FNJN

İSTANBUL UNIVERSITY CERRAHPAŞA

Florence Nightingale Journal of Nursing

DOI: 10.5152/fnjn.2021.21075

Research Article

The Implementation of the WHO's Surgical Safety Checklist by Italian Operating Teams: A Descriptive Study

Fabio Ferraiuolo[1], Angelo Dante[1], Cristina Petrucci[1], Gülten Güvenç[2], Loreto Lancia[1]

[1]Department of Health, Life and Environmental Sciences, University of L'Aquila, Edificio Rita Levi Montalcini, L'Aquila, Abruzzo, Italy
[2]Department of Obstetrics and Gynecology Nursing, Ankara University of Health Sciences, Faculty of Nursing, Ankara, Turkey

ORCID iDs of the authors: F.F. 0000-0003-2203-8715; A.D. 0000-0001-5875-3353; C.P. 0000-0002-1793-2969; G.G. 0000-0002-8330-9497; L.L. 0000-0002-2345-1731

Cite this article as: Ferraiuolo, F., Dante, A., Petrucci, C., Güvenç, G., & Lancia, L. (2022). The implementation of the WHO's surgical safety checklist by Italian operating teams: A descriptive study. *Florence Nightingale Journal of Nursing, 30*(1), 48-54.

Abstract

AIM: The study aimed at reporting the extent to which nurses in operating teams comply with the WHO's surgical safety checklist at the national level.

METHOD: A total of 621 nurses who attended the conferences held by the Association of Italian Nurses in Operating Teams (AICO) in 2019 were selected as the sample group for this descriptive study. They filled a paper-based questionnaire of items, which were according to WHO's recommendations for surgical safety. Descriptive analyses were used to illustrate participants' characteristics and responses to the questionnaire. The chi-square test was used to outline the relation between participants' socio-cultural features and the information on the extent to which participants implemented the surgical safety checklist.

RESULTS: According to the data collected, a majority of the participants (95.2%) claimed to comply with the checklist in perioperative procedures. Moreover, most participants (63.2%) revealed that they revise the checklist according to specific circumstances affecting their workflow and/or operational team. Additionally, almost a third of participants (31.9%) stated that they undertake an oral completion of the steps in the checklist to ensure its effective implementation.

CONCLUSION: In this study, it emerged that the implementation of measures ensuring safety standards is largely inconsistent with the guidelines provided by WHO. Notably, major discrepancies occur when it comes to team members' coordination, the revision of the checklist according to specific circumstances, the oral completion of the checklist's steps during the workflow, and the active contribution of all team members in the implementation of the surgical safety checklist.

Keywords: Checklist, operating room, operating teams' safety, patients' safety, safety standards

Introduction

Within health care systems, a wide range of factors must coexist to effectively respond to patients' needs; diverse professional backgrounds, highly specialized diagnostic and therapeutic measures, multiple organizational plans, and highly complex management issues are all essential elements (Pennini, 2015). Within such a framework, there is a persistent risk of patients incurring fatal or severe complications. Data show that health care systems provide patients with 313 million interventions per year. Accordingly, every year, 4.2 million deaths occur globally within a timeline of 30 days following any surgical intervention, meaning that surgical deaths amount to 7.7% of the global death toll (Nepogodiev et al., 2019). Therefore, adopting strategies aimed at minimizing the risks is a crucial task (Donaldson et al., 2000; Institute of Medicine Committee on Quality of Health Care in America, 2000).

In this regard, data relating to developed countries significantly differ from the corresponding data relating to developing countries. In the former case, severe complications caused by major surgery are associated with 3.0% to 16% of overall interventions, whereas fatal complications occur in less than 1% of overall cases (notably, the percentage varies from 0.4 to 0.8%). In the latter case, however, the percentage of surgical deaths significantly increases, reaching 5.0% to 10.0% of overall cases (World Health Organization [WHO], 2008). In response to this, the WHO has released a surgical safety checklist and the related guidelines for its implementation to reinforce surgical safety (WHO, 2008). This tool aims at minimizing the risks of severe or deadly complications in operating rooms by enhancing teamwork and by fostering better communication among team members (Haynes et al., 2009; Weiser et al., 2010). In this regard, nurses play a pivotal role in ensuring patients' safety and promoting better health outcomes, by collaborating with all the

Corresponding Author: Angelo Dante
E-mail: angelo.dante@univaq.it

Received: April 7, 2021
Accepted: July 24, 2021

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

operating team members in the correct application of the tool (WHO, 2009).

Notably, research shows that surgical deaths and post-operative complications have decreased at a significant rate following the introduction of the surgical safety checklist. For instance, Haynes et al. (2009) have analyzed the impact of the checklist on a sample of 3955 patients, and the results reveal that surgical deaths have significantly decreased by 0.8%, and severe complications have diminished by 4.0%. According to Weiser et al. (2010), surgical deaths have significantly decreased by 2.3%, whereas complications have diminished by 6.7% following the introduction of the surgical safety checklist, on a sample of 908 patients. Thus, by monitoring patients' clinical conditions, researchers have collected encouraging data on the efficacy of the surgical safety checklist. Yet, evaluating the efficacy of the checklist by considering the operating teams' point of view is an inedited perspective that research has never encountered before (Bentivegna et al., 2017; Ferorelli et al., 2019; Giles et al., 2017; Russ et al., 2015; Urbach et al., 2014). An inconsistent or misled implementation of the checklist by operating teams may paradoxically worsen patients' conditions rather than being beneficial. Conversely, the benefits of patients' safety associated with the adoption of the checklist are only obtained when operating teams act consistently with the guidelines. This statement is supported by research carried out at both national and international levels, with the support of external observers, which shows that shortcomings in surgical safety largely result from errors committed by the operating teams when implementing the checklist (Bentivegna et al., 2017; Ferorelli et al., 2019; Giles et al., 2017; Russ et al., 2015; Urbach et al., 2014). However, to the authors knowledge, there is currently no study on the impact of the surgical safety checklist on the workflow of operating teams and on the degree of compliance operating teams observe in implementing the checklist itself in perioperative measures. Arguably, considering such an inedited perspective, research may come up with new hints to improve the efficacy of the tool (Burchett & Ben-Porath, 2019).

The purpose of the present research is to report the extent to which nurses in operating teams comply with WHO's guidelines on the implementation of the checklist, at the national level (Ministry of Health, 2009). This study was focused on the extent to which the participants' socio-cultural factors (gender, age, and workplace) affected the degree of compliance with the WHO guidelines.

Research Questions

1. What is the level of compliance with WHO's guidelines on the implementation of the surgical safety checklist among Italian nurses working in operating teams?
2. Is there a relation between nurses' socio-cultural characteristics and the degree of compliance with WHO's guidelines?

Methods

Study Design

A multisite descriptive study was conducted.

Sample

The sample involved nurses who, at the time of the survey, were members of operating teams at the national level, and participated, during 2019, at one of the Conferences held by the Italian Association of Nurses in Operating Teams (AICO) in the following Italian cities: Riccione (2nd-4th May), Grottammare (5th October), Feltre (20th October), and Scicli (26th October), Trieste (23th November), and Trento (5th December). They expressed their consent prior to taking part to the survey. No specific reason for exclusion was foreseen. A total of 655 nurses out of 1231 national members of AICO, participated in the conferences. Among these, 621 nurses answered the questionnaire, representing 94.8% of the conferences' participants and 50.4% of all national members, respectively. The study being conducted as a pilot study at present, the requirement of a minimum sample size has not been considered.

Data Collection Tools

The participants answered a questionnaire concerning the implementation of the checklist released by the Italian Ministry for Public Health (Ministry of Health, 2009; World Health Organization, 2008, 2009. Prior to its release, the authors approved the content of the questionnaire. The questionnaire contained 12 multiple choice questions divided into two parts: the first part consisted of six questions about participants' general information (i.e., gender, age, workplace, professional experience, academic background) as well as their task within the operating team (i.e., team coordinator, scrub nurse, circulating nurse, nurse anesthetist, or multiple tasks). The second part consisted of six questions on the implementation of the surgical safety checklist within their operating teams. The relevant issues concerned the extent to which participants' operating teams implemented the surgical safety checklist, the level of coordination within their operating teams, the revision of the tool according to specific circumstances, the oral completion of the three steps of the tool according to WHO recommendations, the major hurdle against the regular implementation of the surgical safety checklist, and opinions about the surgical safety checklist (Ministry of Health, 2009; WHO, 2008, 2009). At the beginning of each AICO conference, the participants were informed about the aim of the survey and were adequately guided in correctly filling the questionnaire. Their explicit consent was a prerequisite for contribution to the survey.

Statistical Analysis

The data were processed using the Statistical Package for Social Sciences (SPSS IBM Corp., Armonk, New York, USA) version 25. Descriptive analyses as frequencies, percentage (%), average (a),

and standard deviation (±SD) were used to describe participants' characteristics and responses to the questionnaire. The bivariate analysis outlines the relation between participants' socio-cultural features and the information on the extent to which participants implemented the surgical safety checklist, by referring to the chi-squared test (χ^2) and by assuming a p-value <.05 as the statistical significance level.

Ethical Considerations

The present survey complies with Italian data and privacy protection regulations (Law No. 196/2003 and Law No. 679/16). Despite ethical approval being waived for this type of study, as the enrolment was voluntary and it did not interfere with patient care and clinical activity of the nurses involved, the AICO's board approved the scientific research project (Declaration for the approval of the scientific research project, March 4, 2021). Prior to any submissions of the questionnaire, participants gave their explicit written consent. All questionnaires are stored at the AICO's national site; they are available upon request. The research complies with the principles listed in the Declaration of Helsinki.

Results

Participants

A total of 621 nurses answered the questionnaire, out of 655 nurses participating in AICO's conferences (94.8% of participants). Notably, female participants outweighed male participants (450 female nurses, i.e., 72.5% of participants), and the average age was 46.5 ± 10.2 years (Table 1). A total of 350 participants (56.9%) were employed in Northern Italy and had more than 15 years of professional experience (341 nurses; 54.9%). Most of the participants (392; 63.7%) held a first-level academic nursing education (a diploma or a bachelor's degree); among those who had achieved a postgraduate education (e.g., Master of Science in Nursing, both in advanced clinical practice and management programs), 15 (2.4% of the participants) had completed a scrub nurse course. Moreover, more than half of the participants (345 nurses; 55.6%) declared that they take on more than one specific task within their operating teams.

Degree of Compliance With the Checklist's Guidelines for Its Implementation

According to the results reported, 591 participants (95.2%) consistently implemented the surgical safety checklist in case of both elective and emergency surgery (Table 2). In addition, the checklist coordinator designated by the concerned operating teams is the circulating nurse, in 42.8% of the cases (meaning that in 236 cases, the circulating nurse has been designated as the checklist coordinator). In 392 cases, the participants declared that they revised the checklist due to their workflow's specific circumstances; moreover, only slightly more than a third of the participants (198; 31.9%) claimed that the related operating teams carry out oral completion of steps contained in the checklist. Lack of collaboration by team members was cited as the major hurdle in implementing the checklist in compliance with guidelines by 297 participants (54.7% of the sample). Additionally, 130 participants (21.8%) considered the checklist unhelpful, or alternatively, that improvements in the surgical safety checklist were necessary.

Table 1.
Participants' Characteristics (N = 621)

Characteristics	*n*	%
Gender		
Female	450	72.5
Male	171	27.5
Age		
Average (SD)	46.5	(10.2)
Workplace*		
Southern Italy	162	26.3
Central Italy	103	16.7
Northern Italy	350	56.9
Professional experience		
Less than 5 years	112	18.0
From 5 to 10 years	168	27.1
More than 15 years	341	54.9
Academic background*		
Diploma or Bachelor's degree	392	63.7
Postgraduate courses	223	36.6
Type of postgraduate course attended**		
Critical care	20	8.6
Management	152	65.5
Scrub nurse	15	6.5
Surgical nurse	15	6.5
Other	30	12.9
Task(s) within the operating team		
Team coordinator	119	19.2
Scrub nurse	94	15.1
Circulating nurse	18	2.9
Nurse anesthetist	45	7.2
Multiple tasks	345	55.6

Notes: *Missing data.
**Some participants attended more than one postgraduate course.

Factors Relating to the Degree of Compliance With the Checklist

As displayed in Table 3, those who were more likely to adopt the surgical safety checklist consistently with guidelines were the nurses with the highest average age (46.7 ± 10.2 vs. 42.5 ± 10.3; p=.027) and nurses working in Northern and Southern Italy (96.3% vs. 89.3%; p=.011).

Nurses working in Northern Italy (54.9%; p=.001), those holding more than 15 years of professional experience (54.3%; p=.008), and those holding a Master of Science in Nursing (59.1%; p=.005), were more likely to undertake a verbal

Table 2.
Degree of Compliance Regarding the Implementation of the Checklist Released by the Italian Public Health Ministry (N = 621)

Questions	*n*	%
Regular implementation of the surgical safety checklist for elective or emergency surgical interventions		
Yes	591	95.2
No	9	1.4
Sometimes	21	3.4
Teamwork coordinator		
Scrub nurse	20	3.6
Circulating nurse	236	42.8
Anesthetic nurse	254	46.0
Others	111	17.9
Revision of the surgical safety checklist according to specific circumstances		
Yes	392	63.2
No	187	30.2
Sometimes	41	6.6
Oral completion of the three steps of the surgical safety checklist		
Yes	302	48.6
No	121	19.5
Sometimes	198	31.9
Major hurdle against the regular implementation of the surgical safety checklist*		
Any operating team member's resistance against taking active part in the checklist's implementation	297	54.7
Lack of leadership by the team coordinator	57	10.5
Failure to comply with time schedule as provided by the checklist's guidelines	188	34.6
Opinions about surgical safety checklist		
A necessary tool	465	78.2
Time-consuming and therefore ineffective	5	.8
Excessively lengthy and therefore needs improvement	59	9.9
Unsuited to the Italian operating teams' workflow	66	11.1

Note: *Missing data.

completion of the checklist's steps and involve the whole team in its implementation.

Finally, according to data provided by male nurses (48.5%; $p = .001$) and those working in Southern Italy (61.7%; $p \leq .001$), circulating nurses were identified as more likely to take on coordinating tasks.

Discussion

The risk of complications or errors is high in operating rooms, due to the high complexity and variety of the operations that clinicians practice on a regular basis (Montella et al., 2010; Papadakis et al., 2019; Russ et al., 2013). With the aim of minimizing those risks, the Italian Ministry of Public Health has released a surgical safety checklist, and its implementation has been associated with the best practices to achieve such a goal (WHO, 2008, 2009).

Degree of Compliance with the Checklist's Guidelines for its Implementation

The present research shows that the majority of participants implement the checklist within their workflow (95.2%). Although encouraging, this outcome will remain inconclusive if research does not consider how operating teams implement the checklist in the operating rooms, whether they adhere to WHO's guidelines, and if so, to what extent (Bentivegna et al., 2017; Ferorelli et al., 2019; World Health Organization, 2009). In fact, according to the survey, those who do not consistently apply the checklist call for a relentless sensitization on an adequate and respectful application of WHO's guidelines in all facilities of the national healthcare system. That the sensitization of the team members is a daunting issue to grapple with is confirmed by the fact that, according to data, 21.8% of participants do not consider the checklist to be an essential tool for enhancing surgical safety. Notably, one nurse out of five argues that the checklist is either far too complex, due to the large number of steps, or excessively time-consuming, and therefore, a unsuitable for the stringent workflow of operating teams (Leap, 2014; Peñataro-Pintado et al., 2021).

It is suggested here that the checklist is not inadequate, but rather, due to the wide range of beneficiaries whom it addresses, its content may seem far too broad for specific circumstances. Consequently, by revising the checklist, operating teams may derive better benefit from it and change their mind on its effectiveness. The result of this study reveals that in 63.2% of the cases, the checklist is revised according to specific circumstances.

The WHO surgical safety guidelines suggest that the circulating nurse should coordinate the teams in performing safety tasks and completing all the steps in the checklist (Ministry of Health, 2009; World Health Organization, 2008, 2009). The study reveals that operating teams designated a coordinating member as suggested by the guidelines in less than a half of the cases (42.8% of participants). Therefore, it is suggested that more attention should be paid to identifying specific personnel for coordinating tasks. In this regard, specific training for circulating nurses are encouraged (Tostes & Galvão, 2019; World Health Organization, 2009).

According to the WHO, an oral completion of safety steps is crucial to accomplish solid safety standards. In fact, this enables

Table 3.
Factors Associated With Nurses' Degree of Compliance With Guidelines (N = 621)

	Regular Implementation of the Surgical Safety Checklist for Elective or Emergency Surgical Interventions					Oral Completion of the Three Steps of the Surgical Safety Checklist					Teamwork Coordinator				
	Yes		No			Yes		No			Circulating Nurses		Other Nurses		
	n	%	*n*	%	χ^2/*t*-Test; *p*	*n*	%	*n*	%	χ^2/*t*-Test; *p*	*n*	%	*n*	%	*p*
Gender															
Female	432	96.0	18	4.0	2.454; .117	223	49.6	227	50.4	.559; .455	153	34.0	297	66.0	11.116; .001*
Male	159	93.0	12	7.0		79	46.2	92	53.8		83	48.5	88	51.5	
Age															
Average (SD)	46.7	(10.2)	42.5	(10.3)	2.212; .027	46.0	(10.1)	47.0	(10.3)	–1.228; .220	46.7	(10.6)	46.4	(10.0)	.354; .723**
Workplace															
Southern Italy	156	96.3	6	3.7	8.974; .011	68	42.0	94	58.0	13.084; .001	100	61.7	62	38.3	85.597; <.001*
Central Italy	92	89.3	11	10.7		39	37.9	64	62.1		56	54.4	47	45.6	
Northern Italy	337	96.3	13	3.7		192	54.9	158	45.1		79	22.6	271	77.4	
Professional experience															
Less than 5 years	104	92.9	8	7.1	4.290; .117	46	41.1	66	58.9	9.603; .008	38	33.9	74	66.1	1.065; .587*
From 5 to 10 years	157	93.5	11	6.5		71	42.3	97	57.7		67	39.9	101	60.1	
More than 15 years	330	96.8	11	3.2		185	54.3	156	45.7		131	38.4	210	61.6	
Academic background															
Diploma in Nursing	220	96.9	7	3.1	4.232; .237	129	56.8	98	43.2	12.830; .005	78	34.4	149	65.6	5.574; .134*
Bachelor's degree	155	93.9	10	6.1		77	46.7	88	53.3		57	34.5	108	65.5	
Master of Science in Nursing	22	100.0	-	-		13	59.1	9	40.9		10	45.5	12	54.5	
Postgraduate courses	190	93.6	13	6.4		82	40.4	121	59.6		89	43.8	114	56.2	

Notes: *Chi-square test.
**t-test.

the coordinating member to double check the completion of key actions to ensure patients' safety (Ministry of Health, 2009; World Health Organization, 2008, 2009). Conversely, the checklist proves to be less effective when operational teams fill the checklist by ticking off steps, without explicit double-checking with the whole operating team (Bergs et al., 2015).

However, in line with the relevant literature, the research confirms that the oral completion of safety steps is performed in less than half of cases. Therefore, it is necessary to foster better practices in team communication, toward a comprehensive implementation of the guidelines (Papadakis et al., 2019; Russ et al., 2013).

Factors Relating to the Degree of Nurses' Compliance with the Checklist

According to data, nurses who consistently implement the checklist are older than the average age and primarily belong to Northern and Southern Italy, with those from Central Italy being largely excluded. Moreover, the data show a significant relation between age and professional experience, meaning that the older a nurse is, the longer their professional experience is likely to be. Thus, a more solid professional experience may explain the fact that older nurses are more likely to comply with the guidelines. Furthermore, variations at the geographical level may derive from the fact that the local association of professionals in Northern and Southern Italy efficiently promote the checklist. Therefore, it is suggested that besides measures at the national level, local promotion should be reinforced in some areas, to provide a more homogeneous action throughout the country. Additionally, and not surprisingly, an inefficient promotion of the checklist leads to shortcomings in its implementation as well, as demonstrated by data relating to Central Italy.

In fact, it is argued that poor monitoring of these geographical variations may engender striking differences in the quality of assistance provided to patients and unequal access to a safe health care system throughout the country (Bentivegna et al., 2017; Russ et al., 2015).

Furthermore, data show that those benefiting from either a longer professional experience (i.e., 15 or more years of professional experience or those holding a Master's degree) are more likely to consistently comply with the checklist according to WHO's recommendations, particularly with the oral completion of all fulfilled steps. Therefore, operating teams may improve their implementation of the surgical safety checklist by promoting highly specified training within the teams and investing in advanced learning processes, with due regard to risk management (Candas & Gursoy, 2016; Tostes & Galvão, 2019). Finally, as for the coordinating role, it stands out that more than half of the teams from Southern Italy are overall more compliant than teams from Northern and Central Italy in designating the circulating nurse as the coordinator of the teamwork.

Besides inexperience as a cause of shortcomings within the implementation process, coordination is a major factor in this regard. In fact, data show that major hurdles relating to the implementation process and the consequent delays derive from any team member's resistance to active participation in the completion of the checklist's steps (Georgiou et al., 2018). In this regard, those in charge of coordinating the workflow must be endowed with well-rounded leadership and mediation skills (Peñataro-Pintado et al., 2021; Urbach et al., 2014; World Health Organization, 2009) to foster efficient teamwork (Ministry of Health, 2009; WHO, 2009). Moreover, good communication skills are deemed essential; in fact, poor communication risks endanger the correct implementation of the checklist (Bergs et al., 2015; Georgiou et al., 2018; Peñataro-Pintado et al., 2021; World Health Organization, 2009).

Surveys on the surgical safety checklist so far have focused on the checklist's effectiveness either by analyzing the checklist's effects on patients, by adopting a "from the outside" perspective (Wheelock et al., 2015), or by analyzing administrative data relating to the implementation of the tool (Jones, 2019). In contrast, this is the first descriptive study that analyzes the perspective "from the inside," based on a wide sample of nurses implementing the surgical safety checklist in operating teams at the national level.

Therefore, it is suggested that exhaustive outcomes may only be derived by intertwining results from all aspects of the research on implementation of the surgical safety checklist, from administrative data, to data about the quality of assistance provided, to those on nurses' experiences.

Conclusion and Recommendations

Patient safety is an essential area of the quality of assistance provided by the health care system. Therefore, research in this respect is essential. This is the first descriptive study on the implementation of the surgical safety checklist "from the inside," that is, from the perspective of nurses who implement the checklist daily.

Overall, the data confirm that nurses implement the surgical safety checklist consistently and at a significant rate. However, its implementation does not reflect the relevant recommendations provided by the WHO. Accordingly, the main shortcomings concern coordinating tasks within operating teams and the oral completion of the checklist. Moreover, it emerges that a solid professional experience and advanced academic background are factors that are largely associated with greater compliance with WHO's recommendations. Finally, it stands out that the implementation of the checklist marks significant variations throughout the Italian national territory and, notably, between operating teams in Northern and Southern Italy and those in Central Italy, the latter being less likely to consistently implement the checklist.

An efficient promotion of healthcare requires flawless operational strategies. By paying attention to the clinicians' professional experience, boosting their learning and training process, and promoting equivalent strategies throughout the country, health care systems can provide safer assistance to patients.

Ethics Committee Approval: Ethical approval was not required for this type of study because enrolment was voluntary, and it did not interfere with patient care or the clinical activity of the nurses who participated. In any case, the research was conducted in full compliance with the ethics of research on human subjects and the European legislation, as well as in accordance with the principles listed in the Declaration of Helsinki.

Informed Consent: Participants gave their explicit written consent to participate in the study.

Peer review: Externally peer-reviewed.

Author Contributions: Concept – F.F., A.D.; Design – F.F., A.D.; Supervision – L.L., C.P.; Resources – F.F.; Materials – F.F.; Data Collection and/or Processing – F.F., A.D.; Analysis and/or Interpretation – A.D., L.L., C.P.; Literature Search – F.F.; Manuscript Writing – F.F., A.D., C.P., L.L.; Critical Review – G.G.; Other – G.G.

Acknowledgment: The authors want to sincerely thank AICO (the Italian Operating Room Nurses Association), for the opportunity to conduct this study.

Conflict of Interest: The authors have declared that no conflicts of interest exist.

Financial Disclosure: This study was not supported by any grant.

References

Bentivegna, R., Caminati, A., Agnoletti, V., Bonilauri, S., Buonaccorso, S., Campaniello, G., Dovani, A., Lanciotti, G., Maselli, V., Mastrangelo, S., Montella, M. T., Palladino, T., Pelati, C., Sciolino, L., Zoni, E., Porcu, E., Campagna, A., & Nicastro, O. (2017). OssERvare Project: Direct observation of use of the Safety Surgery CheckList in the operating room. *Recenti Progressi in Medicina*, *108*(11), 476–480. [CrossRef]

Bergs, J., Lambrechts, F., Simons, P., Vlayen, A., Marneffe, W., Hellings, J., Cleemput, I., & Vandijck, D. (2015). Barriers and facilitators related to the implementation of surgical safety checklists: A systematic review of the qualitative evidence. *BMJ Quality and Safety*, *24*(12), 776–786. [CrossRef]

Burchett, D., & Ben-Porath, Y. S. (2019). Methodological considerations for developing and evaluating response bias indicators. *Psychological Assessment*, *31*(12), 1497–1511. [CrossRef]

Candas, B., & Gursoy, A. (2016). Patient safety in operating room: Thoughts of surgery team members on implementing the Safe Surgery Checklist (An example from Turkey). *Perioperative Care and Operating Room Management*, *5*, 1–6. [CrossRef]

Donaldson, M. S., Corrigan, J. M., & Kohn, L. T. (2000). *To err is human: Building a safer health system*. Washington: National Academies Press. [CrossRef]

Ferorelli, D., Lucilla, C., Vincenti, L., Zotti, F., & Dell'Erba, A. (2019). Adoption and implementation of the surgical safety checklist: Improving safety in an Italian teaching hospital. *American Journal of Medical Quality* , *34*(1), 100. [CrossRef]

Georgiou, E., Mashini, M., Panayiotou, I., Efstathiou, G., Efstathiou, C. I., Charalambous, M., & Irakleous, I. (2018). Barriers and facilitators for implementing the WHO's safety surgical checklist: A focus group study among nurses. *Journal of Perioperative Practice*, *28*(12), 339–346. [CrossRef]

Giles, K., Munn, Z., Aromataris, E., Deakin, A., Schultz, T., Mandel, C., Maddern, G., Pearson, A., & Runciman, W. (2017). Use of surgical safety checklists in Australian operating theatres: An observational study. *ANZ Journal of Surgery*, *87*(12), 971–975. [CrossRef]

Haynes, A. B., Weiser, T. G., Berry, W. R., Lipsitz, S. R., Breizat, A. H. S., Dellinger, E. P., Herbosa, T., Joseph, S., Kibatala, P. L., Lapitan, M. C., Merry, A. F., Moorthy, K., Reznick, R. K., Taylor, B., Gawande, A. A., & Safe Surgery Saves Lives Study Group. (2009). A surgical safety checklist to reduce morbidity and mortality in a global population. *New England Journal of Medicine*, *360*(5), 491–499. [CrossRef]

Institute of Medicine (US) Committee on Quality of Health Care in America (2000). *To Err is Human: Building a Safer Health System*. Kohn LT, Corrigan JM, Donaldson MS, editors. Washington (DC): National Academies Press (US); 2000. PMID: 25077248.

Jones, N. (2019). Tune-in and time-out: Toward surgeon-led prevention of "never" events. *Journal of Patient Safety*, *15*(4), e36–e39. [CrossRef]

Leape, L. L. (2014). The checklist conundrum. *New England Journal of Medicine*, *370*(11), 1063–1064. [CrossRef]

Ministry of Health (2009). Manual for safety in operating room: Recommendation and Checklist. Retrieved from http://www.salute.gov.it/imgs/C_17_pubblicazioni_1119_allegato.pdf

Montella, M. T., Polito, C., Gambale, G., Mavilla, L., & Saddemi, M. (2010). La sala operatoria: Rischio clinico e priorità di interventi. *Pratica Medica and Aspetti Legali*, *4*(4), 137–143. [CrossRef]

Nepogodiev, D., Martin, J., Biccard, B., Makupe, A., Bhangu, A., & National Institute for Health Research Global Health Research Unit on Global Surgery. (2019). Global burden of postoperative death. *Lancet*, *393*(10170), 401. [CrossRef]

Papadakis, M., Meiwandi, A., & Grzybowski, A. (2019). The WHO safer surgery checklist time out procedure revisited: Strategies to optimise compliance and safety. *International Journal of Surgery*, *69*, 19–22. [CrossRef]

Peñataro-Pintado, E., Rodríguez, E., Castillo, J., Martín-Ferreres, M. L., De Juan, M. Á., & Díaz Agea, J. L. (2021). Perioperative nurses' experiences in relation to surgical patient safety: A qualitative study. *Nursing Inquiry*, *28*(2), e12390. [CrossRef]

Pennini, A. (2015). *Modelli organizzativi in ambito ospedaliero: Innovare con l'intensità di cura e la complessità assistenziale*. New York: McGraw-Hill Education.

Russ, S., Rout, S., Sevdalis, N., Moorthy, K., Darzi, A., & Vincent, C. (2013). Do safety checklists improve teamwork and communication in the operating room? A systematic review. *Annals of Surgery*, *258*(6), 856–871. [CrossRef]

Russ, S., Rout, S., Caris, J., Mansell, J., Davies, R., Mayer, E., Moorthy, K., Darzi, A., Vincent, C., & Sevdalis, N. (2015). Measuring variation in use of the WHO surgical safety checklist in the operating room: A multicenter prospective cross-sectional study. *Journal of the American College of Surgeons*, *220*(1), 1–11.e4. [CrossRef]

Tostes, M. F. D. P., & Galvão, C. M. (2019). Surgical safety checklist: Benefits, facilitators, and barriers in the nurses' perspective. *Revista Gaucha de Enfermagem*, *40*(spe), e20180180. [CrossRef]

Urbach, D. R., Govindarajan, A., Saskin, R., Wilton, A. S., & Baxter, N. N. (2014). Introduction of surgical safety checklists in Ontario, Canada. *New England Journal of Medicine*, *370*(11), 1029–1038. [CrossRef]

Weiser, T. G., Haynes, A. B., Dziekan, G., Berry, W. R., Lipsitz, S. R., Gawande, A. A., & Safe Surgery Saves Lives Investigators and Study Group. (2010). Effect of a 19-item surgical safety checklist during urgent operations in a global patient population. *Annals of Surgery*, *251*(5), 976–980. [CrossRef]

Wheelock, A., Suliman, A., Wharton, R., Babu, E. D., Hull, L., Vincent, C., Sevdalis, N., & Arora, S. (2015). The impact of operating room distractions on stress, workload, and teamwork. *Annals of Surgery*, *261*(6), 1079–1084. [CrossRef]

World Health Organization. (2009). *WHO surgical safety checklist implementation*. Geneva: World Health Organization. Retrieved from https://www.who.int/patientsafety/safesurgery/checklist_implementation/en/

World Health Organization. (2008). *WHO patient safety: The second global patient safety challenge*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/handle/10665/70080