WHO Surgical Safety Check List –Perceptions of Operating Team

A dissertation submitted in partial fulfilment of the requirements for the award of

Post Graduate Diploma in Health and Hospital Management

by

Dr. Rampal Singh Chauhan

PG/11/076

International Institute of Health Management Research

New Delhi – 110075

May-2013

Certificate of Internship Completion

Dated: 30th April'2013

TO WHOM IT MAY CONCERN

This is to certify that **Dr. Rampal Singh Chauhan** has successfully completed his 3 months internship in our organisation from **February 01, 2013 to April 30, 2013**. During this internship period, he has worked on **"WHO Surgical Safety Checklist – Perceptions of Operating Team"** under the guidance of Dr.Punita Singh and her team at **Octavo Solutions Pvt. Ltd.**
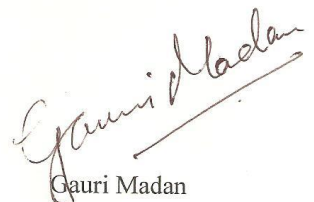
He has successfully completed his dissertation, proven himself professionally, and his performance has been commendable throughout.

We wish him good luck for his future assignments.

Dr. Punita Singh

Assistant Consultant

Gauri Madan

Assistant HR manager

Certificate of Approval

The following dissertation titled **"WHO Surgical Safety Check List – Perceptions of Operating Team"** is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

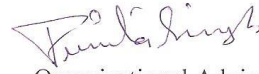Dissertation Examination Committee for evaluation of dissertation

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Prof. I. Bhattacharya	

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This is to certify that **Dr.Rampal Singh Chauhan** a graduate student of the **Post- Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. He is submitting this dissertation titled **"WHO Surgical Safety Check List –Perceptions of Operating Team"** in partial fulfilment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Faculty Mentor	Organizational Advisor
Designation	Designation *Assistant Consultant*
IIHMR	Organization *Octano Solutions Pvt. Ltd*
New Delhi	Address *B4/167, Safdurjung Enclave*
Date	Date *02/05/13*
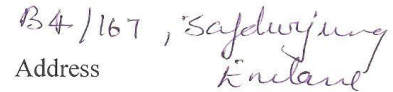
FEEDBACK FORM

Name of the Student: Dr. Rampals Chauhan

Dissertation Organisation: Oclamo Solutions Pvt. Ltd

Area of Dissertation: Healthcare Quality Management System

Attendance: Regular

Objectives achieved: Satisfactorily Achieved

Good Performance

Deliverables:

Strengths: Hardworking, Analytical skill & Good Data analysis skill

Suggestions for Improvement: Communication skill

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

Sunita Singh

Date: 2/05/13
Place: New Delhi

ABSTRACT

The study was carried out to find the acceptability and perceptions of surgical team in Operation Theatre regarding World Health Organisation (WHO henceforth) Surgical Safety Check list (SSC) and assess the knowledge level of team regarding benefits of using Surgical Safety Check list. Three hospital of New Delhi that follow the WHO Surgical Safety Check list were selected using purposive sampling technique. Total 28 personnel were surveyed which included Surgeons, Anaesthetists, Technicians and OT nurses. Selection criteria was established on the basis of their services at health facility i.e. those who were present before and after implementation of WHO SSC in their respective hospital. Structured questionnaire was prepared for the study with most of the questions being closed ended. The communication, teamwork, motivational level and error prevention practices were ranked on the basis of Likert scale (lowest "1" mark for very poor and highest "5" for excellent). Findings of the study were 96% of respondents thought that the check list is very easy to use, 82% thought that check list does not take long time to complete. 7% staff perceived that check list causes obstruction in surgical work flow, the respondents who believed belonged to hospital where only general surgeries were performed. 100% respondents agreed that the check list improves the operating room safety. 75% respondents were fully aware about benefits of SSC and 21% were partial aware about the same. The respondents felt that the use of SSC has helped in improving team communication by 23% (Mean value - Before implementation "3.61", After implementation "4.44") and 16% improvement (Mean Value – Before Implemenation"3.88" and "4.50" After implementation) in team work. 96% respondents recommended continuing using SSC in hospital. Some additions also suggested by surgeons and anaesthetist regarding availability of implants and Nil Per Oss status (Nil by Mouth status) of patient. Provision to record post operative instructions was also suggested. The results of the survey suggest that the WHO Surgical Safety Check list is perceived to increase teamwork and communication among surgical team members and hence effectively enhance patient safety.

ACKNOWLEDGEMENT

DR. RAMPAL SINGH CHAUHAN

PGDHHM

IIHMR, DELHI.

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List of Abbreviations

ACHSI -   Australian Council of Health Standard International

OSPL -   Octavo Solution Private Limited

OR -   Operating Room

OT -   Operating theatre

QCI -   Quality Council of India

SAQ -   Safety Attitude Questionnaires

SSC -   Surgical Safety Check list

WAPS-   World Alliance for Patient Safety

WHA -   World Health Assembly

WHO -   World Health Organisation

PART-1 INTERNSHIP

OCTAVO SOLUTIONS PRIVATE LIMITED

SECTION 1.01 LEARNINGS DURING STUDY PERIOD

The internship was perused at Octavo solution Pvt. Ltd., New Delhi for the period of three months from February 1 to April 30, 2013.

The objective of the internship at Octavo Solutions Pvt. Ltd. was to gather an exhaustive knowledge about the Dimensions of a Healthcare Consulting Organization and apply the insights so gained to succeed in the same industry. The Dimensions of a Healthcare Consulting Organization are Planning, System Development and Operation, Quality Healthcare Certification, Public Private Partnership, Capacity Building, Information and Technology, Knowledge Management and Public and Rural Health. Main objective of the internship was to understand the working of my Organization on Quality Management System and Quality Assurance Program in healthcare sector besides the chosen study title.

SECTION 1.02 ORGANIZATION PROFILE

Octavo Solutions Pvt. Ltd. (OSPL) is a multidisciplinary Health & Hospital Management Consulting firm, established and managed by health management experts, supported in its initiatives and efforts by experienced and reputed experts in field (like Architecture, Engineering, Public Health, Bio-medical Engineering, Clinical Experts, National and International Quality Gurus, Project Management experts), who have successfully undertaken health, hospital and other infrastructure projects ranging from small nursing homes to large medical college hospitals, including public health. It is associated with a number of reputed consulting organizations and thus can draw upon qualitative and latest expertise as and when required. With its ongoing in-house research and quality improvement efforts, the institution always strive to be up-to-date and able to provide the client qualitative, cost effective and comprehensive solutions. The team of OSPL includes highly experienced professionals who have work with QCI, JCI and Australian Council of Health Standard International (ACHSI) and donor-funded projects like, the World Bank and the distinguished clients served includes the Ministry of Health, Govt. of India; State Governments, Private clients, Corporate House & Charitable Hospitals. Octavo Solutions Pvt. Ltd. is the first Consulting firm registered with Quality Council of India (National Accreditation Board for Education and Training) for providing consulting services in field of Healthcare.

Organisation envisions to focus on -

Continuous development of processes for understanding the needs & expectations of the clients; leading to continual improvement and achievement of real client satisfaction. It aims to achieve it through redesigning and developing quality healthcare institutions and hospitals with competitive process designs/models matching national and international standards.

- **Key Strengths and Salient Features of OSPL**
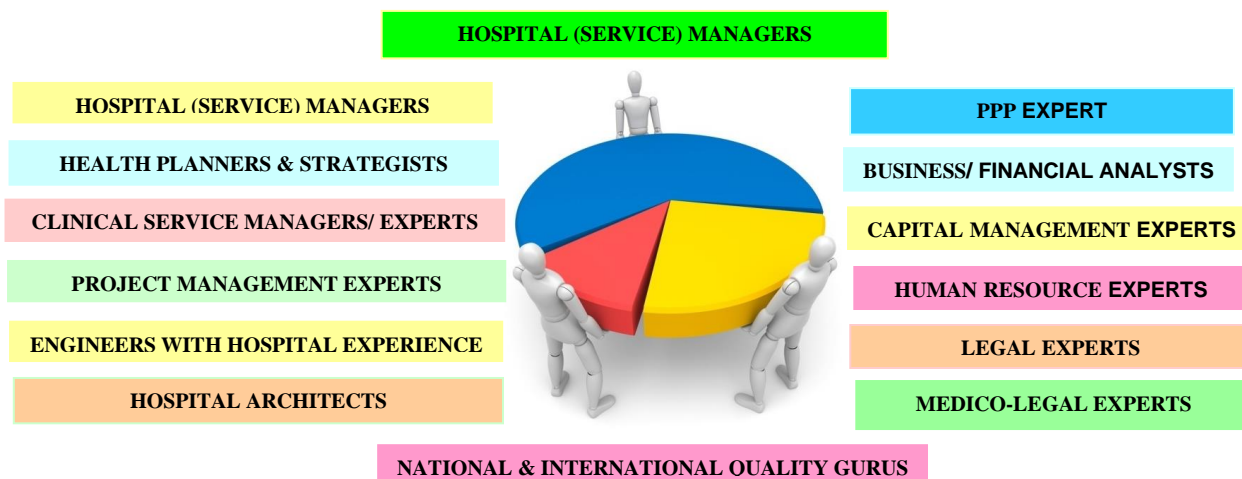
The primary **strength** the company is to partner with the client organization to optimize resources & implement the improvement strategies successfully. To assure successful implementation and competitive advantage, we develops an execution action plan with essential controls for the management system under consideration. Unique Bottom-Up consulting **approach** ensures success of consulting assignments. This approach ensures that plans are accepted & practiced at all the levels of management. Company has unmatched 100% success rate for all the projects taken up.

Key Strengths:-

OSPL is a private Limited company (Reg. No. U72400DL2007PTC159745), Short listed firm with **NHSRC** (National Health Systems Resource Centre) under aegis of Ministry of Health & Family Welfare (Government of India). Company has**Talented Leadership** from leading institutes like All India Institute of Medical Sciences (Delhi), International Institute of Health Management and Research (Delhi), School of Planning and Architecture (Delhi), Tata Institute of Social Sciences (Mumbai), Symbiosis Institute of Health Sciences (Pune), Jamia Hamdard University (Delhi). OSPL has Great Team with all essential skills. Dr. Bidhan Das-Member, Technical Committee of NABH for drafting standards is Managing Director of OSPL.He has drafted Standards for Primary Healthcare (NABH), he is the first ACHS International Surveyor (Australian Council for Health Standards) in India. OSPL is **SE-Asia Partners for ACHSI**. OSPL has presence in **14 states (**including Union Territories). In short

span of just 4 years, OSPL has rendered its **consulting services to over 30,000 beds** within the healthcare sector. OSPL has provided consulting services to over 100 Hospitals (bed range 30-1500), 7 Teaching Hospital & Medical Colleges, 1 Rehabilitation Hospital, 2 Dental Hospital & Colleges, 2 AYUSH Hospitals. Combined Years of Experience of Technical Personnel of OSPL is 68 Man-Years in ISO/ NABL/ NABH/ QMS and Hospital Planning assignments. OSPL's Key Personnel have rich experience of having conducted over 720 Audits/ Assessments and provided consulting services to 497 client organizations for establishing QMS.

Organogram:-

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│ President│  │ Development &    │  │                  │         │  Consultant  │
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              │ │ GM/DGM – BD &│ │
              │ │ Strategies   │ │
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| Accounts & Finance | Administration | | Technical Head-Planning & Designing | Technical Head-Planning & Designing | Technical Head-Planning & Designing | Technical Head-Planning & Designing |

| Manager - Accounts & Finance | Operations, HR, Training & Development & Logistics | | Sr. Consultant/ Consultant/Project Coordinator | Sr. Consultant/ Consultant/Project Coordinator | Sr. Consultant/ Consultant/Project Coordinator | Sr. Consultant/ Consultant/Project Coordinator |

| | Sr. Manager – Operations, HR, T&D & Logistics **(MR)** | | Associate Consultant/Project Coordinator | Associate Consultant/Project Coordinator | Associate Consultant/Project Coordinator | Associate Consultant/Project Coordinator |

| | Asst. Manager - HR | | Assistant Consultant | Assistant Consultant | Assistant Consultant | Assistant Consultant |

| | Office Assistant | | Management Consultant | Management Consultant | Management Consultant | Management Consultant |

PART - 2 DISSERTATION

WHO Surgical Safety Check List – Perceptions of Operating Team

SECTION 2.01 INTRODUCTION

2.01.1 Study background

Patient safety is one of the greatest imperatives in healthcare today. However, there are many obstacles that must be overcome to make the healthcare system truly safe. Confronted with worldwide evidence of substantial public health harm due to inadequate patient safety, the Fifty-fifth World Health Assembly in 2002 adopted a resolution (WHA55.18) urging countries to strengthen the safety of health care and monitoring systems. The resolution also requested that WHO take a lead in setting global norms and standards and supporting country efforts in preparing patient safety policies and practices. In May 2004, the Fifty-seventh World Health Assembly approved the creation of an international alliance to improve patient safety globally, and the World Alliance for Patient Safety was launched in October 2004 to reduce the adverse consequences of unsafe health care[1]. The purpose of the Alliance is to facilitate patient safety policy and practice. It is concentrating its actions on focused safety campaigns called Global Patient Safety Challenges, coordinating Patients for Patient Safety, developing a standard taxonomy, designing tools for research policy and assessment, identifying solutions for patient safety, and developing reporting and learning initiatives aimed at producing 'best practice' guidelines.

The area chosen for the first Challenge, in 2005–2006, was infection associated with health care. This campaign established simple, clear standards for hand hygiene, an educational campaign and WHO's first Guidelines on hand hygiene in health care. The problem area chosen for the second Global Patient Safety Challenge, in 2007–2008, is the safety of surgical care[2]. The goal of the Safe Surgery Saves Lives Challenge is to improve the safety of surgical care around the world by ensuring adherence to proven standards of care in all countries. The WHO Surgical Safety Checklist (WHO SSC) has improved compliance with standards and decreased complications from surgery in eight pilot hospitals where it was evaluated. In 2007 and 2008, a WHO pilot study involving hospitals in eight cities around the globe demonstrated that the use of a simple surgical checklist, developed by WHO, can lower the incidence of surgery-related deaths and complications by one third during major operations. At least half a million deaths per year would be preventable with effective implementation of the WHO Surgical Safety Checklist (WHO SSC) worldwide[3]. The studies indicate that a checklist works because it is more than just a tick sheet: effective adoption generally requires local systems changes and commitment to teamwork for safety.

2.01.2 Surgical Safety Check List and Its components

SURGICAL SAFETY CHECKLIST (First Edition)
World Health Organization

Before induction of anaesthesia ▶▶▶▶▶▶▶▶ **Before skin incision** ▶▶▶▶▶▶▶▶▶▶▶▶ **Before patient leaves operating room**

SIGN IN

☐ PATIENT HAS CONFIRMED
• IDENTITY
• SITE
• PROCEDURE
• CONSENT

☐ SITE MARKED/NOT APPLICABLE

☐ ANAESTHESIA SAFETY CHECK COMPLETED

☐ PULSE OXIMETER ON PATIENT AND FUNCTIONING

DOES PATIENT HAVE A:

KNOWN ALLERGY?
☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS
(7ML/KG IN CHILDREN)?
☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM
• PATIENT
• SITE
• PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ THE NAME OF THE PROCEDURE RECORDED

☐ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)

☐ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)

☐ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Figure 1 WHO Surgical Safety Check list

This check list was mainly formed to reduce operating room errors through-

-Involvement of patients and surgical staff,

-Better communication among the staff as well as with patient,

-Anticipating surgical plan in advance,

-Preparedness for any unexpected emergency or complicated situation during surgery,

-Better recovery plan and management of the patient after surgery.

It also facilitates prevention of -

- Wrong site surgery, operation of wrong patient, wrong procedure,

-Surgical site infection,

-Surgery related deaths.

The WHO SSC is divided into three main sections : Sign In , Time Out , Sign out.

1. Sign In –

This section should be completed before induction of anaesthesia to the patient. This section has seven check elements. The person coordinating the Checklist will verbally review with the patient (when possible) that his or her identity has been confirmed, that the procedure and site are correct and that consent for surgery has been given. The coordinator will visually confirm that the operative site has been marked (if appropriate) and that a pulse oxy meter is on the patient and functioning. The coordinator will also verbally review with the anaesthesia professional the patient's risk of blood loss, airway difficulty and allergic reaction and whether a full anaesthesia safety check has been completed. Ideally the surgeon will be present for "Sign In", as the surgeon may have a clearer idea of anticipated blood loss, allergies, or other complicating patient factors. However, the surgeon's presence is not essential for completing this part of the Checklist.

2. Time Out –

The section also has seven check elements. This section is a pause immediately prior to the first incision given on patient's skin for operation. Each team member will introduce him or herself by name and role. If already partway through the operative day together, the team can simply confirm that everyone in the room is known to each other. The team will confirm out loud that they are performing the correct operation on the correct patient and site and then verbally review with one another, in turn, the critical elements of their plans for the operation using the Checklist questions for guidance. They will also confirm that prophylactic antibiotics have been administered within the previous 60 minutes and that essential imaging is displayed, as appropriate

3. Sign Out –

This is the last section of checklist and it has to be completed before patient leave the operation room. It contains five check points. The team will review together the operation that was performed, completion of sponge and instrument counts and the labelling of any surgical specimens obtained. It will also review any equipment malfunctions or issues that

need to be addressed. Finally, the team will review key plans and concerns regarding postoperative management and recovery before moving the patient from the operating room[4].

Medical care today is undeniably a team effort. No provider can complete the continuum of care alone; communication, cooperation, and coordination are vital to effective care. The Errors in the operating room (OR) can have catastrophic consequences for patients, families, caregivers and entire institutions. Retained sponges, wrong-site operations, mismatched organ transplants or blood transfusions can be the result of interpersonal dynamics, where communication and collaboration breakdowns occur among OR team members.

The aim of the resulting WHO Surgical Safety Checklist First Edition is to reinforce accepted safety practices and foster better communication and teamwork between clinical disciplines. Equipping healthcare providers with high performing teams and providing them with tools to improve communication and patient safety may be the recipe for reliable improvements in safety culture and patient outcomes in surgery[5].

2.01.2 Rationale of the study

The 'operating theatre' has a unique set of team dynamics: professionals from multiple disciplines are required to work in a closely coordinated fashion. This complex environment provides multiple opportunities for unclear communication, clashing motivations, errors arising not from technical incompetence but from poor communication and interpersonal skills. Joint Commission on Accreditation of Healthcare Organizations has identified breakdowns in communication as the leading root cause of wrong-site operations, and other sentinel events[6].

Effective teamwork and communication is essential for achieving high reliability systems and creating a "culture of safety" to support the safe delivery of patient care in operating room. Therefore this study has been conducted to know the perceptions of the users regarding use of WHO surgical safety check list.

2.01.3 Limitations of the study

Small sample size, purposive sampling and chances of recall biasness are some limitations present in this study.

SECTION 2.02 REVIEW OF LITERATURE

Surgical care has been an essential component of health care worldwide for over a century. As the incidences of traumatic injuries, cancers and cardiovascular disease continue to rise the impact of surgical intervention on public health systems will grow. An estimated 234 million major operations are performed around the world each year, corresponding to one operation for every 25 people alive. Each year an estimated 63 million people undergo surgical treatment due to traumatic injuries, another 10 million operations are performed for pregnancy-related complications, and 31 million more are undertaken to treat malignancies[7].

In industrialized countries major complications are reported to occur in 3–16% of inpatient surgical procedures, with permanent disability or death rates of approximately 0.4–0.8%. In developing countries studies suggest a death rate of 5–10% during major surgery. Mortality from general anaesthesia alone is reported to be as high as one in 150 in parts of sub-Saharan Africa. At a minimum seven million surgical patients are harmed by surgical complications each year including at least one million patients who die during or immediately following a procedure[8].

The WHO World Alliance for Patient Safety (WAPS) launched a worldwide campaign to reduce adverse events related to surgery in 2007 i.e. The second Global Patient Safety Challenge: Safe Surgery Saves Lives.

Safe Surgery Saves Lives is a multifaceted, participatory initiative to reduce patient harm through safer surgical care, which includes[9]:

- 10 essential objectives for safe surgery,
- surgical 'vital statistics' to measure progress, and
- Surgical Safety Checklist for each surgical procedure.
- <u>Ten essential objectives for safe surgery</u>-
    1. The team will operate on the correct patient at the correct site.
    2. The team will use methods known to prevent harm from anaesthetic administration, while protecting the patient from pain.
    3. The team will recognize and effectively prepare for life-threatening loss of airway or respiratory function.
    4. The team will recognize and effectively prepare for risk of high blood loss.

5. The team will avoid inducing an allergic or adverse drug reaction known to be a significant risk to the patient.

6. The team will consistently use methods known to minimize risk of surgical site infection.

7. The team will prevent inadvertent retention of sponges or instruments in surgical wounds.

8. The team will secure and accurately identify all surgical specimens.

9. The team will effectively communicate and exchange critical patient information for the safe conduct of the operation.

10. Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.

- Surgical vital statistics -

To ensure basic surgical surveillance, WHO Member States collect the following information:

1. The number of operating rooms in each country;

2. The number of operations performed in operating rooms in each country;

3. The number of trained surgeons and the number of trained anaesthesia professionals in each country;

4. The number of deaths on the day of surgery;

5. The number of in-hospital deaths following surgery.

WHO pilot study involving hospitals in eight cities around the world demonstrated that the use of a simple surgical check list, can lower the incidence of surgery-related deaths and complications by one third during major operations. By September 2009, the WHO checklist had been adopted by as many as 1,841 hospitals in 74 countries. Many research studies were conducted to know the effects of WHO SSC on reducing surgical mortality and morbidity. Only few studies have addressed personnel's acceptance and attitudes toward the WHO Surgical Safety Checklist. Determining personnel's acceptance might reflect their intention to use the checklist while their awareness and knowledge of the checklist might assess the effectiveness of the training process.

A pre and post interventional study conducted by **Alex B Haynes et al.[10](Feb 2013**) to measure the change in safety attitude of surgical staff and relationship to decrease post operative morbidity and mortality by implementing WHO surgical safety check list. The

study was conducted in eight hospitals participating in a trial of WHO surgical safety check list. A safety attitude questionnaire (SAQ) on the base of likert scale (1 to 5, with 5 representing better safety attitude) was prepared for data collection. Clinicians in the pre intervention phase had a mean SAQ score of 3.91, while the post intervention group had a mean of 4.01. The degree of improvement in mean SAQ score at each site correlated with a reduction in postoperative complication rate. The checklist was considered easy to use by 80.2% of respondents, while 19.8% felt that it took a long time to complete, and 78.6% felt that the programme prevented errors. Overall, 93.4% would want the checklist used if they were undergoing operation.

Another study was conducted to know the Acceptance of the WHO Surgical Safety Checklist among surgical personnel in hospitals by **Juan J Delgado Hurtado et al.[11](2012).** The study reveals that out of 147 surgical personnel who answered the questionnaire, 93.8% were aware of the existence of the WHO Surgical Safety Checklist and 88.8% of them reported knowing its objectives. More nurses than other personnel knew the checklist had to be used before the induction of anaesthesia, skin incision, and before the patient leaves the operating room. Most personnel thought using the WHO Surgical Safety Checklist is beneficial and that its implementation was a good decision. Between 73.7% and 100% of nurses in public and private hospitals, respectively, reported the checklist had been used either always or almost always in the general elective surgeries they had participated.

According to a report "The WHO Surgical Safety Checklist: to reduce harm by consistent use of best practice" published by the **National Patient Safety Agency (2011)**, after the introduction of the Five Steps (Briefing, Sign In, Time Out, Sign Out and Debriefing) to Safer Surgery in a teaching Hospitals, the average number of patients treated increased from 3.5 to 4.5 per 8-hour session[12]. There is evidence that improved planning and teamwork results in shorter operating times for complex surgery and improved outcomes for patients. Structured briefings and checklists improve team communication, the sharing of information, decision making and planning. There is local variation, and success depends on such factors as attitudes of clinical staff, the leadership provided by trust management and senior clinicians and the relations between clinicians in surgical teams. To engage the entire operating theatre team in implementation, changes in culture and team working are necessary. **Helmiö P et al.[13] (June 2011)** conducted a study to measure patient safety, team work and communication among the surgical staff by using WHO SSC. The study reveals that the checklist improved verification of the patient's identity (P<0.001). Awareness of the patient's

medical history, medication and allergies increased (P<0.001). Knowledge of the names and roles among the team members improved. The otolaryngologists and anaesthesiologists discussed possible critical events more often (P<0.001), and postoperative instructions were better recorded after use of the checklist. In addition, the checklist enhanced communication between operation team members.

Axel Fudickar, Kim Hörle, Jörg Wiltfang, Berthold Bein[14] (2012) done a secondary study by reviewing 20 studies conducted before February 2012 on effects of WHO Surgical Safety Checklist on safety related behaviour. According to study the two surgical outcome studies documented a relative improvement of perioperative mortality by 47% in one study and by 62% in the other, as well as a relative improvement of perioperative morbidity by 36% in one study and by 37% in the other. Improved interdisciplinary communication was also found.

A study conducted by **Nilsson et.al[15] (2010)** to know a year follow up of personnel attitudes after implementation of a pre-operative checklist. The study findings reveal that

Staff attitudes toward a surgical checklist were mostly positive one year after their introduction in two large hospitals in Sweden. (>90%: it increases patient safety). Team briefings among surgeons, anaesthetists and nurses based on a short structured list significantly reduced the number of communication failures per procedure. The personnel were positive to a similar checklist at the end of surgery, before leaving the OR.

Leonard, M. et.al.[15] (2004) conducted a study to assess the critical importance of effective teamwork and communication in providing safe care. Study reveals that Adoption of standardized tools and behaviours is a very effective strategy in enhancing teamwork and reducing risk in a more complex care environment. These tools can effectively bridge the differences in communication style between nurses, physicians and others that result from the current educational process.

SECTION 2.03 OBJECTIVES

2.03.1 General objective –

To study the perceptions of Operating team regarding use of Surgical Safety Check list.

2.03.2 Specific objectives –

- To determine perceptions of Operating team regarding usefulness and acceptability of Surgical Safety Check list as well as their perceptions about team communication and team work after its use.
- To determine what more is seek by Operating team to improve the structure of Surgical Safety Check list.

SECTION 2.04 METHODOLOGY

STUDY TYPE –

- Cross sectional study.

STUDY AREA –

- Three Hospitals of New Delhi using WHO SSC.

STUDY POPULATION –

- Surgical Team members (Surgeons, Anaesthetists, Technicians and Nurses) who were present before and after implementation of SSC in their respective hospitals.

SAMPLING UNIT –

- Three hospitals were selected and 28 respondents participated in the study.

Description of hospitals and study respondents

Hospital	Types of surgeries	Total OTs	Total OT team members who were present before and after implementation of WHO SSC	Sample Taken				
				Surgeons	Anaesthetist	Technician	OT Nurse	**Hospital Wise Total Sample**
55 bedded	General surgeries	2	7	1	1	1	2	**5**
104 bedded	Super specialty Surgeries	3	14	2	1	0	5	**8**
490 bedded	General and Super specialty Surgeries	20	70	2	4	3	6	**15**
			Category Wise Total Sample	**5**	**6**	**4**	**13**	**Total 28**

SAMPLING DESIGN –

- Purposive sampling used for selecting hospitals performs general, super specialty and both kind of surgeries and same sampling method used for selecting surgical team members.

DATA COLLECTION TOOLS –

- Structured questionnaires
- The communication, teamwork, motivational level and error prevention practices were ranked on the basis of Likert scale (lowest "1" mark for very poor and highest "5" for excellent).

DATA COLLECTION TECHNIQUE –

- Respondents were individually interviewed using the pre structured questionnaire.

SECTION 2.05 STUDY FINDINGS AND DATA ANALYSIS –

Demographic details-

The demographic details of the respondents are as follow –

Table 1 Age group distribution of respondents

Category	21-30 yr	31-40 yr	>40 yr	Total
OT Nurses	7	3	3	13
Technician	0	2	2	4
Anaesthetist	1	3	2	6
Surgeons	0	3	2	5
Total	8	11	9	28

29% respondents belongs to 21-30 year age group, 39% belongs to 31-40 year age group and 32% belongs to >40 year age group.

Table 2 Gender wise distribution of respondents

Category	Female	Male	Total
Nursing staff	8	5	13
Technician	0	4	4
Anaesthetist	4	2	6
Surgeons	1	4	5
Total	13	15	28

Out of total 28 respondents, 54% were male and 46% were female.

User friendliness of WHO Surgical Safety Check list –

Out of total 28 respondents 96% staff felt that WHO surgical safety check list is easy to use and there is no difficulty in completing it.
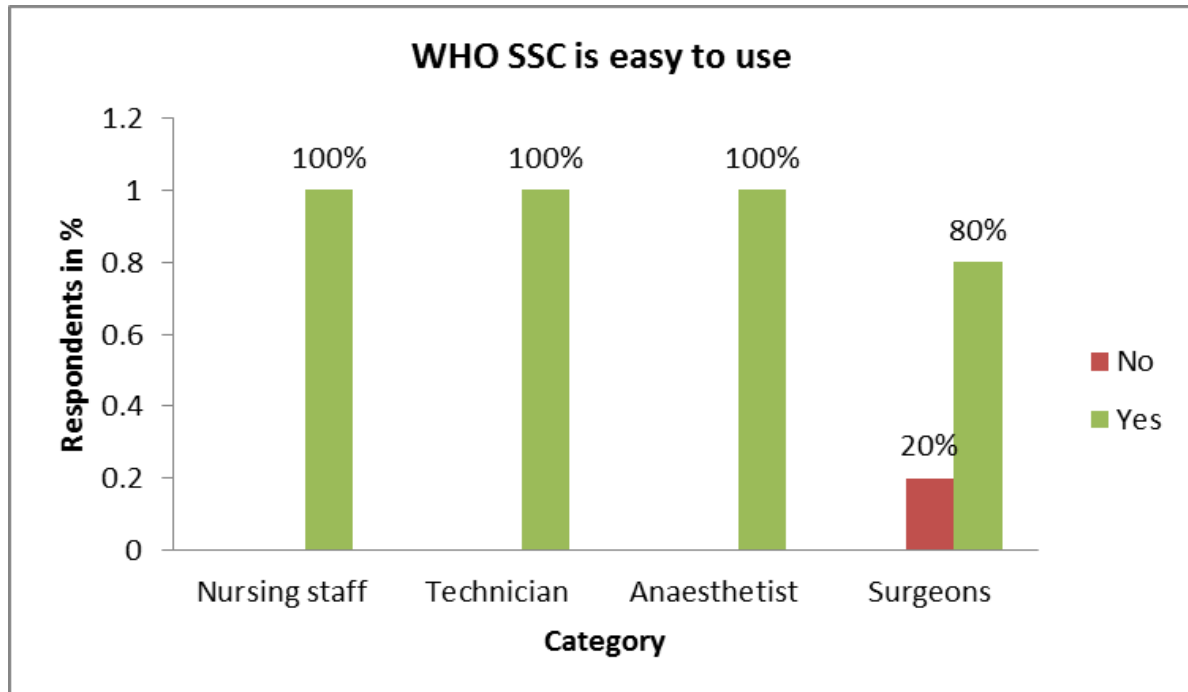

Figure 2 User friendliness of WHO SSC

20% surgeons thinks that WHO SSC is not easy to complete by the technicians and nursing staff as they have to wait for Anaesthetist's and Surgeons' comment on expected blood loss and anticipated complication for the surgery going to be performed.

WHO SSC takes long time to complete –

Out of all surgical team members, 82% believe that it does not take long time to complete and 18% thinks that checklist takes long time to complete and. 50% technicians, 17% anaesthetist and 15% nursing staff thinks that check list takes long time to complete. (Figure 3)
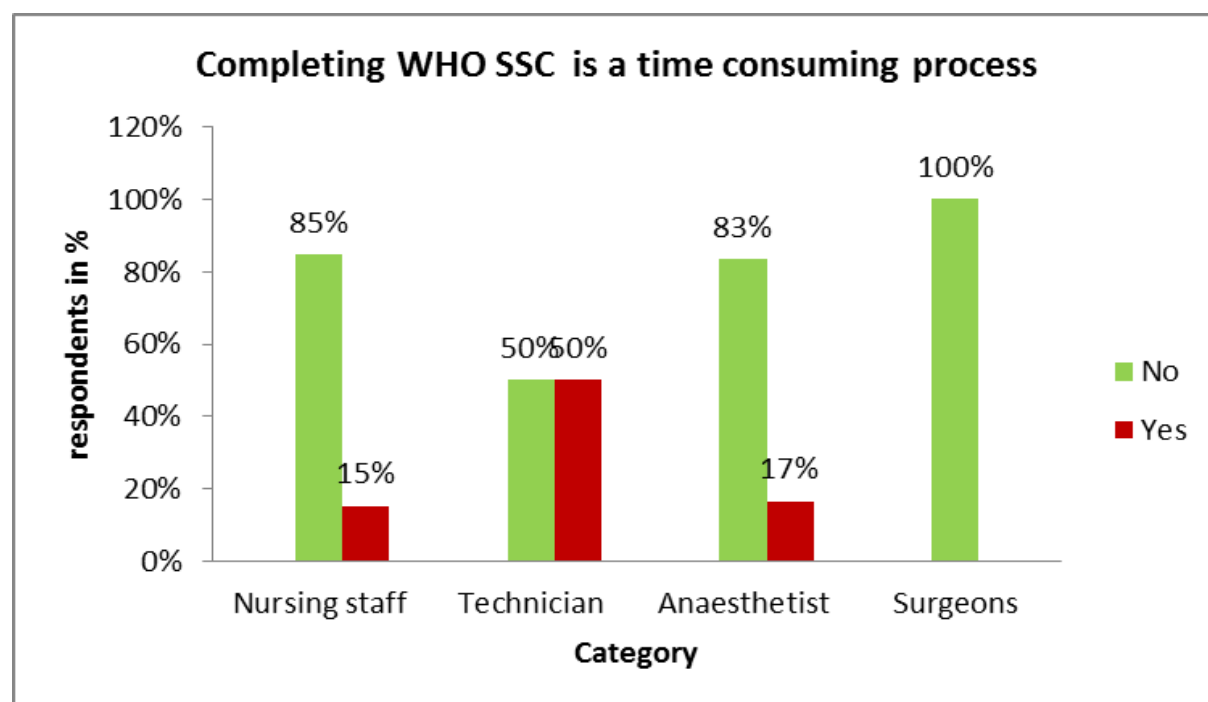

Figure 3 Time consumed for completion of WHO SSC

WHO SSC improves operating room safety -

Table 3 WHO SSC improves operating room safety

WHO SSC Improves operating room safety		
Designation	**Yes**	**No**
Nursing staff	13	0
Technician	4	0
Anaesthetist	6	0
Surgeons	5	0
Total	**28**	

Although the 18% respondents feel that checklist takes long time to complete but all surgical team members (100%) perceive that the operating room safety has been improved by using WHO SSC.

WHO Surgical Safety Check list causes obstruction in process flow –

93% surgical team members think that WHO SSC doesn't cause any obstruction in workflow of surgical process. Only 7% thinks that it causes obstruction in surgical workflow. Surgeons and Anaesthetists think that it don't cause any obstruction but 25% technicians and 8% nursing staff feel that WHO SSC cause obstruction in their work flow.
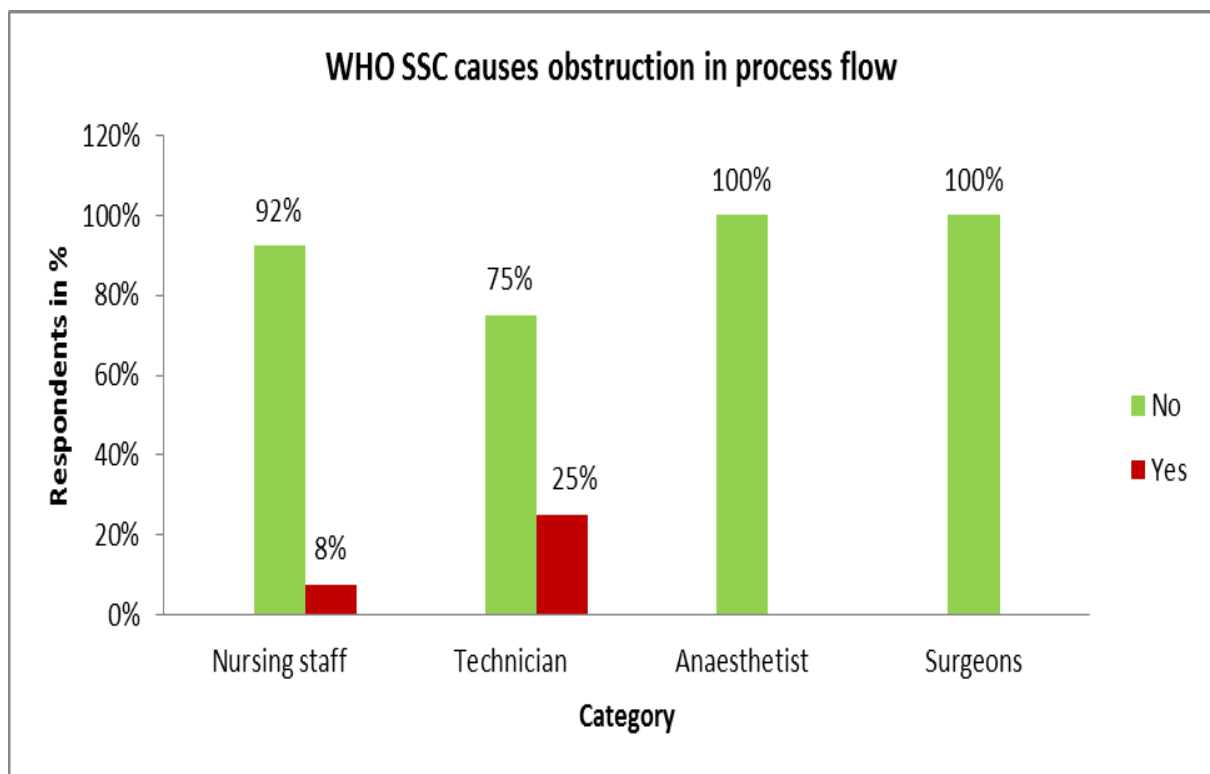

Figure 4 WHO SSC causes any obstruction in process flow

Respondents working in hospital where mostly general surgeries are performed, think that Check list causes obstruction in work flow because most of cases do not required marking of patient surgical site, no >500ml blood loss and minor chances of critical events in general surgeries, so personnel think that 19 check points mentioned in WHO SSC cause obstruction in their surgical work flow and is not required to be carried out. The respondents working in hospital where super specialty surgeries (i.e. Cardiac surgeries) are performed felt that using SSC causes no obstruction in surgical work flow and rather helps in better team work, team communication and outcome of surgeries (Refer Table 4)

Table 4 Hospital wise (type of surgeries performed) surgical team member's perception for WHO SSC causes obstruction in process flow

Type of Surgeries performed in Hospital	Check list cause obstruction in process flow		Total
	No	Yes	
Mainly General Surgeries	4	1	5
Mainly Super specialty surgeries	8	0	8
Both general and super specialty surgeries	14	1	15
Total	26	2	28

Periodic training required for effective implementation of WHO Surgical Safety Check list -

Out of total 28 respondents, 68% feel periodic training is required for effective implementation of WHO surgical safety check list. 32% feel that one training is required and will prove to be sufficient for effective implementation of SSC, no need of periodic training.
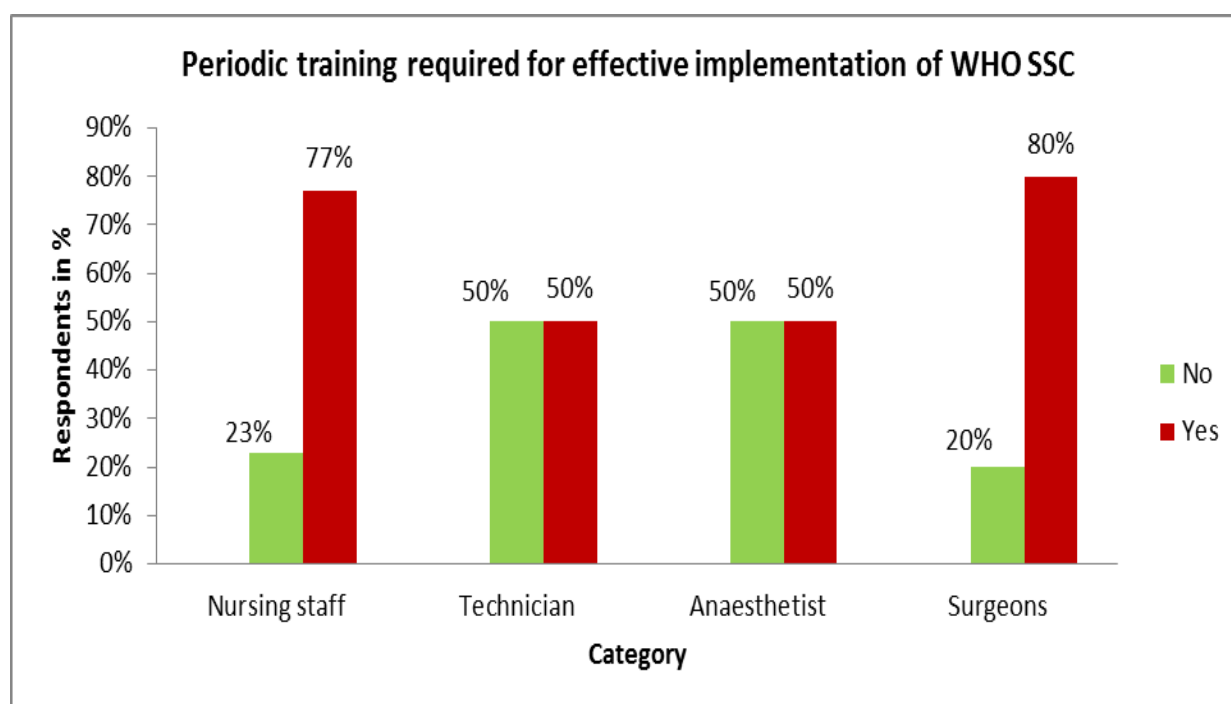

Figure 5 Periodic training required for effective implementation of WHO SSC

80% Surgeon, 77% OT nurses, 50% Anaesthetist and 50% technicians feel that periodic training is required for effective implementation of WHO SSC.

Awareness about benefits of WHO Surgical Safety Checklist –

75% of respondents were fully aware, 21% partially aware and 4% are less aware regarding benefits or objectives of using WHO surgical safety check list.
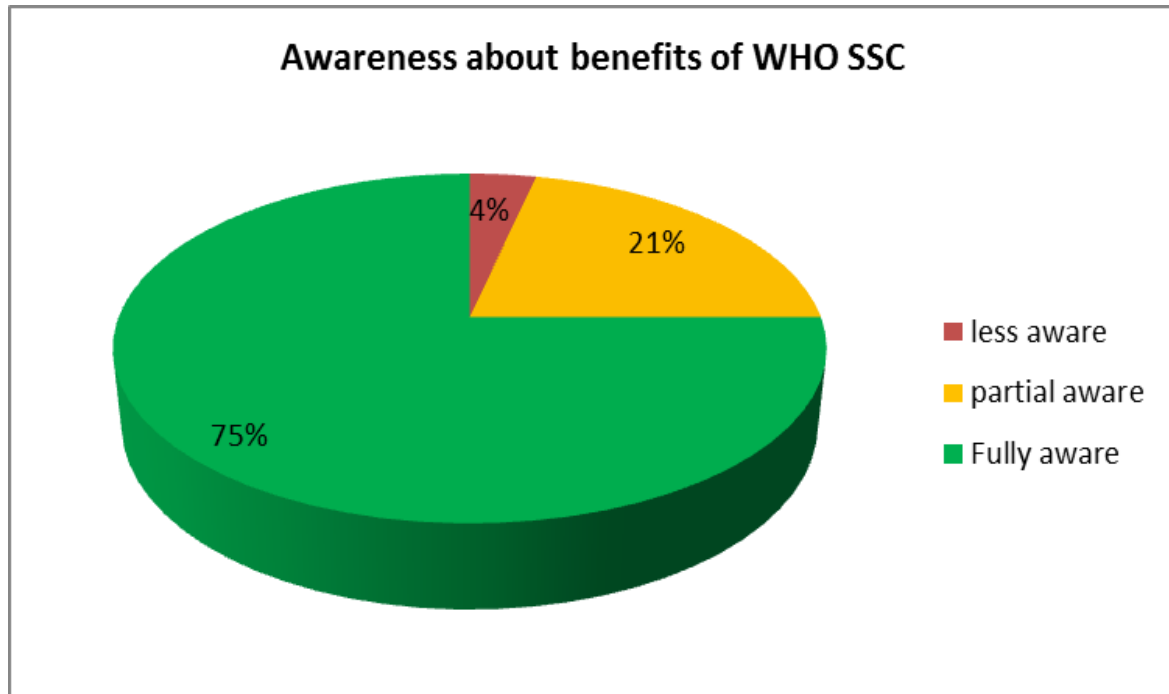

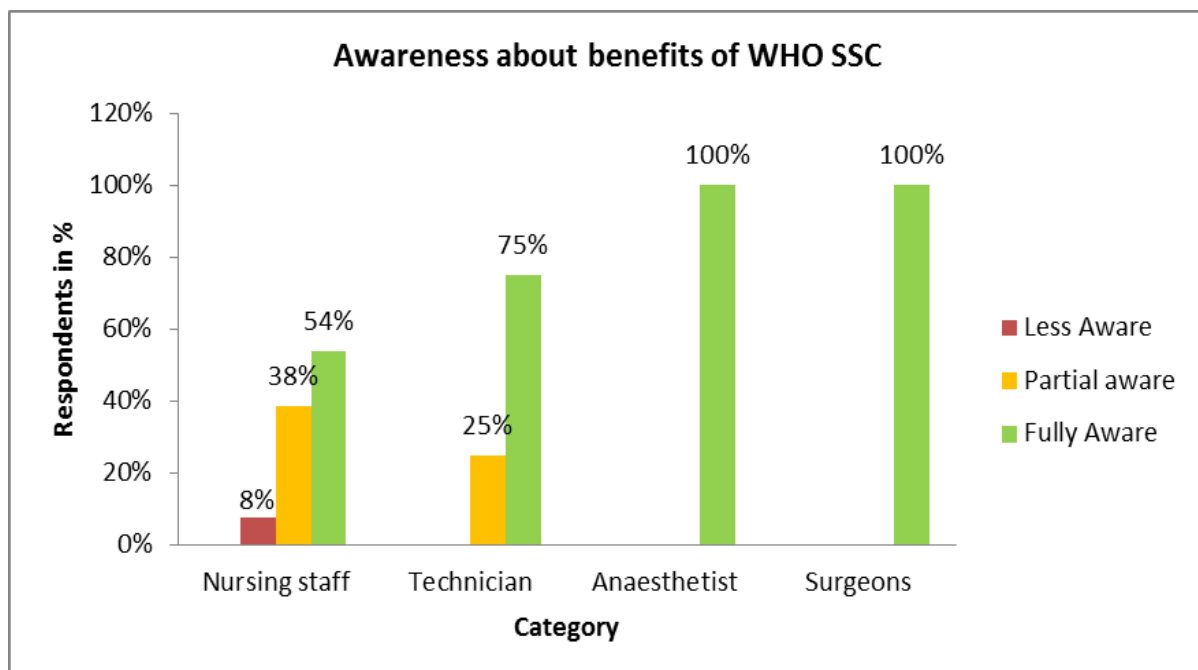**Figure 6 Awareness about benefits of WHO SSC among all surgical team members**

Figure 7 Team member's category wise awareness about benefits of WHO SSC

All surgeons, all Anaesthetist and 75% technicians are fully aware. Around half of OT nurses are not fully aware about benefits of WHO surgical safety check list. (Refer Figure 7)

Perceived improvement in prevention of errors in OT room –

Perception about prevention of errors in OT room was rated on the basis of likert scale. Before using the check list, error prevention practices were perceived as very good (mean value "3.39" i.e. towards very good) and after implementation of WHO SSC, prevention of error in OT room perceived as excellent (mean value "4.46" i.e. towards excellent). Overall 32% improvement felt by all team members (Surgeons, Anaesthetists, Technicians and Nurses).

Perceived improvement in motivational level of staff by using WHO SSC –

The motivational level was perceived by surgical staff was rated on the basis of likert scale. Before using the check list, motivational level was perceived as very good (mean value "3.36" i.e. towards very good) but after implementation of WHO SSC, prevention of error in OT room was perceived as excellent (mean value "4.36" i.e. towards excellent). Overall 30% improvement was felt in level of motivation by all team members (Surgeons, Anaesthetists, Technicians and Nurses).

Perception about improvement in Communication by using WHO SSC –

Perception about communication between team members was rated on the basis of likert scale.

Table 5 Perception about improvement in communication by using WHO SSC

Perception about team communication									
Surgical Team		Surgeons		Anaesthetist		Technicians		Nurses	
		Before	After	Before	After	Before	After	Before	After
Surgeons	Before	3.40		4.00		3.00		3.2	
	After		4		4.8		4.4		4.4
Anaesthetist	Before	3		3.8		3		3.5	
	After		4.3		4.5		4.2		4
Technicians	Before	3.0		3.8		3.8		3	
	After		4.3		4.8		4.5		4.0
Nurses	Before	4.2		3.7		3.5		4.1	
	After		4.7		4.6		4.4		4.5

"Before" and "After" word in the table refers to before implementation of WHO SSC and after implementation of WHO SSC

The mean value of communication for all respondents was 3.61 (towards very good) before implementation of WHO SSC and after implementation, it becomes 4.44 (towards excellent) that means 23% improvement perceived by surgical team members.

47% (Mean Value – Before implementation "3" and After implementation "4.4") and 38% (Mean Value – Before implementation "3.2" and After implementation "4.4") improvement in communication was perceived by surgeons with technicians and nurses. Anaesthetists feel that 44% communication improved (Mean Value – Before implementation "3" and After

implementation "4.3") with surgeons. Technicians perceived 43% improvement (Mean Value – Before implementation "3" and After implementation "4.3") in communication with surgeons. Nurses feel that 13% communication improved (Mean Value – Before implementation "4.2" and After implementation "4.7") with surgeons and 25% (Mean Value – Before implementation "3.7" and After implementation "4.6") with anaesthetist by using WHO Surgical safety Check list.

(Refer table 5)

Perception about improvement in Team work among team members –

Perception about communication between team members was rated on the basis of likert scale. The mean value of team work for whole surgical team was 3.88 (towards very good) before implementation of WHO SSC list and after implementation it becomes 4.50 (towards excellent) that means 16% improvement perceived by team members.

Table 6 Perception about team work improvement by using WHO SSC

Perception about Team work									
Surgical Team		Surgeons		Anaesthetist		Technicians		Nurses	
		Before	After	Before	After	Before	After	Before	After
Surgeons	Before	3.8		4.2		3.8		3.8	
	After		4		4.6		4.4		4.6
Anaesthetist	Before	3.7		4.2		3.3		3.5	
	After		4.2		4.8		4.3		4.2
Technicians	Before	3.5		4.0		4.5		4	
	After		4.3		4.8		4.8		4.8
Nurses	Before	4.2		3.7		3.6		4.1	
	After		4.6		4.5		4.5		4.6

*"Before" and "After" words in the table refers to before implementation of WHO SSC and after implementation of WHO SSC

Surgeons perceive that there is significant improvement in team work with technicians i.e. 16% (Mean Value – Before implementation "3.8" and After implementation "4.4") and with nurse i.e. 21% (Mean Value – Before implementation "3.8" and After implementation "4.6"). Anaesthetists feel that the team work with technician has been improved by 30% (Mean Value – Before implementation "3.3" and After implementation "4.3") and with nurses it has improved by 19% (Mean Value – Before implementation "3.5" and After implementation "4.2"). Technicians perceived maximum improvement in team work with surgeons i.e. 21% (Mean Value – Before implementation "3.5" and After implementation "4.8") and nurses feel maximum improvement in team work with technicians i.e. 23% (Mean Value – Before implementation "3.6" and After implementation "4.5") and with anaesthetist i.e 22% (Mean Value – Before implementation "3.7" and After implementation "4.5").

(Refer table 6)

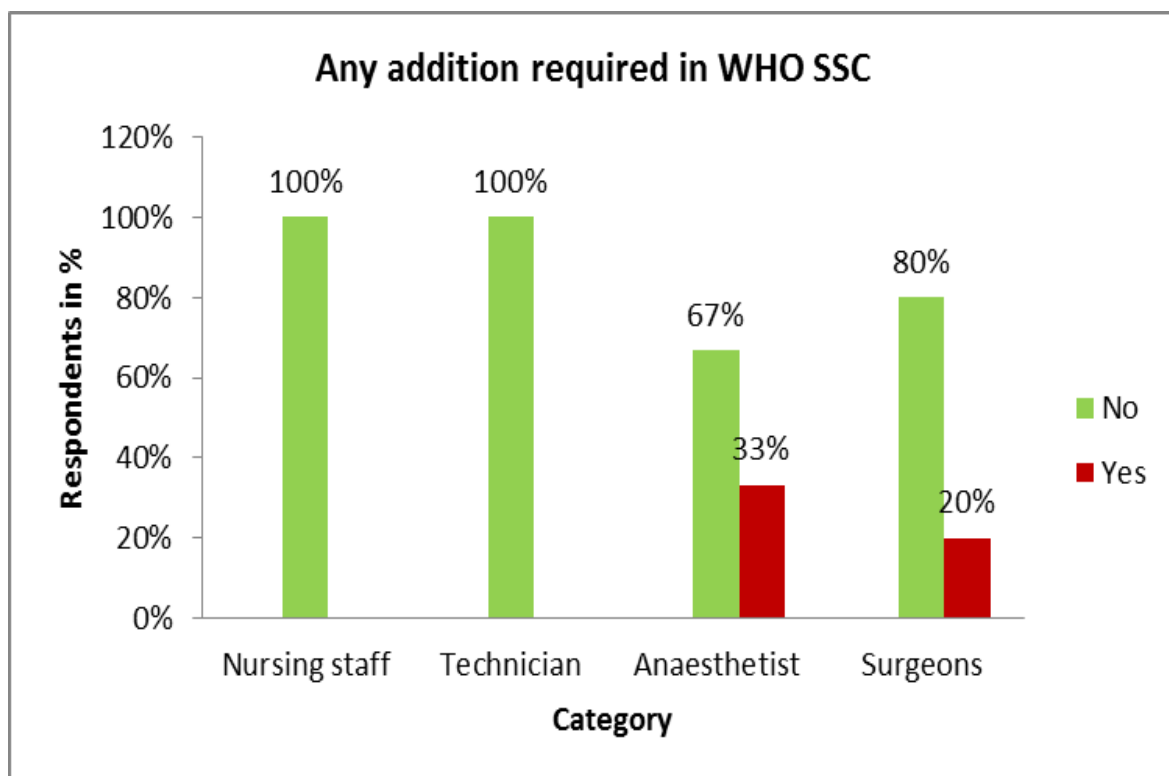**Any addition required in existing WHO SSC -**

Figure 8 Any addition required in WHO SSC

89% respondents feel that no addition required in but 11% feel that additional information is required to be recorded in existing WHO SSC. 33% anaesthetists and 20% surgeons require some addition in existing WHO Surgical safety check list. An Orthopaedic surgeon suggested

that there should be an additional check point for availability of implants which would be used in a particular surgery. An anaesthetist suggested for Nil Per Oss (NPO) or Nil by Mouth Status of the patient should be included in check list. An another anaesthetist suggested that there should be a column for post operative instruction given by surgeons and anaesthetist that will be helpful in post operative care to the patient reducing perioperative complications.

Any deletion required in WHO Surgical Safety Check list -

Table 7 Perception of surgical team for any deletion required in WHO SSC

Any deletion required in existing WHO SSC		
Category	**No**	**In %**
Nursing staff	13	100
Technician	4	100
Anaesthetist	6	100
Surgeons	5	100
Total	28	100

No respondent was found to suggest any deletions in components of WHO Surgical safety check list. All respondents were found to believe that all components of check list are very specific and relevant.

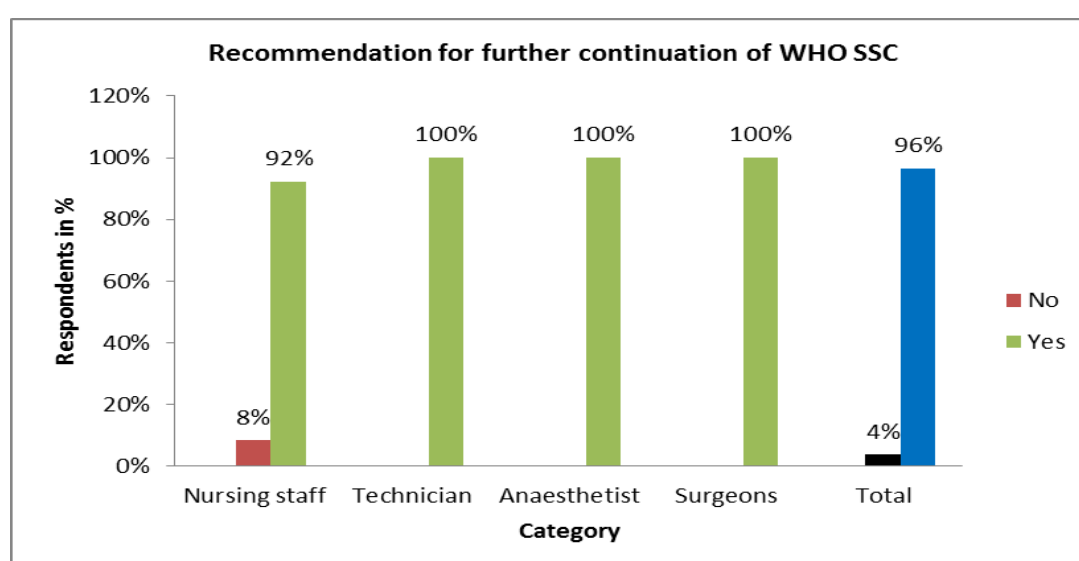**Recommendation for further continuation –**

Figure 9 Recommend for further continuation of WHO SSC

96% of respondents suggested for further continuation of WHO Surgical Safety Check list. They perceive that it is a good tool for patient safety, error prevention, better communication and teamwork.

SECTION 2.06 DISCUSSION

The acceptance and perceptions of Surgical team members towards WHO surgical safety Check list on various aspects are determined during the study. The findings suggest that the WHO Surgical Safety Check list is very easy to use, less time consuming as well as it improves operating room safety by increasing communication and team work among all members of different category (i.e. Surgeons, Anaesthetists, Technicians and Nurses) involved in complex surgical setting. 82% team members think that WHO SSC does not take long time to complete. Amongst technicians who were interviewed 50% felt that it takes long time to complete and required attention as this may lead to causal attitude toward use of surgical safety check list.

Most personnel thought using the WHO Surgical Safety Checklist is beneficial. 75% team members are fully aware about benefits of WHO surgical safety check list. Another finding that 92% nurses recommended for further continuation of the check list. The findings support the results of study conducted by **Juan J Delgado Hurtado et al** to know the acceptance of the WHO Surgical Safety Checklist among surgical personnel.

93% surgical personnel think that WHO SSC don't cause any obstruction in surgical care work flow. The remaining 7% thinks that it causes obstruction in their workflow. 25% technicians and 8% nursing staffs are included in these 7% who thought the check list causes obstruction in process flow. Personnel who working in hospital where general surgeries performed, think that Check list cause obstruction in working process flow because most of cases marking of surgical site is not required, no >500 ml blood loss and minor chances of critical events in general surgeries, so personnel think that 19 check points mentioned in WHO SSC cause obstruction in their surgical work flow. The al staff from hospitals where super specialty surgeries performed thinks that it doesn't cause any obstruction in surgical work flow.

The team work and communication was considerably good among same category (Surgeons-Surgeon, Anaesthetist- Anaesthetist, Technician- Technician and Nurses- Nurses) of team members before use of check list but after using the WHO SSC there is significant change perceived in inter category team members regarding communication and team work. That shows the team work as well as communication among whole surgical team has been improved by using WHO SSC. 23% (Mean value- Before implementation "3.61" and After

Implementation "4.44") and 16% (Mean value- Before implementation "3.88" and After Implementation "4.50") improvement in communication and team work respectively and 30% (Mean value- Before implementation "3.36" and After Implementation "4.36") improvement in level of motivation. Improvement by almost one third (32%) is perceived (Mean value- Before implementation "3.39" and After Implementation "4.46") in error prevention practices of surgical team members after using the check list. This finding can be correlated to the WHO pilot study conducted by **Alex B Haynes and team,** which demonstrated that the use of a simple surgical checklist, developed by WHO, can lower the incidence of surgery related deaths and complications by one third during major operations.

Surgeons and anaesthetist feel that some additions like a check point for availability of implants, check point for Nil by Oss and a column for post operative instructions are required in existing WHO SSC to make it more effective. No one has suggested any deletion from total 19 check points present in existing check list.

68% feel that periodic training is required for effective implementation of WHO surgical safety check list though 32% feel that only one time training is sufficient for effective implementation of SSC and no need of periodic training for effective implementation. The results of the survey suggest that the WHO Surgical Safety Check list is an effective tool for patient safety by improving teamwork and communication among surgical team members. The level of motivation also has increased among team. The check list is very easy to use and it doesn't take more time to complete. All members recommended WHO SSC for further continuation in the hospitals.

SECTION 2.07 RECOMMENDATIONS

WHO surgical safety check list has been observed as a very effective tool to increase operating room safety. WHO surgical safety check list prevents around one third of surgery related mortality and post operative complications by improving communication and team work among all surgical team personnel. In this study 36 surgical personnel surveyed to know their perception towards WHO Surgical Safety Check list and its acceptance among them by framing structured questionnaire. On the basis of study findings followings major recommendations are suggested –

- As check list is very easy to use and applicable for all kind of surgical OT i.e. OT for general surgeries and OT for Super specialty surgeries, so all hospital should follow the WHO SSC.

- The effective implementation of WHO SSC check list require support from top management of the hospital and the involvement of all surgical team members to achieve a common goal of operating room patient safety.

- The briefing and debriefing should be carried out for better results and effective communication & team work. .
  - As briefing is carried out before the Sign In stage, so it helps in to know who all the team members for particular surgical case are, the plan for the particular case can be discussed in advance among all team members. Any doubt of surgical team member can be cleared in advance. Any anticipated event or risk can be highlighted.
  - Debriefing should be performed after time out stage, before all surgical team members leave the operating room. It helps to learn that what went well and what didn't. Note down the positive as well as negative points which happen during surgery. It helps in learning for next similar cases.

- As there are different set-ups for general and super specialty surgeries, the check list should be customised according to with the help of all surgical team members to avoid obstructions in workflow and time consumption in unnecessary checks.

- Before implementing the check list in any hospital, the objectives and benefits of implementation of surgical safety check list should be clear to all team members. Team trainings are required for such clarity.

- Periodic training and meeting should be carried out for all surgical team members so that any updates (additions and deletions) in check list can be communicated to all team members. A new effective plan for use of Surgical safety check list can be come out with this kind of session.

SECTION 2.08 CONCLUSION

The WHO surgical safety check list is a good initiative towards the patient safety in operating room. WHO surgical safety check list has significant effects on reducing surgical related mortality and morbidity by improving team work and communication among the surgical team members. The findings of this study reveals that the WHO surgical safety check list is very much acceptable among all surgical team members and the all personnel perceived that the communication and team work among senior and junior team members had been improved significantly. 23% improvement in Communication (Mean value- Before implementation "3.61" and After Implementation "4.44") and 16% improvement (Mean value- Before implementation "3.88" and After Implementation "4.50") in teamwork perceived by all team members according to study findings. The staffs also perceive themselves more motivated after using the WHO Surgical Safety Check list. There should be periodic training given to the staff for its effective implementation and make them well aware about benefits of WHO SSC. All surgical team members who were surveyed perceive that operating room safety has been improved by using surgical safety check list. The effective implementation of WHO SSC check list require support from top management of the hospital and the involvement of all surgical team members to achieve a common goal of operating room patient safety. As there are different set-ups for general and super specialty surgeries, the check list can be customise according to the need by involving all surgical team members to avoid obstructions in workflow and time consumption in unnecessary checks. Therefore equipping healthcare providers with high performing teams and providing them with tools to improve communication and patient safety may be the recipe for reliable improvements in safety culture and patient outcomes in surgery.

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APPENDICES-

I. Questionnaires for all surgical team members -

<u>**WHO Surgical Safety Check List –Perceptions of Operating Team**</u>

Questionnaires for Surgical Team members

Date- ……………

Name - .... Age................. Gender ....

Designation.. Related Department ....

Hospital - ....

Q.1 Do you think that WHO surgical Safety Check (SSC) List is easy to use?

☐ Yes   ☐ No

Q.2 Do you think that WHO Surgical Safety Check (SSC) list takes long time to complete?

☐ Yes   ☐ No

Q.3 Do you think that operative room safety is improved by using WHO SSC ?

☐ Yes   ☐ No

Q.4 Do you think that the task of completing the check list creates obstruction in existing process flow?

☐ Yes   ☐ No

Q.5 Do you think that periodic training is required for its effective implementation?

☐ Yes   ☐ No

Q.6 Write any three benefits of following WHO Surgical Safety Check list?

1..

2...

3...

Q.7 Please answer the followings:

Criteria	Excellent	Very Good	Good	Poor	Very poor
	5	4	3	2	1
Before implementation of WHO SSC					
1. Communication among staff					
2. Team work among staff					
3. Motivational level among staff					
4. Error reductions practices in operating room					
After implementation of WHO SSC					
1. Communication among staff					
2. Team work among staff					
3. Motivational level among staff					
4. Error reduction practices in operating room					

Q.8 Please rate the followings-

score	Excellent	Very good	Good	Poor	Very Poor
	5	4	3	2	1

- **Before implementation** of WHO Surgical Safety Check list -

Communication Matrix				
	Surgeon	Anaesthetist	Technicians	Nurses
Surgeons				
Anaesthetist				
Technicians				
Nurses				
Team work Matrix				
	Surgeon	Anaesthetist	Technician	Nurses
Surgeon				
Anesthetise				

Technician			
Nurses			

- **After implementation** of WHO Surgical Safety Check list –

Communication Matrix			
	Surgeon	Anaesthetist	Technicians	Nurses
Surgeons				
Anaesthetist				
Technicians				
Nurses				
Team work Matrix			
	Surgeon	Anaesthetist	Technician	Nurses
Surgeon				
Anesthetise				
Technician				
Nurses				

Q.9 Do you think some addition required in existing check list ?

☐ Yes   ☐ No

If yes, then what are they?

………………………………………..……………

………………………………………..……………

Q.10 Do you think any deletion required in existing check list ?

☐ Yes   ☐ No

If yes, then what are they?

………………………………………..……………

………………………………………..……………

Q. 11 Will you recommend it for further continuation?

☐ Yes   ☐ No