



# **Implementation of WHO Surgical Safety Checklist and Pre-operative Anxiety Levels to Study the Effect on Post-operative Recovery among Surgery Patients**

**Rajesh Hadia<sup>1\*</sup>, Juliet Joy Joseph<sup>1</sup>, Jilce Mathew<sup>1</sup>, Shivani Patel<sup>1</sup>,  
Trupal Rathod<sup>3</sup>, Dhaval Joshi<sup>3</sup>, Bhavin Shah<sup>2</sup>, Sunil Baile<sup>1</sup>,  
Kushalkumar Gohel<sup>1</sup>, Sunil Kardani<sup>1</sup> and Rajesh Maheshwari<sup>1</sup>**

<sup>1</sup>*Department of Pharmacy, Sumandeep Vidyapeeth Deemed to be University, Vadodara-391760,  
Gujarat, India.*

<sup>2</sup>*Department of Surgery, SBKS Medical Institute and Research Centre, Sumandeep Vidyapeeth  
Deemed to be University, Vadodara-391760, Gujarat, India.*

<sup>3</sup>*Department of Pharmacy Practice, Maliba Pharmacy College, Mahuva-Bardoli Road,  
Bardoli-394350, Gujarat, India.*

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/JPRI/2021/v33i37A32009

### Editor(s):

- (1) Dr. Barkat Ali Khan, Gomal University, Pakistan.  
(2) Dr. Giuseppe Murdaca, University of Genoa, Italy.

### Reviewers:

- (1) Hamid Mirhosseini, Yazd Shahid Sadoughi University of Medical Sciences, Iran.  
(2) Neeran Obied Jasim, University of Qadisiyah, Iraq.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/70615>

**Original Research Article**

**Received 08 May 2021  
Accepted 13 July 2021  
Published 15 July 2021**

## **ABSTRACT**

**Background:** World Health Organization Surgical Safety Checklist demonstrated a significant reduction in both morbidity and mortality.

**Objectives:** This study aimed to find out the feasibility of implementation of WHO Surgical safety checklist in the routine practice, to ensure the teams follow critical safety steps, consistency in patient safety, and to maintain a culture that values achieving it, to assess the pre-operative status and post-operative quality of recovery among the patients undergoing surgery.

**Methodology:** It is a prospective and observational study. A total of 65 patients of age group 18 and above were included in the study. The data was collected by filling the patient medical record

\*Corresponding author: E-mail: [docrajesh.hadia@gmail.com](mailto:docrajesh.hadia@gmail.com);

sheet.

**Result:** A total of 65 patients were included in the study. 64.62% were male, 35.38% were female. Out of 65 patients 61.54% experienced pre-operative anxiety; of which 20% of patients (n=9) showed very fast to fast recovery, 27.5% of patients (n=11) showed moderate recovery) and 52.5% of patients (n=21) showed slow to very slow recovery.

**Conclusion:** Implementation of the WHO surgical safety checklist may improve miscommunications between the OR team, avoid unexpected errors ((Improving teamwork and communication). Appointing a staff or member of the OR team with the responsibility to check the checklist may improve the feasibility to implement the WHO SSC. The level of pre-operative anxiety greatly influences postoperative recovery. Thus, the Surgical and Anaesthetic team must assess the patient's pre-operative anxiety and take the necessary step before surgery.

*Keywords: WHO SSC; preoperative anxiety; postoperative recovery.*

## 1. INTRODUCTION

Anxiety is a psychological phenomenon that causes uneasiness and fears which result from the anticipation of fearsome events. The uneasy emotional state that is "anxiety", is very common among the people undergoing surgery, neglecting it leads to a negative impact on the overall surgical outcome as it is associated with several postoperative complications such as an escalation in postoperative pain, delay of healing, and prolonged hospital stay & recover poorly. [1-3] Surgery can be a life-saving or life-changing intervention in many conditions and the provision of surgical services is being increasingly recognized as a significant public health issue. The WHO surgical safety checklist is a patient safety approach that was introduced aiming to reduce surgical complications across the world. Improving teamwork and communication is one of the main goals of using the checklist. All the hospitals already practice all the points in the checklist but it helps to ensure that important safety steps are reliably followed for each operation. [4] The WHO developed a simple tool to improve the safety of surgical practice by motivating the whole operating team, surgeons, anesthesia professionals, and nurses to perform important safety checks during vital paths of pre-operative care. [5] Recognizing risk factors would help in providing psychological assistance during the preoperative visit through which stress can be reduced. Some sets of patients, for example, females, juvenile patients, patients who have no history of surgical operation have an increased level of preoperative anxiety. [6] Evaluation of anxiety done with the help of "Amsterdam Preoperative Anxiety & Information Scale". APAIS was developed by Moerman. et.al. 1996; it is simple and easily used before the operation as it is a less time-consuming scale containing 6 item questionnaires. [7] Long-term recovery

affects a patient's physiological activity, the activity of daily living, routine work, cognitive function return to an expected level or not, and the overall recovery rate of a patient after surgery. [8] Need of study: We had observed that very few studies have been carried out on this topic in Gujarat, a state of India, where postoperative morbidity and mortality are relatively high while comparing to global standards. Implementation of a surgical safety checklist is believed to reduce the rate of morbidity and mortality to some extent. Along with this we also planned to find out the relationship between anxiety on post-operative complications, as few such studies have been carried out in Gujarat. So, we planned to do this study in our Dhiraj General Hospital, Piparia, in the Vadodara district of Gujarat.

## 2. METHODOLOGY

It was an observational study conducted for 6 months at the Department of Surgery of the Dhiraj General Hospital, Vadodara. All the admissions to Surgery Department were referred for surgery included in the study. All the relevant data was obtained from the patients' medical records and the patient interviewed. The post-operative recovery rate of the patients was observed an hour after the completion of surgery. Patients' pre-operative anxiety was assessed by using Amsterdam Pre-operative Anxiety Information Scale; this scale had questions, based on the answers given by the patients, their pre-operative anxiety was assessed. Post-operative recovery for each patient was assessed using the Post-operative Quality of Recovery Scale, where the scale had 18 questions each question carried 10 marks giving us a total score of 180, based on the answers given by the patient they were scored and were categorized as recovering very slow, slow,

moderate, fast and very fast. All the relevant data collected and recorded electronically.

Descriptive statistics used for the analysis of the data. After the data collection, all the data were exported to statistical software for statistical analysis. All the quantitative data were represented in percentage (%) and mean ± standard deviation. Comparative statistical differences were calculated using appropriate parametric tests. The categorical data were represented in the median and comparative statistical differences were calculated by using appropriate non-parametric statistical tests. (Chi-square test and independent t-test). The graphical representative was used for a better understanding of the data. A p-value of ≤0.05 was considered significant.

**3. RESULT**

A total of 65 patients were included in the study among which 35.38% of patients were female (N=23) and 65.62% were male(N=42). The ages of the patients ranged between 18 & 79, and the mean age was 43.69 ± 16.40 years. About 38.46% of surgeries (n=25) performed were Hernioplasty, 15.38% surgeries (n=10) were of fistulotomy and/or fistulectomy, 9.23% surgeries (n=6) were of cholecystectomy, and 6.15% were of Modified Radical Mastectomy (MRM). All over 47.69% of surgeries were performed under Local anesthesia and 52.31% surgeries were performed under general anesthesia.

WHO Surgical Safety Checklist: The adherence to the surgical safety checklist in the general surgery department was poor. The percentage of the checklist that was completed entirely was 0%. An average of only 48.03% of each checklist was completed. Sign-In: The domain was the most performed section. Of 6 questions; the marking of the first question was 100% (n=65), the marking of the second question was 73.8% (n=48), the marking of the third question was 98.4% (n=64), the marking of the fourth question was 49.2% (n=32), the marking of the fifth question was 56.9% (n=37), the marking of the sixth question was 46.15% (n=30) (Fig. 1). Time-Out: This domain was a moderately performed section. This domain had 7 questions of which; the marking of the first question was 87.69% (N=57), the marking of the second question was 86.15% (N=56), the marking of the third question was 13.84% (N=9), the marking of the fourth question was 10.76% (N=7), the marking of the fifth question was 15.38% (N=10), the marking of the sixth question was 12.30% (N=8), the marking of the seventh question was 26.15% (N=17) (Fig. 2). Sign-Out: This domain was the most poorly performed section. Out of 5 questions; the marking of the first question was 46.15%(N=30), the marking of the second question was 23.07% (N=15), the marking of the third question was 10.76% (N=7), the marking of the fourth question was 18.46% (N=12), the marking of the fifth question was 41.53% (N=27) (Fig. 3).

**Table 1. Demographic details**

<b>Age (years)</b>	
Min-Max	18-79
Mean ± SD	43.69±16.40
<b>Gender n, (%) N=65</b>	
Female	23, (35.38)
Male	42, (65.62)

**Table 2. Features of surgery and anesthesia distributions**

<b>Operation type</b>	<b>No. of cases;(N=65)</b>	<b>% of cases</b>
Fistulotomy/fistulectomy	10	15.38
Cholecystectomy	6	9.23
Hernioplasty/Meshplasty	25	38.46
MRM	4	6.15
Others	20	30.77
<b>Type of anesthesia</b>		
Local	31	47.69
General	34	52.31

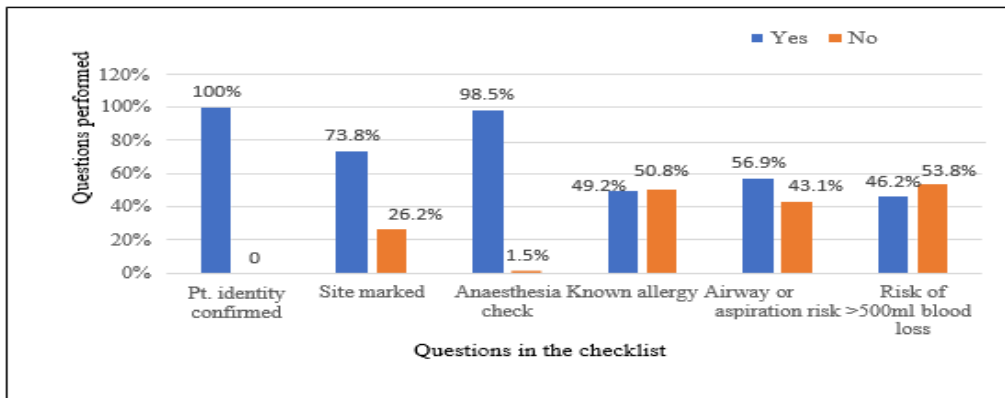


Fig. 1. Checklist performed in sign-in-section

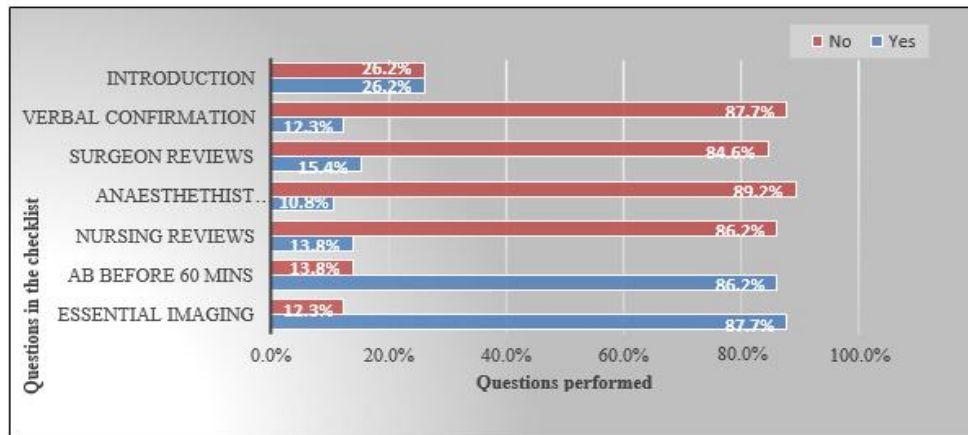


Fig. 2. Checklist performed in time-out-section

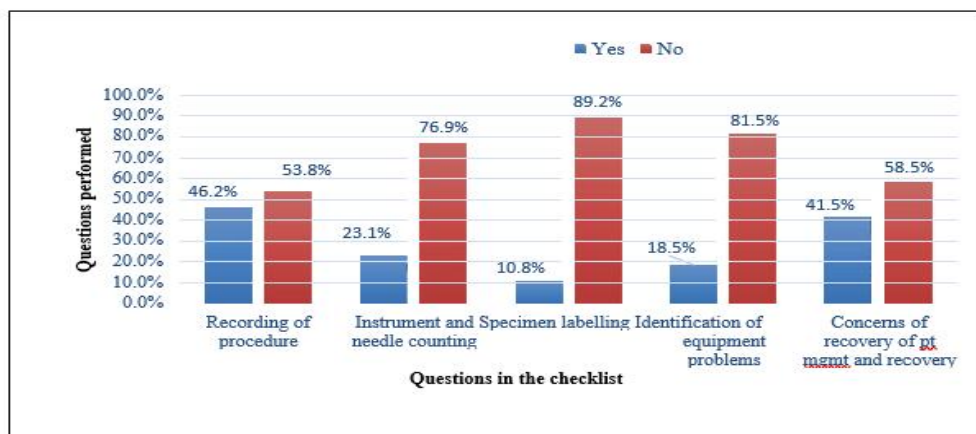


Fig. 3. Checklist performed in sign-out domain

Assessment of Pre-operative anxiety: pre-operative anxiety was assessed 1 hour before the surgery using APAIS (Amsterdam Preoperative Anxiety Assessment Scale) questionnaire. Out of 65 patients, 61.54% (n=40) patients were found to have experienced preoperative anxiety. Preoperative anxiety in females was found to be 73.91% (n=17) which was statistically significantly higher than the male 54.76% (n=23) ( $p = 0.0373$ ). Comparisons of the level of anxiety in both genders are given in Fig. 4; 16.67 % males and 26.08% females were represented with mild anxiety. 28.37 % male and 39.13 % female showed a moderate level of anxiety. 9.5% male and 8.6% female had severe anxiety.

Type of surgery vs Anxiety: Comparing anxieties in major and minor surgery (Fig. 5) it was found that 65.63% of patients (n=21) who underwent major surgery (N=32) had anxiety while 57.58% of patients (n=19) with minor surgeries (N=33) had anxiety. There is a statistically significant correlation between major and minor surgeries in terms of pre-operative anxiety ( $p = 0.0455$ ).

Preoperative anxiety and Type of Anesthesia: It was found that 52.3% of our patients (N=34) were operated under local Anesthesia and 47.7% (N=31) of the cases were operated under general Anesthesia. Fig. 6 shows the preoperative Anxiety level of the patients who underwent general Anesthesia (n=17, 67.64%) which was found to be statistically significantly higher than the patients who underwent local Anesthesia (n=23, 54.84%) ( $p = 0.045229$ ).

Pre-operative anxiety and Post-Operative Recovery: Post-operative recovery was assessed using the PQRS (Post-Operative Quality of Recovery Scale) questionnaire. These follow-up questions were asked to patients at 1st hour, Day 1, Day 3, Day 15, and Day 30 post-surgery. Recovery patterns were categorized into Very fast, Fast, Moderate, Slow and Very Slow which indicates recovered on D1 or less than that, D3, D15, D30, and >D30 respectively. Among Anxious patients, 20% of patients (n=9) shown very fast to fast recovery, 27.5% patients (n=11) shown moderate recovery, 52.5% patients (n=21) shown slow to very slow recovery. The pattern of recovery in patients with different levels of anxiety is given below in Fig. 7. The level of preoperative anxiety had a statistically significant correlation with the recovery rate ( $p = 0.0001$ ) i.e., preoperative anxiety has a significant influence on post-operative recovery. G. Recovery pattern for each visit Percentage of patients recovered on each visit is shown in Fig. 8. About 3.07% patients (n=2) recovered in 1st hour, 9.23% patients (n=6) on day 1, 23.07% (n=15) on day 3, 30.76% (n=20) on day 15 and 9.23% (n=6) on day 30. About 24.61% of patients (n=16) were not recovered on day 30. H. Overall average recovery on each visit an average of 60.98% recovery (Average(x) =109.77) in all domain was observed in 1 st hour which gradually increased by 78.74% on day 1 (x=141.74), 88.18% on day 3 (x=158.74), 95.04% on day 15(x=171.08) and about 97.86% on day 30 (x=176.15) (Fig. 9).

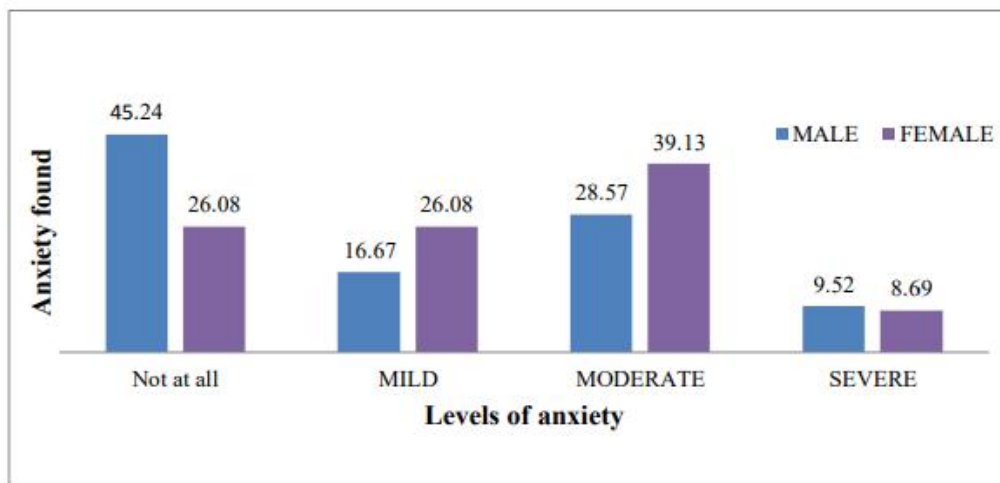


Fig. 4. Comparison of level of anxiety based on gender

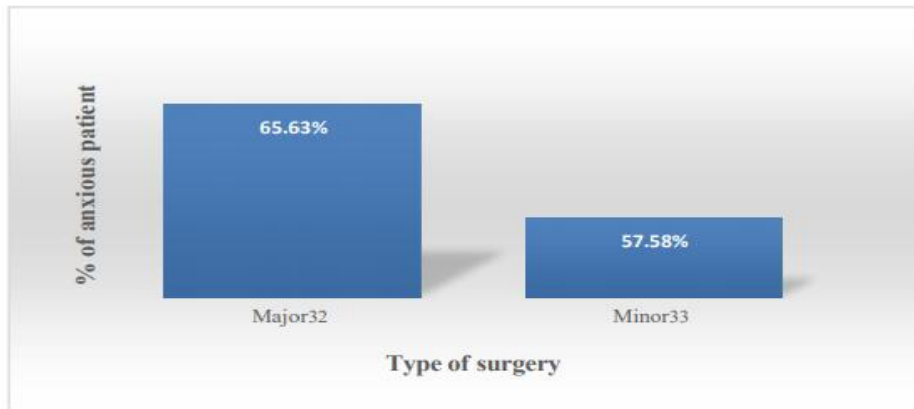


Fig. 5. Anxiety in major and minor surgery

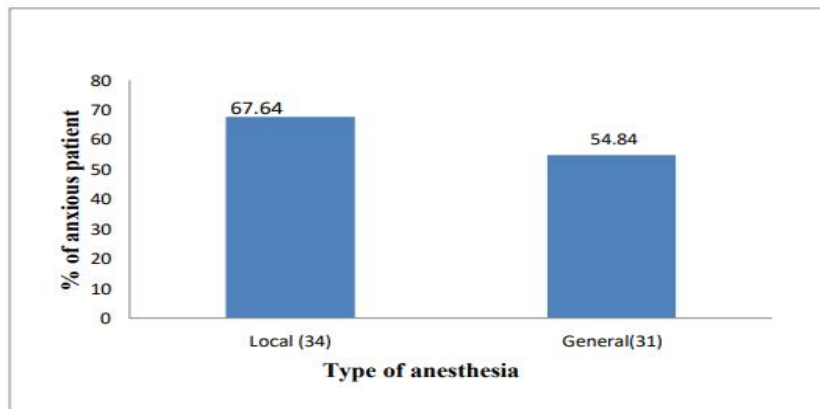


Fig. 6. Anxiety in local and general anesthesia

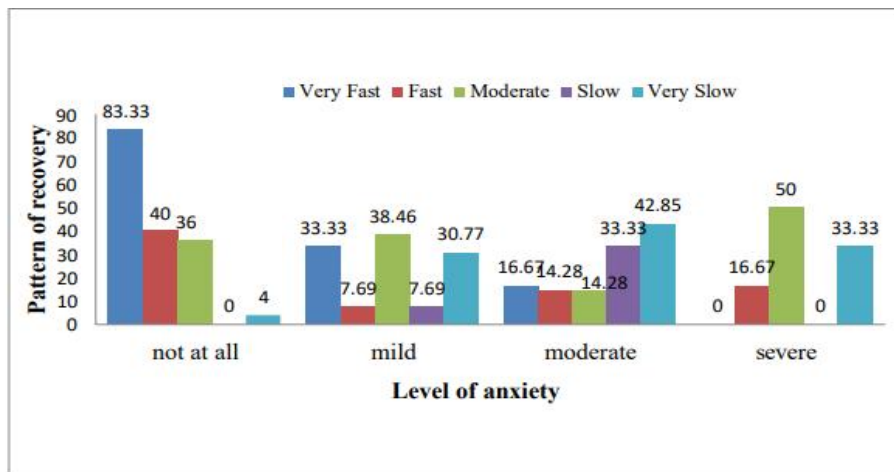


Fig. 7. Pattern of recovery in patients with different level of anxiety



Fig. 8. Percentage of patient recovered on each visit

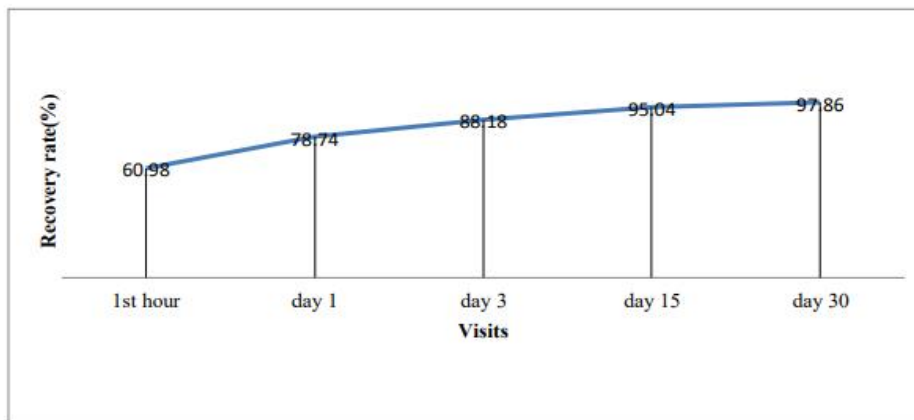


Fig. 9. Average recovery rate in all domains on each visit

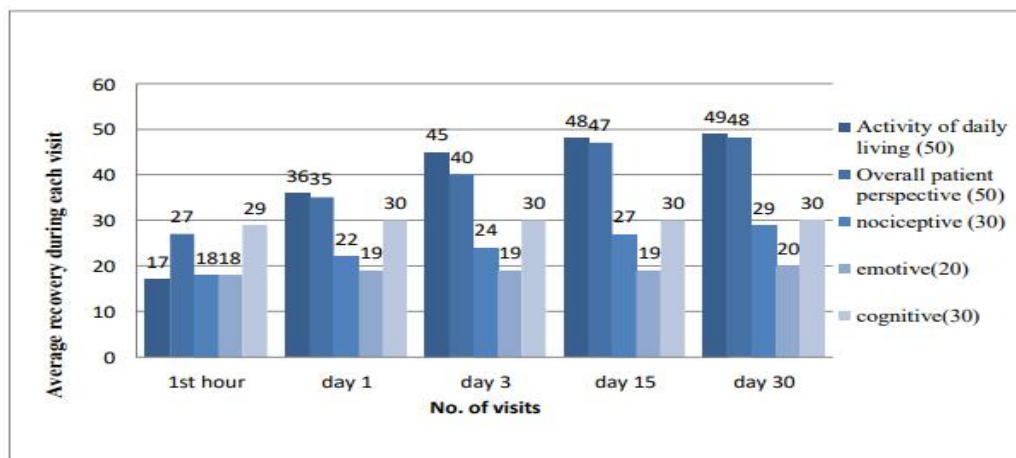


Fig. 10. Average recovery in all domains during each visit

Average recovery in each domain on each visit  
 Average recovery in each domain for each visit is given in Fig. 10. In 1st hour cognitive and emotive domains shown better recovery compared to other domains. A full recovery in the cognitive domain was found on day 1 while other domains too recovered but not completely. The recovery gradually improved and on day 30, 100% recovery was observed in the cognitive and emotive domain, 96.67% recovery in the nociceptive domain, 96% recovery in the overall patient perspective domain, and 98% recovery in Activity of daily living domain.

The activity of daily living Recovery of activity of daily living (ADL) domain (Fig. 11) was 34% in 1st hour which shown a statistically significant increase on D1, D3 & D15 (Chi-square=36.38,  $p < 0.0001$ ). 98% of patients were fully recovered on D30 in the ADL domain. Overall Patient Perspective Domain the Overall Patient Perspective (OPP) domain (Fig. 12) shown a

54% recovery in 1 st hour which increased significantly on d1 (70%), d3 (80%), d15 (94%), and d15 (96%). On every visit, there was a significant increase in the recovery rate. Chi-square: 15.318 ( $p = 0.0041$ ).

Nociceptive domain Similarly, the nociceptive domain (Fig. 13) shown about 60% recovery in the first hour, 73.3% on day 1, 80% on day 3, 96.67% on day 30. Thus, on every visit, there was a significant gradual increase in recovery. Chi-square: 10.2836 ( $p = 0.0360$ ). M. Emotive domain Recovery in Emotive (Fig. 14) domain showed no statistical significance in the number of days post-surgery and recovery rate. Although a 95% recovery was observed on D1 in the case of the emotive domain. N. Cognitive domain: Similarly cognitive domain (Fig. 15) also shown a recovery of about 96.67% in 1 st hour and a complete recovery (100%) from day 1. The recovery day had no statistically significant number of days post-surgery.

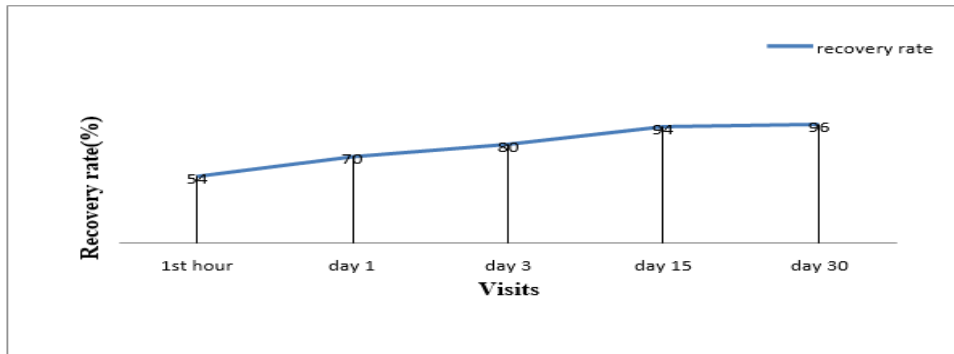


Fig. 11. Recovery rate in Activity of daily living domain

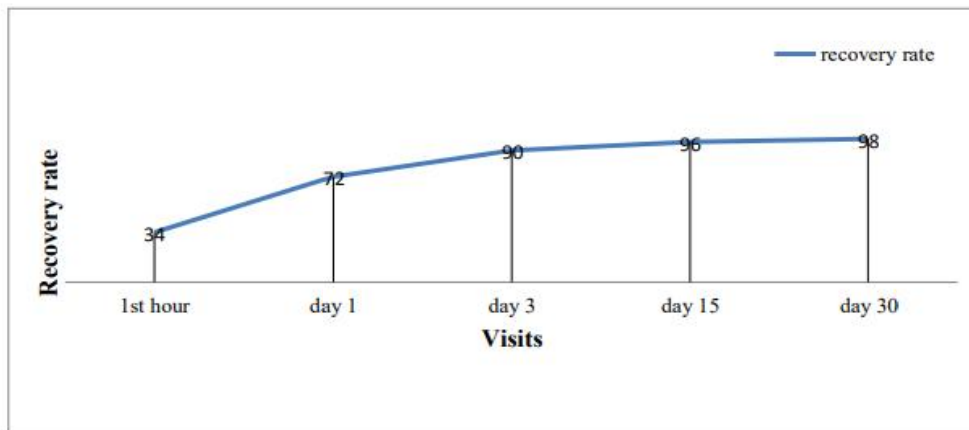


Fig. 12. Recovery pattern in OPP domain



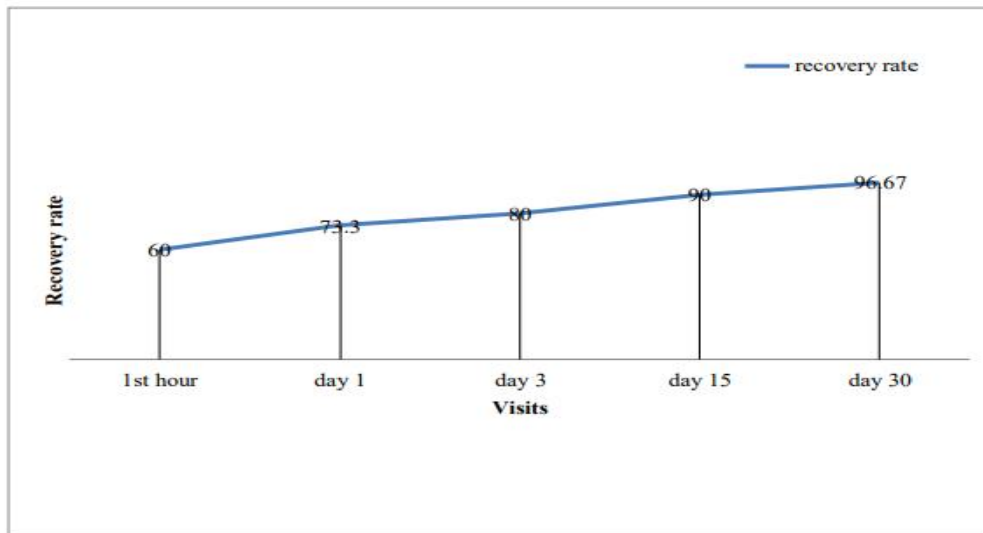


Fig. 13. Recovery rate in nociceptive domain

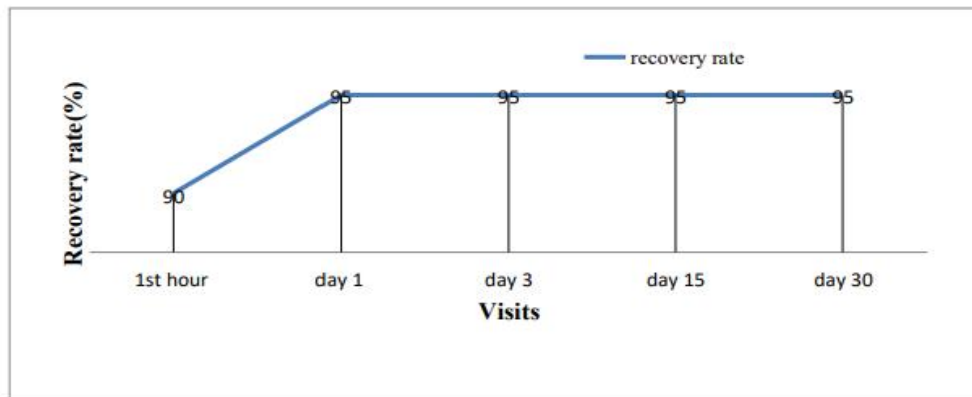


Fig. 14. Recovery rate of emotive domain

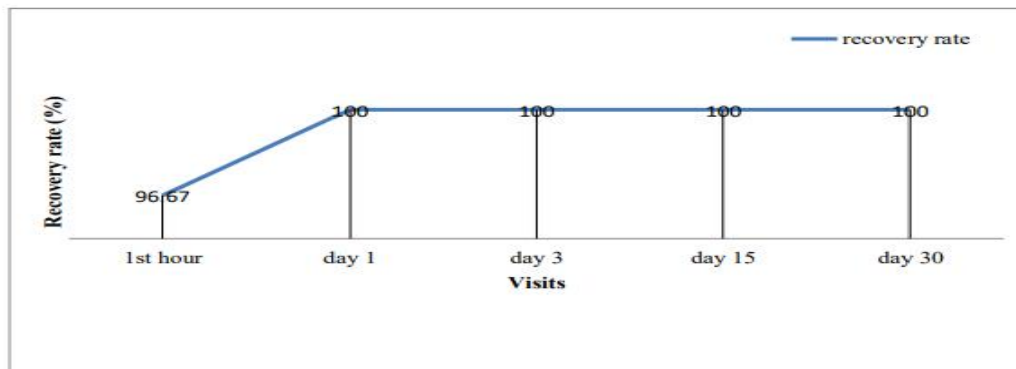


Fig. 15. Recovery rate of cognitive domain

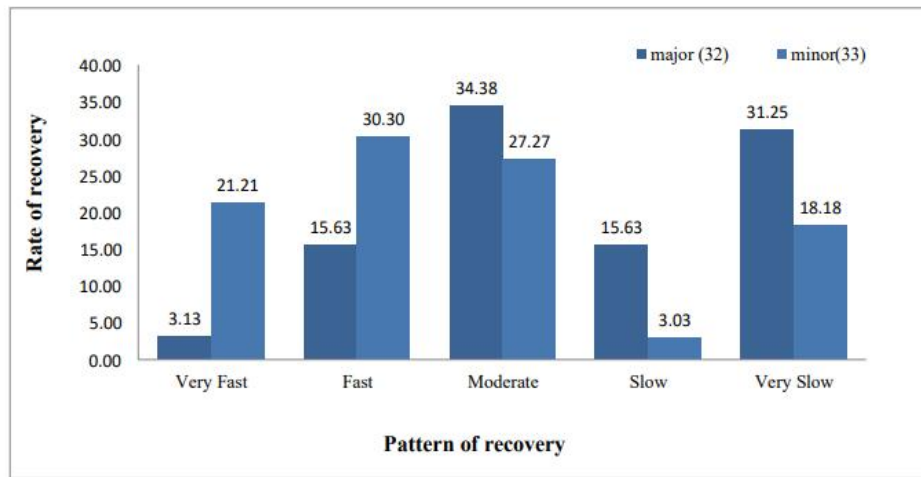


Fig. 16. Recovery pattern based on type of surgery

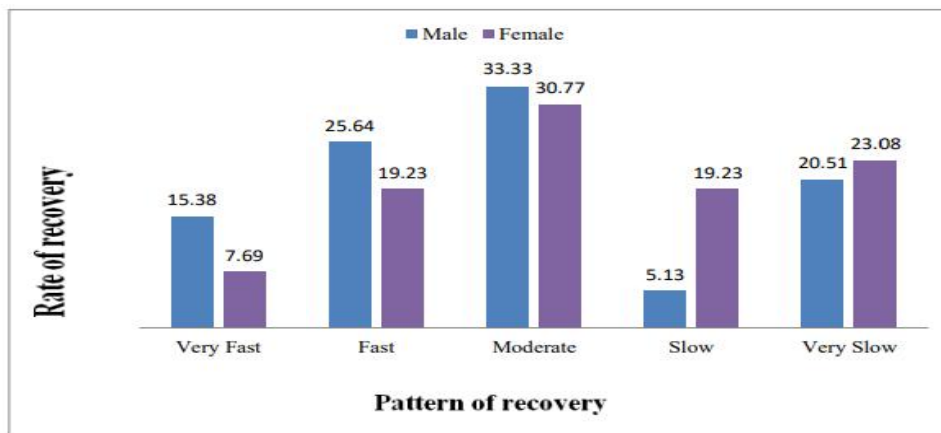


Fig. 17. Recovery pattern in different genders

Gender based pattern of recovery: Among 39 male patients, 15.38% (n=6) shown very fast recovery, 25.64% (n=10) shown fast recovery, 33.33% (n=13) shown moderate recovery, 5.13% (n=2) shown slow recovery, and about 20.51% (n=8) shown very slow recovery. While among 26 female patients, 7.69% (n=2) shown very fast recovery, 19.23% (n=5) shown fast recovery and about 23.08% (n=6) shown very slow recovery. Thus, male patient recovered significantly faster than female patients {chi-square = 39.28 (p=0.001) df=4} (Fig. 17).

#### 4. DISCUSSION

Surgery can be a life-saving or life-changing intervention in many conditions and the provision of surgical services is being increasingly

recognized as a significant public health issue. All the hospitals already practice all the points in the checklist but it helps to ensure that important safety steps are reliably followed for every operation. Pre-operative anxiety is the most prevalent problem during the preoperative period ascites associated with several postoperative complications such as an escalation in postoperative pain, delay of healing, and prolonged hospital stays. Our study mainly aims to check the feasibility of implementation of the WHO surgical safety checklist; also find out the prevalence of pre-operative anxiety and its relation to post-operative recovery among the surgery patients. In our study, we found that the checklist that was completed entirely was 0% with an average of only 48.03% of each checklist is completed. The least performed components

of the checklist were verbal confirmation: surgeon reviews, anesthetic reviews, nursing reviews, and specimen labelling. A similar study conducted by Dominique McGinlay et.al. [9] Brasov Romania was poor with 0% of checklists having been completed entirely with an average of only 55% of checklists being completed. In this study the worst performed components of the checklist were; team members introducing themselves and that the surgeon, anesthesia professional, and nurses' reviews of key concerns for recovery and management of the patient.

In a study conducted by Rene Schwendimann et.al [10] in a Swiss Academic center; adherence to Team time out (TTO) and Team sign out (TSO) ranged between 96- 100% in TTO and 22% in TSO, whereas in our study the Sign-In component of the checklist was the most commonly performed section 70.76%, the Time-Out component was moderately performed 42.8%, the Sign-Out was the most poorly done section 28%. The factors that encouraged adherence to the Sign-In domain in our study was full staff contribution to encourage patient safety, and the factors that reduced adherence in the Sign Out domain was the lack of a member who monitors the completion of the checklist. According to the mixed-method observational study by Rene Schwendimann et al [10], the unavailability of key OR team members at sign-out time was the most common reason for omission or incomplete use of the TSO.

In our study the compliance for the first, second, and third domains of the SSC was 70.76%,42.8%, and 28% also, the feasibility for implementing the surgical safety checklist would be only successful if there is active participation from every member of the operating room. Similar was found in the study conducted by Ambulkar R et.al [11] to check the quality after implementation of the surgical safety checklist, the result obtained was; the compliance for the first, second and third part of the SSC was 100%, 78%, and 76.5% respectively and concluded that the raise definite scale of improvement and compliance with all the items on the checklist and active participation by all team members is crucial for successful implementation of the checklist. An important observation was made in our study that the assignment of an individual who would monitor the checklist and its adherence in each division of the checklist would help in the more successful implementation of the surgical safety checklist.

An observational study conducted by Anne. E. Pugel et.al [12] to review the literature related to the surgical safety checklist as a communication land has concluded that complications in surgery and lack of communication can be minimized by using the surgical safety checklist, also the morbidity and mortality gets suppressed by the implementation of the WHO surgical safety checklist. In our study due to the limited number of samples, we cannot comment on the decrease of the morbidity and mortality rates by the implementation of the checklist; however, improvement in communication between the team members can be met by the implementation of the WHO surgical safety checklist.

Regardless of any disease, hospitalization, is known to give rise to anxiety among the patients who are admitted for surgery. In a study conducted by Henok Mulugeta et.al [13], Northwest Ethiopia the prevalence of preoperative anxiety among surgical patients showed that 61% of patients had a significantly high level of pre-operative anxiety; in our study of 65 patients. 61.54% (N=40) showed a significant level of anxiety.

In a study conducted by Fatma Celik et.al [14] to identify how the operation, anesthesia, patients' age, gender affect patients' anxiety levels; wherein it was found that anxiety sub-scores of the patients who underwent general anesthesia were found to be significantly higher than the patients who underwent regional anesthesia, also anxiety sub-scores of females were found to be significantly higher than the males. Similar results were found in our study; wherein preoperative Anxiety level of the patients who underwent general anesthesia (n=17, 67.64%) was found to be statistically significantly higher than the patients who underwent local anesthesia (n=23, 54.84%) (p=0.045229), also Preoperative anxiety in female was found to be 73.91% (n=17) which was statistically significantly higher than the male 54.76% (n=23) (p=0.0373), the tool APAIS is an effective method to measure patient anxiety and it might be beneficial to use during preoperative visits. In our study, it was found that 65.63% of patients (n=21) who underwent major surgery (N=32) had anxiety while 57.58% of patients (n=19) with minor surgeries (N=33) had anxiety. There is a statistically significant correlation between major and minor surgeries in terms of pre-operative Anxiety (p=0.0455); a similar was found in a study conducted by Ramesh Ghimireet and

Pramila Poudel et.al that the level of anxiety was significantly associated with age and type of surgery.

An observational study conducted by Achmet Ali et.al [15], the effect of pre-operative anxiety on postoperative pain control and recovery from anesthesia have concluded that an increase in pre-operative anxiety levels has a turndown effect on recovery from anesthesia and post-operative pain; a similar result was found in our study where patients who had moderate to severe anxiety had a slow pattern of recovery which shows that pre-operative anxiety has a notable influence of post-operative recovery.

## 5. CONCLUSION

The WHO Surgical safety checklist was developed to decrease errors and adverse events and increase teamwork and communication in surgery. In our study, we tried to check the feasibility of the implementation of the WHO surgical safety checklist in routine practice. Our study demonstrates the factors which promote, and hinder the consistent application of the WHO surgical safety checklist namely individual, procedural and contextual. Moreover, consistent use of the checklist remains crucial to patient safety in surgery in which role models are of particular significance besides formal training efforts. Thus, our study suggests that patient's sex, mental health status, knowledge about the type of surgery, and type of anesthesia should be considered and assessed preoperatively since these factors seem to harm patient's postoperative quality of recovery. Appropriate preoperative counselling considering all the risk factors that predispose to preoperative anxiety and poor quality of post-operative recovery may be helpful.

## CONSENT

A consent form from the patient was taken a day prior and pre-operative anxiety was assessed before the patients were taken to Operating Room (OR).

## ETHICAL APPROVAL

The study obtained ethical approval from the Sumandeeep Vidyapeeth Institutional Ethics Committee (Ref no: SVIEC/ON/Phar/BNPG18/D19040).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Pritchard MJ. Identifying and assessing anxiety in pre- operative patients. *Nursing Standard*. 2009;23(51).
2. Royse CF, Newman S, Chung F, Stygall J, McKay RE, Boldt J. Development and feasibility of a scale to assess postoperative recovery the post-operative quality recovery scale. *Anaesthesiology: The Journal of the American Society of Anaesthesiologists*. 2010;113(4):892- 905.
3. Boker A, Brownell L, Donen N. The Amsterdam preoperative anxiety and information scale provides a simple and reliable measure of preoperative anxiety. *Canadian Journal of Anesthesia*. 2002;49(8):792-8.
4. Weiser TG, Regenbogen SE, Thompson KD, Haynes AB, Lipsitz SR, Berry WR. An estimation of the global volume of surgery: A modelling strategy based on available data. *The Lancet*. 2008;372(9633):139-44.
5. WHO Surgical Safety Checklist. World Health Organization; 2009. Available:<https://www.who.int/patientsafety/safesurgery/checklist/en/>. [cited 13 September 2019].
6. Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T. Preoperative anxiety and associated factors among adult surgical patients in Debre Markos and FelegeHiwot referral hospitals, Northwest Ethiopia. *BMC anaesthesiology*. 2018;18(1):155.
7. Pritchard MJ. Identifying and assessing anxiety in pre-operative patients. *Nursing Standard*. 2009;23(51).
8. Royse CF, Newman S, Chung F, Stygall J, McKay RE, Boldt J. Development and feasibility of a scale to assess postoperative recovery the post-operative quality recovery scale. *Anesthesiology: The Journal of the American Society of Anesthesiologists*. 2010;113(4):892- 905.
9. Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T. Preoperative anxiety and associated factors among adult surgical patients in Debre Markos and Felege Hiwot referral hospitals, Northwest Ethiopia. *BMC Anesthesiology*. 2018;18(1).

10. Schwendimann R, Blatter C, Lüthy M, Mohr G, Girard T, Batzer S, Davis E, Hoffmann H. Adherence to the WHO surgical safety checklist: An observational study in a Swiss academic center. *Patient Safety in Surgery*. 2019;13(1):14.
11. Ambulkar R, Ranganathan P, Salunke K, Savarkar S. The World Health Organization Surgical Safety Checklist: An audit of quality of implementation at a tertiary care high volume cancer institution. *Journal of Anaesthesiology, Clinical Pharmacology*. 2018;34(3):392.
12. Pugel AE, Simianu VV, Flum DR, Dellinger EP. Use of the surgical safety checklist to improve communication and reduce complications. *Journal of Infection and Public Health*. 2015;8(3):219-25.
13. Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T. Preoperative anxiety and associated factors among adult surgical patients in Debre Markos and Felege Hiwot referral hospitals, Northwest Ethiopia. *BMC Anesthesiology*. 2018;18(1):155.
14. Celik F, Edipoglu IS. Evaluation of preoperative anxiety and fear of anesthesia using APAIS score. *European Journal of Medical Research*. 2018;23(1):41.
15. Ali A, Altun D, Oguz BH, Ilhan M, Demircan F, Koltka K. The effect of preoperative anxiety on postoperative analgesia and anesthesia recovery in patients undergoing laparoscopic cholecystectomy. *J Anesth*. 2014;28(2):222-227. DOI:10.1007/s00540-013-1712-7

© 2021 Hadia et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle4.com/review-history/70615>