Surgical Team Members' User Evaluations on the Use of Safe Surgery Checklist^{TR} during Surgical Intervention

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Abstract

Aim: The Safe Surgery Checklist is a critical tool the World Health Organization developed to improve patient safety and reduce surgical errors. This study aimed to evaluate the opinions of surgical team members regarding using the Safe Surgery Checklist^{TR} during surgical intervention and to develop recommendations to improve their compliance.

Method: This cross-sectional and descriptive study was conducted with 334 healthcare professionals, including 162 nurses and 172 anesthesia technicians, working in Istanbul between January 02, 2024, and March 31, 2024. Data were collected using the Safe Surgery Checklist^{TR} Implementation Perception Questionnaire developed by the researchers in line with the literature and consisted of 33 items evaluating various elements of the checklist. Statistical analyses, including reliability tests (Cronbach's alpha) and descriptive statistics, were performed using the Statistical Package for the Social Sciences 26 program.

Results: The overall Cronbach's alpha value for the Safe Surgery Checklist^{TR} Implementation Perception Questionnaire was 0.966, indicating high reliability. Participants reported a mean score of 153.57±16.41, with a positive agreement rate of approximately 93%. The highest positive agreement was found for the item "Patient risk assessment should be performed" (98.8%) and the lowest agreement was found for confirming the necessity of prophylactic antibiotics (74.9%).

Conclusion: The study's results revealed that although awareness of the Safe Surgery Checklist^{TR} was high among team members, adherence to the practice varied, especially among less experienced and less educated staff. This highlights the need for education and communication strategies to improve adherence to the Safe Surgery Checklist^{TR} and increase patient safety and the importance of its successful implementation.

Keywords: Checklist, compliance, patient safety, quality of healthcare, surgical nursing.

Cerrahi Ekip Üyelerinin Cerrahi Girişim Sırası Güvenli Cerrahi Kontrol Listesi^{TR} Kullanımına İlişkin Kullanıcı Değerlendirmeleri

Öz

Amaç: Güvenli Cerrahi Kontrol Listesi, Dünya Sağlık Örgütü tarafından hasta güvenliğini artırmak ve cerrahi hataları azaltmak için geliştirilmiş kritik bir araçtır. Bu araştırmanın amacı, cerrahi ekip üyelerinin cerrahi girişim sırasında Güvenli Cerrahi Kontrol Listesi^{TR}'nin kullanımına ilişkin görüşlerini değerlendirmek ve uyumlarını artırmaya yönelik öneriler geliştirmektir.

Yöntem: Kesitsel-tanımlayıcı tasarımda gerçekleştiren bu çalışma, 02 Ocak 2024- 31 Mart 2024 tarihleri arasında İstanbul ilinde çalışan, 162 hemşire ve 172 anestezi teknisyeni/teknikeri olmak üzere 334 sağlık

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ETHICAL STATEMENT: This study was carried out with the approval of the Ethics Committee of İstanbul Atlas University, dated 09/10/2023 and numbered 08/01. A signed subject consent form in accordance with the Declaration of Helsinki was obtained from each participant

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profesyoneli ile gerçekleştirildi. Veriler literatür doğrultusunda araştırmacılar tarafından geliştirilen, kontrol listesinin çeşitli öğelerini değerlendiren 33 maddeden oluşan Güvenli Cerrahi Kontrol Listesi^{TR} Uygulama Algısı Anketi kullanılarak toplandı. İstatistiksel analizler, güvenilirlik testi (Cronbach's alpha) ve tanımlayıcı istatistikler dahil olmak üzere Statistical Package for the Social Sciences 26 programı kullanılarak yapıldı.

Bulgular: Güvenli Cerrahi Kontrol Listesi^{TR} Uygulama Algısı Anketi için genel Cronbach alfa değeri 0,966 olup yüksek güvenilirliğe işaret etmektedir. Katılımcılar ortalama 153,57 ± 16,41 puan bildirmiş olup, pozitif uyum oranı yaklaşık %93'tür. En yüksek pozitif katılımın "Hastanın risk değerlendirmesi yapılmalıdır" maddesinde (%98.8), en düşük katılımın ise profilaktik antibiyotiklerin gerekliliğinin teyit edilmesinde (%74.9) olduğu belirlendi.

Sonuç: Araştırma sonuçları ekip üyeleri arasında Güvenli Cerrahi Kontrol Listesi^{TR}'ye ilişkin farkındalığın yüksek olmasına karşın, özellikle daha az deneyimli ve eğitim seviyesi daha az çalışanlar arasında uygulamaya bağlılığın değişkenlik gösterdiğini ortaya koymaktadır. Bu durum, Güvenli Cerrahi Kontrol Listesi^{TR}'ye uyumu iyileştirmek ve hasta güvenliğini artırmak için eğitim ile iletişim stratejilerine duyulan ihtiyacı ve başarılı bir şekilde uygulanmasının önemini vurgulamaktadır.

Anahtar Sözcükler: Kontrol listesi, uyum, hasta güvenliği, sağlık hizmeti kalitesi, cerrahi hemşireliği.

Introduction

Surgical errors are preventable and unintentional injuries that occur during the surgical process. These errors are not inherent risks of surgical procedures and can be prevented by effectively training healthcare professionals to ensure compliance with appropriate guidelines. Preventing high-impact but low-risk errors, such as foreign objects left in the body during surgery, mislabelled surgical specimens, and surgery on the wrong patient or at the wrong site, is critical to patient safety[1]. Analyses show that there are many reasons for surgical errors; factors such as poor communication, unnecessary or emergency procedures, inadequate training, and burnout among healthcare workers are among the common causes of surgical errors[2].

Performing the surgical procedure according to specific protocols is important to prevent adverse events[3]. To prevent such errors, the World Health Organization developed the Safe Surgery Checklist (SSC) in 2008, which consists of 19 items[3-7]. The use of this list has been reported to reduce major complications and contribute to patient safety[6,7].

In Turkey, the Ministry of Health adapted this list into a four-level, 30-item form and created the SSC^{TR}[4,8]. The literature highlights the importance of assessing SSC in the operating theatre environment and recommends studies on the impact of high compliance on surgical complications[3,7,9,10]. Studies report that SSC has positive effects on patient safety, but there are different approaches to compliance with safety protocols[3,10,11]. These findings suggest that further research is needed to identify areas for improvement[7,12].

This study aimed to assess the opinions of surgical team members regarding the use of the SSC^{TR} and to develop recommendations to improve their compliance.

Material and Methods

Type of Research

The study was conducted using a cross-sectional descriptive design. The study population comprised 334 healthcare workers based in Istanbul between January 02, 2024, and March 31, 2024.

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Study Design and Participation

The study population comprised all anaesthesia technicians and nurses employed in Istanbul. Given the number of independent variables (33), the sample size was calculated to be 272, in line with the parameters of a 0.05 significance level, 95% power and an effect size of 0.15[13]. It was intended that at least 136 employees from each occupational group should be included in the research sample. The study sample comprised a total of 334 health professionals, of whom 162 were nurses and 172 were anaesthesia technicians.

Inclusion and Exclusion Criteria

To participate in the research, individuals must meet the following criteria:

- Be at least 18 years of age
- Voluntarily accept to take part in the research and give consent
- To be a nurse or anaesthesia technician.

Data Collection Tools

A series of five questions were posed to ascertain the identifying characteristics of the participants, age, occupation, education level, experience of working in a surgical clinic, and position in the unit where they were employed. The data were collected using the 'Safe Surgery Checklist TR Implementation Perception Questionnaire' (SSC^{TR}-IPQ), which comprises 18 items about the SSC^{TR} and 33 items covering the surgical intervention process, formulated by the extant literature[4,14].

Safe Surgery Checklist^{TR} Implementation Perception Questionnaire (SSC^{TR}-IPQ): The form developed by the researchers was reviewed by two specialist physicians in anesthesiology and reanimation, as well as a nurse academician, to obtain expert opinion. Additionally, based on expert opinion, the item related to the verification of the patient's identity information, the procedure, and the surgical site prior to the administration of anesthesia (item 10), as well as the items regarding the introduction of all surgical team members before the incision (items 17 and 18), were excluded from the scope of the study, as they were not open to evaluation or suggestion. Following the Safe Surgery Checklist^{TR}, the section entitled 'Before Leaving the Clinic' (comprising nine items) has been excluded from the present study, in line with the stated purpose of the investigation[8]. Accordingly, evaluation questions were prepared for the items included in the remaining 18 items out of the 21 items under the sections 'Before Anaesthesia', 'Before Surgical Incision' and "Before Exiting the Operation" in the SSC^{TR}. The questionnaire was constructed with 33 items for evaluation and three sub-dimensions: Pre-Anaesthesia Practices (PAP), Pre-Operative Incision Practices (PIP) and Pre-Operative Discharge Practices (PDP). Each item was rated on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree), where higher scores indicate a more positive perception and stronger agreement with safe surgical practices. The total score for the SSCTR-IPQ was obtained by summing the responses to all 33 items, resulting in a possible score range from a minimum of 33 to a maximum of 165 points. Each sub-dimension score was calculated by summing the scores of the relevant items within that specific domain. Accordingly, the score range for the PAP sub-dimension, which consists of 9 items, was between 9 and 45; for the PIP sub-dimension, which includes 15 items,

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between 15 and 75; and for the PDP sub-dimension, which also comprises 9 items, between 9 and 45. In addition to total and subscale scores, a significance score was calculated by dividing the total score by the number of items, providing a mean score on a 5-point scale. This calculation allows for a more standardized interpretation of participants' agreement levels across the entire scale. Higher significance scores reflect greater agreement with safe surgical checklist practices and indicate more favorable perceptions regarding their implementation in clinical settings.

Data Collection

The study commenced with the recruitment of nurses and anaesthesia technicians from hospitals in Istanbul province, all of whom were members of the surgical team. These individuals were initially identified at the Prof. Dr. Cemil Taşçıoğlu Hospital in Istanbul and then reached through the snowball sampling method. The data collection form was distributed online to the participants who had consented to take part in the study voluntarily. Furthermore, the Turkish Association of Surgical and Operating Theatre Nurses assisted in the dissemination of the data collection form to the aforementioned team members.

Statistical Analysis

The findings from the study were evaluated using the SPSS (Statistical Package for the Social Sciences, IBM Corp., Armonk, NY, USA) 26 program. The normality of the scores obtained from each continuous variable was analyzed using descriptive, graphical, and statistical methods. The Kolmogorov-Smirnov test was employed to ascertain the normality of the scores obtained from a continuous variable through a statistical methodology. Cronbach alpha reliability coefficients were calculated to assess the scales' reliability. Categorical variables were presented as frequencies (n, %) and continuous variables were presented as means and standard deviations. Comparisons between two groups in continuous variables were conducted using an independent samples t-test. Comparisons between three or more groups were conducted using a one-way ANOVA (analysis of variance) test. Chi-square tests (Pearson's chi-square test and Fisher's exact test) were employed for the comparison of qualitative data. The results were evaluated within a 95% confidence interval, and statistical significance was determined to be $p < 0.05$.

Ethical Considerations

Approval was granted by the Istanbul Atlas University Non-Interventional Scientific Research Ethics Committee on 9 October 2023, with the ethics committee decision bearing the number 08/01. The requisite institutional permission was obtained from the Education Planning Board (EPB) of Istanbul Prof. Dr. Cemil Taşçıoğlu Hospital with the letter dated 5 June 2023 and numbered E-48670771-020-217017077. Subsequently, other participants were recruited through the snowball sampling method, beginning at this initial center. The data were recorded, and the study was conducted following the World Medical Association Declaration of Helsinki and the Personal Data Protection Law (PDPL). All participants provided informed voluntary consent.

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Results

It was established that 48.5% of the participants were nurses and 51.5% were anaesthesia technicians. It was observed that 51.2% of the participants were within the age range of 18-25 years, 65% had obtained either a high school diploma or an associate degree, 68.2% had been employed in the surgical unit for five years or less, and 94% were currently engaged in active employment (Table 1).

Table 1. Participant descriptive characteristics (n=334)

Characteristics	**n**	**%**
Age (year)		
18-25	171	51.2
26-35	108	32.3
36-45	42	12.6
46 and over	13	3.9
Educational Status		
High school and associate degree	217	65.0
Undergraduate and postgraduate	117	35.0
Surgical unit experience		
1 year and less	120	35.9
2-5 years	108	32.3
More than 5 years	106	31.7
Position in the unit he/she works		
Charge nurse/technician	20	6.0
Staff	314	94.0
Profession		
Nurse	162	48.5
Anaesthesia technician	172	51.5

The Cronbach's alpha reliability coefficient for the total score of the SSC^{TR}-IPQ was found to be α=0.966, while the Cronbach's alpha values for the sub-dimensions of the SSC^{TR}-IPQ ranged between α=0.877 and 0.944. The internal consistency values calculated for the SSC^{TR}-IPQ total score and sub-dimensions indicated that the SSC^{TR}-IPQ was highly reliable. The corrected item-total score correlation coefficients for the 33 items of the SSC^{TR}-IPQ were found to range from r=0.39 to r=0.81. The inter-item correlation matrix for the SSC^{TR}-IPQ revealed a positive and adequate relationship between items (Table 2).

The mean total score obtained by the participants from 33 items of the SSC^{TR}-IPQ was 153.57±16.41. The significance score obtained by dividing the participants' score from the SSC^{TR}-IPQ measurement by the total number of items was 4.65±0.49 out of 5 points. The rate of participants' positive agreement with the SSC^{TR}-IPQ items was approximately 93%. SSC^{TR}-IPQ was hierarchically analyzed in 3 sub-dimensions: Pre-anaesthesia Practices (PAP), Pre-operative Incision Practices (PIP) and Pre-Operative Discharge Practices (PDP). The mean total score and significance level of the participants in the

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subscales of PAP, PIP and PDP were calculated as 42.45±4.44 (significance, 4.72±0.49), 69.49±7.88 (significance, 4.63±0.53) and 41.64±5.22 (significance, 4.63±0.58), respectively. It was observed that the sub-dimension in which the participants had the highest positive agreement was the PAP with a rate of 94%. When the SSC^{TR}-IPQ item-based positive agreement rates were analysed, it was found that the statement with the highest rate of agreement (98.8%) was 'The patient's risk assessment should be performed', and the statement with the lowest rate of agreement (74.9%) was 'It should be confirmed that there is no need for prophylactic antibiotic use in untreated patients within 60 minutes before the incision.'. When the SSC^{TR}-IPQ items were evaluated as a whole, it was determined that the participants showed a negative agreement of 10% or more for 6 items (items 2, 18, 19, 25, 26 and 27) (Table 2).

Table 2. SSC^{TR}-IPQ item statistics (n=334)

	SSC^{TR}-IPQ	**Positive participation, n(%)**	**Mean±SD**	**CITC**	**α**
	PAP-Total Score		**42.45±4.44**		**0.877**
	PAP-Significance Score		**4.72±0.49**		
1	The surgical site marking must be checked.	315(94.3)	4.66±0.85	0.51	
2	If there is no marking in the operation area, it must be ensured that it is not applicable.	262(78.4)	4.22±0.98	0.45	
3	The controls in the anaesthesia safety checklist must be performed.	325(97.3)	4.76±0.68	0.62	
4	It should be checked that the pulse oximeter is working on the patient.	324(97)	4.79±0.65	0.65	
5	Risk assessment of the patient should be done.	330(98.8)	4.81±0.53	0.76	
6	The presence of a known allergy of the patient should be checked.	328(98.2)	4.87±0.58	0.69	
7	It should be checked whether the necessary imaging devices are available.	322(96.4)	4.76±0.66	0.68	
8	The risk of blood loss over 500 ml should be assessed.	322(96.4)	4.74±0.63	0.72	
9	If there is a risk of blood loss over 500 ml in the patient, it should be checked that appropriate vascular access and necessary fluid preparations have been made.	327(97.9)	4.82±0,57	0.79	
	PIP-Total Score		**69.49±7.88**		**0.944**
	PIP-Significance Score		**4.63±0.53**		
10	One member of the team must verify the patient's identity by voice.	313(93.7)	4.68±0.73	0.72	
11	One member of the team must verify the surgery to be performed by voice.	317(94.9)	4.67±0.73	0.78	
12	One member of the team should verify the site of the surgery by voice.	322(96.4)	4.71±0.66	0.78	
13	The estimated duration of surgery should be reviewed in critical events.	306(91.6)	4.49±0.80	0.68	
14	Expected blood loss in critical events should be reviewed.	327(97.9)	4.69±0.62	0.80	
15	Unexpected events that may develop during surgery in critical events should be reviewed.	321(96.1)	4.66±0.64	0.79	

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16	Possible anaesthetic risks that may develop during surgery should be reviewed in critical events.	325(97.3)	4.73±0.59	0.76	
17	The position of the patient in critical events should be reviewed.	327(97.9)	4.70±0.61	0.79	
18	Prophylactic antibiotic use within 60 minutes before the incision should be checked.	300(89.8)	4.49±0.81	0.67	
19	It should be confirmed that there is no need for prophylactic antibiotic use in untreated patients within 60 minutes before the incision.	250(74.9)	4.08±1.07	0.39	
20	It should be checked that the materials to be used are ready.	329(98.5)	4.82±0.54	0.79	
21	Sterilisation of the materials to be used must be checked.	328(98.2)	4.83±0.55	0.79	
22	The need for monitoring of blood sugar should be checked and decided.	312(93.4)	4.55±0.74	0.69	
23	Anticoagulant use should be checked.	326(97.6)	4.73±0.62	0.80	
24	The need for deep vein thrombosis prophylaxis should be checked and decided.	320(95.8)	4.66±0.66	0.78	
	PDP-Total Score		**41.64±5.22**		**0.906**
	PDP-Significance Score		**4.63±0.58**		
25	The patient must verbally verify the surgery performed.	264(79)	4.30±1.07	0.59	
26	Verbally verify the operation for the surgery performed.	272(81.4)	4.35±1.01	0.61	
27	Verbally verify the surgical site for the surgery performed.	271(81.1)	4.31±1.06	0.59	
28	Instrument/spanner/compress and needle counts must be made.	328(98.2)	4.84±0.53	0.75	
29	It must be checked that the identity information is written correctly on the sample taken from the patient.	327(97.9)	4.83±0.56	0.79	
30	It should be checked that the region where the patient was taken is correctly written on the sample taken from the patient.	326(97.6)	4.81±0.58	0.79	
31	Recommendations of the anaesthesiologist regarding the critical needs of the patient after surgery should be reviewed.	327(97.9)	4.75±0.59	0.78	
32	The surgeon's recommendations regarding the critical needs of the postoperative patient should be reviewed.	328(98.2)	4.73±0.58	0.81	
33	The unit to which the patient will be sent after the operation must be verified.	324(97)	4.71±0.66	0.74	
	SSC^{TR}-IPQ -Total Score		**153.57±16.41**		**0.966**
	SSC^{TR}-IPQ -Significance Score		**4.65±0.49**		

SSC^{TR}-IPQ: Safe Surgery ChecklistTR Practice Perception Questionnaire; PAP: Pre-Anesthesia Practices; PIP: Pre-operative Incision Practices; PDP: Pre-operative Discharge Practices; CITC: Corrected item-total correlation; α: Cronbach's alpha; SD: Standart Deviation

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When examining the variables associated with a rate of disagreement of 10% or more among participants, the rate of disagreement was statistically significantly higher among participants with a high school education and an associate degree to the statement 'The patient should be verbally confirmed for the surgery performed' (χ^2=8.790; p=0.003). While all participants working in the responsible nurse/technician position positively agreed with the statement 'If there is no marking in the operating area, it should be ensured that it is not applicable', 22.9% of the active participants negatively agreed with the statement (p=0.010). Compared to nurses, anaesthesia technicians had a statistically significantly higher rate of disagreement with the statements 'The patient should be verbally informed about the operation performed' and 'The operation should be verbally informed about the operation performed' (item 25, χ^2=8.679; p=0.003 and item 26, χ^2=8.044; p=0.005) (Table 3).

Table 3. Distribution of the statements that the participants disagreed or were undecided at a rate of 10% and above according to their descriptive characteristics (n=334)

Characteristics		**Item-2**	**Item-18**	**Item-19**	**Item-25**	**Item-26**	**Item-27**
	n	**(-)/N**	**(-)/N**	**(-)/N**	**(-)/N**	**(-)/N**	**(-)/N**
Total	334	72(21.6)	34(10.2)	84(25.1)	70(21)	62(18.6)	63(18.9)
Age range, n(%)							
18-25	171	44(25.7)	15(8.8)	43(25.1)	37(21.6)	31(18.1)	33(19.3)
26-35	108	21(19.4)	15(13.9)	25(23.1)	22(20.4)	21(19.4)	20(18.5)
36-45	42	7(16.7)	3(7.1)	11(26.2)	9(21.4)	8(19)	8(19)
46 and over	13	0(0)	1(7.7)	5(38.5)	2(15.4)	2(15.4)	2(15.4)
Test value		6.213[a]	2.507[a]	1.478[a]	0.320[a]	0.170[a]	0.133[a]
***P*-value**		0.102	0.474	0.687	0.956	0.982	0.988
Educational Status, n(%)							
High school and associate degree	217	51(23.5)	25(11.5)	54(24.9)	56(25.8)	45(20.7)	46(21.2)
Undergraduate and postgraduate	117	21(17.9)	9(7.7)	30(25.6)	14(12)	17(14.5)	17(14.5)
Test value		1,386[a]	1.219[a]	0.023	**8.790[a]**	1.938[a]	2.209[a]
***P*-value**		0.239	0.270	0.879	**0.003***	0.164	0.137
Surgical unit experience, n(%)							
1 year and less	120	31(25.8)	9(7.5)	30(25)	30(25)	24(20)	26(21.7)
2-5 years	108	22(20.4)	13(12)	29(26.9)	20(18.5)	18(16.7)	17(15.7)
More than 5 years	106	19(17.9)	12(11.3)	25(23.6)	20(18.9)	20(18.9)	20(18.9)
Test value		2.215[a]	1.501[a]	0.306[a]	1.851[a]	0.427[a]	1.304[a]
***P*-value**		0.330	0.472	0.858	0.396	0.808	0.521
Position in the unit he/she works, n(%)							
Charge nurse/technician	20	0(0)	0(0)	3(15)	3(15)	3(15)	3(15)
Staff	314	72(22.9)	34(10.8)	81(25.8)	67(21.3)	59(18.8)	60(19.1)
Test value		-[b]	-[b]	-[b]	-[b]	-[b]	-[b]
***P*-value**		**0.010***	0.243	0.425	0.777	0.999	0.999
Profession, n(%)							
Nurse	162	34(21)	14(8.6)	41(25.3)	23(14.2)	20(12.3)	27(16.7)
Anaesthesia technician	172	38(22.1)	20(11.6)	43(25)	47(27.3)	42(24.4)	36(20.9)
Test value		0.060[a]	0.813[a]	0.004[a]	**8.679[a]**	**8.044[a]**	0.991[a]
***P*-value**		0.806	0.367	0.948	**0.003***	**0.005***	0.320

*p<0.05, a: Pearson chi-squared test, b: Fisher's exact chi-squared test, N: Neutral, (-): Negative participation

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When the total and subscale scores of the SSC^{TR}-IPQ were analysed according to the descriptive characteristics of the participants, it was found that there was a statistical difference only in the occupation variable. It was found that anaesthesia technicians had statistically significantly lower mean scores on the SSC^{TR}-IPQ total (t=2,419; p=0.016), PAP (t=2,027; p=0.047) and PDP (t=3,206; p=0.002) sub-dimensions compared to nurses (Table 4).

Table 4. Mean scores of SSC^{TR}-IPQ participation level according to the descriptive characteristics of the participants (n=334)

		SSC^{TR}-IPQ			
		PAP	**PIP**	**PDP**	**Total**
Characteristics	**n**	**Mean±SD**	**Mean±SD**	**Mean±SD**	**Mean±SD**
Age (year) n(%)					
18-25	171	4.67±0.55	4.63±0.57	4.62±0.63	4.64±0.55
26-35	108	4.78±0.28	4.67±0.37	4.65±0.44	4.70±0.32
36-45	42	4.65±0.68	4.52±0.68	4.55±0.73	4.56±0.67
46 and over	13	4.93±0.07	4.72±0.36	4.74±0.44	4.78±0.24
Test value		2.124[b]	0.962[b]	0.510[b]	1.065[b]
***P*-value**		0.097	0.411	0.676	0.364
Educational Status, n(%)					
High school and associate degree	217	4.69±0.52	4.62±0.55	4.59±0.61	4.63±0.52
Undergraduate and postgraduate	117	4.76±0.44	4.65±0.48	4.70±0.51	4.70±0.45
Test value		1.306[a]	0.536[a]	1.637[a]	1.131[a]
***P*-value**		0.192	0.592	0.103	0.259
Surgical unit experience, n(%)					
1 year and less	120	4.64±0.63	4.59±0.67	4.56±0.72	4.59±0.65
2-5 years	108	4.76±0.28	4.69±0.33	4.69±0.39	4.71±0.28
More than 5 years	106	4.76±0.47	4.63±0.51	4.64±0.55	4.67±0.47
Test value		2.402[b]	1.027[b]	1.443[b]	1.565[b]
***P*-value**		0.092	0.359	0.238	0.211
Position in the unit he/she works, n(%)					
Charge nurse/technician	20	4.83±0.32	4.72±0.33	4.67±0.37	4.74±0.29
Staff	314	4.71±0.50	4.63±0.54	4.62±0.59	4.65±0.51
Test value		1.093[a]	0.797[a]	0.319[a]	0.780[a]
***P*-value**		0.275	0.426	0.750	0.436
Profession, n(%)					
Nurse	162	4.77±0.30	4.69±0.37	4.73±0.40	4.72±0.32
Anaesthesia technician	172	4.66±0.62	4.58±0.63	4.53±0.70	4.59±0.61
Test value		**2.027[a]**	1.825[a]	**3.206[a]**	**2.419[a]**
***P*-value**		**0.047***	0.069	**0.002***	**0.16***

SSC^{TR}-IPQ: Safe Surgery ChecklistTR Practice Perception Questionnaire; PAP: Pre-Anesthesia Practices; PIP: Pre-operative Incision Practices; PDP: Pre-operative Discharge Practices; *p<0.05; a: Independent sample t-test; b: One-way ANOVA test; SD: Standard Deviation

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Discussion

The Safe Surgery Checklist (SSC), as a key component of the 'Safe Surgery Saves Lives' campaign launched by WHO in 2008, is an effective tool that aims to increase patient safety in healthcare, strengthen communication between teams, and improve outcomes by reducing surgical errors[15]. Research reports that many healthcare professionals recognize the benefits of SSC, but levels of engagement vary among team members in practice[16-18]. According to the results of a multinational survey, 70.9% of respondents stated that the checklist contributed to patient safety, but only 50.3% were satisfied with the compliance of other team members[19]. This suggests that there is a greater need for education and communication strategies to promote a culture of safety and co-operation in surgical teams. Bozkurt and Tüzer's study emphasized the importance of the SSC^{TR} in terms of effective communication and teamwork and stated that the checklist should be seen as a tool that improves team dynamics beyond formality[20]. It has been reported that there is a lack of confidence in the use of checklists among employees with low levels of education, and that this is due to inadequate training[19,21]. Research findings show that compliance decreases as the level of education decreases and that knowledge and experience deficiencies are common, especially among young, inexperienced healthcare workers. These findings suggest that comprehensive training programs and the promotion of a safety culture are needed to increase the effectiveness of the SSC^{TR} and ensure the compliance of teams.

The study revealed that participants exhibited a mean score for SSC^{TR}-IPQ that was in line with the items, and demonstrated a high level of agreement with the sub-dimensions of the PAP. This high level of positive agreement suggests that surgical team members hold a favourable perception of the SSC^{TR}. This finding is consistent with the results of previous studies which have demonstrated that surgical safety checklists can enhance communication within surgical teams and raise healthcare professionals' awareness of patient safety culture[15,20]. The high compliance rate observed in the Pre-Anesthesia Practices subscale serves to underscore the critical importance of this stage in ensuring patient safety. As reported by Liu and Mehigan[15] the highest compliance rates were observed in the verification of patient identity, surgical site safety, and anaesthesia safety. The findings indicate that surgical teams hold a favourable view of the SSC^{TR} and patient safety. The high mean score on the SSC^{TR} Implementation Perception Questionnaire indicates a high level of adherence among participants about communication, teamwork, and safety protocols.

The high positive compliance rate of 93% for the SSC^{TR} items in the study demonstrates that surgical team members recognise the importance of the checklist in improving patient outcomes. This high level of compliance is noteworthy, particularly in light of the inherent challenges associated with implementing safety protocols in operating theatres, where circumstances requiring prompt decision-making are often encountered[20]. The findings of the study lend support to the positive perceptions held by team members of the SSC^{TR} and their confidence in their ability to enhance patient safety. The high mean scores and emphasis on preoperative practices suggest the potential benefits of standardising surgical safety checklists. Nevertheless, further research is required to optimise the long-term effects and intra-team use of the SSC^{TR}.

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The highest positive agreement rate was observed in the statement “Patient risk assessment should be performed,” which indicates that surgical teams prioritize patient safety and embrace the importance of preoperative assessments, as emphasized in the literature[15]. The lowest compliance rate was observed for the statement 'It should be confirmed that prophylactic antibiotic use is not required within 60 minutes before the incision'. This may indicate possible deficiencies in the routine practices of the clinic, or it may reflect a confidence that the practice is already fully fulfilled. In either case, non-compliance with this item may be attributed to a lack of awareness or training. The timely administration of prophylactic antibiotics is crucial in preventing surgical site infections. However, there have been reports in the literature indicating inconsistent compliance with these guidelines[22,23].

The study revealed that negative agreement rates of 10% or more were particularly prevalent in items 2, 18, 19, 25, 26 and 27. These items pertain to side marking, prophylactic antibiotic administration, and verification of the patient/operation and the surgical site. This indicates a dearth of knowledge among team members regarding the significance of these practices. Moreover, unfavourable agreement rates on these items present a significant risk to the safety of surgical procedures and patients.

It was observed that negative participation rates differed according to the level of education, age group and professional experience of the participants. The observation that individuals with a high school or associate degree have a higher incidence of non-compliance with surgical verification processes highlights the significance of educational background and professional experience in the effective utilisation of surgical safety checklists. Prior research has also underscored the influence of educational attainment on healthcare professionals' adherence to safety protocols[15,20]. High negative participation rates reflect the difficulties experienced in the effective implementation of the checklist and suggest that a lack of understanding of the importance of verification processes, particularly among employees with lower levels of education, may contribute to high negative participation rates[24]. The results of the study is consistent with those reported in the existing literature. The aforementioned findings indicate that healthcare institutions experience deficiencies in leadership with regard to the development of a patient safety culture and the enhancement of the qualifications of healthcare professionals through continuing education programs.

Study Limitations

One of the limitations of this study is that the findings may not be generalizable to the broader surgical team in Istanbul, as the data were collected from a limited sample. The study was conducted exclusively with nurses and anesthesia technicians, which may restrict the diversity of perspectives within the surgical team.

Conclusion

While the safe surgery checklist is an invaluable tool for enhancing surgical safety, its efficacy hinges on the comprehensive involvement and adherence of all team members. It is recommended that continuing education programs that promote a culture of patient safety be developed and implemented to increase compliance, particularly among healthcare professionals with low levels of education. A robust educational process,

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efficacious communication strategies, and a supportive team environment can enhance patient safety in surgical settings by fostering compliance with safety protocols. It is recommended that future research focus on the development of interventions that address the identified barriers to compliance with the Safe Surgery Checklist[TR].

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Conflict of Interest

The authors declare that they have no conflicts of interest.

Author Contributions

NA: Conceptualization, Methodology, Writing – Original Draft, Writing - Review & Editing, Supervision.

HBK: Methodology, Writing–Original Draft, Writing-Review & Editing, Supervision.

SG: Methodology, Writing-Review & Editing, Supervision.

FH: Methodology.

REFERENCES

1. Santos G, Jones MW. Prevention of Surgical Errors. In: StatPearls [Internet]. StatPearls Publishing; 2023.
2. Ahsani-Estahbanati E, Sergeevich Gordeev V, Doshmangir L. Interventions to reduce the incidence of medical error and its financial burden in health care systems: A systematic review of systematic reviews. *Front Med (Lausanne)*. 2022;9:875426. doi: 10.3389/fmed.2022.875426
3. Rodziewicz TL, Houseman B, Hipskind JE. *Medical Error Reduction And Prevention*. In: StatPearls. StatPearls Publishing; 2022.
4. World Health Organization (WHO). *Implementation Manual WHO Surgical Safety Checklist*. WHO; Published date 2009. Accessed February 2023. https://www.who.int/publications/i/item/9789241598590
5. Gillespie BM, Harbeck EL, Lavin J, et al. Evaluation of a patient safety programme on surgical safety checklist compliance: A prospective longitudinal study. *BMJ Open Qual*. 2018;7(3):e000362. doi: 10.1136/bmjoq-2018-000362.
6. Ribeiro L, Fernandes GC, Souza EG, et al. Safe surgery checklist: Filling adherence, inconsistencies, and challenges. *Rev Col Bras Cir*. 2019;46(5):e20192311. doi: 10.1590/0100-6991e-20192311.
7. Neuhaus C, Spies A, Wilk H, et al. Attention everyone, time out!: Safety attitudes and checklist practices in anesthesiology in Germany. *J Patient Saf*. 2021;17(6):467-471. doi: 10.1097/PTS.0000000000000386.
8. Sağlık Bakanlığı (SB). *Güvenli Cerrahi Uygulama Rehberi*. 2.0 ed. Sağlık Hizmetleri Genel Müdürlüğü; 2015. ISBN: 978-975-590-576-1. Accessed March 11, 2023. https://shgmkalitedb.saglik.gov.tr/TR,12638/sks-rehberleri.html

9. Gökay P, Taştan S, Ayhan H, İyigün E, Can MF. Dünya Sağlık Örgütü güvenli cerrahi kontrol listesinin kullanımı: Sistematik inceleme. *Gülhane Tıp Derg*. 2016;58(2):136-142.

10. Karayurt Ö, Damar HT, Bilik Ö, Özdöker S, Duran M. Ameliyathanede hasta güvenliği kültürünün ve güvenli cerrahi kontrol listesinin kullanımının incelenmesi. *Acıbadem Univ Sağlık Bilimleri Derg*. 2017;1:16-23.

11. Kasatpibal N, Sirakamon S, Punjasawadwong Y, et al. Satisfaction and barriers of surgical safety checklist implementation in a nonmandatory adoption resource-limited country. *J Patient Saf*. 2021;17(8):e1255-e1260. doi: 10.1097/PTS.0000000000000453.

12. Christofer R, Gerd J, Per O, Kristina Å, Per AL. Compliance with the WHO surgical safety checklist: Deviations and possible improvements. *Int J Qual Health Care*. 2013;25(2):182-187. doi: 10.1093/intqhc/mzt004.

13. StatCalc calculator. Accessed August 2024. https://www.danielsoper.com/statcalc/calculator.aspx?id=1

14. Candaş B, Gürsoy A. Cerrahide hasta güvenliği: Güvenli cerrahi kontrol listesi. *ERÜ Sağlık Bilimleri Fak Derg*. 2015;3(1):40-50.

15. Liu LQ, Mehigan S. A systematic review of interventions used to enhance implementation of and compliance with the world health organization surgical safety checklist in adult surgery. *AORN J*. 2021;114(2):159-170. doi: 10.1002/aorn.13469.

16. Treadwell JR, Lucas S, Tsou AY. Surgical checklists: A systematic review of impacts and implementation. *BMJ Qual Saf*. 2014;23(4):299-318.

17. Schwendimann R, Blatter C, Lüthy M, et al. Adherence to the WHO surgical safety checklist: An observational study in a Swiss academic center. *Patient Saf Surg*. 2019;13:1-6. doi: 10.1186/s13037-019-0194-4.

18. Gong J, Ma Y, An Y. The surgical safety checklist: A quantitative study on attitudes and barriers among gynecological surgery teams. *BMC Health Serv Res*. 2021;21:1106. doi: 10.1186/s12913-021-07130-8.

19. Urban D, Burian BK, Patel K, et al. Surgical teams' attitudes about surgical safety and the surgical safety checklist at 10 years: A multinational survey. *Ann Surg Open*. 2021;2(3):e075. doi: 10.1097/AS9.0000000000000075.

20. Bozkurt S, Tüzer H. Cerrahide hasta güvenliği: Cerrahi ekibinin güvenli cerrahi kontrol listesini uygularken karşılaştığı ramak kala olayların incelenmesi. *Bezmialem Sci*. 2023;11(1):120-127. doi: 10.14235/bas.galenos.2022.14632.

21. Bosk CL, Dixon-Woods M, Goeschel CA, Pronovost PJ. Reality check for checklists. *Lancet*. 2009;374(9688):444-445. doi: 10.1016/S0140-6736(09)61440-9.

22. Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Am J Health Syst Pharm*. 2013;70(3):195-283. doi: 10.2146/ajhp120568.

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23. Ban KA, Minei JP, Laronga C, et al. American College of Surgeons and Surgical Infection Society: Surgical site infection guidelines, 2016 update. *J Am Coll Surg*. 2017;224(1):59-74. doi: 10.1016/j.jamcollsurg.2016.10.029.

24. Paterson C, McKie A, Turner M, Kaak V. Barriers and facilitators associated with the implementation of surgical safety checklists: A qualitative systematic review. *J Adv Nurs*. 2024;80(2):465-483.

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