

## Assessment of Surgical Safety Checklist use and Attitude Towards it Among the Operating Room Staff: A Prospective Observational Study

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### Abstract

**Introduction:** Inter-professional teamwork—an important factor for patient safety. World Health Organization (WHO) introduced Surgical Safety Checklist which has shown to improve intraoperative teamwork and contribute to postsurgical safety culture by reducing surgical morbidity and mortality. Our aim is assessing the use of surgical safety checklist, its completion rate and attitude of operating room staff towards its use, barriers to implementation and methods to improve compliance.

**Methods:** A prospective study was conducted In August 2018, a total of 262 surgeries were performed in the department of general surgery, accordingly surgeries were observed for briefing team and data collected regarding the completion of Surgical Safety Checklist (SSC). Post August questionnaires were given to operating room staff to ask their opinions regarding the checklist, beliefs and barriers.

**Results:** Only 16.03% of the checklist were completely performed, while 55.72% remained partially complete and 28.2% were such that none of the components of checklists in the patient files were filled in; with more usage of checklist during elective procedures, 13.14% completely performed and 73.14% were partially complete. About 57.47%

of checklist remained completely unused during emergency surgery. Overall, lack of briefing team was noted in >80% of time. More than 80% of people believed that usage of checklist reduces likelihood of human error and main barrier for lack of usage being lack of training and assertiveness.

**Conclusion:** Appropriate utilization and compliance of Surgical Safety Checklist is dependent on the training of staff. It cannot be assumed that the introduction of a checklist will lead to improved outcomes unless followed. The functioning of checklist requires people to make one salient change particularly, the operating team has to pause during sign in (SI) time out (TO) and sign out (SO) phases before continuing as it just acts as a reminder at every stage of surgery. Actual usage of checklist has to be made rather than blindly filling in the box because compliance is important than the completeness of the checklist.

**Keywords:** Surgical safety checklist, Sign in, Time out, Sign out.

### Introduction

Around the world surgical complications are considerable cause of death and disability. They are catastrophic to patient, costly to healthcare systems, and often preventable, though their prevention requires a change in health care systems and individual behaviours.<sup>1</sup> The World Health Organization (WHO) has developed a comprehensive perioperative checklist as a primary intervention of the "Safe Surgery Saves Lives" program—a sincere effort to reduce surgical deaths around the world.<sup>2</sup>

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This checklist is similar to those used in aviation, aeronautics and product manufacturing. The surgical safety checklist (SSC) consists of 19 items and for the timing of WHO surgical safety checklist, three phases in the work flow pattern that had naturally amended 'pause points' were identified. first prior to induction of anaesthesia, second prior to skin incision and third prior to patient leaving the operating room.<sup>3</sup> The items included in the SSC are aimed at preventing uncommon but serious errors, basically by reminding the team to confirm patient identity, surgical site, and other important characteristics such as comorbid conditions or anticipated complications. Results from the initial prospective, sequential, time-series observational study showed significant reductions in complications, in-hospital mortality, rates of unplanned reoperation, and surgical site infection (SSI) compared to pre-checklist rates.<sup>4</sup> The assessment of patient safety perceptions and behaviors of members of surgical teams allows one to identify the most vulnerable areas so that operating surgeons can promptly intervene in order to solve problems in the operating room<sup>5</sup>, checklist helps for the same in a organized manner. J. Bergs *et al.* showed that Reduction in postoperative complications correlates with adherence to the aspects of care embedded in WHO SSC.<sup>6</sup> Our aim is assessing the use of surgical safety checklist, its completion rate, compliance attitude of operating room staff towards its use, barriers to implementation and methods to improve compliance, though we haven't looked into the postoperative complications of surgeries performed.

## Materials and Methods

An observational study was conducted in august 2018 in the department of general surgery, a total of 262 surgeries were performed out of which 87 were emergency and 175 were elective with

an average of 6-7 elective and 2-3 emergency surgery's per day, accordingly surgeries were observed for the presence of briefing team and data collected regarding the completion of Surgical Safety Checklist (SSC). Post august a total of 16 questions were given pertaining to Attitude, Knowledge, Adaptation and Practicability of surgical safety checklist [SSC] to operating room staff i.e -surgeons, anesthetist, OT nursing staff. Circulated by e-mail, whats up groups and other messengers. Responses were collected, compared and statistically analysed using surveymonkey. Com. [questionare described in annexure].

## Results

Only 16.03% (42) of the checklist were completely performed, while 55.72% (146) remained partially complete and 28.2% were such that none of the components of checklists in the patient files were filled in i.e about 74 out of 262 SSC were completely unused. So, the overall completeness being 71.75%.

With breifing team noted 16% of the time, as found in sections completely performed and eventually lack of briefing team in >80% of time.

More usage of checklist was noted during elective procedures about 86.2% (151).13%(23) were complete and 73.14% (128) were partially complete with time out section to be filled maximally. Whereas during emergency surgeries 42.5%(37) of checklist were used (completely and partially filled) and 57.4% (50) remained unused (Fig. 1).

Among 262 checklist, 188 were filled in 71.75% with 146 checklist 55.7% being partially filled in, the following table depicts the number of checklist that were filled partially in separate components of both elective and emergency surgery. The time out component of checklist was the most commonly performed 56.87% and sign in component was the

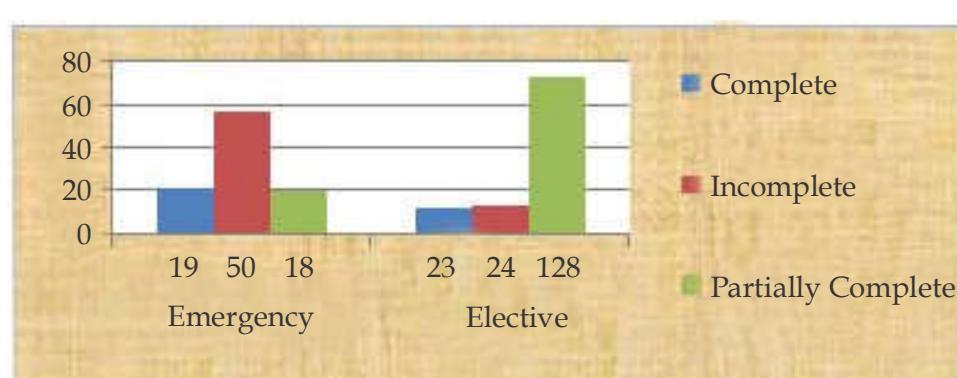


Fig. 1: Completeness of checklist-elective vs emergency

most poorly done section 27.48% (Table 1) (Fig. 2).

Post study questionnaire were distributed to the operating room staff. 116 members filled the questionnaire of which 62 were surgical personal, 21 were anesthetic personal and 33 were nursing staff. Of which 50% of the people knew that WHO introduced checklist (Fig 3).

Amongst all the people in operating room nursing staff support the use of checklist-58% (Fig 4).

Four questionnaire were such that it would assess the need of man power, their compliance and their indulgence into the right use of checklist at right time (Table 2).

Eight questionarie were to assess the attitude of operating room staff towards the checklist and factors affecting its regular usage. Regarding man power when asked if number of people in OT affect completion rate,72% felt it to be true, which is significant @  $p < 0.01$ . while 53% felt the position of surgery in OT affect completion rate which is insignificant @  $p < 0.05$  (Fig 5).

Though 100% of people thought it to be useful only 59.32% had initited the use of it in the past and rest 40.66% would like to initiate the use of it in future. Among OT staff 23.93% of them think SSC causes delays and 6.78% think it doesn't work, all values were significant @  $p < 0.05$ . (Fig. 6).

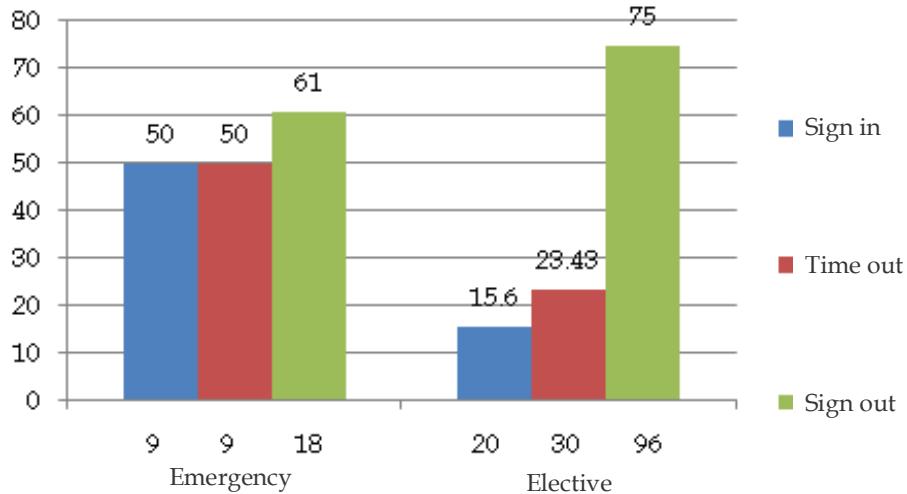


Fig. 2: Components of checklist-completion rate

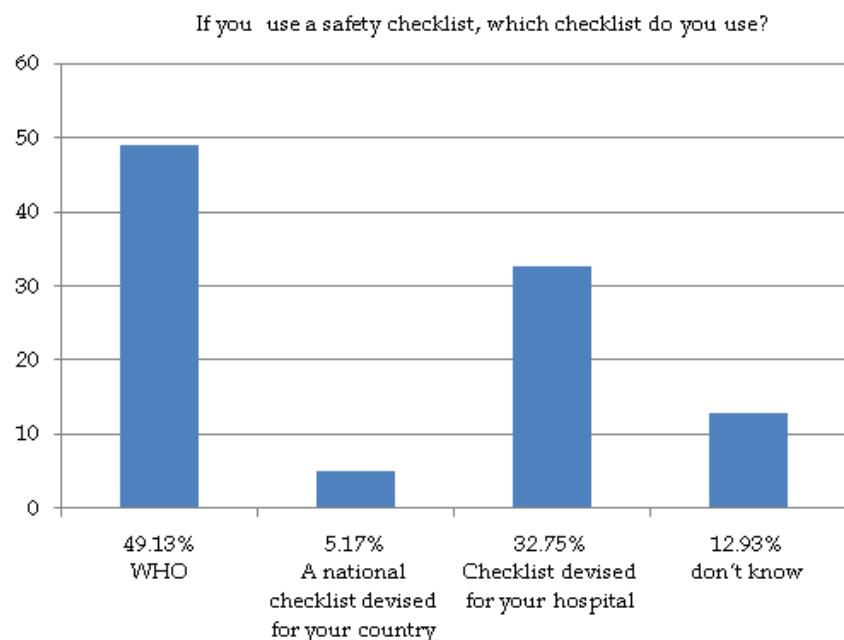


Fig. 3: Knowledge

Regarding belief and barriers for implementation -multiple responses were recorded. 77.78% of people believe checklist reduces the likelihood of human error, 66.7% believe it improves patient safety (Fig. 7).

And the main barrier for lack of usage being lack of training and assertiveness 42.59 and 35.19%

respectively. 11.11% feel failure of documentation being the cause though precautions are followed All found to be significant @  $p < 0.01$  and lack of training significant @  $p < 0.05$  (Fig. 8).

## Discussion

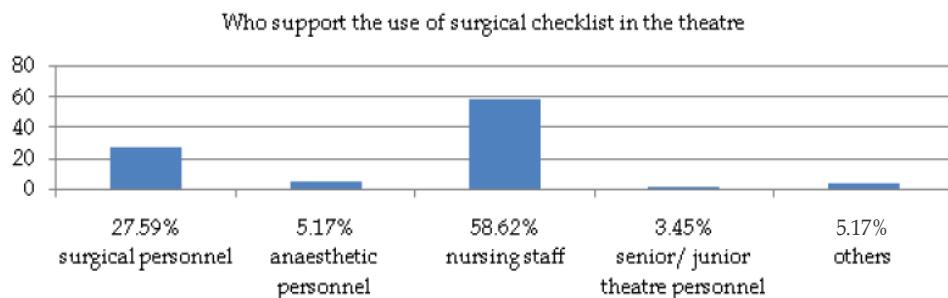


Fig. 4: who support the use of surgical checklist in the theatre

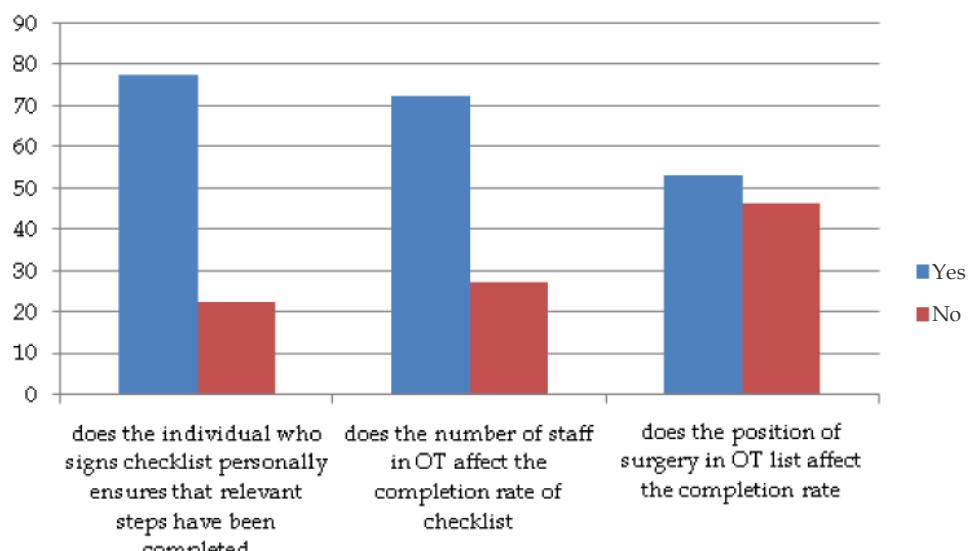


Fig. 5: Adaptation

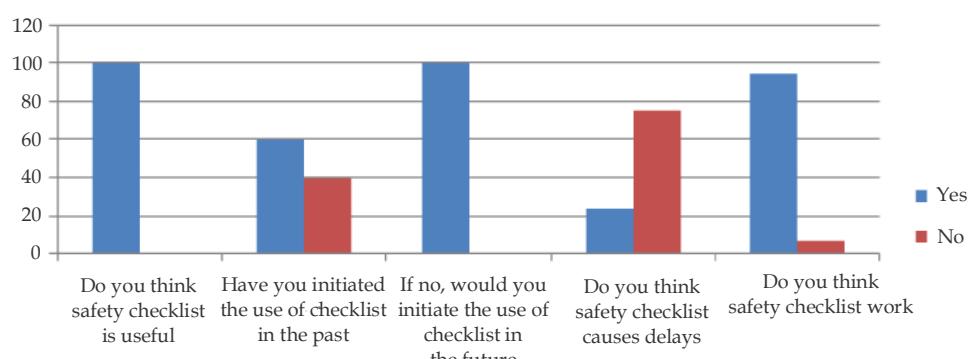
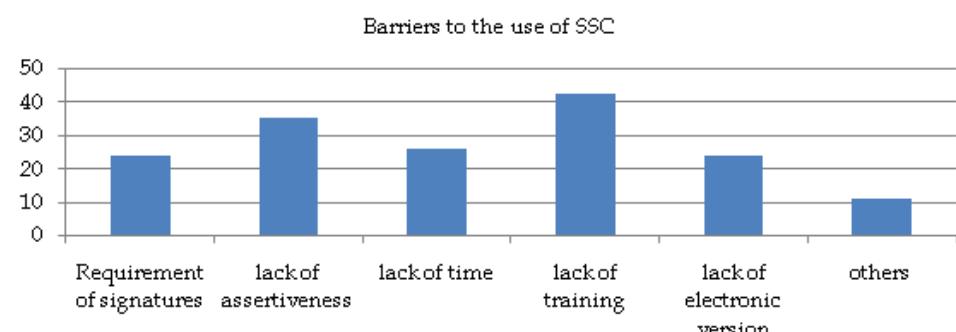


Fig. 6: Adaptation



**Fig. 7:** Practicability



**Fig. 8:** Practicability

**Table 1:** Completeness of Components of SCC

		Only sign in	Only sign out	Only time out
Emergency Surgery	With signatures	2	5	0
	Without signatures	0	0	0
		Sign in + time out	Time out + sign out	Sign in + sign out
	With signatures	7	4	0
Elective Surgery	Without signatures	0	0	0
		Only sign in	Only sign out	Only time out
	With signatures	2	14	80
	Without signatures	1	0	0
		Sign in + time out	Time out + sign out	Sign in + sign out
	With signatures	3	6	6
	Without signatures	6	1	3

**Table 2:** Checklist

	Never	Occasionally	Most of the time	All the time
In the operating room, do you use a safety checklist?	5.17%	25.86%	34.48	34.48
Before the start of first case in the operating room, do you have a team briefing to discuss the patients on the operating list?	25.86	40.5	25.86	7.75
Before the surgical incision is made, do you stop and confirm the patient's identity; the operation to be performed; the consent form has been signed; cross-matched blood is available; and that antibiotic prophylaxis has been commenced if appropriate?	8.62	18.97	43.1	29.31
At the end of the operation, do you have a 'sign out' session to check the name of the procedure performed; that the instrument count is correct; that any specimens have been labelled?	17.24	15.51	23.27	43.96

**Table 3:** Adaptation

	<b>Yes</b>	<b>No</b>	<b>Chi-Square Value</b>
Does the individual who signs checklist personally ensures that relevant steps have been completed	90	26	35.31**
Does the number of OT staff in OT affect the completion of the checklist	84	32	23.31**
Does the position of surgery in OT affect the completion of the checklist	62	54	0.55
Do you think the safety checklist is useful?	116	0	116.00**
Have u initiated the use of checklist in the past	70	46	4.97*
If no, would u initiate the use of checklist now [sub question of previous question]	46	0	46.00**
Do you think the safety checklist causes delays?	28	88	31.03**
Do you think the safety checklist doesn't work	110	6	93.24**

**Table 4:** Beliefs about SSC [Practicability]

	<b>Yes</b>	<b>No</b>	<b>Chi-Square Value</b>
Using checklist reduces likelihood of errors	84	32	23.31**
Improves patient safety	72	44	6.76**
Improves team work	62	54	0.55
Others	2	114	108.14**

**Table 5:** Barriers to the use of checklist [knowledge]

	<b>Yes</b>	<b>No</b>	<b>Chi-Square Value</b>
Requirement of signatures	26	90	35.31**
Lack of assertiveness	38	78	13.79**
Lack of time	28	88	31.03**
Lack of training	46	70	4.97*
Lack of electronic version	26	90	35.31**
Others	13	105	71.73**

Note: \* - Significant at  $p < 0.05$ , \*\* - Significant at  $p < 0.01$

Our study showed moderate completeness rate of SSC, with positive attitude towards the checklist, but with a lack of briefing team in >80% of time indicating low compliance.

Conley *et al.* 2010 investigated the factors influencing implementation of the checklist in five Washington hospitals and concluded that effectiveness was dependent on the ability of leaders to explain and show how to use the checklist and why it has to be used.<sup>7</sup> Which has to be inculcated in the current setup to improve the compliance rate.

Borchard *et al.* complied the results as overall compliance rate ranging from 12% to 100% (mean of 75%) and for time out from 70 to 100% (mean of 91%)<sup>8</sup> similarly our study showed a compliance rate of about 71.75% with varying degree of completeness with time out section being maximally performed of about 56.87% compared to other sections.

Most of the checklists were filled in maximally during emergency surgery in regard to results of melekic *et al.*<sup>9</sup>, but with regard to current context maximal usage was found in elective surgery and

probable reason being despite of non usage of checklist-most of the components were filled in and hence completeness rate was satisfactory.

Similar to the research by Nilsson *et al.* (2010) all the operating room personnel had positive attitude towards the checklist. Majority of the operating room personnel believed that checklist improves communication and collaboration among personnel. It is easy to use in surgery and valued as important tool in every patient's case.<sup>10</sup>

Santana *et al.* showed that 90.0% of respondents agreed that checklist helps in prevention of errors in the operating room, and our study showed 77.78% acceptance for the same. over all, the use of checklist at pause points helps in the completion of important aspects which if missed can cause significant postoperative unwanted outcome.<sup>11</sup>

Limitation of study being audit cycle is not completed. Effects on morbidity or mortality is not discussed, completion of SSC in different departments are not considered.

## Conclusion

The functioning of checklist requires people to make one salient change particularly, the operating team has to pause during sign in (SI) time out (TO) and sign out (SO) phases before continuing as it just acts as a reminder at every stage of surgery. Actual usage of checklist has to be made rather than blindly filling in the box because compliance is important than the completeness of the checklist.

## Annexures

### Questionnaires

#### Attitude

- Before the start of first case in the operating room, do you have a team briefing to discuss the patients on the operating list?
- Before the surgical incision is made, do you stop and confirm the patient's identity; the operation to be performed; the consent form has been signed; cross-matched blood is available; and that antibiotic prophylaxis has been commenced if appropriate?
- At the end of the operation, do you have a 'sign out' session to check the name of the procedure performed; that the instrument count is correct; that any specimens have been labelled?

#### Knowledge and Usage

- Do you use a checklist
- Which checklist do you use
- Who supports the use of checklist

#### Practicability

- Beliefs about SSC
- Barriers to implementation

#### Adaptation

- Does the individual who signs checklist personally ensures that relevant steps have been completed
- Does the number of OT staff in OT affect the completion of the checklist
- Does the position of surgery in OT affect the completion of the checklist
- Do you think the safety checklist is useful?
- Have u initiated the use of checklist in the past

- If no, would u initiate the use of checklist now [sub question of previous question]
- Do you think the safety checklist causes delays?
- Do you think the safety checklist doesn't work

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