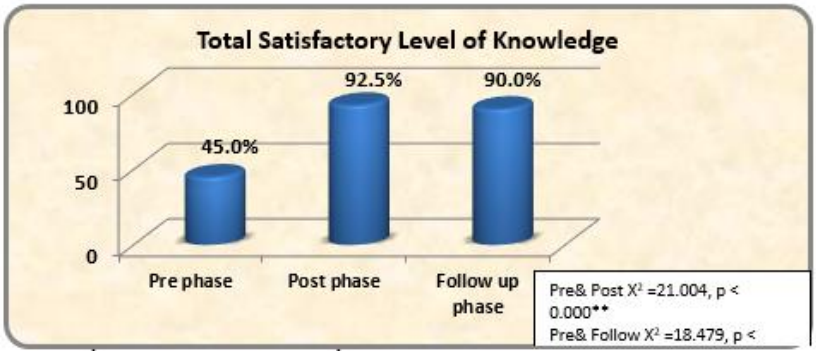
Table (3) this table shows that there was statistical significant correlation between nurses' level of knowledge and their level of attitude at post implementation phase of SLP (r=0.306 at p≤0.05*) respectively. As well, there was highly statistical significant correlation between nurses' level of knowledge and their level of practice at post implementation phase of SLP (r=0.579 respectively at p≤ 0.001**). Moreover, there was highly statistical significant correlation between nurses' level of practice and their level of attitude at post implementation phase of SLP (r=0.560 respectively at p≤ 0.001**).

Table (4) This table shows that, there was no statistical significant correlation between nurses' level of knowledge and their level of attitude at follow up implementation phase of SLP (r=0.212 respectively at p> 0.05). As well, there was highly statistical significant correlation between nurses' level of knowledge and their level of practice at follow up implementation phase of SLP (r=0.628 respectively at p≤ 0.001**). Moreover, there was highly statistical significant correlation between nurses' level of practice and their level of attitude at follow up implementation phase of SLP (r=0.926 respectively at p≤ 0.001**).

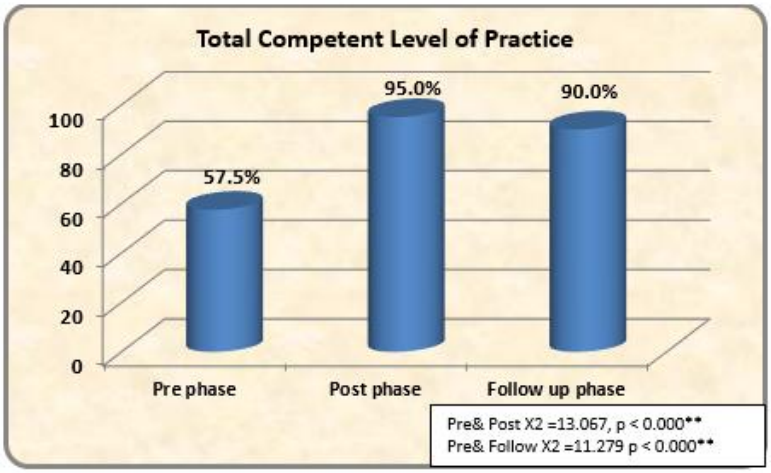
Table (1): Number and percentage distribution of demographic characteristics among nurses under study (n=40).

Item	No	%
Age group (years)		
20- <30	**16**	**40.0**
30- <40	**20**	**50.0**
≥40	**4**	**10.0**
Mean ± SD Min-max)(	**33.10±6.83 24-50**	
Gender		
Male	**2**	**5.0**
Female	**38**	**95.0**
Marital status		
Married	**34**	**85.0**
Single	**6**	**15.0**
Level of education		
Nursing Diploma	**18**	**45.0**
Technical health Institution	**14**	**35.0**
Nursing bachelory	**8**	**20.0**
Experience		
< 5	**5**	**12.5**
5- < 10	**10**	**25.0**
10 +	**25**	**62.5**
Mean ± SD (min-max)	**13.95±8.61 1-32**	
Attendance of training courses regarding patient safety measures in operating room.		
Yes	**13**	**32.5**
NO	**27**	**67.5**
Availability of manual guide regarding nurses' performance related to patient safety measures in operating room.		
Yes	**0**	**0.0**
No	**40**	**100.0**

Figure (1): Percentage distribution of the studied nurses regarding their total satisfactory level of knowledge about patient safety in operating room at pre/ post implementation of SLP and follow-up phase (n=40)

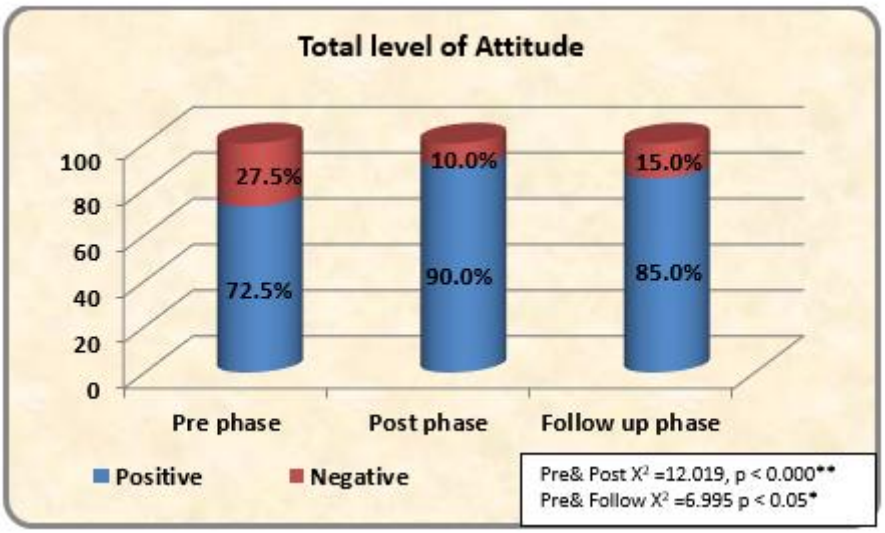


X 2 1: Between pre, post phase, X 2 2: Between pre, follow up phase
(* A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001)
Figure (2): Percentage distribution of the studied nurses regarding their total competent level of practice regarding patient safety in operating room at pre/ post implementation of SLP and follow-up phase (n=40).



X 2 1: Between pre, post phase, X 2 2: Between pre, follow up phase
(* A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001)

Figure (3): Percentage distribution of the studied nurses regarding their total level of attitude regarding patient safety in operating room at pre/ post implementation of SLP and follow-up phase (n=40).



X 2 1: Between pre, post phase, X 2 2: Between pre, follow up phase
(* A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001)

Table (2): Correlation between total score of nurses' knowledge, practice and attitude regarding patient safety in operating room at pre implementation phase of SLP (n=40)

Pre- phase	Knowledge		Attitude	
	r	p-value	r	p-value
Knowledge			0.053	0.638
Practice	0.371	0.018*	0.019	0.906

Table (3): Correlation between total score of nurses' knowledge, practice and attitude regarding patient safety in operating room at post implementation phase of SLP (n=40).

Post phase	Knowledge		Attitude	
	r	p-value	r	p-value
Knowledge			0.306	0.032*
Practice	0.579	0.000**	0.560	0.000**

* * Highly statistically significance p≤ 0.001 * Statistically significance p≤ 0.05

Table (4): Correlation between total score of nurses' knowledge, practice and attitude regarding patient safety in operating room at follow up implementation phase of SLP.

Post phase	Knowledge		Attitude	
	r	p-value	r	p-value
Knowledge			0.212	0.190
Practice	0.628	0.000**	0.926	0.000**

* * Highly statistically significance p≤ 0.001 * Statistically significance p≤ 0.05

No statistically significance p> 0.05

Discussion

Concerning demographic characteristics of the studied nurses, the results of the current study revealed that, two fifths of the studied nurses were aged from twenty to less than Thirty years old and half of them aged from Thirty to less than Forty years old with the mean age 33.10 ± 6.83 years old. This finding could be clarified in the light nature of operating room unit as area of specialty necessitates young qualified and adult nurses were aware enough for better quality of nursing care offered and abled to tolerate the working load and need of active personnel in operating room usually at the age less than Forty years .

The previous findings were consistent with **Yavuz. (2023)** in the study entitled " Patient Safety Culture Perception Among Surgical Nurses " who mentioned that the majority of the studied nurses', their ages were between 18 to 49 years with the mean age 29.08 ± 6.60 years. While, the previous findings were inconsistent with **Seo and Lee. (2023)** in the study entitled " Effects of Nurses' Perceptions of Patient

Safety Rules and Procedures on Their Patient Safety Performance: The Mediating Roles of Communication about Errors and Coworker Support" who mentioned that the majority of the studied nurses were aged from 20 to 29 years old.

Regarding gender, the current study showed that, the majority of the studied nurses were females. It might be related to the greater fraction of the nurses in Egypt was females and might be also related to the studying of

nursing in Egypt was exclusive for female only till few years ago nursing schools graduate large number of females than males. This finding in the same line with **Khong et al., (2020)** in the study titled "Operating room nurse self-reported knowledge and attitude on perioperative pressure injury" who found that most of the studied nurses were females.

Meanwhile, the previous findings were inconsistent with **El-Shafei et al. (2019)** in the study titled "World Health Organization Surgical Safety Checklist with Addition of Infection Control Items: Intervention study in Egypt" and showed that the majority of the studied participants were male.

In relation to marital status, the current study revealed that most of nurses were married. This may be related to the majority of the studied nurses were in marriage phase according to Egyptian culture. This finding agreed with **Lemos et al., 2022** in the study titled" Role of perioperative nursing in anesthesia: a national overview" who stated that the majority of the studied nurses were women, with a mean age of 41.09 years and were married.

Concerning level of education, the present study revealed that, about less than half of the studied nurses were diploma nurses. This finding may be due to the shortage of number of bachelor nurses who working in the operating room units as the highly qualified nurses recruited as supervisors and perform administrative work. So, the largest numbers of nurses graduated from nursing schools were recruited as staff nurses there to cover the activities needed the OR units.

This findings were in agreement with **Gouda et al. (2019)** in the study titled " Factors affecting postoperative nursing performance in the surgical units" who stated that half of the studied nurses were secondary diploma nurses.

Concerning experiences, the present study revealed that about two thirds of studied nurses had experiences more than ten years old in operating room unit with mean = 13.95 ± 8.61 years. This might be explained in the light of nature of operating room unit as area of specialty necessitates that safety and maintenance of procedures are crucially dependent on experienced nursing care, with constant observation to ensure monitoring and immediate detection of any problems so that they can be rapidly assessed and treated.

The previous findings were inconsistent with **El-Sherbiny et al., (2020)** in the study titled "Assessment of patient safety culture among paramedical personnel at general and district hospitals" who stated that the largest percentage of participants had between 6to 10years of experience.

As regard to training courses, the present study showed that, more than two third of studied nurses didn't attend training courses regarding patient safety measures in operating room and all of them didn't have manual guide regarding nurses' performance related to patient safety in operating room. This might be due to shortage of training programs regarding these issues to improve their performance, the staff nurses did not aware about the importance of operating room safety and its effect on patient safety positively in addition to there is no time for attending any extra training courses as a result of work overload.

The previous results were inconsistent with **Fathy et al. (2022)** in a paper titled " Nurses ' Performance Regarding the Patients ' Safety Measures in Operating Theater" who stated that more than three quarters of the studied nurses attended training courses related to patients' safety measures in operating theater, however, this reflected positively on their performance.

Concerning to the overall satisfactory level of nurses' knowledge about patient safety in operating room, the current study revealed that the majority of studied nurses had highly statistically significant improvement in total satisfactory level of nurses' knowledge at post and follow up phases as compared to pre phase of SLP implementation. This improvement could be due to effectiveness of SLP as a teaching learning strategy as well as using soft and hard copy of colored booklet that contained understandable, and reliable review of knowledge that reflect the positive effect of SLP on knowledge at post and follow up phases as compared to pre phases of SLP implementtion.

The previous findings were supported with **Pooja and Shantibala . (2023)** in a paper titled" The Impact of an Educational Program on Knowledge and Perception of Patient Safety Culture among Nurses in the Two Medical Colleges of Manipur: A Quasi-Experimental Study" who stated that the majority of studied nurses had statistically significant improvement in total satisfactory score of nurses' level of knowledge at post and follow up phases as compared to pre phase of program implementation.

In addition, the previous findings were supported with **Jamshidi et al. (2021)** in a paper titled" Does problem-based learning education improve knowledge, attitude, and perception toward patient safety among nursing students? A randomized controlled trial " who stated that the majority of the nursing students' knowledge about patient safety increased significantly after problem-based learning education educational approach.

Concerning the overall competency level of practice regarding patient safety measures in operating room, the current study revealed that the majority of the studied nurses had highly statistically significant improvement in total competent level of nurses' practice regarding patient safety measures in operating room at post and follow up phases as compared to pre phase of SLP implementation. According to the researcher point of view, this result reflected that SLP was effective in the improvement of nurses' level of practices regarding patient safety measures in operating room due to increase nurses' level of knowledge. As well as using soft and hard copy of colored booklet that contained understandable, and reliable medical information and standardized surgical patient safety checklist which was evident in the post and follow up phases.

The previous finding is consistent with **Armstrong et al. (2022)** in a paper titled" Effect of the surgical safety checklist on provider and patient outcomes: a systematic review" who stated that the majority of the studied groups had total satisfactory level of performance regarding surgical safety checklist after the program implementation compared to pre-program implementation with highly statistically significant differences between pre and post-implementation of the training program.

Concerning to the overall level of attitude regarding patient safety in operating room, the current study revealed that the majority of the studied nurses had highly statistically significant improvement in total level of attitude regarding patient safety in operating room between pre/post phases of the SLP implementation and there was a statistically significant improvement between pre/follow up phases of the SLP implementation.

This improvement might be an indicator of the success of SLP which result in increased nurses' level of knowledge and practice about patient safety in operating room. Therefore, nurses' level of attitude changes toward positive. Therefore, patient safety is improved by learning from, identifying, and minimizing safety hazards, which are important factors in reducing patient harm and creating a safety attitude among the staff.

The previous results were supported by **Al Habahbeh & Alkhalaileh. (2020)** in the study titled" Effect of an educational program on the attitudes towards patient safety of operation room nurses" who stated that there was positive effect of an educational workshop on OR nurses' attitudes with highly statistically significant differences between pre/post implementation of educational program that reflects the success of the program.

While, the previous results were inconsistent with **Elmwafie et al. (2022)** in the study titled " Impact of Safety Guidelines on Nurses' Knowledge regarding Incidents and Nurses' Safety Attitude at Neonatal Intensive Care Unit " Who stated that the majority of the studied nurses had a weak positive safety attitude in most areas of scale attitude questionnaire at post program intervention as more than half of them were dissatisfied with their work.

In addition, the current study result revealed that there was no statistical significant correlation between nurses' level of knowledge and their level of attitude at pre implementation phase of SLP. As well, there was no statistical significant correlation between nurses' level of practice and their level of attitude. From the researcher point of view, this indicated that the attitude of the studied nurses negatively correlated with their knowledge and practice due to lack of nurses' level of knowledge and practice before SLP implementation.

The previous results were consistent with ***Ebraheim and Eltaib, (2023)*** in the study titled "Improving Nurses 'Compliance with Standard patients' Fall Prevention Protocol in Surgical Departments" who stated that ere was no statistical significant correlation between nurses' level of knowledge and their level of attitude. As well, there was no statistical significant correlation between nurses' level of practice and their level of attitude in pre-program phase.

Meanwhile, the previous results were inconsistent with ***Feng et al. (2022)*** in the study titled "Knowledge, attitude, and practice of surgical site infection prevention among operating room nurses in southwest China" who stated that there was a significant correlation between nurses' level of knowledge and their level of attitude. As well, there was significant correlation between nurses' level of attitude and their level of practice at pre implementation phase.

As well, there was statistical significant correlation between nurses' level of knowledge and their level of practice at pre implementation phase of SLP. From the researcher point of view, this indicated that while nurses have a theoretical knowledge of the issue, proper education can help them understand the nuances of the issue and why it is important to put their knowledge into practice.

The previous study result was consistent with ***Alwhab et al. (2021)*** who stated that there was highly statistically significant relation regarding nurses' total level of knowledge and total level of practice at pre implementation of education program.

While the previous result was inconsistent with ***Ibrahim et al. (2023)*** who stated that there was no statistically significant relation between knowledge and practice of nurses' at pre-training strategy implementation.

As well, the current study showed that there were positive statistical significant correlation between nurses' level of knowledge, practice and attitude at post implementation phase of SLP. This may be attributed to the positive effect of SLP on improving nurses' level of knowledge practice and attitude that reflects the success of SLP as promoting high the level of knowledge could be translated to positive attitude and subsequently good behavior and the positive attitude will result in improving practices, as each one associated with the other.

Also, the previous study result was consistent with **Cho et al. (2022)** in the study titled" Effect of online education on the knowledge on, attitudes towards, and skills in patient safety for nursing students in Korea: a mixed-methods study" who stated that there was positive statistical significant correlation between nurses' level of knowledge, their level of practice and their level of attitude at post implementation of online educational program regarding patient safety.

Moreover, the current study showed that there was no statistical significant correlation between nurses' level of knowledge and their level of attitude at follow up implementation phase of SLP. As well, there was highly statistical significant correlation between nurses' level of knowledge and their level of practice at follow up implementation phase of SLP. Also, there was highly statistical significant correlation between nurses' level of practice and their level of attitude at follow up implementation phase of SLP.

The previous study result was consistent with **Rayan et al. (2021)** who reported that there was a positive highly significance correlations among total knowledge score and total practice score related to occupational health hazards among nurse interns throughout program phases. While the previous results were inconsistent with his study in some finding as there was highly statistically significance correlations between total attitude score and total knowledge score regarding occupational health hazards among nurse interns through follow up program phases.

Conclusion

Based on the result of the current study; it can be concluded that: the self -learning package (SLP) had positive effect on the studied nurses regarding patient safety in operating room with highly statistically significant improvement regarding nurses' level of knowledge, and practice throughout three phases (pre/post and follow-up) of self –learning package implementation, there was highly statistically significant improvement regarding nurses' level of attitude between pre/post phases , and there was a statistically significant improvement between pre/follow up phases of the SLP implementation which support study hypothesis that there will be a significant positive change on nurses' performance regarding patient safety in operating room post implementation of self-learning package .

Recommendation

Based on finding of the current study, the following recommendation could be suggested:
Regarding nursing performance:

- Provision of study SLP in the operating room to promote patient safety and enforce self- learning education.
- Manual guide booklet including nursing guidelines regarding nurses' performance related to patient safety measures should be available in operating room units.

Regarding research:

- Replication of the study on wide probability sample in different areas to monitor improvement in nurses' performance regarding patient safety in operating room.

Regarding nursing education:

- On-going and regular in-service training courses regarding evidence-based guidelines should include patient safety checklist in the operating room.
- Orientation programs for newly recruited nurses regarding patient safety in operating room should be performed prior to start dealing for such group of patients.

References

1. **Abd El Hamid ,L.A, Shazly ,M., Fakhry, S.F. & Saad, N.F.(2018)**: Self-Learning Package Related to Patient Safety Goals and its effect on Nurse Interns' Performance and Awareness of Patient Safety Culture. Egyptian Journal of Health Care. 9(1):316-333. DOI: 10.21608/ EJHC.2018.46499.
2. **Aktaş, F., & Damar, H. (2022).** Determining Operating Room Nurses' Knowledge and Use of Evidence-Based Recommendations on Preventing Surgical Site Infections. Journal of perianesthesia nursing : official journal of the American Society of PeriAnesthesia Nurses / American Society of PeriAnesthesia Nurses, 37(3), 404–410. https://doi.org/10.1016/j.jopan.2021.08.012
3. **Al Habahbeh, A. & Alkhalaileh, M. (2020):** Effect of an educational programme on the attitudes towards patient safety of operation room nurses British Journal of Nursing, 29(4):222-228. DOI: 10.12968/bjon.2020. 29.4.222.
4. **Alaa-Eldeen, T.M, Saad A.Y and Elrefaee, N.** (2012): Assessment Of nurses' practices related to safety of intra operative surgical patient undergoing general anesthesia. J Am Sc ; 8(8):118-130. Available at: http://www.jofamericanscience.org.
5. **Alwhab, H., Elsenousy, T. and Ahmed, H. (2023):** Effect National Patient Safety Goals on Nurses Performance and Patients outcomes. Teikyo Medical journal, 45(1): 382. DOI: TMJ-30-12-2021-10938.
6. **Amin, B Ali, N., Shahzeb, M., Ahmad, S. & Shah, A. (2023):** Knowledge and safety practices on occupational hazards among operating room staff in Mardan Medical Complex, Mardan, Pakistan. Journal of Anaesthesia, Pain & Intensive Care, 27(1): 59-64. DOI: https://doi.org/10.35975/apic.v27i1.2119.
7. **Armstrong, B., Dutescu , I. & Nemoy, L. (2022):** Effect of the surgical safety checklist on provider and patient outcomes: a systematic review. BMJ Qual Saf, 31(6):463-478. DOI: 10.1136/bmjqs-2021-014361
8. **Bahar S, Önler E (2020):** Turkish surgical nurses' attitudes related to patient safety: A questionnaire study. Nigerian Journal of Clinical Practice, 23(4): 470- 75. DOI: 10.4103/njcp.njcp_677_18.
9. **Bali, R. (2022)**. Operating Room Protocols and Infection Control; PP. 173–194. DOI: 10.1007/978-981-15-1346-6_9
10. **Bansal B, Ray M (2021**): Surgical Safety Checklist: Relevance and Importance. In Multidisciplinary Approach to Surgical Oncology Patients. Springer, Singapore. Pp. 63-67. DOI: 10.1007/978-981-15-7699- 7-8.
11. **Brasaite, Kaunonen and Suominen.(2015):** Healthcare professionals' knowledge, attitudes and skills regarding patient safety; 29(1):30-50. DOI: 10.1111/scs.12136
12. **Cho, D., Lee , W., Kim, S. & Choi, S. (2022):** Effect of online education on the knowledge on, attitudes towards, and skills in patient safety for nursing students in Korea: a mixed-methods study. Journal of educational evaluation for health professions, pp. 41-19. DOI: 10.3352/ jeehp. 2022.19.14.
13. **Christensen and Kockrow.(2014):** Adult Health Nursing.6thed.U.S.A; 44-50. Available at:www.bookaid.org
14. **Ebraheim, M. and Eltaib, F. (2023):** Improving Nurses 'Compliance with Standard patients' Fall Prevention Protocol in Surgical Departments. Article Egyptian Journal of Health Care, 14(4): 1214-1234. DOI: DOI: 10.21608/ejhc.2023.341603.
15. **Elhadidy, A.A. (2022):** International Patient Safety Goals. Journal of Health Quality; P p.45931. Available at: https://m-quality.net. Accessed on 25 November 2022.
16. **Elmwafie , S., Abdallah , A. & Abduallah, R. (2022):** Impact of Safety Guidelines on Nurses' Knowledge regarding Incidents and Nurses' Safety Attitude at Neonatal Intensive Care Unit. Tanta Scientific Nursing Journal, 25(2):152-162. DOI: 10.21608/ TSNJ. 2022.242190.
17. **El-Shafei A, Ibrahim S, Tawfik A et al. (2019):** World Health Organization Surgical Safety Checklist with Addition of Infection Control Items: Intervention study in Egypt. Open Access Macedonian Journal of Medical Sciences, 7(21): 3691. DOI:10.3889/oamjms.2019.593
18. **El-Sherbiny, N., Ibrahim,E. & Abdel-Wahed, W. (2020):** Assessment of patient safety culture among paramedical personnel at general and district hospitals, Fayoum Governorate, Egypt. The Journal of Egypt Public Health Association, 95: 4. DOI: https://doi. org/10.1186/s 42506-019-0031-8.

19. **Fairchild, S.L, o'shea, R.K and Robin, D. (2017):** Pierson and Fairchild's Principles & Techniques Of Patient Care. 5th Edition, Kindle Edition. louis, Missouri, Canada; 308(1):308. Available at: www. Elsevier.com
20. **Fathy, E., Abdalla, K. & Abdelatief , D . (2022).** Nurses ' Performance Regarding the Patients ' Safety Measures in Operating Theater. Egyptian Journal of Health Care, 13 (1):3.DOI: 10.21608/ejhc.2022.254435.
21. **Feng, W., Sia, W. and Kitrungrote, L. (2022):** Knowledge, attitude, and practice of surgical site infection prevention among operating room nurses in southwest China. Belitung nursing journal; 8(2): 124–131. DOI: 10.3354 6/bnj.2018.
22. **Gouda A, Mohammed E, Ameen D (2019):** Factors affecting postoperative nursing performance in the surgical units. Egyptian Journal of Health Care, 10(1): 50-64. DOI: 10.21608/EJHC.2019.26750.
23. **Gunahariati, N , Sutajaya, I. & Arnyana, I. (2022).** Development of patient safety learning module based on problem based learning for nursing students at the College of Health Sciences. Bali Medical Journal, 11(1): 174-183. DOI:10.15562/bmj.v11i1.3248.
24. **Hanfy, E., Taha, N. & Ahmed, Z. (2021).** Factors affecting Nurses Performance Regarding Patient Safety in Emergency Operating Rooms. 25(6):18986– 18995. DOI:10.21608/ZNJ.2022.227118.
25. **Ibrahim, S., Aly, R. and Ghaith, E. (2023):** Training Strategy to Enhance Nurses' Performance Regarding Risk Management at Port Said General Hospital. Port Said Scientific Journal of Nursing, 10(1):1-20. DOI: 10.21608/PSSJN.2023.131174.1190.
26. **Jamshidi, H., Maslakpak, M. & Parizad, N. (2021):** Does problem-based learning education improve knowledge, attitude, and perception toward patient safety among nursing students? A randomized controlled trial .Journal of Biomedical Nursing, 20:70**.** DOI: 10.1186/s12912-021-00588-1.
27. **Joint of commission (2022)**: International patient safety goals. https://www.jointcommissioninternational.org. Accessed on 27 November 2022.
28. **Khong , B., Goh, B., Phang, L. & David, T. (2020):** Operating room nurses' self-reported knowledge and attitude on perioperative pressure injury. Int Wound J; 17(2):455-465. DOI: 10.1111/ iwj.13295.
29. **Lemos. C & Povida, v. (2022):** Role of perioperative nursing in anesthesia: a national overview. Rev Esc Enferm USP; 56: 465. DOI: 10.1590/1980-220X-REEUSP-2021-0465.
30. **Letvak, S., Marjorie Jenkins, M., Doss, C. & McCoy, T. (2023):** At Risk Safety Behaviors of the Perioperative Nursing Team: A Direct Observational Study. Healthcare (Basel). 2023 Mar; 11(5): 698. DOI: 10.3390/healthcare 11050698.
31. **Marshall S.D & Touzell A. (2020):** Human factors and the safety of surgical and anaesthetic care. Journal of Anaesthesia; 1(24): 75. DOI: 10.1111/anae.14830.
32. **Matte, D., Wagner, B., Rocha, T., Rieth, B., Patricia, T. and Fernandes, S. (2020):** Safety Climate in the Operating Room: Attitude of the Health Professional. Cogitare enfermagem, 25: 65577. DOI:10.5380/ce.v25i0.
33. **Mohabir, P.K. & Coombs, A.V. (2022):** Surgery. Journal of MSD MANUAL; Available at: https://www.msdmanuals.com**.** Accessed on 20 November 2022.
34. **Mohamed ,S. &, Ibrahim, R. (2021):** Effect of self -learning module on nurses' performance regarding care of patients with chest tube. Egyptian journal of Nursing & Health Sciences, 2(1): 1-10. DOI: https: //doi.org/10.37506/mlu.v20i4.2085.
35. **Mohamed, N., Ragheb, M. & Ali, H. (2020).**Effect of Implementing an Educational Program on Nurses' Performance Regarding Intraoperative Surgical Patient Safety. Egyptian Journal of Health Care, 13(1):1-3. https://ejhc.journals.ekb.eg/article
36. **Mohammed, S.N., Ahmed, H. & Ibrahim, M. (2019):** Nurses' Performance Regarding Patient Safety in Operating Room at Zagazig University Hospitals. Thesis in Medical Surgical Nursing.
37. **Norton EK, Singer SJ and Sparks W. (2016):** Operating room clinicians' attitudes and perceptions of a pediatric surgical safety checklist at 1 institution..; Journal of PeriAnesthesia Nursing; 33(6):935-945. DOI: 10.1097/ PTS.0000000000000120.
38. **Phillips N (2016):** BERRY& KOHN'S OPERATING ROOM TECHNIQUE. Thirteenth ed. Louis Missouri; Elsevier. Canada, PP. 586-596. Available at: www.lccn.loc.gov
39. **Pooja, A. & Shantibala , K. (2023) :** The Impact of an Educational Program on Knowledge and Perception of Patient Safety Culture among Nurses in the Two Medical Colleges of Manipur: A Quasi-Experimental Study. *Indian* Journal of Public Health 67(2): p 265-270. DOI: 10.4103/ijph.ijph_1416_22.
40. **Rayan, H., Adam, S. & Abdrabou, H. (2021):** Effect of Training Program Regarding Occupational Health Hazards on Nurse Interns' Knowledge and Practice. Medico-legal Update, Vol. 21, No. 2. DOI:10.37506/ mlu.v21i2.2750.
41. **Salvaraji, L. Jeffree, M., Lukman, K. and Saupin, S. (2022):** Electrical safety in a hospital setting: A narrative review. Annals of Medicine and Surgery, 78 (1): 103781. DOI:10.1016/j.amsu.2022.103781.

42. **Sen J., and Sen B (2013):**Control of Hazards in Operation Theater. Indian Journal of Clinical Practice; 31(7):2340-2341. https: pubmed.com
43. **Seo, J. & Lee, S. (2023):** Effects of Nurses' Perceptions of Patient Safety Rules and Procedures on Their Patient Safety Performance: The Mediating Roles of Communication about Errors and Coworker Support. Journal of Nursing Management, 2023(1):1-9. DOI: https://doi.org/10.1155/2023/2403986.
44. **Sutherland-Fraser, S., Davies, M., Gillespie, B.M., Lockwood, B. (2021):** Perioperative Nursing: An Introduction. Netherlands: Elsevier Health Sciences, pp. 508. Available at: https://www.google.com.eg/books, accessed on 22 November 2022.
45. **Wæhle, H., Haugen, A., Wiig, S. & Søfteland, E. (2020):** How does the WHO Surgical Safety Checklist fit with existing perioperative risk management strategies? Anethnographic study across surgical specialties. BMC Health Services Research, 20: 111. DOI: 10.1186/s 12913-020-4965-5.
46. **Wahr, J., Hines, R. & Nussmeier, N. (2022):** Operating room hazards and approaches to improve patient safety. Available at: www.UpToDate.com
47. **Whitlock, J. (2019):** The Role of a Circulating Nurse. Journal of Perioperative Practice; 19(3):106-13. 23. https://www.verywellhealth.Com.
48. **Williams, E. (2018):** Roles of a Scrub Nurse. Journal of American Science 8(8):118-130. Available at: https://work.chron.com.
49. **World Health Organization (2017):** The World Health Organization Surgical Safety Checklist. London, United Kingdom.Available at: http://www.who.int/surgery/Chapter2.
50. **World Health Organization. (2019)**: Patient safety- Global action on patient safety; pp. 26-72. https://apps.who.int.
51. **World Health Organization. (2021)**. Action Framework for Safe and Affordable Surgery in the Western Pacific Region (2021–2030). https://www.who.int/vietnam/health-topics/patient-safety
52. **World Health Organization. (2023)**. Why safe surgery is important. https://www.who.int/teams/integrated-health-services
53. **Yavuz, M., Çilingir , D., Bulut, E., Gürsoy, A., Aydın,A. & Altınbaş, B. (2023):**Patient Safety Culture Perception Among Surgical Nurses**. (2023):** Patient Safety Culture Perception Among Surgical Nurses. Journal of Education and Research in Nursing, 20(2):127-132. DOI: 10.14744/jern.2021.21188
54. **Zagazig university hospital statistical office. (2022).** Statistical Report of surgical procedures performed annually.