

**Analysis of barriers to implementing the WHO Surgical
Safety Checklist in multiple tertiary care hospitals of
Peshawar**



SUPERIOR UNIVERSITY

Faculty of Allied Health Sciences

The Superior University, Lahore

**Analysis of barriers to implementing the WHO Surgical Safety Checklist in
multiple tertiary care hospitals of Peshawar**

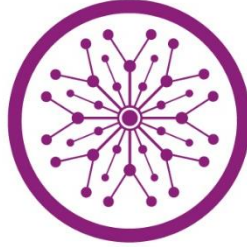


SUPERIOR UNIVERSITY

**Thesis Submitted to
The Superior University Lahore
In Partial Fulfillment of the
Requirement for the Degree of
Master of Science in Allied Health Sciences**

**By
IMAD UD DIN KHAN
Roll No. SU91-MSAHW-S23-054
Session: 2023-2025
Faculty of Allied Health Sciences**

**Analysis of barriers to implementing the WHO Surgical Safety Checklist in
multiple tertiary care hospitals of Peshawar**



SUPERIOR UNIVERSITY

Thesis Submitted to

The Superior University Lahore

In Partial Fulfillment of the

Requirement for the Degree of

Master of Science in Allied Health Sciences

By

IMAD UD DIN KHAN

Roll No. SU91-MSAHW-S23-054

Session: 2023-2025

Faculty of Allied Health Sciences

Author's Declaration

I hereby state that my MS thesis titled “**Analysis of barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals of Peshawar**” is my work and has not been submitted previously by me for taking any degree from this University, **The Superior University, Lahore**, or anywhere else in the country/world. At any time if my statement is found to be incorrect even after my graduation, the university has the right to withdraw my MS/M.Phil. degree.

Imad Ud Din Khan

Date: _____

Plagiarism Undertaking

I solemnly declare that research work presented in the thesis titled “**Analysis of barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals of Peshawar**” is solely my research work with no significant contribution from any other person.

Small contribution/help wherever taken has been duly acknowledged and that complete thesis has been written by me. I understand the zero-tolerance policy of the HEC and University, **The Superior University, Lahore**, towards plagiarism. Therefore, I as an author of the above-titled thesis declare that no portion of my thesis has been plagiarized and any material used as a reference is properly referred/cited. I undertake that if I am found guilty of any formal plagiarism in the above-titled thesis, even after awarding of MS/M.Phil. degree, the University reserves the rights to withdraw/revoke my MS/M.Phil. degree and that HEC and the University have the right to publish my name on the HEC/University website on which names of students are placed who submitted a plagiarized thesis.

Student/Author Signature: _____

Imad Ud Din Khan

Research Completion Certificate

This is to certify that the thesis entitled “**Analysis of barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals of Peshawar**” submitted by “**Imad Ud Din Khan**” has been accepted towards the partial fulfillment of the requirement for “**MS Allied Health Sciences**”. The quality of the work contained in this thesis is adequate for the award of degree.

Signature: _____

Supervisor Name: Dr. Tasra Bii

Designation: Assistant Professor

Certificate of Approval

This is to certify that the research work presented in this thesis, titled “**Analysis of barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals of Peshawar**” was conducted by “**Imad Ud Din Khan**” under the supervision of “**Dr. Tasra Bibi**”

No part of this thesis has been submitted anywhere else for any other degree. This thesis is submitted to the Faculty of Allied Health Sciences, The Superior University, Lahore in partial fulfillment of the requirements for the degree of Master of Science in the field of “**Allied Health Sciences**” in Faculty of Allied Health Sciences at The Superior University, Lahore.

Student Name:

Signature: _____

Examination Committee:

Session Chair:

Signature: _____

a) External Examiner:

Signature: _____

b) Internal Examiner:

Signature: _____

c) Supervisor: Dr Tasra Bibi

Signature: _____

d) PL/HOD: Dr. Hafiz Shehzad

Signature: _____

e) Dean: Prof. Dr. M. Naveed Babur

Signature: _____

f) Controller of Examination: Dr. M. Haris

Signature: _____

DEDICATION

This research is dedicated to my parents, and siblings. People who never stop believing in me and who along **ALLAH ALMIGHTY** have been my

“FOOTPRINTS IN THE SAND”

That is

MY PARENTS

Whose prayers have been a force behind all my inspirations and made me successful in all fields of life. They gave me everything but asked for nothing.

ACKNOWLEDGEMENT

In the name of Allah, the most Gracious, the most Merciful.

I am extremely thankful to Almighty ‘Allah’ Who is the entire source of knowledge and wisdom endowed to mankind, for providing me with the acumen and vision to complete this endeavor.

I would like to express my profound gratitude to my supervisor for his wise counsel and encouraging attitude towards this study. I am extremely grateful to him for immensely facilitating me during my study period by ensuring the provision of favorable circumstances and conducive environment. This project would not have been possible without his support and expert guidance.

In the end, I would like to extend my deepest gratitude to my family members. Without their encouragement, I would not have been able to complete this endeavor.

Imad Ud Din Khan

Table of Contents

Faculty of Allied Health Sciences	i
The Superior University, Lahore	i
Author's Declaration	i
Plagiarism Undertaking.....	ii
Certificate of Approval.....	iv
DEDICATION	v
LIST OF TABLES	viii
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS	xi
INTRODUCTION.....	1
OBJECTIVE.....	16
Chapter 2	17
LITERATURE REVIEW	17
Chapter 3	27
Chapter 4	29
RESULTS.....	29
Chapter 5	57
DISCUSSION	57
CONCLUSIONS.....	61
Limitation	61
Recommendations	61
REFERENCES.....	62
APPENDICES.....	67
URDU CONSENT FORM.....	68
DEMOGRAPHICS FORM & QUESTIONNAIRES	69
PERMISSION LETTER	70
PLAGIARISM REPORT	72

LIST OF TABLES

Table No.	Description	Page
Table 1: Age.....		29
Table 2: Education Level		29
Table 3: Have you attended any training regarding SSC [Surgical Safety Checklist]?. 30		
Table 4: When did you receive your training regarding SSC after your hiring/changing department?		31
Table 5: Do you observe any lack of professionalism and work ethics in your colleagues regarding SSC?		39
Table 6: Do you receive any motivation from your colleagues?		40
Table 7: Does your team leader provide a learning environment in the OT?		41
Table 8: Do your colleagues share their learning experiences after attending training with you?		42
Table 9: Do senior surgeons/staff nurses/OT technologists encourage and facilitate you in adhering to the SSC?		43
Table 10: Do you feel that incomplete SSC is due to your colleague's negative response and attitude?		44
Table 11: Who is the person most often left out or ignored during SSC completion/marketing time?		45
Table 12: Fig 16: Do the surgeon and other staff in rush cause delays in SSC completion?		46
Table 13: What is the main reason that negatively impacts team dynamics in the OT?. 47		
Table 14: Is there any audit done by the hospital regarding SSC?		48
Table 15: What is the gap between the audits?		49
Table 16: Is there any poster/leaflet of SSC exhibited in the OT?.....		49
Table 17: Is there any training provided by the hospital regarding SSC?		50
Table 18: Are all the instruments, equipment, and other supplies available enough in each OR?		51
Table 19: Are there any penalties for not adhering to the SSC?		51
Table 20: Does the hospital have a dedicated team for monitoring SSC adherence?.....		52
Table 21: Is there any feedback mechanism in place for reporting issues with SSC?		52

Table 22: Does the hospital administration support the use of the SSC?	53
Table 23: Are resources [Time, Staff] allocated adequately for SSC adherence?	53
Table 24: Does the hospital conduct regular reviews of SSC compliance?	54
Table 25: Are there any incentives for teams that consistently adhere to the SSC?	54
Table 26: Does the hospital provide sufficient materials and tools [e.g., printed checklists] for SSC use?	55
Table 27: Is there an established protocol for emergency surgeries that incorporates the SSC?	55
Table 28: Does the hospital culture prioritize patient safety and the use of the SSC? ...	56
Table 29: Does hospital administration visibly promote and support the SSC?	56

LIST OF FIGURES

Figure No.	Description	Page
Figure 1:	Designation.....	29
Figure 2:	What is the main purpose of the SSC?	31
Figure 3:	Do you attend the training provided by your hospital every time?	32
Figure 4:	Do you think SSC is not useful at all and imposed on you?	33
Figure 5:	What is the reason you often skip filling out the SSC?	34
Figure 6:	Have you encountered any difficulties in understanding the SSC?.....	35
Figure 7:	Do you believe that the SSC improves patient outcomes?	36
Figure 8:	Does your energy level decrease as the surgical list goes on?	37
Figure 9:	Which section of the SSC do you often complete?	38
Figure 10:	Do you observe any lack of professionalism and work ethics in your colleagues regarding SSC?.....	39
Figure 11:	Do you receive any motivation from your colleagues?	40
Figure 12:	Does your team leader provide a learning environment in the OT?.....	41
Figure 13:	Do your colleagues share their learning experiences after attending training with you?	42
Figure 14:	Do senior surgeons/staff nurses/OT technologists encourage and facilitate you in adhering to the SSC?.....	43
Figure 15:	Do you feel that incomplete SSC is due to your colleague's negative response and attitude?	44
Figure 16:	Who is the person most often left out or ignored during SSC completion/marketing time?	45
Figure 17:	Fig 16: Do the surgeon and other staff in rush cause delays in SSC completion?	46
Figure 18:	What is the main reason that negatively impacts team dynamics in the OT?	47

LIST OF ABBREVIATIONS

WHO	World Health Organization
OT	Operation Theater
OR	Operating Room
SSC	Surgical Safety Checklist
CSSD	Central Sterile Service Department
FDA	Food and Drug Administration

ABSTRACT

Background: The WHO [2008] Surgical Safety Checklist [SSC], has been greatly promoted worldwide as an improved tool for standardizing communication, teamwork, and adherence to essential safety practices during surgical procedures to increase patient safety. However, implementation of the SSC in lower and middle income country like Pakistan is highly challenging despite its proven benefits to reduce surgical complications and mortality. The objective of this study is to identify and analyze the barriers to the effective implementation of the WHO SSC in many tertiary hospitals of Peshawar, Pakistan. The paper investigates how these prevent the adoption or consistent use of the SSC, toward informing context specific strategies to enhance surgical safety outcomes.

Methodology: For this purpose cross sectional descriptive research study at Maqsood Medical complex Peshawar was used. For sample size, Slovin's formula estimates a total of 254 participants, including physicians, nurses, anesthesia staff, OT technologists and OT managers. Structured questionnaires were used to collect the data from individual experiences, interprofessional dynamics and organizational factors that affect SSC implementation. The Institutional Review Board of Superior University approved the ethical approval and informed consent was confirmed from all participants. IBM® SPSS® Statistics, Version 29 was used to perform data analysis with the use of descriptive and inferential statistics.

Results: Various key barriers to the consistent application of the WHO SSC in the tertiary care hospitals of Peshawar were identified. 23.8% indicated high levels of resource constrains including shortages of materials, staffing and equipment as a major limitation. Furthermore, 26.2% of the participants replied that the compliance reviews were infrequently conducted, suggesting that there was not sufficient oversight and accountability. Even though 76.2% of respondents stated they received incentives for SSC adherence, the degree of inconsistency in this provided incentive structure offers space for improvement. Moreover, only 47.6% of respondents confirmed full integration of the SSC within the emergency surgery protocols and thus a gap in the use of the SSC in high stakes situation. Generally, the supporters of SSC saw hospital culture and

leadership support to the initiative in a positive light, with 81% of the respondents agreeing that the administration promoted the use of SSC visibly. The strong opinion was however complemented by a minority dissenting voice [4.8 % disagreeing and 14.3 % neutral], specifically that stronger cultural reinforcement of patient safety values is required. As other barriers, there was lack of staff involvement, improper training, reluctance to change and vague communication about the benefit of the SSC.

Conclusion: There is a complex interaction of resource constraint, cultural and leadership deficiencies and protocol inadequacy that prevent the implementation of the WHO Surgical Safety Checklist in Peshawar tertiary care hospitals. These barriers need dealing with in various ways, from better use of resources, blanket emergency protocols, greater leadership support and staff training, targeted. These findings emphasize the need for context specific strategies in overcoming unique low resource challenges for transformative innovations to be achieved. Awareness of these barriers can help in achieving sustainable adoption of the SSC in Peshawar and similar areas, leading to an improvement in surgical safety and patient outcomes.

Chapter 1

INTRODUCTION

A checklist is an organized tool designed to help users identify, plan, evaluate, or confirm various tasks or items. It serves as a practical visual or verbal guide, assisting individuals in managing the limitations of short-term memory. Among the earliest well-known examples of checklists was its application in the process of central venous catheter insertion. [1]

In 2009, the World Health Organization's Patient Safety Program, Safe Surgery Saves Lives, went on to create a Surgical Safety Checklist [1,2]. More than 310 million surgical procedures are carried out worldwide every year and in order to improve patient safety and surgical accuracy. Surgical Safety Checklist is a simple way to standardize some aspects of patient care[3]

The World Health Organization [WHO] surgical safety checklist is the most widely used surgical checklist, comprising 19 items in three domains: state that these, are prior to induction of anesthesia [sign in], prior to surgical incision [time out] and prior to the patient leaving the operating theatre [sign out] [4]. Eight hospitals around the world used this surgical safety checklist primarily which reduces major complications from 11% to 7% immediately [3].

However, the implementation and maintenance of using the WHO Surgical Safety Checklist has been difficult in many settings [5,6] In 2008, the WHO Surgical Safety Checklist was a similar tool to improve safety in the operating theatre. It encourages key safety checks to be performed at three critical points: Also, administration of diabetes medications before anaesthesia is administered, before skin incision, and before the patient leaves the operating room [4].

The WHO Surgical Safety Checklist has great potential benefits but its use in practice has been variable. Barriers to successful implementation of the checklist in hospitals worldwide including in low- and middle-income countries such as Pakistan have been studied by several [7].

The potential benefits of the WHO Surgical Safety Checklist have been well documented, but implementation of the checklist in the actual setting has been patchy. The barriers to successful implementation of the checklist in hospitals across the world have been explored in several studies including hospitals in low-and middle-income countries like Pakistan [7].

The World Health Organization Surgical Safety Checklist is an enrolled in the improvement of patient safety performed in surgical process. Nevertheless, it continues to be implemented worldwide and despite this, there are major challenges of ensuring effective adoption and utilization of the checklist from a resource constrained setting. The key barriers in implementation of WHO Surgical Safety Checklist in tertiary care hospitals of Peshawar, Pakistan are studied here in [7].

The World Health Organization Surgical Safety Checklist is essential in helping us to improve patient safety during surgical procedures [8]. Covers important parts including team introductions, review of critical steps, and verification of equipment and supplies before and after surgery [8]. The checklist has been extensively implemented and associated with better surgical outcomes: reduced mortality and morbidity. [8,9].

Unfortunately, though, research suggests that compliance with the checklist is anything but standard with items such as absent team members and lack of pausing and focusing on the checks. This research paper aims to study the barriers to the proper implementation of the WHO Surgical Safety Checklist in the tertiary care hospitals in Peshawar, Pakistan.

First of all, Surgical Safety Checklist was developed in order to help the surgeon to successfully end the life of patients. However, it is also known that Surgery is associated with a large risk of complications, such as infection, trauma, excessive bleeding, structural or anatomical damage and death [10]. In the developed world, perioperative deaths are estimated 0.4–0.8% and the rate of major complications 3–17%. These [almost] half of the complications can be reduced by following a systematic and organized points table of rules and safe steps in surgery and improving communication in the surgical team. The WHO had structured the SSC to reduce the major complication

and mortality rate to overcome this problem [3,11].

As per the development of the SSC, major complications, mortality and morbidity have significantly come down [12]. Results of the internationally conducted studies. Nevertheless, how and why the SSC was introduced and implemented is not entirely clear, and ultimately led to these staggering of results. This contributes to SSC implementation improvement and as such, contribute to improvement of interdisciplinary communication and understanding among the OR staff somehow helped to realize the improvements of these [11,13]. Therefore, the aim of this study was to evaluate the various barriers that are hindering the implementation of WHO SSC in the tertiary care hospitals of Peshawar, Pakistan.

Some in the healthcare system already understand that barriers prevent successful implementation and effective use of the SSC in the developing world [3]. However, these barriers can be Organizational, Interprofessional and individual. Other researchers have previously reported the OT staff's perception on organizational policy repetition of same SSC, and delay in surgery start time as individual barriers [11]. Decreased or insufficient involvement for the OR staff, engagement, communication, and verification are included in the interprofessional barriers [14]. Some of identified interprofessional main barriers are hierarchical barriers that mainly consisted of lack of assertiveness and influence combined with preoccupation with other tasks [15]. However, both organisational barriers and also its contributing factors [lack of training & monitoring, lack of Nurses and OT Technologists, lack of leadership in OR staff] are also significantly contributing. Also they lack of communication to OR requirement. Therefore, the OR staff may not support changes that may best suit the organization and may be unwilling to amend monitoring and changing procedures [16].

Previously, a number of barriers to implementation of the WHO Surgical Safety Checklist have been recognized, including lack of leader commitment, poor teamwork and communication, inadequate training and education, and resistance to change [7,13,17,18].

A major barrier is the lack of clinical motivation for healthcare personnel to strictly

conform to the checklist. Clinicians often regard the checklist as an administrative burden that gets in the way of surgical workflow, rather than an aid for improving patient safety [19,20].

Hierarchical culture is yet another main issue as many healthcare settings are hierarchical hinder open communication together with teamwork. If junior staff identify potential safety issues, they may hesitate to speak up or challenge more senior colleagues [11].

There are also regional differences [found to impact implementation]. Studies of checklist use in low- and middle-income countries such as Pakistan demonstrate that inadequacies such as lack of resources, heavy workloads and unavailability of dedicated personnel to oversee and also to monitor checklist compliance are major issues [21].

The evidence does seem to indicate that there is need for a multimodal approach to effectively implement the WHO Surgical Safety Checklist, as it addresses all barriers found at individual/personal, interpersonal and organisational level. For instance, securing strong leadership support, optimising checklist content and workflow integration, providing comprehensive training and facilitating a transparent, team spirit and continuous improvement culture [22,23].

Various barriers for implementation of WHO Surgical safety Checklist in tertiary care hospitals of Peshawar, Pakistan exist. Adherence to total completion of the checklist was the major limiting factor. Another key barrier to the implementation of the checklist is a lack of a streamlined and cohesive approach pursued in implementing the checklist, in the complex and dynamic operating theatre environment [23]

Deviation from the WHO Surgical Safety Checklist can have life threatening repercussions, negatively impacting patient safety and dramatically increasing the risk of surgical adverse events. For instance, if you fail to finish the checklist or skip important steps, you can end up disrupting communication among surgical teams, which in turn can escalate your chances of error, like wrong site surgery, retained surgical items or medication error [WHO Surgical Safety Checklist, 2024, p.14]. Errors in this verification process can lead to significant patient harm including longer hospital stays,

increased healthcare costs, and death [24].

The rationale behind each checklist item and the possible effects of exclusion are stated in the WHO Surgical Safety Checklist, 2024. In addition, it is likely that inconsistent checklist use will promote a complacent culture in the operating room, undermining the total commitment to patient safety because each procedure may not be performed in a rigorous manner everyday.

Multiple factors contribute to the nonadherence to the checklist beyond immediate patient harm, but include organizational consequences. Poor checklist compliance in hospitals may put them at risk of greater medico legal risk and reputational damage [25]. It is discussed that checklist adherence for medico legal issues is very much important. In addition, failure on the part of the hospital in utilizing the checklist may also impede implementation of compliance with accreditation standards and an assurance of a commitment towards quality improvement [25]. All of this could hurt their standing with the healthcare community, and limit future opportunities for growth and development. Lastly, non adherence may cause less staff morale and job satisfaction, as healthcare workers get frustrated and disempowerment when their discomforts about improving patient safety were not supported. But it can lead to staff turnover, and negative work environment.

The general principles of patient safety and implementation issues should be adequately trained on the surgical teams and hospital administrators. Another barrier is resistance to change by surgical teams that may view the checklist as an unneeded burden [5].

On the contrary, evidences have shown that adherence to the WHO Surgical Safety Checklist will improve significantly surgical procedure safety and patient outcomes and decreasing associated adverse events. Using a surgical checklist has been demonstrated to be strongly associated with a reduction in surgical complications such as infections, bleeding and unintended retained items [e.g. sponges, instruments] [26]. The impact of surgical checklists on patient outcomes is discussed in this study. The checklist ensures that key safety steps are conducted in the same way every time, helps to reduce human error, and promotes communication among surgical teams [17].

Pugel et al. points out that the functionality of the SSC in providing effective communication and minimizing complications. From this stem a safer surgical environment and reduced risk of preventable harm to patients [17].

In addition, studies have demonstrated that adherence to the SSC positively impacts teamwork and communication inside the operating room. Having a structured framework for communication using the checklist allows everyone on the team to be on the same page, and have the same plan for the surgery [21].

A second study explored the evolution and consequences of the SSC over a decade. Enhanced communication could also help to prevent misunderstandings and errors and so improve patient safety. Additionally, the SSC focuses on creating an atmosphere of safety in the operating room since vigilance and adherence to standard procedures are emphasized. As hard as it seems, its reasonably straightforward purpose is applicable to increasing awareness of potential risks and a deeper interest in patient safety among surgical staff [21]. Finally, the use of the SSC allows for continuous quality improvement by giving valuable data to know rates of adherence and areas for improvement. Using this data, you are able to recognize and determine systemic problems that can potentially lead to surgical errors, which will help improve patient safety [21,27].

Other main barriers are insufficient supervision and accountability, lack of coordination among different health care providers, and the absence of required resources for checklist implementation [e.g., checklists, pens, lighting and noise control] [22,28].

The main factors preventing implementation of the WHO surgical safety checklist were divided up into 3 major categories; personal/individual, interpersonal, and organizational. Lack of motivation, poor understanding of benefits, and resistance to change were personal/individual barriers; insufficient training was a process barrier. Poor teamwork, ineffective communication and hierarchical culture existed in the operating room, which were the interpersonal barriers. Some organisational barriers were lack of leadership support, lack of resources and the organisational culture which did not integrate it well enough into existing workflows [1,29].

Personal/individual Barriers:

Surgeons are often cited as impediments to the successful implementation of the WHO Surgical Safety Checklist, but personal barriers between theatre staff may be just as important. Individuals' attitudes, beliefs, and perceptions about the checklist, and its potential to increase patient safety often create the barriers to checklist use. A big barrier is a lack of awareness and understanding of what the checklist is for and what it offers. If staff does not fully understand how a checklist contributes to better patient outcomes, that staff might not fully embrace the use of the checklist. Another situation in which errors and inconsistency in the use of the checklist may happen is insufficiency in education and training on how the checklist must be used and performed. If staff are not trained adequately, they would not understand the rationale behind including every checklist item and how each item contributes to patient safety [11].

Lack of motivation and perceived benefits among staff. To many clinicians, the checklist is simply viewed as an additional administrative distraction to surgical workflow rather than a way to enhance safety. Resistance to change long entrenched practices and procedures. Surgeons and anaesthetists can be notoriously reluctant to change procedures, let alone adopt new ones, and have long standing routines. In other cases, inadequate training and education in the rationale and correct use of the checklist [29].

Another key personal barrier is the lack of dedication to patient safety principles. Other staff of some organization may perceive the checklist as a another bureaucratic burden rather than valuable document that prevents adverse events [30]. Adopting this mindset can result in an unwillingness to incorporate the checklist into common day to day surgical practices. Moreover, individual values or perceptions of teamwork and communication can also cause a person to follow a checklist. If staff members haven't been training in open communication and working together, they may likely be less interested in working through the checklist process. Also, there can be a big personal barrier in resistance to change, in general. Adopting new processes in and of itself can

be difficult, even if they are suggested by evidence. Because surgical teams can develop routine behaviors and may be reluctant to change [31].

The latter facing very much larger personal barriers from operating theatre staff in implementing the WHO Surgical Safety Checklist effectively. The main set of these barriers is based on the individual attitudes, beliefs and perceptions of the checklist and its functionality. The lack of motivation and understanding of the beneficial of the checklist play a key role [11]. Clinicians regard the SSC as an additional administrative burden that disturbs formalized workflows, rather than as a tool for improving patient safe. Such perception can result in reluctance to accept fully checklist principles and the resistance to change [3]. Additionally, poor training and education on the reason for, and correct utilization of the checklist, can hinder the successful application of this tool [Treadwell et al., 2013]. And staff may not fully understand the importance of any one checklist item, or how each applies to the bigger picture of patient safety, resulting in frequent incomplete and inconsistent use [30].

One other very important personal barrier is the natural resistance of all established practices and procedures to change. In many surgical teams, routine develops and resistance to change exists, particularly if there is a body of evidence for the effectiveness of the new process [31]. The resistance can be shown as one dismissing the importance of checklist or deliberately breaking up with it's step by step procedures. Individual factors such as workload pressure, shortage of time and a perceived shortage of resources can also accentuate these personal barriers. Checklist completion may not be a priority for staff if they feel overwhelmed or under resourced, and therefore view it as less important than other work which must be done. Targeted education, training and leadership support of these personal barriers is critical to create a safety culture and to ensure WSO SSC compliance on a consistent basis [24].

Overcoming these personal barriers to checklist use necessitates a combination of targeted education and training programs, clear articulation of the checklist's benefits, and nurturing culture in which rehearsals for each operation are understood by senior clinicians to be an important part of patient safety in the operating theatre. Also important is the ability to promote checklist adherence and the use of checklists in a

positive light through leadership support, role modeling by senior clinicians, and the emphasis on adopting systemic rather than individual initiatives [20].

Lack of coordination between different healthcare providers involved in the surgical process and ineffective communication. Not all the time surgeons, anaesthetists, and nursing staff communicate clearly or work in harmony leading to the difference in implementation of the checklist [32].

Additionally, a deficiency in communication and coordination among various healthcare providers involved in the surgical process can interfere with the implementation of the checklist [33]. Surgeons or anaesthetists may not speak fully; or nursing staff may not speak at all; or they work unevenly together, creating gaps in the impact of the checklist and in the joint understanding of the importance of the checklist. Lingard provides examples of this issue and classifies the communication failure types in the operating room as being hazardous for patient safety. Even though Lingard does not focus on the SSC per se, its communication patterns probably also influence checklists. Furthermore, in diverse healthcare settings, communication challenges can be compounded by cultural and language barriers. Such barriers can cause misunderstandings, misinterpretations of the checklist items and essentially impair patient safety [33].

A poor team and the lack of comprehension of who should be using the checklist and to what degree are also noted. If surgical teams do not work as a team and as a whole, where each member participates in the checklist process, the checklist process loses its effectiveness [20].

Lack of a shared understanding of why the checklist matters and by stretched teams. The effect of checklist in surgical teams will erode when they are not running cohesively and each member of the team is not active during the checklist [20].

Further, the true effectiveness of it is compromised by its lack of a true team-based approach in which all team members are truly engaged in the checklist process. The potential for the checklist to positively impact outcomes may be weakened when surgical teams are not working in the same direction together, a shared commitment to safe patients [13]. These interpersonal barriers can be addressed by creating the culture

of open communication, teamwork and shared responsibility of patient safety in the operating theatre. Its suboptimal implementation can also be a result of behavioral barriers such complacency or disengagement with the checklist process. There are various factors that can cause these behaviors: not believing that the checklist is effective or perceiving that it does not apply to one's role [34].

Secondly, interpersonal barriers within the operating theatre environment similarly militate against valid implementation of the WHO Surgical Safety Checklist. The hierarchical culture that frequently prevails in surgical settings with junior staff reluctant to talk up or question more senior colleagues, even if they do have concerns about safety, is a key factor. Yet, by sealing that power dynamic, open communication and collaborative teamwork, both prerequisites for executing the checklist successfully, can be inhibited [20].

It is also important to note that how communication and coordination among multiple healthcare providers participating in the surgery process is delivered clearly can hinder the checklist implementation. Doctors [surgeons, anaesthetists, etc] and their nursing staff do not always communicate well together or implement the checklist cohesively, meaning there are holes in the application and a lack of shared understanding of what the checklist is for and how to use it [29].

The checklist process can be compromised even further by not having a true team based approach with all members involved in the checklist process. The potential for the checklist to improve outcomes may be diminished when surgical teams do not work as a single coordinated team, sharing the commitment for patient safety. These interpersonal barriers can only be addressed by creating an open communication, teamworking and shared accountability for patient safety culture in the operating theatre environment. Behavioral barriers too, e.g. complacency or lack of interaction with the checklist process can hinder its proper implementation. The reasons behind these behaviors could be due to a number of things, like a disbelief in the ability of the checklist or believing that it is not focused upon what one does.

Organizational and Systemic Barriers:

However, the effective implementation of the WHO Surgical Safety Checklist is effectively hindered by organizational barriers. Checklist adoption and adherence can be severely impeded by a lack of dedicated resources, including funding, personnel, and training materials [8]. Furthermore, a perceived 'top down' approach to implementation without timely inform, and buy into of the multidisciplinary team, may result in suboptimal compliance rates.

In addition, confusing hospital policies and blurred lines of personal accountability over the filling of checklists can foment confusion and conflict on the team. Combining high staff turnover, long shifts, and the reality of staff shortages with existing time constraints makes it very difficult for healthcare professionals to choose and regularly complete the checklist before surgery commences [19].

The organisational and systemic barriers to checklist implementation underline the necessity of an integrated approach that conditions the use of resources, clarifies policy, and mobilises key players at all stages of implementation. Completion of Surgical Safety Checklist [35].

If the hospitals do not invest in the proper training and ongoing training of the staff, the hospital staff would then see the system as something additional to carry in the work as opposed to a great tool in increasing patient safety. Inconsistency in utilizing and failure to realize the full checklist potential may be induced by this [8].

However, Treadwell et al. underlines how checklist effective implementation requires sufficient, adequate resources. Moreover, it does not integrate with existing hospital procedures and documentation to make things more difficult. Without seamless combination to the surgical workflow, the checklist is likely to be viewed as an anonymous administrative task and compliance will decrease [8].

Having to navigate these organizational and systemic barriers demands a multi layered approach to things like resource allocation, policy clarity, and the inclusion of all stakeholders in the implementation process [36].

Apart from interpersonal barriers, organizational and systemic factors also impede the

successful implementation of the WHO Surgical Safety Checklist. A major barrier is the non availability of dedicated resource and support for right implementation process. The surgical checklist may not be incorporated properly into the surgical workflow because the healthcare institution does not allocate enough time, training, or financial resources into it. If this situation is not carefully planned, staff may be confused about their respective roles and responsibilities, so the use of the checklist lacks ownership and commitment amongst the stakeholders [8].

Another barrier to organisational integration is the absence of integration with current hospital procedures and documentation. Healthcare professionals will be less likely to adopt the use of the checklist if it is seen as one more logistical hurdle on the path to the operation as opposed to an integrated part of the surgical process [35].

In addition, the absence of ongoing monitoring, feedback, and continuous improvement mechanisms can further impede the sustainability of the checklist implementation [37].

However, organizational and systemic barriers are also likely to hinder effectively the WHO Surgical Safety Checklist implementation. A large barrier is that there is a lack of dedicated resources and support for the implementation process. The proper integration of the checklist into a surgical workflow may not be given enough time, training, or money in healthcare institutions. The result of this can be confused staff as to their responsibilities so far as different roles and ultimately a lack of ownership and commitment to the use of the checklist [8,37].

A second barrier is that the application is not integrated with hospital procedures and documentation. The healthcare professionals might not give high priority on the usage of checklist, if they see the checklist as a further administrative burden, instead of an integral part of the surgical process [35].

In the last place, the lack of on-going monitoring, feedback, and a system for continuous improvement can also diminish the sustainability of the checklist implementation [37].

Express Overview According to Verwey and Gopalan, another main organisational barrier is the absence of a strong audit system and performance monitoring . Checklist

implementation cannot readily be assessed for effectiveness nor can areas where improvement can be made unless there are regular audits and feedback mechanisms. Barriers to checklist use are studied and monitoring and evaluation is highlighted. This problem could be made worse when there is hardly a consequence for non compliance from the checklist by the staff [3]. Equally important, the absence of leadership support and commitment to support the process may defeat the implementation process itself. As long as hospital administrators and surgical leaders do nothing to champion the checklist, to make it a priority, then it signals that patient safety is not an area of focus. The drawbacks include this discourages staff to entirely embrace the checklist and can result in a culture of complacency. Fourth, a real lack of essential supplies and equipment as well as inadequate staffing levels can practicality reduce implementation of the checklist. If surgical teams are already stretched thin and don't have adequate resources, they may be more likely to do less of the checklist – maybe they just don't see it as a priority compared to other things that absolutely need to get done that day.

The Current Literature and SSC:

Although numerous authors have published on barriers for WHO Surgical Safety Checklist implementation globally, there is dearth of research relating to implementation of similar checklists in Peshawar, Pakistan or similar low-resource settings. However, existing studies of barriers typically focus on these in high income countries or generalize findings across a range of contexts, failing to consider the distinct challenges presented to healthcare systems in developing nations [11,19].

Resources challenges, cultural impact in healthcare practices and different levels of training and education among healthcare providers are some of these challenges. Studies such as Lim et al. and Paterson et al. provide important evidence regarding broader barriers and facilitators, but fail to provide the insider view of implementation within the particular sociocultural and economic landscape of Peshawar [11,19]. Treadwell et al. similarly offers a systematic review of impacts and implementation, but does not undertake a focused analysis of the challenges of implementation for environments with limited resources [8].

Additionally, scarce literature exists assessing the relationships between distinct levels of barriers – personal, interpersonal and organisational – in Peshawar's healthcare system. Using the framework, I explain how to reason through these barriers to determine how they interact with and influence one another, and thus identify the most effective way to intervene on each barrier. However, an example is while looks into barriers to checklist use in theatres, they do not look at the dynamics within Peshawar's operating rooms. Existing literature also does not provide high quality qualitative studies exploring Peshawar healthcare providers perspectives on SSC [3]. To tailor implementation strategies to the local context it is important to understand their experiences, beliefs, and attitudes towards the checklist. Additionally, the effectiveness of particular interventions to overcome these barriers in Peshawar needs research. General implementation recommendations exist, but evidence based strategies for specific local context are lacking.

This gap in the literature dictates a need for additional research targeting only Peshawar, Pakistan. Particularly valuable would be studies using mixed methods approaches that bring together quantitative data on checklist adherence with qualitative data from healthcare providers. This research could, for example, examine the uniqueness of Peshawar hospitals' contextual barriers to SSC implementation, and further determine which barriers are most influential on preventing SSC implementation. The results could also be used to develop contextually oriented interventions geared to improving patient safety on hospital wards in Peshawar.

In this study the groundwork has been laid in understanding the multi faceted challenges that have blocked the effective implementation of the WHO Surgical Safety Checklist in Peshawar, Pakistan. This research sets out to identify what are the key obstacles to checklist adherence and thus to patient safety, by exploring the complex interplay of personal, interpersonal and organizational barriers to adherence. The goal at the end of the day is that the results will help inform the development of interventions, targeted to the specific needs and circumstances of the Peshawar healthcare system to improve the checklist and ultimately to improve surgical outcomes. The results of this study will add to existing literature by providing an in-depth understanding of regional barriers to

patient safety in Peshawar's operating rooms, along with practical recommendations to promote a patient safety culture within its operating rooms.

Hospitals need to take a comprehensive approach to addressing these organizational and systemic barriers, which may include dedicated resources, clear policies and procedures, strong leadership support and on-going monitoring and feedback mechanisms.

In the last, the WHO Surgical Safety Checklist has been proven to have benefits but implementation in tertiary care hospitals of Peshawar, Pakistan is met with many barriers. Overcoming these barriers will be crucial for realising the full patient safety potential of this important intervention to which a holistic, individual, interpersonal and organisational approach will be necessary.

OBJECTIVE

To assess and evaluate barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals of Peshawar

Chapter 2

LITERATURE REVIEW

WHO Surgical Safety Checklist, a globally used instrument of patient safety to promote communication, teamwork and adherence to the essential safety practices in the operating area [8,11]. The checklist has been adopted worldwide in healthcare settings, and many studies have shown that it reduced surgical complications and mortality [7,8,28].

Since 2009, the WHO Surgical Safety Checklist has emerged as a cornerstone of patient safety initiatives locally and in operating rooms worldwide [1]. Its implementation has been associated with massive improvements in surgical complications and mortality [18]. Communication, teamwork, and adherence to vital safety practices will be promoted because the checklist confronts several measures that play a part in adverse events occurring in surgery. Another Study offers a detailed study of this checklist, its impacts and its implementation strategies. Despite that the evidence supports its potential effectiveness, SSC implementation has faced a number of challenges, ranging in different healthcare settings [12].

Introduced in 2009, the WHO Surgical Safety Checklist, is a landmark initiative globally in patient safety [1]. This development followed an appreciation that preventable surgical errors were occurring at an unnerving rate and the realization that safety standards have to be standardized. The focus on teamwork, communication, and the basic surgical safety steps is what keeps the culture of safety fostered by the checklist [31]. Across diverse geographical settings, studies have shown that checklist use reduces surgical complications and mortality and the checklist has become a global standard for safe surgery [8]. Fudickar et al. analyzes the checklist's impact on complication rates and communication, while providing a systematic review of its effects and implementation strategies [31].

Lack of buy-in and commitment from healthcare staff, notably surgeons, is one of the most important barriers to successful implementation of SSC. Resistance to change, a view of a checklist as a bureaucratic requirement rather than a safety enhancing tool, and hierarchical cultures can all lead to lack of staff engagement and adherence to a checklist [8].

A further important issue is the challenge of making the adjusted generic SSC locally applicable. The checklist provides a standardized framework that standardizes content and processes but is effective only when the content and processes are tailored to the

unique needs, workflows, and resources of a particular hospital [38].

Furthermore, SSC implementation is hindered by resource constraints, including constrained funding, shortages in staffing and lack of training, particularly for low and middle income countries. Tostes & Galvão et al., stated that in order to sustain and ensure the effectiveness of the checklist, these systemic issues must be addressed [39].

A major barrier to SSC implementation success is that healthcare professionals, particularly surgeons, lack buy in. In hierarchical cultures and when the culture is resistant to change, staff engagement and adherence may be eroded when those same cultures perceive the checklist as a bureaucratic requirement rather than a safety enhancer [8].

A second key challenge is the fact that the generic SSC is quite hard to tailor to local contexts. The checklist offers a standardized framework, but it must be tailored to fit individual hospital needs, workflows and resources to be effective [38].

Budgetary constraints [e.g. limited fund, staffing deficit, lack of training] are other major obstacles towards SSC implementation, especially in low and middle income countries. It is essential to address these systemic issues in order to improve the sustainability and the application of the checklist [39].

However, buy-in and commitment of healthcare professionals particularly surgeons for the successful implementation of the checklist is typically constrained by a number of barriers both at individual and organization levels. At the individual level the major barriers are issues of resistance from healthcare providers, lack of staff engagement and ownership and inadequate training. The checklist was seen by some studies providers as another administrative burden or some do not have an understanding about the importance of the checklist for patient safety [11,40].

At the organizational level, resource constraints, hierarchical cultures or, a lack of dedicated implementation strategies can prevent the proper integration of the checklist into routine clinical practice [41].

Furthermore, the successful execution of the WHO Surgical Safety Checklist should occur in a contextual manner, with different contextual challenges to and facilitators of implementation present in different healthcare settings. Which of these implementation barriers require a multifaceted approach including individual, interpersonal, and organisational interventions in order to be overcome? [8].

Implementation at the organizational level can be hindered by the lack of leadership support, misallocation of resources and the failure to integrate the checklist into current workflow hierarchy [Lim et al., 2023]. 2 The effective use of the checklist is also

hindered by a hierarchical organisational culture, which discourages openness, team-based decision making, and a sense of equity and ownership [25].

Following guidance from the WHO Surgical Safety Checklist that was first proposed in 2009, the Checklist has been widely adopted as a worldwide standard for enhancing surgical safety. A higher awareness of the growing incidence of preventable surgical errors and adverse events with their impact on patient outcomes and healthcare systems globally drove its development [42]. The framework of the checklist, focusing on teamwork, communication and adherence to essential safety steps, has been appreciated by healthcare providers all over the world and used in many varied surgical setting [24]. The global impact of the SSC has been studied by numerous reviewers who show it significantly reduces surgical complications and mortality. These results have emphasized the relevance of the checklist for improving patient safety at a relatively low cost in various countries and healthcare systems as a CBE [8].

Many studies have shown there to be strong correlation between adherence to the WHO Surgical Safety Checklist and improved patient outcome. Treadwell et al., perform a comprehensive literature review of evidence regarding dissemination of checklists with findings of decreased rates of surgical complications including infections, hemorrhaging and surgical removal of unintended objects.

Further supporting these findings, Bliss et al., 2010 finds that 30 day postoperative morbidity decreased in cases in which the checklist was used. The checklist has been advocated to reduce human error, improve team work and communication, as well as, adherence to particular security practices, making surgery safer [43].

The WHO Surgical Safety Checklist has been proven to have clear benefits, however its successful implementation is still difficult in many settings — even in tertiary care hospitals in Peshawar, Pakistan.

While widely adopted around the globe, the implementation of the WHO Surgical Safety Checklist is plagued with many challenges. Individual resistance to change among healthcare providers, including that informed by increased workload or perceptions of the checklist as irrelevant [Jain et al., 2018] have been identified in studies as barrier at care level. In addition, poor training and lack of resources, especially in low resource settings, impedes effective implementation [44].

Adapting the SSC to local contexts in ways supportive of these cultural nuances and existing workflows also represents a challenge. The presence of these barriers makes the checklist taxing to use, and highlights the requirement of customised implementation strategies, as well as formative evaluation the elimination of barriers contextually

accrued in each of the healthcare settings to assist in the integration of the checklist and help maximise its potential to improve surgical safety [3].

The widespread adoption of the SSC has, however, been hampered by different challenges in different regions of the world. However, studies have noted that there are barriers to implementation of the checklist, including resistance to change amongst healthcare providers, problems with the training and resource of the individuals that will work with the checklist, and difficulties in adapting the checklist to local contexts [19]. These challenges emphasize the importance of needs of context specific implementation strategies and ongoing evaluation of effectiveness of the checklist. In addition, the existing differences in healthcare infrastructure, cultural practices and resources availability of different countries have affected the extent of SSC implementation and its effect on surgical outcomes [44]. Achieving solutions to these global challenges will require collective action, the exchange of information, and continuous research towards optimizing the implementation of the checklist and ensuring its greatest value to support international efforts of improving surgical safety [44].

While widely adopted around the globe, the implementation of the WHO Surgical Safety Checklist is plagued with many challenges. Individual resistance to change among healthcare providers, including that informed by increased workload or perceptions of the checklist as irrelevant Jain et al., have been identified in studies as barrier at care level. In addition, poor training and lack of resources, especially in low resource settings, impedes effective implementation [25,44].

Adapting the SSC to local contexts in ways supportive of these cultural nuances and existing workflows also represents a challenge [3]. The presence of these barriers makes the checklist taxing to use, and highlights the requirement of customised implementation strategies, as well as formative evaluation the elimination of barriers contextually accrued in each of the healthcare settings to assist in the integration of the checklist and help maximise its potential to improve surgical safety [45].

The widespread adoption of the SSC has, however, been hampered by different challenges in different regions of the world. However, studies have noted that there are barriers to implementation of the checklist, including resistance to change amongst healthcare providers, problems with the training and resource of the individuals that will work with the checklist, and difficulties in adapting the checklist to local contexts [19]. These challenges emphasize the importance of needs of context specific implementation strategies and ongoing evaluation of effectiveness of the checklist. In addition, the existing differences in healthcare infrastructure, cultural practices and resources

availability of different countries have affected the extent of SSC implementation and its effect on surgical outcomes [44]. Achieving solutions to these global challenges will require collective action, the exchange of information, and continuous research towards optimizing the implementation of the checklist and ensuring its greatest value to support international efforts of improving surgical safety.

Despite extensiveness of current literature on barriers to implementation of WHO surgical safety checklist globally, no work is reported on Peshawar, Pakistan, or other resource scarce countries.

The barriers of healthcare systems in existing studies may be limited to high income countries or generalize findings across diverse settings without paying due attention to the specific challenges that would be faced by developing nation's healthcare system. Resource constraints, cultural influences on healthcare practices, and level variations of training and education among healthcare professionals are some of these challenges [46].

In addition, there is not much research on the nexus between various barrier levels – personal, social [interpersonal], and organizational – within Peshawar's healthcare system.

Some of these barriers have been studied in diverse healthcare settings, with suggestions for the successful implementation of checklists that include leadership commitment from institutional leaders to be local champions and the need for staff feedback and alignment of the checklist with its systems and processes the environment [8].

The adoption and implementation of the SSC have varied regionally depending on factors related to healthcare infrastructure, resource availability and cultural context. The checklist is widespread in surgical practice for many high income regions and has contributed to enormous improvements in patient safety [30]. Nevertheless, the difficulties of motivating consistent adherence and fitting the checklist to local requirements still persist. The role of anesthetists in formulating the SSC is discussed by Gordon et al [30]. However, in low and middle income regions, such implementation has been constrained by resource, training opportunity and awareness in health care professionals [44]. Vivekanantham et al. discusses the challenges and advantages of SSC deployment in developing countries. However, to apply implementation strategies and make the most of the checklist, it will be important to understand any variations among regions [44].

Literature on barriers to WHO Surgical Safety Checklist implementation exists worldwide, yet the current literature has a gap in research centers in Peshawar, Pakistan

or similar low resource settings. However, current studies commonly focus on barriers related to high-income countries or make broad assumptions of barriers across different contexts as Pugel et al. overlooking the particular challenges that developing nation healthcare systems face. Such as resource constraints, cultural influences on the healthcare practice, and various levels of training and education of healthcare professionals are some challenges [17].

In addition, little has been written on how various levels of barriers such as personal, interpersonal or organizational ones operate together within Peshawar's healthcare system. It is important to understand how these factors interact and impact checklist adherence to create appropriate interventions. For example, though the barriers and facilitators have been studied, they tend to generalize without a nuanced understanding that lies within Peshawar's healthcare context [11,19].

The literature gap, however, limits our ability to develop targeted approaches for reducing SSC implementation variation and for improving patient safety within this particular region. However, this research seeks to fill this gap by studying the identified barriers preventing SSC in tertiary care hospitals of Peshawar with its distinct socioeconomic and cultural environment. This thesis will examine the interplay of personal, interpersonal and organizational factors previously found to impact checklist adherence, and makes sense of these barriers within Peshawar's healthcare system. This research will identify the most important obstacles hindering the implementation of SSC in this region and inform the development of contextually appropriate strategies to improve SSC implementation and increase patient safety in this region.

Many ways have been explored in theorizing the difficulties at hand in implementing the SSC. Verwey and Gopalan conducted a study in two hospitals in Durban, South Africa, using questionnaires to assess theatre staff perceptions of barriers to SSC use [3]. They deliver a localized viewpoint on the kind of challenges that they face in that context. Their findings are, however, limited to other settings because of the narrow scope of their study. In contrast, Paterson et al. conducted a qualitative systematic review, synthesizing findings from multiple studies across various healthcare settings [19]. Given that, this approach provides a more holistic view of barriers of SSC implementation that include individual, team, and organizational factors. Yet, the breadth that this review provides may not provide the fine, context-specific details available from more localized studies such as [3].

In Verwey et al. and Paterson et al., the findings concerning the barriers of the implementation relate to staff resistance to change, lack of time, and staff perception of

irrelevance of the checklist to specific surgical procedures. Although both studies point out these challenges, Paterson et al., offers a more in-depth analysis, which divides barriers into the levels of individual, team, and organization. Categorizing SSC adherence provides a way to understand the many factors affecting SSC adherence. However, both studies are notable for an insufficient focus on cultural context. The study though is located within the South Africa context but does not examine how culture affects SSC implementation. Likewise, the scope of [Paterson et al., 2023] is too broad for cultural insights on different settings. Future research is required to examine the interaction between cultural factors with various other barriers, and how these barriers can adversely impact SSC implementation in different contexts. The qualitative systematic review approach of Paterson et al. provides a more robust, in depth and extensive analysis of the existing literature compared to the single site, questionnaire-based study by Verwey et al. The methodology difference influences the generalizability and depth in the findings. Even though the literature on coupled design provides important contributions, more research is needed that focuses on the specific challenges in working in low resource settings, where these challenges take place in the distinctive sociocultural and economic conditions of these regions [3,19].

Meanwhile, two other relevant studies from Lim et al. and Tostes and Galvão draw separate conclusions to the present study. The findings of our research are analysed and compared with studies on lean manufacturing and lean principles in Healthcare management.

An integrative review on facilitators and barriers to SSC implementation at three levels, including individuals, professions, and organizations, was conducted by Lim et al. [Lim et al., 2023]. They reviewed studies across a broad range of studies in a number of different surgical specialties in developed and European countries. The results revealed that SSC implementation strengthened team cohesion and communication, resulting in higher patient safety and increased information compliance rates. Although, barriers such as manpower limitation, hierarchical culture, and staff's unavailability and informality were also identified [11,23,39].

Tostes and Galvão also performed an integrative review, about the implementation process of the SSC in health services. They reviewed different implementation strategies [SCS introduction and optimization], and the factors that facilitate or hinder the successful use of the SSC were explored. The results of this research indicated that it takes effective leadership, clear delegation of responsibility, collaboration, and institutional support to implement the SSC [39].

These studies overlap somewhat in their findings. The spotlight focuses on teamwork, communication and leadership in SSC implementation success. They also recognize barriers of resources limited and of organizational culture. Nevertheless, other differences are remarkable. Lim et al. gives an overall view of facilitators and barriers at different levels, whereas Tostes & Galvão et al, gives more detailed informations on the implementation process. Furthermore, both [Lim et al., 2023] and [Tostes & Galvão, 2019] rely predominantly on studies conducted in developed countries without a clearly defined scope, which may hinder the generalizability of their results across various contexts [11,39].

As such, I focused on Walker et al. and Abbott et al. who explore how surgical safety checklists impact and are implemented, particularly the WHO Surgical Safety Checklist. Then their findings will be compared, discrepancies will be discussed, and gaps in the current literature will be identified [40,47].

At first, this paper reviews literature concerning the SSCs impact on patient outcomes [Walker et al., 2012]. First, they point to the enthusiasm when the WHO SSC was first launched in 2008, and second to evidence that has since accumulated showing that the WHO SSC could actually improve patient safety if it is implemented as intended. Changes in safety culture, leadership, flexibility, and teamwork are needed for successful implementation, according to the authors. Although they neglect to discuss the nitty gritty of how to implement SSC or the intricacies of embedding SSCs in distinctive health care settings, the paper is well grounded within the concept of SSCs [40,47].

To investigate the relationship between SSC exposure and postoperative outcomes, Abbott Et al perform a prospective observational cohort study, systematic review and meta-analysis. Based on their findings, they find that patients exposed to the SSC do better postoperatively. But they recognize it is hard to prove a direct causal connection, and that observed improvements may just as easily be the result of hospitals where checklists are standard practice also offering superior care overall. The study also points out the difficulties of accounting for factors that complicate potential explanations, for example, changes in perioperative care over time or in use of the checklist [40].

Evaluation of these studies suggests a common finding that SSCs have a beneficial effect on patient outcomes. Both recognize that realization of these benefits depends on proper implementation. But each has a different vision, as well as scope. A broader literature overview of the literature on SSCs is provided by [Walker et al., 2012]; [Abbott et al. 2017] describes a specific study design and methodology to determine the

consequences of SSC exposure. Because of this difference in scope, implementation challenges and contextual factors are discussed at different levels of detail [40,47].

Both studies fail to adequately discuss cultural context. In their paper [Walker et al., 2012] the need for changes in safety culture is mentioned, however, the cultural aspects relevant for the implementation and adherence of SSC are not explored. However, their findings, [Abbott et al., 2017], are not explicit about how they accounted for the potential effect of the cultural variation on their findings. More work is needed before understanding the interaction of cultural aspects with other barriers and SSC effectiveness "full circle" in various settings of healthcare. Moreover, both studies would be improved if certain implementation strategies and their effectiveness in different contexts were more completely understood. Such guidance can provide more practical guidance on SSC implementation and maximizing its impact on patient safety for healthcare professionals [40,47].

The existing literature offers valuable insight into the barriers to WHO Surgical Safety Checklist implementation; however, much less is known about the challenges that are unique to use in low resource settings, such as tertiary care hospitals in Peshawar, Pakistan.

Among local implementations, the SSC implementation in Peshawar, Pakistan is unique. The checklist's potential benefits are recognized by all, but its effective use will depend on careful contextualisation within the local healthcare system. Cultural influence in terms of views and practices in healthcare, resource restrictions, and the preexisting team dynamics of surgical team can be highly influential in checklist adherence besides effectiveness. The research on Peshawar is limited thus necessitating further study on local barriers and facilitators for SSC implementation. This work seeks to fill this gap through an examination of the unique challenges and opportunities surrounding the use of the checklist within Peshawar's healthcare system, leading to a more nuanced understanding of how to achieve maximum utility of the checklist in this setting.

To fulfil this gap, this research attempts to identify the particular barriers to SSC implementation within the tertiary care hospitals of Peshawar. Under the particular sociocultural and economic circumstance of this area it is ever urgent to know People how they confront this unique situation. This study will endeavor to understand the interplay between personal, interpersonal, and organizational factors in driving checklist adherence in Peshawar, and in doing so will develop a more nuanced understanding of the barriers in Peshawar's healthcare system. Through the identification of the most influential obstacles, this research will help guide the development of contextually

appropriate strategies to improve SSC implementation and thereby improve patient safety in this region.

Problem Statement:

Various individual factors [such as knowledge, age, dedication, experience, workload, awareness, and education level], interprofessional factors [including behavior, staff attitude, cultural values, team dynamics, professionalism, communication and work ethics], and organizational barriers [such as administration, management, and resource allocation] significantly hinder the usage, implementation, and effectiveness of the Surgical Safety Checklist in tertiary care hospitals in Peshawar. These barriers lead to compromised patient safety and suboptimal surgical outcomes, necessitating a comprehensive analysis to identify and address these challenges.

Chapter 3

METHODOLOGY

3.1. Research Design

This study employed a descriptive cross-sectional research design to investigate the barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals in Peshawar.

3.2. Clinical Settings

This study was conducted at tertiary care hospitals of Peshawar including Lady Reading Hospital LRH, Hayatabad Medical Complex HMC, Khyber Teaching Hospital KTH, Rehman Medical Institute Peshawar RMI, Maqsood Medical Complex and Peshawar General Hospital.

3.3. Sample Size

According to Slovin's formula N is number of populations which is taken approximately 500 while e is margin of error which is 0.05.

$$n = N / [1 + Ne^2]$$

$$N=500, e = 0.05$$

$$n=500/1+500[0.05]^2$$

$$n=222$$

3.4. Sampling Technique

A stratified random sampling technique was utilized to recruit participants for this study.

3.5. Duration of Study

The duration of study was 04 months.

3.6. Selection Criteria

3.6.1. Inclusion Criteria

All the Operating room staff having more than one-year experience including physician, staff nurses, Anesthesia staff, operation theatre technologist and OT Manager.

3.6.2. Exclusion Criteria

All the patients in operation theatre, OT Attendants, pharmacy personal and CSSD staff.

3.7. Ethical Consideration

a) Informed Consent: Participants are provided with clear and concise information about the study, including its purpose and benefits, and their right to withdraw at any time. The informed consent document was written in understandable language and address any questions participants may have.

b) Confidentiality and Privacy

We maintained participant's confidentiality by ensuring all data is anonymized and securely stored.

c) Ethical Approval

The ethical approval was obtained from the Institutional Review Board [IRB] of Superior University before commencing the study. The IRB have reviewed the research proposal and ensured it adheres to ethical guidelines and protects participant rights.

3.8. Data Collection Procedure

Data for this study was collected using a structured questionnaire.

3.9. Data Analysis

Data was analyzed using the Statistical Package for the Social Sciences [IBM® SPSS® Statistics, Version 29]. Descriptive variables will be presented in frequencies, percentages, mean and standard deviation [SD], median. Chi-square test will be used to evaluate the outcome and improvement.

Chapter 4

RESULTS

Demographics:

Table 1: Age

Gender	Frequency	Percentage	Cumulative Percentage
Female	12	4.7	4.7
Male	242	95.3	100.0
Total	254	100.0	100.0

Table 2: Education Level

Education Level	Frequency	Percentage	Cumulative Percentage
Bachelors	168	66.1	66.1
HSSC/Diploma	59	23.2	89.4
MCPS	9	3.5	92.9
MS/Mphil	18	7.1	100.0
Total	254	100.0	100.0

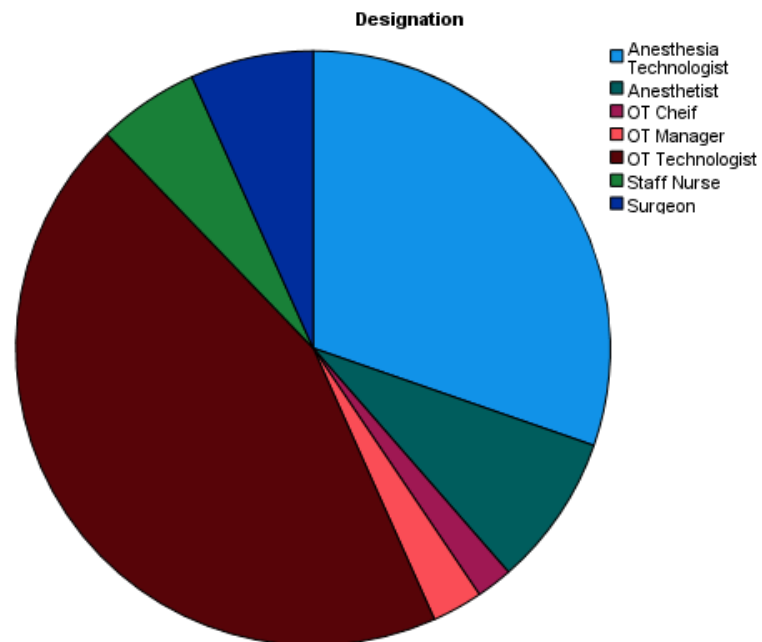


Figure 1: Designation

Personal Barriers:

Training: A majority of the participants (85.7%) reported having attended training related to the WHO Surgical Safety Checklist (SSC), while a smaller proportion (14.3%) indicated they had not received any such training. This finding suggests that training programs for the SSC are widely available and attended by most respondents. However, the presence of individuals who have not undergone training highlights a critical gap that may contribute to personal barriers in the effective implementation of the checklist.

Table 3: Have you attended any training regarding SSC [Surgical Safety Checklist]?

Answer	Frequency	Percentage	Cumulative Percentage
No	40	15.7	15.7
Yes	214	84.3	100.0
Total	254	100.0	100.0

Timing of Training: The timing of training regarding the WHO Surgical Safety Checklist [SSC] after hiring or departmental change varied among the participants. A significant proportion, 17 respondents [40.5%], reported receiving their training within the first month of their employment, which indicates a strong emphasis on early orientation. Additionally, 9 respondents [21.4%] received training within three months, and 11 respondents [26.2%] were trained within six months, showing that a majority [88.1%] were trained within the first six months. However, a smaller group, consisting of 1 respondent [2.4%], received training within the first year, while 4 respondents [9.5%] were trained more than a year after their hiring or department change. These findings suggest that, while early training is common, the 9.5% who experienced a delay of more than a year may face challenges in adopting the SSC effectively, potentially contributing to personal barriers in its implementation.

Table 4: When did you receive your training regarding SSC after your hiring/changing department?

Answer	Frequency	Percentage	Cumulative Percentage
More than a year after	24	9.4	9.4
Within 1st month	100	39.4	48.8
Within 1st year	5	2.0	50.8
Within 3 months	58	22.8	73.6
Within 6 months	67	26.4	100.0
Total	254	100.0	100.0

Knowledge about purpose of SSC: The knowledge of the operation theatre staff regarding the main purpose of the WHO Surgical Safety Checklist [SSC] was assessed, and the findings reveal significant insights. Among the participants, 35 respondents [83.3%] correctly identified the primary purpose of the SSC as improving patient safety, highlighting a strong understanding of its core objective. Six respondents [14.3%] believed the checklist's purpose was to enhance team communication, reflecting a partial awareness of its benefits. However, one respondent [2.4%] incorrectly perceived the purpose as compliance with hospital regulations. These results indicate that while the majority of staff demonstrate accurate knowledge of the SSC's primary purpose, there is still a need for further education to address misconceptions and reinforce the comprehensive benefits of the checklist.

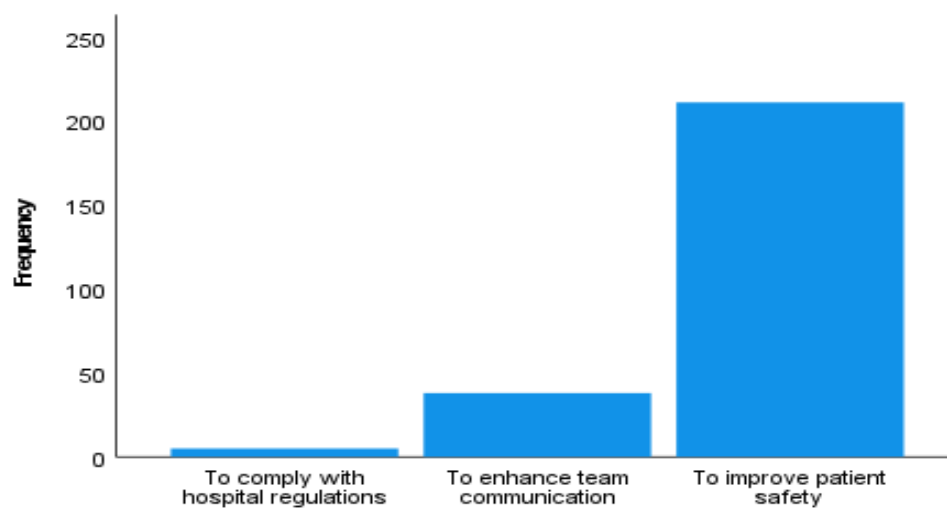


Figure 2: What is the main purpose of the SSC?

Frequency of attending training sessions:

The frequency of attending training sessions provided by the hospital was evaluated, revealing diverse participation levels among respondents. Out of the 42 participants, 16 [38.1%] reported attending training most of the time, while 14 [33.3%] stated they always attended, making up a combined 71.4% who regularly participated in hospital-provided training sessions. On the other hand, 8 respondents [19.0%] mentioned attending training sessions only sometimes, 3 respondents [7.1%] reported never attending, and 1 respondent [2.4%] stated they rarely attended. These findings highlight that while the majority of respondents frequently attend training, a notable minority [28.6%] have inconsistent or no participation, which could indicate a need to address barriers to training attendance to ensure consistent engagement across all staff.

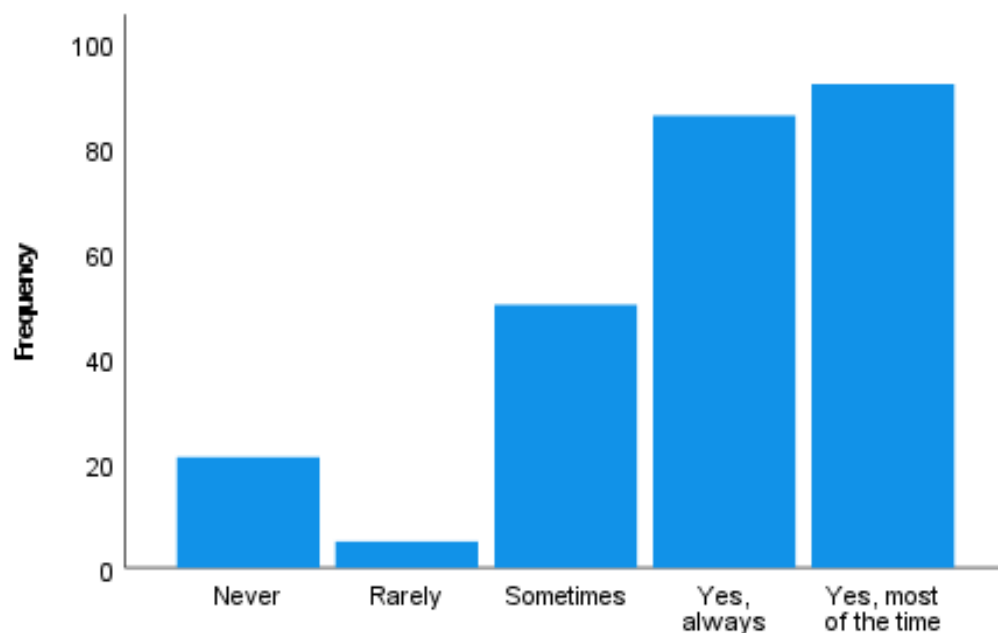


Figure 3: Do you attend the training provided by your hospital every time?

Perception of OT staff regarding usefulness of WHO SSC:

The perception of operation theatre [OT] staff regarding the usefulness of the WHO Surgical Safety Checklist [SSC] was assessed, with responses revealing a range of

opinions. Among the participants, 8 respondents [19.0%] strongly disagreed that the SSC is not useful and imposed on them, while 12 respondents [28.6%] disagreed, indicating that 47.6% of the staff believe the checklist is beneficial. Conversely, 7 respondents [16.7%] agreed, and an equal number [16.7%] remained neutral on the subject. Additionally, 8 respondents [19.0%] strongly agreed with the notion that the SSC is not useful and is imposed on them. These results suggest a polarized perception among OT staff, with nearly half acknowledging its usefulness, while a notable portion either views it negatively or remains indifferent. This highlights the need for targeted interventions, such as awareness campaigns or feedback sessions, to address misconceptions and reinforce the checklist's importance.

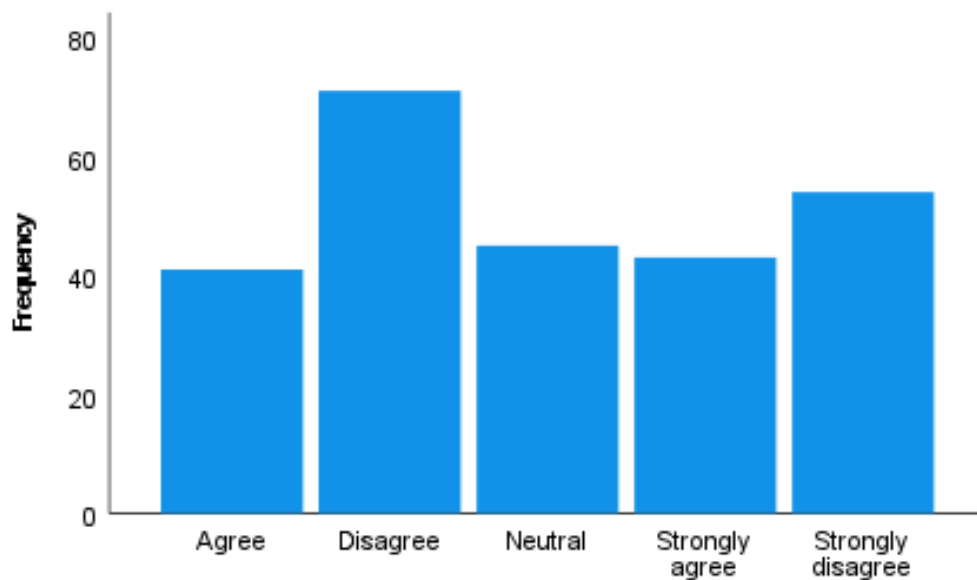


Figure 4: Do you think SSC is not useful at all and imposed on you?

Reasons for skipping the completion of the WHO SSC:

The reasons for skipping the completion of the WHO Surgical Safety Checklist [SSC] among operation theatre staff were evaluated, revealing varied factors contributing to non-compliance. The most commonly cited reason was lack of time, reported by 17 respondents [40.5%], highlighting the impact of time constraints on adherence. Another significant factor was "other" reasons, specified by 13 respondents [31.0%], suggesting

additional underlying causes that may require further exploration. Forgetfulness accounted for 7 responses [16.7%], indicating the need for reminders or systematic prompts. A smaller proportion of respondents, 3 [7.1%], attributed their non-compliance to a lack of enforcement, while 2 respondents [4.8%] perceived the checklist as irrelevant to their work. These findings underscore the multifaceted nature of barriers to SSC completion, emphasizing the need for time-efficient processes, better enforcement policies, and strategies to improve the perceived relevance and integration of the checklist into routine practices.

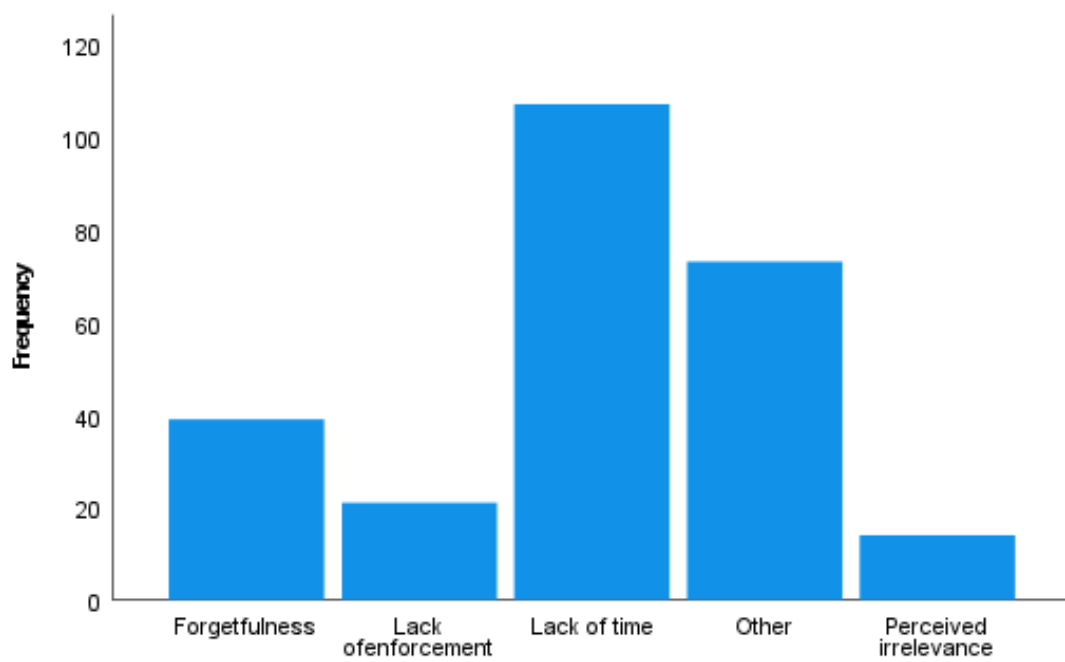


Figure 5: What is the reason you often skip filling out the SSC?

Difficulties faced by OT staff in understanding the points of the WHO SSC:

The difficulties faced by operation theatre staff in understanding the points of the WHO Surgical Safety Checklist [SSC] were assessed, revealing varied experiences. Among the participants, 17 respondents [40.5%] reported encountering difficulties occasionally, indicating that while understanding is generally manageable, challenges arise intermittently. Additionally, 13 respondents [31.0%] stated that they frequently faced difficulties, suggesting that a substantial portion of staff struggle consistently with

comprehending the checklist. On the other hand, 12 respondents [28.6%] reported never experiencing any difficulties, reflecting a strong grasp of the SSC points among nearly one-third of the staff. These findings highlight the need for targeted training and simplified communication strategies to ensure that all staff can effectively understand and implement the checklist, thereby enhancing its overall utility and adherence.

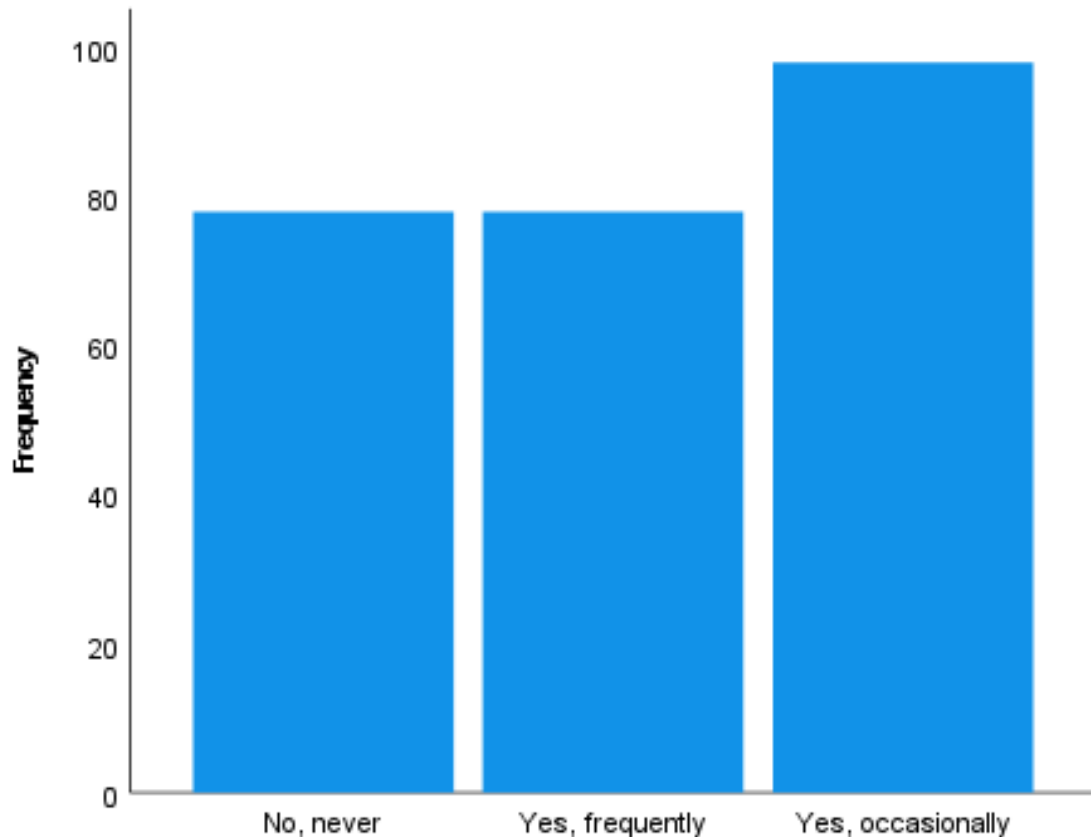


Figure 6: Have you encountered any difficulties in understanding the SSC?

Belief of operation theatre staff regarding the effectiveness of the WHO SSC:

The belief of operation theatre staff regarding the effectiveness of the WHO Surgical Safety Checklist [SSC] in improving patient outcomes was assessed, showing largely positive perceptions. Among the participants, 24 respondents [57.1%] strongly agreed that the SSC contributes to better patient outcomes, while 12 respondents [28.6%] agreed, resulting in a combined 85.7% of staff expressing positive beliefs about its impact. Meanwhile, 5 respondents [11.9%] remained neutral, indicating uncertainty

about its benefits. Only 1 respondent [2.4%] disagreed with the notion that the SSC improves patient outcomes. These findings demonstrate widespread confidence in the SSC's role in enhancing patient safety and outcomes, though the presence of neutral and negative responses suggests a need for further education to reinforce its significance.

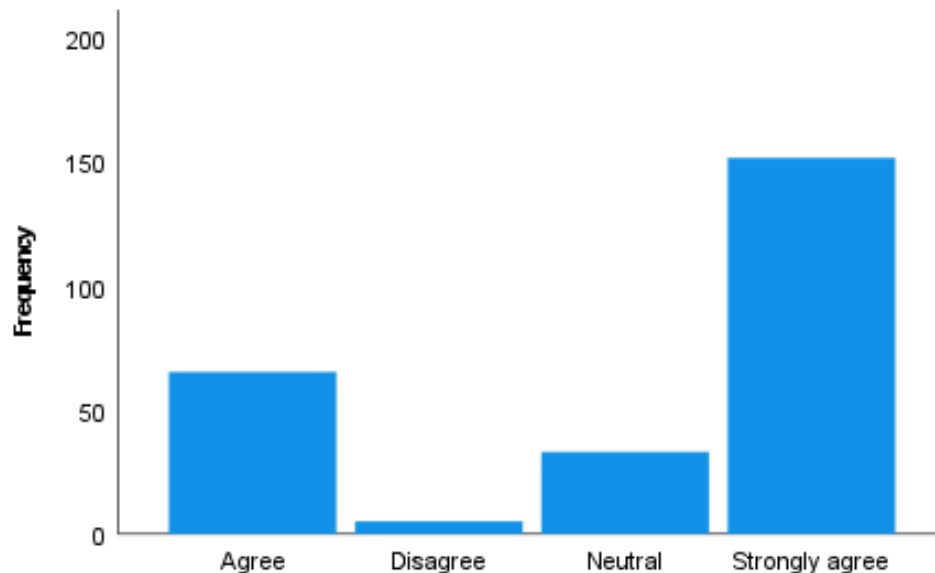


Figure 7: Do you believe that the SSC improves patient outcomes?

Energy Level as SSC goes on:

The impact of surgical workload on the energy levels of operation theatre [OT] staff was assessed, highlighting varying degrees of fatigue as the surgical list progresses. Among the participants, 19 respondents [45.2%] reported that their energy levels somewhat decrease, while 11 respondents [26.2%] stated that their energy decreases significantly. Together, this indicates that 71.4% of the staff experience a decline in energy during surgical procedures. In contrast, 8 respondents [19.0%] reported that their energy levels remain consistent throughout, and 4 respondents [9.5%] were unsure about any change in their energy. These findings suggest that a significant majority of OT staff experience fatigue during extended surgical lists, which could impact their focus and adherence to protocols such as the Surgical Safety Checklist [SSC]. Addressing this issue through

scheduling adjustments, breaks, and workload management may improve both energy levels and overall checklist compliance.

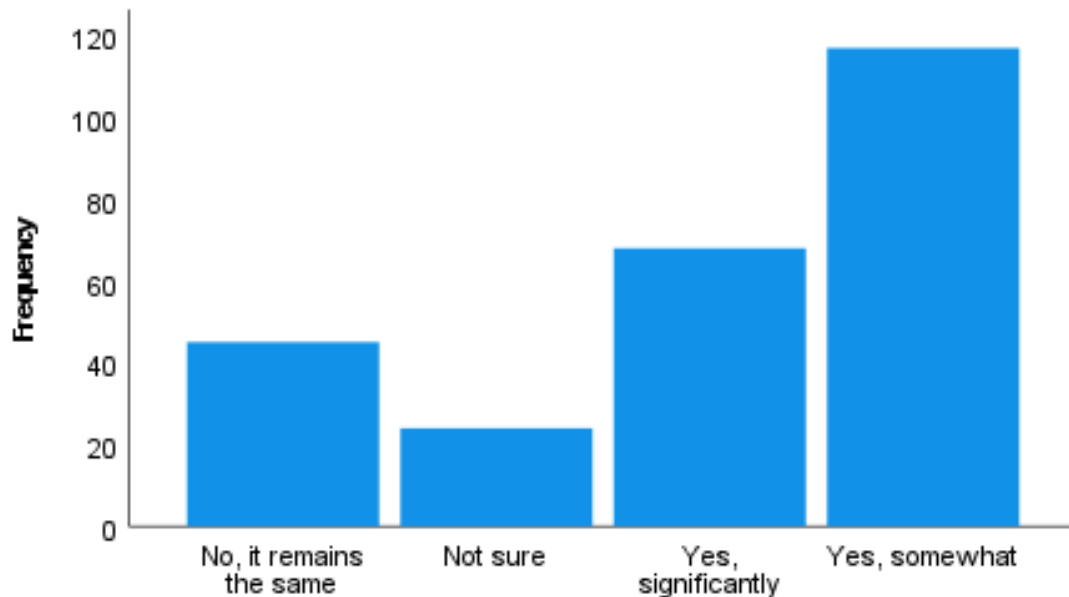


Figure 8: Does your energy level decrease as the surgical list goes on?

Completion of different sections of the WHO SSC:

The completion of different sections of the WHO Surgical Safety Checklist [SSC] by operation theatre [OT] staff was analyzed, showing varied adherence levels. Among the respondents, 21 [50.0%] reported completing all sections of the SSC, indicating consistent compliance by half of the staff. However, 10 respondents [23.8%] stated they often complete only the "Sign-in" section, while 6 respondents [14.3%] focus on the "Time-out" section. A smaller proportion, 2 respondents [4.8%], reported completing only the "Sign-out" section. Notably, 3 respondents [7.1%] admitted to not completing any section of the checklist. These results highlight that while a majority engage with the checklist fully or partially, there are gaps in adherence, suggesting a need for further training and reinforcement of the importance of completing all sections of the SSC to ensure optimal patient safety and compliance.

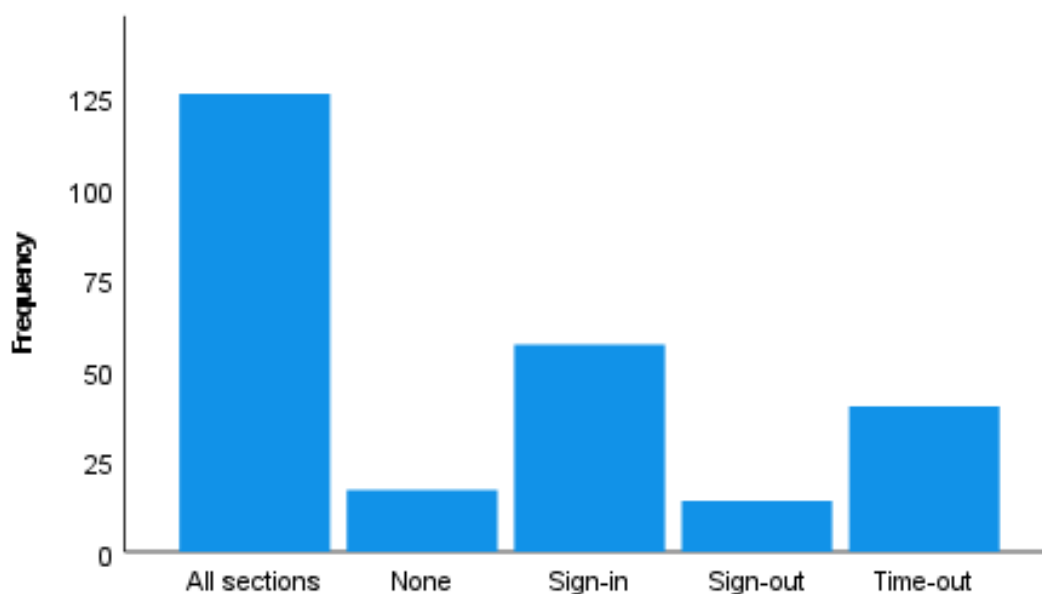


Figure 9: Which section of the SSC do you often complete?

Interpersonal:

lack of professionalism and work ethics among OT Staff regarding the WHO SSC:

The observation of a lack of professionalism and work ethics among operation theatre [OT] staff regarding the WHO Surgical Safety Checklist [SSC] was evaluated, revealing varying levels of concern. Among the respondents, 16 [38.1%] reported frequently observing unprofessional behavior, while an equal number [38.1%] stated they rarely observed such issues. Additionally, 9 respondents [21.4%] noted occasional lapses in professionalism and work ethics. Only 1 respondent [2.4%] reported never observing any lack of professionalism among their colleagues. These findings suggest that while some staff maintain professional conduct, there is a significant proportion frequently or occasionally observing unprofessional behaviour. Addressing these concerns through stricter enforcement of standards and enhanced training may improve adherence to the SSC and overall professional conduct in the OT setting.

Table 5: Do you observe any lack of professionalism and work ethics in your colleagues regarding SSC?

Answer	Frequency	Percentage	Cumulative Percentage
Rarely	94	37.0	37.0
Yes, frequently	99	39.0	76.0
Yes, occasionally	61	24.0	100.0
Total	254	100.0	100.0

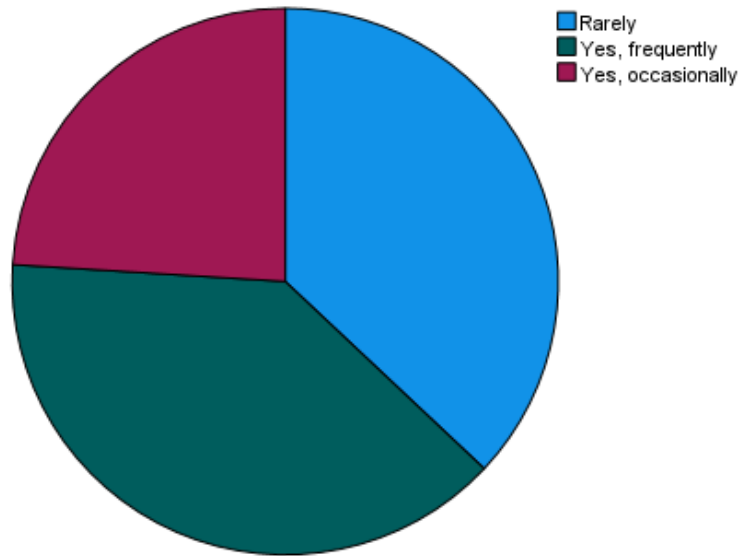


Figure 10: Do you observe any lack of professionalism and work ethics in your colleagues regarding SSC?

Do you receive any motivation from your colleagues?

In the evaluation of colleague motivation there was found that a peer is the source of motivation for most, 24 out of 42 [57.1%], respondents. Moreover, 11 participants [26.2%] had occasional encouragement by colleagues. Still, 6 people [14.3%] reported that they do not often receive such an incentive and one of the respondents [2.4%] said that they never get any such motivation from colleagues

Table 6: Do you receive any motivation from your colleagues?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	5	2.0	2.0
Rarely	5	16.5	18.5
Yes, occasionally	138	54.3	72.8
Yes, regularly	69	27.2	100.0
Total	254	100.0	

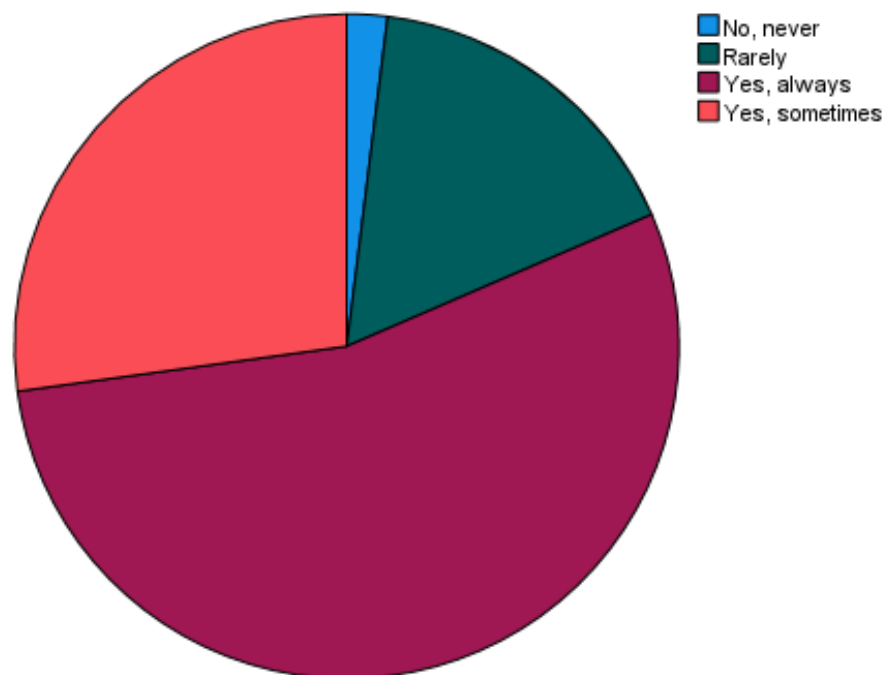


Figure 11: Do you receive any motivation from your colleagues?

Does your team leader provide a learning environment in the OT?

The result of the assessment of team leaders acting as someone who provides a learning environment in the OT is that 23 out of 42 [54.8%] of the respondents claimed that the team leader in their unit notably creates such an environment. Furthermore, 14 participants [33.3%] also expressed that sometimes the team leader does offer

opportunities for learning. However, 7.1% [3 respondents] responded that their team leader never promotes a learning environment and 2.4% [1 individual] responded that he never promotes a learning environment except for occasionally. It is notable that none of the 1 [2.4%] respondent clearly answered.

Table 7: Does your team leader provide a learning environment in the OT?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	17	6.7	6.7
Rarely	5	2.0	8.7
Yes, always	133	52.4	61.0
Yes, sometimes	99	39.0	100.0
Total	254	100.0	100.0

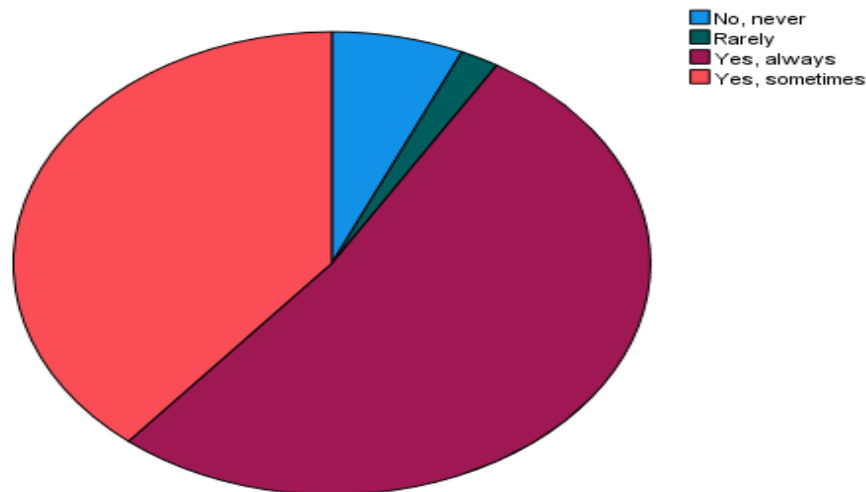


Figure 12: Does your team leader provide a learning environment in the OT?

Do your colleagues share their learning experiences after attending training with you?

The evaluation of colleagues to share the learning experiences from the training shows that 19 out of 42 individuals [45.2%] always share the knowledge. Furthermore, 14 of the participants [33.3%] said that sometimes their colleagues share their learning

experiences. Five respondents however [11.9%] say such a sharing happens only rarely, and 4 respondents [9.5%] say 'never' in response to the question regarding whether anyone in his colleagues share their training experiences.

Table 8: Do your colleagues share their learning experiences after attending training with you?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	26	10.2	10.2
Rarely	29	11.4	21.7
Yes, always	115	45.3	66.9
Yes, sometimes	84	33.1	100.0
Total	254	100.0	100.0

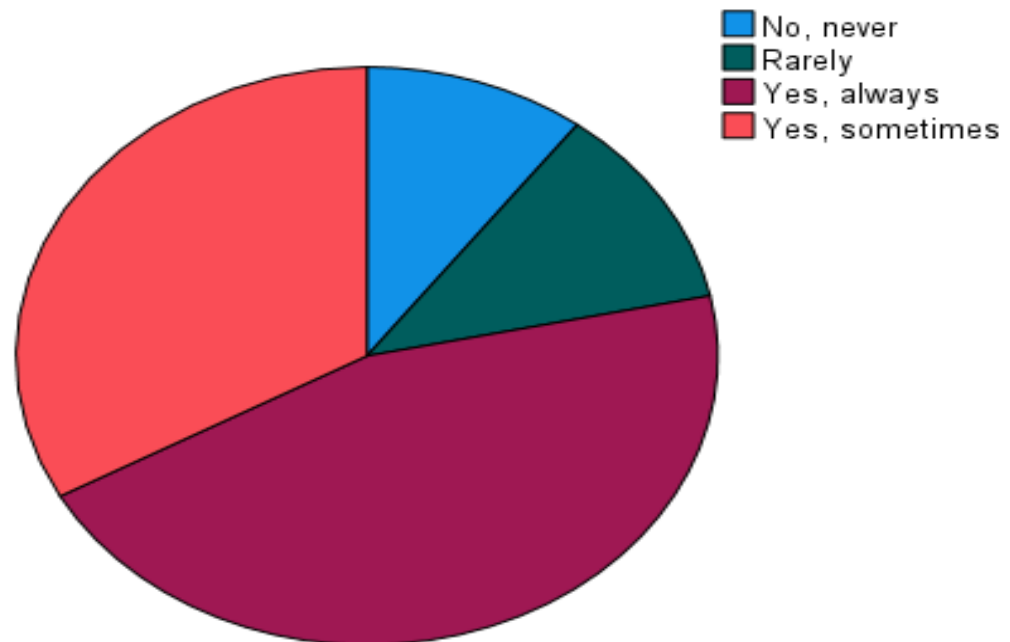


Figure 13: Do your colleagues share their learning experiences after attending training with you?

Do senior surgeons/anesthetists/staff nurses/OT technologists encourage and facilitate you in adhering to the SSC?

In the assessment of the support in encouraging and facilitating the adherence to the Surgical Safety Checklist [SSC] we found that 18/42 [42.9%] of the respondents always get support from the senior surgeons anesthetists, staff nurses and OT technologists. Participants were equally divided [42.9 %] on whether they ever get encouraged for SSC adherence. Nevertheless, 4 participants [9.5 per cent] mentioned that support is seldom provided; and 2 participants [4.8 per cent] claimed that they never at any point received support.

Table 9: Do senior surgeons/staff nurses/OT technologists encourage and facilitate you in adhering to the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	12	4.7	5.5
Rarely	17	6.7	12.2
Yes, always	113	44.5	56.7
Yes, sometimes	110	43.3	100.0
Total	254	100.0	100.0

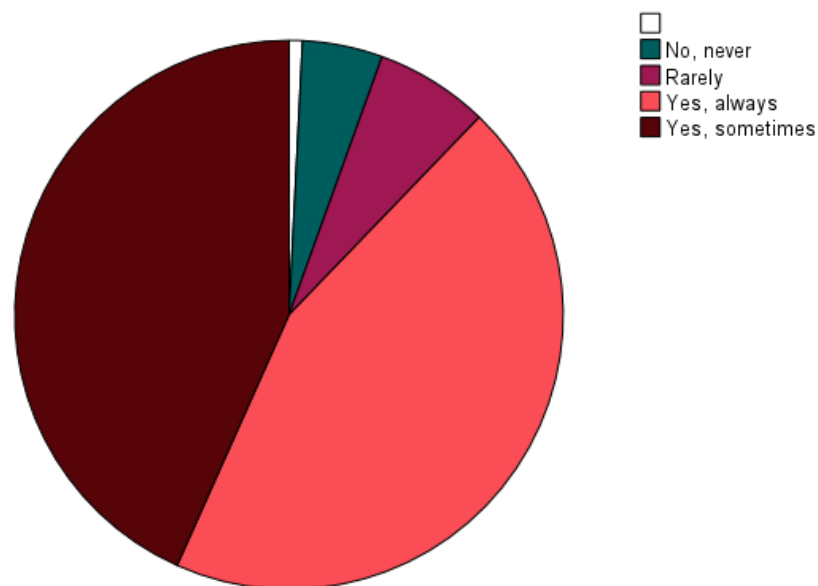


Figure 14: Do senior surgeons/staff nurses/OT technologists encourage and facilitate you in adhering to the SSC?

Do you feel that incomplete SSC is due to your colleague's negative response and attitude?

While assessing whether negative response and attitude of colleagues complete the incomplete Surgical Safety Checklist [SSC], results differed in respect to the respondents. Of these 42 participants, 15 reported that sometimes, inappropriate behaviors of negative attitude cause incomplete SSC adherence, while 10 reported that such behaviors often lead towards incomplete SSC adherence. It was also recognized that the negative responses of colleagues hardly ever contribute to SSC non-compliance by 8 participants [19.0%]. On the other hand, 9 [21.4%] of the respondents denied any link between incomplete SSC and the manifestation of negative colleague attitudes.

Table 10: Do you feel that incomplete SSC is due to your colleague's negative response and attitude?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	53	20.9	21.4
Rarely	48	18.9	40.5
Yes, often	63	18.9	64.3
Yes, sometimes	90	35.4	100.0
Total	254	100.0	100.0

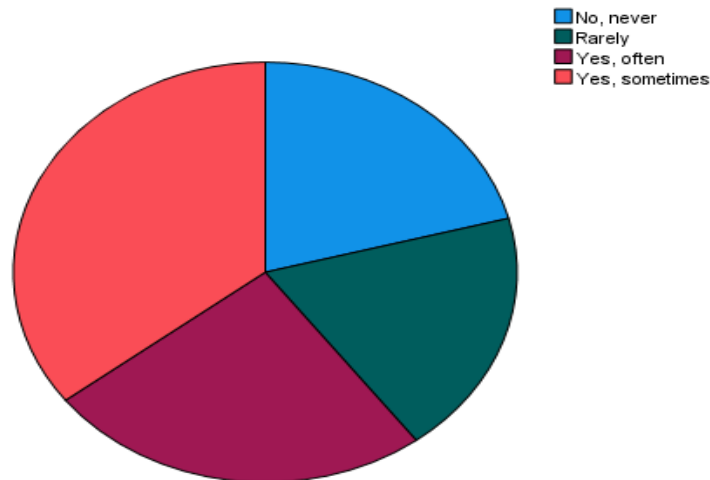


Figure 15: Do you feel that incomplete SSC is due to your colleague's negative response and attitude?

Who is the person most often left out or ignored during SSC completion/marketing time?

Personnel is left out or ignored most frequently during the completion or marking of the Surgical Safety Checklist [SSC]. Bearing in mind that there were 42 of the respondents, 15 [35.7%] singled out surgeons, while 11 [26.2%] responded that nurses are most likely to be excluded. In addition, 7 [16.7%] of the respondents were left out by either anesthetists or operation theatre [OT] technologists. Only a small proportion [2, 4.8%] did not mention any specific role.

Table 11: Who is the person most often left out or ignored during SSC completion/marketing time?

Answer	Frequency	Percentage	Cumulative Percentage
Anesthetist	49	19.3	19.3
Nurse	66	26.0	45.7
OT Technologist	49	19.3	65.0
Surgeon	89	35.0	100.0
Total	254	100.0	100.0

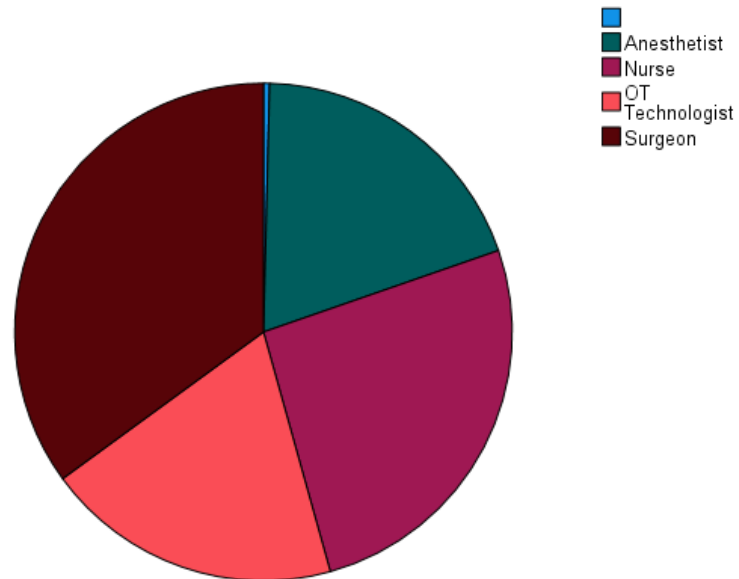


Figure 16: Who is the person most often left out or ignored during SSC completion/marketing time?

Do the surgeon and other staff in rush cause delays in SSC completion?

The data reveals that the urgency of surgeons and surrounding staff members is a contributing aspect as to why schedules for completing the Surgical Safety Checklist [SSC] are delayed. Out of the 42 respondents, 20 [47.6%] answered that such delays do sometimes take place; 10 [23.8%] replied always that there are such delays because staff are in a hurry. Furthermore, there are 9 participants [21.4%] who affirmed that delay very seldom occurs; there is also 3 participants [7.1%] who affirm that they have not experienced such delays at all.

Table 12: Fig 16: Do the surgeon and other staff in rush cause delays in SSC completion?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	19	7.1	7.1
Rarely	50	21.4	28.6
Yes, often	59	23.8	52.4
Yes, sometimes	126	47.6	100.0
Total	254	100.0	100.0

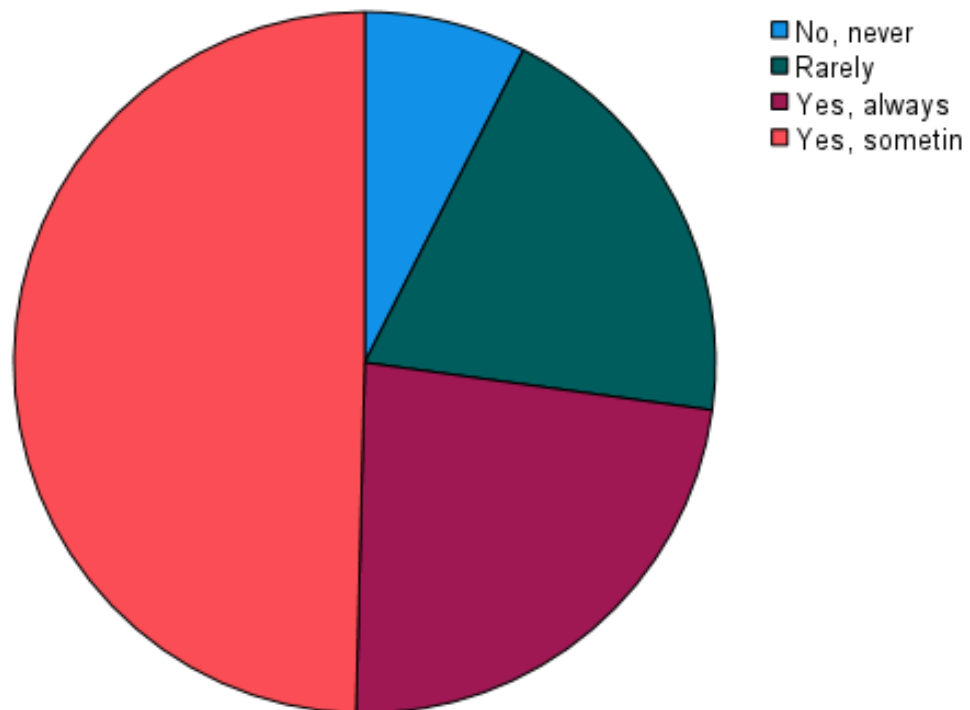


Figure 17: Fig 16: Do the surgeon and other staff in rush cause delays in SSC completion?

What is the main reason that negatively impacts team dynamics in the OT?

Time pressure was found to be the most unfavourable factor in the OT impacting team dynamics, as 45.2% [n = 19] of respondents stated this was so. Yet, lack of communication also stands out as issue among 11 participants [26.2%]. Moreover, eight 19.0% respondents state additional problem thanks to unclear roles and responsibilities. Simultaneously, 4 subjects [9.5%] reported the lack of adequate staffing was a negative factor.

Table 13: What is the main reason that negatively impacts team dynamics in the OT?

Answer	Frequency	Percentage	Cumulative Percentage
Insufficient staffing	27	10.6	10.6
Lack of communication	50	19.7	30.3
Time pressure	117	46.1	76.4
Unclear roles and responsibilities	117	23.6	100.0
Total	254	100.0	100.0

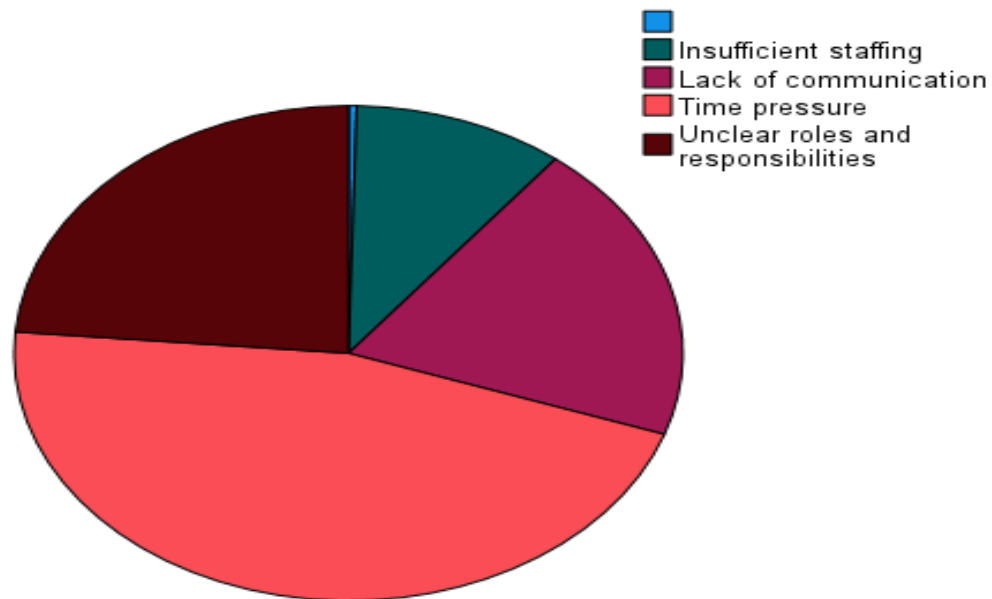


Figure 18: What is the main reason that negatively impacts team dynamics in the OT?

Organizational Barriers:

Audit done by the hospital regarding SSC?

The results affirm that, of the 23 respondents [54.8%], there is confirmation that audits are carried out regularly which may indicate a structured process to support adherence to SSC. Furthermore, 13 respondents [31.0%] further revealed that audits are done occasionally, indicating that some kind of a frequent audit is done. Yet, 4 [9.5%] of them indicated that there are no audits and 2 [4.8%] of them stated that they are hardly carried out. Hospital auditing of SSC compliance was found to be more than half emphasized in greater than half of the hospitals, but it is still infrequent or non-existent in the minority. Further reinforcing audit mechanisms may also help to increase adherence to the SSC, offer greater protection from patient safety and better surgical outcomes.

Table 14: Is there any audit done by the hospital regarding SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	26	10.2	10.2
Rarely	12	4.7	15.0
Yes, occasionally	77	30.3	45.3
Yes, regularly	139	54.7	54.8
Total	254	100.0	100.0

What is the gap between the audits?

Variations in the frequency of hospital audits concerning the WHO Surgical Safety Checklist were assessed for time gap. Twelve [28.6%] of the respondents reported that audit occurs within less than three months, illustrating that there is the tendency for proactive monitoring of compliance. Also, 12 respondents [28.6%] indicated that audits run every 6 to 12 months and 10 [23.8%] stated the same interval is 3 to 6 months. 2 respondents [4.8%] also indicated that more than a year after auditing occurs leading to the lapses in adherence. Significantly, 6 respondents [14.3%] revealed that there are no

audits at all and this shows a huge oversight gap. These findings highlight that while the majority of hospitals audit at reasonable interval, other institutions do not perform consistent monitoring, which may have implications on the implementation of the SSC.

Table 15: What is the gap between the audits?

Answer	Frequency	Percentage	Cumulative Percentage
3-6 months	60	23.6	23.6
6-12 months	79	31.1	54.7
Less than 3 months	60	23.6	78.3
More than a year	14	5.5	83.9
No audits conducted	41	16.1	100.0
Total	254	100.0	100.0

Poster/Leaflet of SSC exhibition in the OT:

The respondents were asked if there were WHO Surgical Safety Checklist [SSC] posters or leaflets present in the operation theatre [OT]. According to the findings, 17 of the participants [40.5%] had stated that SSC posters or leaflets are always present in the OT [et al 2016], implying that safety protocols are visibly accessible at all times. Also, 15 respondents [35.7%] stated that these materials are displayed sometimes, therefore implying that SSC guidelines are reinforced sometimes. 6 [14.3%] however responded that there have never ever been displayed these sorts of posters and leaflets while 4 [9.5%] said that it sometimes display these things. Results showed that although there is a fair proportion of OTs that have visibility of SSC, some OTs tend to appear arbitrary in displaying educational materials thereby reducing the potential to reemphasise surgical safety practice.

Table 16: Is there any poster/leaflet of SSC exhibited in the OT?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	34	13.4	13.4
Rarely	23	9.1	22.4
Yes, always	117	46.1	68.5
Yes, sometimes	80	31.5	100.0
Total	254	100.0	100.0

Training provided by the hospital regarding SSC:

There was evaluation of the availability of the WHO Surgical Safety Checklist [SSC] hospital provided training among the respondents. Results show that while some 17 participants [40.5%] reported the occasion the organization provides training, 15 respondents [35.7%] responded that training is provided regularly, meaning that the staff is basically trained in SSC. Nevertheless, 5 participants [11.9%], stated that they have never received any training while an equal number of participants [11.9%] mentioned that training is rarely provided. These results indicate that the availability of SSC training in the majority of hospitals does not ensure that SSC is practiced at a uniform frequency, which may affect the overall awareness and implementation of surgical safety protocols.

Table 17: Is there any training provided by the hospital regarding SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	31	12.2	12.2
Rarely	33	13.0	25.2
Yes, occasionally	104	40.9	66.1
Yes, regularly	86	33.9	100.0
Total	254	100.0	100.0

Are all the instruments, equipment, and other supplies available enough in each OR?

There was evaluation of the availability of the WHO Surgical Safety Checklist [SSC] hospital provided training among the respondents. Results show that while some 17 participants [40.5%] reported the occasion the organization provides training, 15 respondents [35.7%] responded that training is provided regularly, meaning that the staff is basically trained in SSC. Nevertheless, 5 participants [11.9%], stated that they have never received any training while an equal number of participants [11.9%] mentioned

that training is rarely provided. These results indicate that the availability of SSC training in the majority of hospitals does not ensure that SSC is practiced at a uniform frequency, which may affect the overall awareness and implementation of surgical safety protocols.

Table 18: Are all the instruments, equipment, and other supplies available enough in each OR?

Answer	Frequency	Percentage	Cumulative Percentage
Rarely	12	4.7	4.7
Yes, always	165	65.0	69.7
Yes, sometimes	77	30.3	100.0
Total	254	100.0	100.0

Are there any penalties for not adhering to the SSC?

The need to examine the enforcement of penalties for not abiding by the Surgical Safety Checklist [SSC] among operating room staff was investigated. It shows that 17 respondents [40.5%] indicated that penalties are always imposed, which indicate strict compliance in some hospitals. In addition, 9 participants [21.4%] also pointed out that sometimes there are penalties enforces [indicating lack of consistent adherence of disciplinary actions]. In the meantime, 11 respondents [26.2%] stated that penalties are rarely given, and other 5 participants [11.9%] claimed that penalties are never imposed.

Table 19: Are there any penalties for not adhering to the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	31	12.2	11.9
Rarely	65	25.6	38.1
Yes, always	96	37.8	78.6
Yes, sometimes	62	24.4	100.0
Total	254	100.0	100.0

Does the hospital have a dedicated team for monitoring SSC adherence?

The extent to which Surgical Safety Checklist [SSC] was implemented in hospitals was assessed in terms of the presence of dedicated team for adherence monitoring. It is

found that out of 42 respondents 25 [59.5%] affirmed that there was such a team in their hospital [more than half of hospitals have a structured approach to ensure SSC compliance]. But while 10 [23.8 per cent] said there is no dedicated monitoring team in place, there are gaps in overseeing what most SAHs consider essential. Also, out of the 7 respondents [16.7%], 7 were unsure about the existence of a monitoring team suggesting the absence of awareness on SSC enforcement measures.

Table 20: Does the hospital have a dedicated team for monitoring SSC adherence?

Answer	Frequency	Percentage	Cumulative Percentage
No	60	23.6	23.6
Not sure	44	17.3	40.9
Yes	150	59.1	100.0
Total	254	100.0	100.0

Is there any feedback mechanism in place for reporting issues with SSC?

The evaluation of the Surgical Safety Checklist [SSC] system was achieved by assessing the presence of an existing feedback mechanism to report issues related to the SSC among the hospital staff. The outcome shows that 18 respondents [42.9%] indicated that there exists a feedback mechanism all the time and reporting as well as addressing concerns is consistent. Furthermore, 14 participants [33.3%] responded that it is sometimes available, 5 respondents [11.9%] on the other hand said that it is seldom available and 7 participants [16.7%] said it is very rare. From the rest, 5 participants [11.9%] said that there is no feedback mechanism whatsoever.

Table 21: Is there any feedback mechanism in place for reporting issues with SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	29	11.9	11.9
Rarely	33	11.9	23.8
Yes, always	114	42.9	66.7
Yes, sometimes	78	33.3	100.0
Total	254	100.0	100.0

Does the hospital administration support the use of the SSC?

Staff were assessed for the level of support offered by hospital administration for the use of Surgical Safety Checklist [SSC]. Findings indicate that the highest believer [45.2%] is the fact that 19 respondents strongly believes that the administration supports the implementation of SSC while 15 of the participants [35.7%] also believe that the administration is supporting the implementation of SSC but to a lesser extent. However, 7 people [16.7%] remained neutral with regards to the administrative support, meaning that it was unclear or simply not enforced as it should be. Most notable of all, one participant [2.4%] strongly agreed that the hospital administration does not provide support for use of SSC.

Table 22: Does the hospital administration support the use of the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
Neutral	42	16.7	16.7
Strongly do not support	7	2.4	19.0
Strongly support	108	45.2	64.3
Support	97	35.7	100.0
Total	254	100.0	100.0

Are resources [Time, Staff] allocated adequately for SSC adherence?

First, the adequacy of the resources—resources of time and staff—allocated towards the Surgical Safety Checklist [SSC] were evaluated. According to the results, 17 respondents [40.5%] think that there is no lack of resources and 15 participants [35.7%] also believe that but sometimes they are enough. As for the last question, we believe that 10 respondents [23.8%] who answered that resources are sometimes rarely allocated properly proves the potential difficulties related to consistent implementation.

Table 23: Are resources [Time, Staff] allocated adequately for SSC adherence?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	53	23.8	23.8
Yes, always	102	40.5	64.3
Yes, sometimes	99	35.7	100.0
Total	254	100.0	100.0

Does the hospital conduct regular reviews of SSC compliance?

Assessed was the frequency of hospital conduction of reviews regarding the SSC compliance. The results were that 19 respondents [45.2%] said that the hospital always does regular reviews and 12 participants [28.6%] said reviews are done sometimes. Review is however, rarely done according to 8 respondents [19.0%], whereas no review is ever made according to 2 respondents [4.8]. Moreover, 1 respondent [2.4%] did not state his/her position.

Table 24: Does the hospital conduct regular reviews of SSC compliance?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	16	7.1	7.1
Rarely	47	19.0	26.2
Yes, always	113	45.2	71.4
Yes, sometimes	78	28.6	100.0
Total	254	100.0	100.0

Are there any incentives for teams that consistently adhere to the SSC?

Assessment of incentives to teams complying with the SSC at all times revealed that 17 respondents [40.5%] claimed that incentives are always provided and 15 participants [35.7%] said that there are times incentives are provided. However, 6 [14.3%] of the respondents noted that they rarely give incentives while 4 [9.5%] of the respondents mentioned no incentives are provided by any of their company.

Table 25: Are there any incentives for teams that consistently adhere to the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	28	9.5	9.5
Rarely	33	14.3	23.8
Yes, always	94	40.5	64.3
Yes, sometimes	99	35.7	100.0
Total	254	100.0	100.0

Does the hospital provide sufficient materials and tools [e.g., printed checklists] for SSC use?

With regard to the availability of materials and tool, such as SSC use checklist, 24 [57.1%] reported that these are always provided by the hospital. Moreover, 9 [21.4%] participants said that they might be able to use such materials sometimes. Four respondents [9.5%], however, presented that they hardly receive it, and 5 [11.9%] stated that they never get it.

Table 26: Does the hospital provide sufficient materials and tools [e.g., printed checklists] for SSC use?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	40	11.9	11.9
Rarely	21	9.5	21.4
Yes, always	140	57.1	78.6
Yes, sometimes	53	21.4	100.0
Total	254	100.0	100.0

Is there an established protocol for emergency surgeries that incorporates the SSC?

When assessing whether an established protocol for emergency surgeries includes the Surgical Safety Checklist [SSC], 20 respondents [47.6%] affirmed intergration of the SSC on emergency surgeries protocols. Furthermore, 16 participants [38.1%] answered that the SSC is mixed in only. Three respondents [7.1%], however, said that there is no such protocol while another three [7.1%] did not know.

Table 27: Is there an established protocol for emergency surgeries that incorporates the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No	18	7.1	7.1
Not sure	23	7.1	14.3
Yes, fully	121	47.6	61.9
Yes, partially	92	38.1	100.0
Total	254	100.0	100.0

Does the hospital culture prioritize patient safety and the use of the SSC?

The evaluation was carried out to find out whether the hospital culture values patient safety and the use of SSC. Twenty one [50.0%] respondents strongly agreed with this statement and 13 [31.0%] agreed. Nevertheless, 6 respondents [14.3%] were neutral and also 2 respondents [4.8%] disagreed.

Table 28: Does the hospital culture prioritize patient safety and the use of the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
Agree	71	31.0	31.0
Disagree	12	4.8	35.7
Neutral	43	14.3	50.0
Strongly Agree	128	50.0	100.0
Total	254	100.0	100.0

Does hospital administration visibly promote and support the SSC?

The assessment of whether hospital administration visibly promotes and supports the implementation of the Surgical Safety Checklist also indicates that a majority of the respondents, 26 out of 42 [61.9%] believe administration always supports the implementation of SSC. Further, 8 [19.0%] of the participants mentioned that the administration sometimes encourages its use. In addition, 6 people [14.3%] said that the support is seldom present and two people [4.8%] said that there is no support seen.

Table 29: Does hospital administration visibly promote and support the SSC?

Answer	Frequency	Percentage	Cumulative Percentage
No, never	18	4.8	4.8
Rarely	33	14.3	19.0
Yes, always	156	61.9	81.0
Yes, sometimes	47	19.0	100.0
Total	254	100.0	100.0

Chapter 5

DISCUSSION

It was found through the study that there were several barriers to the consistent implementation of the WHO Surgical Safety Checklist by the tertiary care hospitals of Peshawar, Pakistan. A major obstacle was identified as lack of resources and proper allocation, 23.8% of the respondents felt that resources were never properly allocated [48]. This barrier was due to the insufficient materials, such as checklists, poor staffing, and equipment shortages [48].

The factors that play into SSC followship in the observed setting are shown to be complex. A majority [71.4%], of respondents stated that they at least sometimes conducted SSC compliance reviews, but nearly a quarter [26.2%] stated that they infrequently, or that they did not, conduct reviews. The inconsistency of oversight with regard to the implementation of checklists may impede identifying areas for improvement and reinforce consistent use of the checklist. It also seems that incentives for consistent SSC adherence are not being provided evenly. While only 23.8% said they rarely or never received incentives, 76.2% of respondents voted that they either always or sometimes received them. Consequently, this discrepancy indicates potential flaws of incentive structures currently employed in order to foster consistent adherence. Only 78.6% of responders report that the necessary materials and tools for the SSC use are present; therefore, the situation has a more positive look. The remaining 21.4% of results reporting infrequent or no use of materials shows one area where resources could be better distributed. One crucial element of being safe for patients especially during the critical moments is integration of the SSC in the existing protocols for emergency surgeries. However, although a majority [85.7%] of respondents indicated some degree of SSC integration into emergency protocols, only 47.6% reported having fully integrated SSC.

One of the limitations of the effectiveness of this partial integration lies in the checklist's potential lack of effectiveness in emergency scenarios, and it would be worthwhile to look further into. Lastly, the data imply a largely positive view of hospital

culture and administrative support for SSC. The majority [81%] of respondents perceived the administrative support for the SSC to be visible and a combined total of 81% agreed or strongly agreed that hospital culture values patient safety and SSC use. Nevertheless, the existence of neutral [14.3%] and disagreeing [4.8%] participants raises the possibility of opportunities in the establishment of a more solid culture of patient safety. Overall, these results highlight the necessity of a multi-pronged intervention to increase SSC use, beyond just resources, but also addressing cultural, as well as systemic, factors that impact SSC use.

It is shown that the factors involved in SSC followship in this observed setting are complex. Of these, a majority [71.4%] reported that they conducted SSC compliance reviews at least sometimes, while a near quarter [26.2%] of respondents reported they infrequently, or did not, conduct SSC compliance reviews. The discrepancy of oversight with respect to called for checklists may retard identifying those areas that deserve improvement and delaying same over use of the checklist. It seems that incentives for consistent SSC adherence are not being provided evenly as well. Twenty three and eight tenths percent mentioned they rarely or never received incentives, compared with twenty six tenths percent that always or sometimes received them. As a result, this discrepancy signals shortcomings of the incentive structures used to maintain continuous applicability. Over 78.6% of the responders states that the material and tools necessary for the SSC use are present; the picture is much brighter there. One area of improvement in the distribution of resources is found in the remaining 21.4% of results that report infrequent or no use of materials. Incorporation of the SSC in the current protocols for the emergency surgeries is one essential component of being safe to the patients particularly during critical stages. Despite most [85.7%] of participants indicating some level of SSC integration into emergency protocols, only 47.6% had completely integrated the SSC. As one of the constraints of this partial integration, the effectiveness of the checklist lacks effectiveness in emergency scenarios and therefore it would also be worth looking into further. Finally, the data indicate that most hospital culture and administrative support of the SSC is positive. Most [81%], however, believed that administration supported the SSC, and in total 81% responded that they either agreed or

strongly agreed that hospital culture values patient safety and SSC use. However, there exists the possibility that there may be opportunities to improve a more robust culture of patient safety due to the existence of neutral [14.3%] and disagreeing [4.8%] participants. Taken together, these results suggest that interventions to increase use of SSC should have multiple prongs directed at resource, cultural, and systemic factors that shape or influence use of SSC.

Results from the present study on hospital culture and administrative support for SSC are consistent with the broader SSC literature. Despite the majority of respondents perceiving a culture that emphasizes patient safety and visible administrative support, the dissenting voices help to demonstrate where further work is required to enhance the core components. In agreement with an associated study on obstacles to staff implementation of surgical safety checklists by Fourcade et al. [49]. Efforts should be made to address staff concerns, to offer sufficient training, and to cultivate an environment of collaboration to support utilization of the checklist. Similarly, Munthali et al.'s qualitative study highlights the impact of leadership support, clear communication, and having a safe working culture in making SSCs work. Collectively these findings suggest that further SSC adherence must be addressed via a multi-pronged approach that tackles systemic and cultural factors [48].

The results of this present study to obtain hospital culture and administrative support on SSC implementation, concur with the earlier literature on SSC implementation. On the other hand, most respondents felt a visible administrative support and a culture that emphasizes patient safety; however, contrary voices suggest for the continued strengthening of these fundamental components. According to the work of Fourcade et al. barriers to staff adoption of surgical safety checklists include addressing staff concerns, providing adequate training, and creating an environment of collaboration for adoption of the checklist. Munthali et al. concluded similarly that leadership support, clear communication and a good safety culture all contribute to enabling the implementation of SSC. Taken together, these findings indicate that a comprehensive SSC adherence strategy that addresses both systemic and cultural factors will be necessary to realize sustainable gains in governance of SSC use [48,49].

The other key barrier related to the absence of a comprehensive protocol for emergency surgeries, which includes SSC. Out of all the respondents, only 47.6 percent stated that the SSC is fully incorporated into the emergency surgery protocol. The SSC integration in emergency procedures could assist resolving problems linked to resource constraint and workload in critical situations.

Additionally, the study also indicates that hospital culture and leadership contributes to the implementation of SSC. 50% of the respondents strongly agreed that the hospital values patient safety and use of SSC, 14.3% were neutral about it, while 4.8% disagreed with it. Respondents also think 61.9% of respondents that the hospital administration always visibly promotes and supports the SSC, whereas 14.3% think that there is rarely support.

Lack of staff involvement, lack of training, lack of staff willingness to change, unclear communication about the benefits of having an SSC were also reported as factors hindering the implementation of SSC.

However, and in conclusion, implementation of the WHO Surgical Safety Checklist is challenged in Peshawar Tertiary Care Hospitals due to resource constraints, cultural and leadership deficiencies, as well as protocol deficiencies. By tackling these barriers with a multi pronged approach of improved resource allocation, comprehensive emergency protocols, enhanced leadership support, and targeted staff training, sustainable implementation of this key patient safety tool becomes possible.

CONCLUSIONS

In summary, the use of WHO Surgical Safety Checklist in the Peshawar's tertiary care hospitals is plagued with many challenges; limited resources, protocol inadequacies and sub- optimality of hospital culture and leadership. This patient safety tool presents several potential barriers to adoption including improving resource allocation, implementation of comprehensive emergency protocols, increasing leadership support, and targeted training of staffs. Addressing these barriers through a multi-pronged approach may help enable sustainable adoption of the tool.

Existing literature on facilitators and barriers to SSC implementation also confirm the findings that appropriate and appropriate tailored strategies to overcome the unique challenges of Peshawar and other low and middle income settings need further research and evaluations.

Limitation

The study has limitations in that the sample size is relatively small, and the data is self-reported, subject to social desirability bias.

Recommendations

Further research needed to evaluate the pinpoint barriers in Pakistan, across all category's hospitals.

REFERENCES

1. Weiser TG, Haynes AB, Lashoher A, Dziekan G, Boorman DJ, Berry WR, et al. Perspectives in quality: Designing the WHO surgical safety checklist. *International Journal for Quality in Health Care*. 2010 Aug 11;22[5]:365–70.
2. Parry A. Safety rules are your best tools. *Journal of Operating Department Practitioners*. 2014 May 2;2[4]:201–201.
3. Verwey S, Gopalan PD. An investigation of barriers to the use of the world health organization surgical safety checklist in theatres. *South African Medical Journal*. 2018 Apr 1;108[4]:336–41.
4. Lyons VE, Popejoy LL. Meta-Analysis of Surgical Safety Checklist Effects on Teamwork, Communication, Morbidity, Mortality, and Safety. *West J Nurs Res*. 2014 Feb;36[2]:245–61.
5. Melekcie TB, Getahun GM. Compliance with Surgical Safety Checklist completion in the operating room of University of Gondar Hospital, Northwest Ethiopia. *BMC Res Notes*. 2015 Aug 19;8[1].
6. Sk S, Pb T, Ty T, Dk M, Shrestha SK, Bikram Thapa P, et al. Compliance and outcome of implementing World Health Organization surgical safety check list in surgical practice in a teaching hospital. Vol. 4, *Journal of Kathmandu Medical College*.
7. Barimani B, Ahangar P, Nandra R, Porter K. The WHO Surgical Safety Checklist: A Review of Outcomes and Implementation Strategies. Vol. 21, *Perioperative Care and Operating Room Management*. Elsevier Inc.; 2020.
8. Treadwell JR, Lucas S, Tsou AY. Surgical checklists: A systematic review of impacts and implementation. Vol. 23, *BMJ Quality and Safety*. BMJ Publishing Group; 2014. p. 299–318.
9. Kim FJ, da Silva RD, Gustafson D, Nogueira L, Harlin T, Paul DL. Current issues in patient safety in surgery: A review. *Patient Saf Surg*. 2015 Jun 5;9[1].
10. Forrest J, Turrentine FE, Guerlain S, Bovbjerg V, Poole GR, Lebeau K, et al. The Surgical Safety Checklist: Lessons Learned During Implementation [Internet]. Available from: <http://www.npsf.org/>.
11. Lim PJH, Chen L, Siow S, Lim SH. Facilitators and barriers to the

- implementation of surgical safety checklist: an integrative review. *International Journal for Quality in Health Care* [Internet]. 2023 Oct 31;35[4]. Available from: <https://academic.oup.com/intqhc/article/doi/10.1093/intqhc/mzad086/7319718>
12. Gillespie BM, Hamilton K, Ball D, Lavin J, Gardiner T, Withers TK, et al. Unlocking the “black box” of practice improvement strategies to implement surgical safety checklists: A process evaluation. *J Multidiscip Healthc*. 2017 Apr 5;10:157–66.
 13. Nugent E, Hseino H, Ryan K, Traynor O, Neary P, Keane FBV. The surgical safety checklist survey: A national perspective on patient safety. *Ir J Med Sci*. 2013 Jun;182[2]:171–6.
 14. Papaconstantinou HT, Jo C, Reznik SI, Smythe WR, Wehbe-Janek H. Implementation of a Surgical Safety Checklist: Impact on Surgical Team Perspectives.
 15. Riley R. Review : Working together: inter professional collaboration. *Journal of Child Health Care*. 1997 Dec 1;1[4]:191–4.
 16. Spry CC. Perioperative nurses should keep monitoring within their specialty. *AORN J*. 1990 Apr 19;51[4]:1071–2.
 17. Pugel AE, Simianu V V., Flum DR, Patchen Dellinger E. Use of the surgical safety checklist to improve communication and reduce complications. *J Infect Public Health*. 2015 May;8[3]:219–25.
 18. Kurlberg G. Implementation of WHO Surgical Safety Checklist and its Outcome in South Asia [Internet]. Available from: www.jiom.com.np
 19. Paterson C, Mckie A, Turner M, Kaak V. Barriers and facilitators associated with the implementation of surgical safety checklists: A qualitative systematic review. Vol. 80, *Journal of Advanced Nursing*. John Wiley and Sons Inc; 2024. p. 465–83.
 20. Berlinger N, Dietz E. STATE OF THE ART AND SCIENCE Time-out: The Professional and Organizational Ethics of Speaking Up in the OR [Internet]. Vol. 18, *AMA Journal of Ethics*. 2016. Available from: www.amajournalofethics.org
 21. Weiser TG, Haynes AB. Ten years of the Surgical Safety Checklist. *British Journal of Surgery*. 2018 Jul 1;105[8]:927–9.

22. Mejia OAV, Fernandes PMP. Checklists as a central part of surgical safety culture. Vol. 140, Sao Paulo Medical Journal. Associacao Paulista de Medicina; 2022. p. 515–7.
23. Do Prado Tostes MF, Galvão CM. Surgical safety checklist: benefits, facilitators, and barriers in the nurses' perspective. Rev Gaucha Enferm. 2019;40[spe].
24. Implementation Manual WHO Surgical Safety Checklist 2009 Safe Surgery Saves Lives.
25. Jain D, Sharma R, Reddy S. WHO safe surgery checklist: Barriers to universal acceptance. J Anaesthesiol Clin Pharmacol. 2018;34[1]:7.
26. Walker IA, Reshamwalla S, Wilson IH. Surgical safety checklists: Do they improve outcomes? Vol. 109, British Journal of Anaesthesia. Oxford University Press; 2012. p. 47–54.
27. Weiser TG, Porter MP, Maier R V. Safety in the operating theatre - A transition to systems-based care. Vol. 10, Nature Reviews Urology. 2013. p. 161–73.
28. Bashford T, Reshamwalla S, McAuley J, Allen NH, McNatt Z, Gebremedhen YD. Implementation of the WHO Surgical Safety Checklist in an Ethiopian Referral Hospital. Patient Saf Surg. 2014 Mar 28;8[1].
29. Fourcade A, Blache JL, Grenier C, Bourgain JL, Minvielle E. Barriers to staff adoption of a surgical safety checklist. BMJ Qual Saf. 2012 Mar;21[3]:191–7.
30. Gordon PC, Reed AR. The anaesthetist and the world health organization surgical safety checklist. Vol. 18, Southern African Journal of Anaesthesia and Analgesia. Medpharm Publications; 2012. p. 6–7.
31. Fudickar A, Hörle K, Wiltfang J, Bein B. “Surgical safety checklist” der Weltgesundheitsorganisation: Auswirkungen auf komplikationsrate und interdisziplinäre kommunikation. Vol. 109, Deutsches Arzteblatt. 2012. p. 695–701.
32. Semel ME, Resch S, Haynes AB, Funk LM, Bader A, Berry WR, et al. Adopting A Surgical Safety Checklist Could Save Money And Improve The Quality Of Care In U.S. Hospitals. Health Aff. 2010 Sep;29[9]:1593–9.
33. Lingard L. Communication failures in the operating room: an observational classification of recurrent types and effects. Qual Saf Health Care. 2004 Oct 1;13[5]:330–4.

34. Russ S, Rout S, Sevdalis N, Moorthy K, Darzi A, Vincent C. Do Safety Checklists Improve Teamwork and Communication in the Operating Room? A Systematic Review. *Ann Surg*. 2013 Dec;258[6]:856–71.
35. Kwon EG, Gurakar M, Guzhñay B, Vicuña AL, Perry HB, Razzak J, et al. Surgical Safety Checklist Completion and Barriers to Completion in a Mobile Surgery Program. *J Am Coll Surg*. 2018 Oct;227[4]:S133.
36. Fischer F, Lange K, Klose K, Greiner W, Kraemer A. Barriers and strategies in guideline implementation—a scoping review. Vol. 4, *Healthcare [Switzerland]*. MDPI; 2016.
37. Haugen AS, Sevdalis N, Sjøfteland E. Impact of the World Health Organization Surgical Safety Checklist on Patient Safety. Vol. 131, *Anesthesiology*. NLM [Medline]; 2019. p. 420–5.
38. Gagliardi AR, Straus SE, Shojania KG, Urbach DR. Multiple interacting factors influence adherence, and outcomes associated with surgical safety checklists: A qualitative study. *PLoS One*. 2014 Sep 26;9[9].
39. Tostes MF do P, Galvão CM. Implementation process of the surgical safety checklist: Integrative review. Vol. 27, *Revista Latino-Americana de Enfermagem*. Escola de Enfermagem de Universidade de Sao Paulo; 2019.
40. Abbott TEF, Ahmad T, Phull MK, Fowler AJ, Hewson R, Biccard BM, et al. The surgical safety checklist and patient outcomes after surgery: a prospective observational cohort study, systematic review and meta-analysis. *Br J Anaesth*. 2018 Jan 1;120[1]:146–55.
41. Schwendimann R, Blatter C, Lüthy M, Mohr G, Girard T, Batzer S, et al. Adherence to the WHO surgical safety checklist: An observational study in a Swiss academic center. *Patient Saf Surg*. 2019 Mar 12;13[1].
42. Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AHS, Dellinger EP, et al. Changes in safety attitude and relationship to decreased postoperative morbidity and mortality following implementation of a checklist-based surgical safety intervention. *BMJ Qual Saf*. 2011;20[1]:102–7.
43. Bliss LA, Ross-Richardson CB, Sanzari LJ, Shapiro DS, Lukianoff AE, Bernstein BA, et al. Thirty-day outcomes support implementation of a surgical safety

- checklist. *J Am Coll Surg*. 2012 Dec;215[6]:766–76.
44. Vivekanantham S, Ravindran RP, Shanmugarajah K, Maruthappu M, Shalhoub J. Surgical safety checklists in developing countries. Vol. 12, *International Journal of Surgery*. 2014. p. 2–6.
 45. Kearns E, Khurshid Z, Anjara S, De Brú A, Rowan B, Mcauliffe E. Power dynamics in healthcare teams-a barrier to team effectiveness and patient safety: A systematic review [Internet]. Available from: https://academic.oup.com/bjsopen/article/5/Supplement_1/zrab032.091/6217263
 46. Artemiou E, Adams CL. Leading a Clinical Communication Program in a Remote Setting: Practical Considerations from ROSS University School of Veterinary Medicine, St. Kitts. *MedEdPublish*. 2017 Feb 17;6:31.
 47. Walker IA, Reshamwalla S, Wilson IH. Surgical safety checklists: Do they improve outcomes? Vol. 109, *British Journal of Anaesthesia*. Oxford University Press; 2012. p. 47–54.
 48. Munthali J, Pittalis C, Bijlmakers L, Kachimba J, Cheelo M, Brugha R, et al. Barriers and enablers to utilisation of the WHO surgical safety checklist at the university teaching hospital in Lusaka, Zambia: a qualitative study. *BMC Health Serv Res*. 2022 Dec 1;22[1].
 49. Fourcade A, Blache JL, Grenier C, Bourgain JL, Minvielle E. Barriers to staff adoption of a surgical safety checklist. *BMJ Qual Saf*. 2012 Mar;21[3]:191–7.

APPENDICES

ENGLISH CONSENT FORM

Description of the Research and Your Participation

You are invited to participate in a research study conducted by IMAD UD DIN KHAN

The purpose of this research is to evaluate the “Analysis of barriers to implementing the WHO Surgical Safety Checklist in multiple tertiary care hospitals of Peshawar”

Risks and Discomforts

There are no risks and discomfort associated with this research.

Potential Benefits

The participants will get indirect benefits as the findings of the study will help to overcome the factors associated with non-adherence to anti-tuberculosis treatment.

Protection of Confidentiality

We will do everything we can to protect your privacy. Your identity will not be revealed in any publication resulting from this study.

Voluntary Participation

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study.

CONSENT

I have read this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's Signature _____ Date: _____

A copy of this consent form should be given to the participant.

URDU CONSENT FORM

میں _____ تصدیق کرتا/ کرتی ہوں کہ محترم IMAD UD DIN KHAN نے اپنی اس تحقیق

“ANALYSIS OF BARRIERS TO IMPLEMENTING THE WHO SURGICAL SAFETY CHECKLIST IN MULTIPLE TERTIARY CARE HOSPITALS OF PESHAWAR ”

زیرنگرانی DR. TASRA BIBI کے متعلق بتا دیا ہے۔ مجھے اس تحقیق کی نوعیت، مقاصد، اہداف، توقعات، فوائد اور خطرات کے متعلق ، ساری معلومات فراہم کر دی گئی ہیں اس تحقیق کے دوران ساری معلومات صیغہ راز میں رہیں گی اور مریض کا نام اور دیگر معلومات صرف تحقیق کے لیے استعمال ہوں گی۔ مجھے یہ بھی بتا دیا گیا ہے کہ میں اس تحقیق سے متعلق ہر قسم کے سوال پوچھنے کا مجاز ہوں اور یہ تحقیق صرف ایک شخص کا مفاد میں نہیں ہے بلکہ بحسنیت مجموعی انسانیت کا مفاد اس سے وابستہ ہے۔ تمام تفصیلات جاننے کے بعد یس تحقیق میں شامل ہونے یا نہ ہونے پر کسی کا قائل نہیں ہوں۔ اس تحقیق سے کسی بھی وقت علیحدہ ہونے پر مجھ پر کوئی پابندی نہیں ہو گی۔ میں بذاتِ خود بقائمی حوش و حواس اور رضا مندی سے اس تحقیقاتی عمل میں شامل ہوتی/ ہوتا ہوں۔

دستخط محقق _____

دستخط شرکت کار _____

تاریخ _____

DEMOGRAPHICS FORM & QUESTIONNAIRES

PERMISSION LETTER

ETHICS COMMITTEE LETTER

PLAGIARISM REPORT