



A BIBLIOMETRIC ANALYSIS OF THE SURGICAL SAFETY CHECKLIST: TRENDS, IMPACT AND FUTURE DIRECTIONS

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ABSTRACT

The Surgical Safety Checklist (SSC) is a form-based instrument for analyzing surgical risks. This SSC is commonly used to improve patient safety and decrease surgical mistakes. This systematic review uses bibliometric analysis to provide insights about SSC trends, impacts, and future research paths. A comprehensive search of major scientific databases was conducted to discover relevant articles published between 2017 and 2022. The keywords used were connected to the Surgical Safety Checklist, and bibliometric analysis was utilized to filter papers before establishing inclusion criteria to choose the most relevant research for analysis. According to this report, there is a growing global interest in this topic.

Based on bibliometric analysis, it was found that there was a growth in the number of publications related to SSC in the time period studied. These findings demonstrate the growing global interest in SSC topics as key trends in research focus, including specific aspects of checklist implementation, effectiveness, and related outcomes, have been identified. The analysis also influenced countries, institutions and leading authors contributing to the field of SSC.

The systematic review discusses the impact and implications of research on SSC highlighting the positive influence of SSC in improving surgical outcomes and patient safety culture in hospitals. This review also explores emerging research directions, such as the integration of new technologies and the application of SSC in different surgical specialties. Additionally, it identifies knowledge gaps and areas requiring further research to optimize effective implementation of the SSC.

Keywords ; Systematic Review, Surgical Safety Checklist, Hospital Safety Culture

ABSTRAK

Daftar Tilik Keselamatan Pembedahan (SSC merupakan alat bantu berupa formulir yang digunakan untuk timbang terima pembedahan, SSC ini sudah digunakan secara luas untuk meningkatkan keselamatan pasien dan mengurangi kesalahan pembedahan. Tinjauan sistematis ini melalui analisis bibliometrik memberikan wawasan tentang tren, dampak, dan arah penelitian di masa depan terkait dengan SSC. Pencarian dilakukan secara sistematis berdasarkan database ilmiah utama untuk mengidentifikasi artikel relevan yang terbit antara tahun 2017 sampai dengan 2022. Kata kunci yang digunakan berkaitan dengan Daftar Tilik Keselamatan Pembedahan dan analisis bibliometrik digunakan untuk memfilter artikel, kemudian menetapkan kriteria inklusi untuk memilih studi yang paling relevan untuk dilakukan analisis. Dalam kajian ini didapatkan meningkatnya minat global terhadap topik tersebut.

Berdasarkan analisis bibliometrik didapatkan pertumbuhan jumlah publikasi yang terkait dengan SSC pada kurun waktu yang diteliti. Juga didapatkanditemuan yang menunjukkan meningkatnya minat global terhadap topik SSC menjadi tren utama dalam fokus penelitian ini, hal ini termasuk aspek spesifik penerapan SSC, keefektifan, dan hasil pelaksanaannya telah diidentifikasi. Analisis tersebut juga dipengaruhi oleh negara, institusi, dan penulis terkemuka yang berkontribusi di bidang in pada SSC.

Tinjauan sistematis ini membahas dampak dan implikasi penelitian pada SSC yang menyoroti pengaruh positif dari SSC dalam meningkatkan hasil bedah dan keselamatan pasien serta meningkatkan budaya keselamatan di rumah sakit. Tinjauan ini juga mengeksplorasi arah penelitian yang muncul, seperti integrasi teknologi baru dan penerapan daftar Tilik Keselamatan Pembedahan dalam spesialisasi bedah yang berbeda. Selain itu, ini mengidentifikasi kesenjangan pengetahuan dan area yang memerlukan penelitian lebih lebih lanjut untuk mengoptimalkan penerapan Daftar Tilik Keselamatan Pembedahan secara efektif.

Keywords ; Sistematis Review, Daftar Tilik Keselamatan Pembedahan, Budaya Keselamatan di rumah sakit

INTRODUCTION

The World Health Organization's (WHO) patient safety movement established the checklist as part of its Global Patient Safety Challenge. This Safe Surgery Saves Lives program brings together surgeons, gynecologists, anesthesiologists, ward and theatre nurses, infection control experts, public

health personnel, patient advocates, and biomedical engineers to find potential to improve surgical care safety(White et al. 2021). Another technique to increase patient safety is to use the Surgical Safety Checklist in the pre and postoperative periods, which allows for the monitoring of predicting signs and symptoms of surgical complications and the early diagnosis of adverse events (Alpendre et al. 2017).

Process management is essential for implementing any safety project. This research addresses the complexities and problems of applying the World Health Organization surgical safety checklist, contributing to global conversations about putting policy into reality. Implications for nurse management: The efficient implementation of a checklist necessitates a coordinated management approach in partnership with team members. These approaches will facilitate learning experiences that will contribute to a shared knowledge of the change being executed by all team members (O'Brien, Graham, and Kelly 2017).

Patient safety during surgery is an important factor in the success of surgical patients. To address critical data regarding each surgical case, a surgical safety checklist is an important patient safety tool utilized by the operating room team (Mersh, Melesse, and Chekol 2021).

Despite high-quality evidence of its benefits, there have been challenges in applying the surgical safety checklist appropriately and consistently. (Brown et al. 2021).

METHOD

This study used bibliometric analysis to evaluate research of Analysis on The Surgical Safety Checklist: Trends, Impact and Future Directions. We conducted a document Systematic Literature Review with Database from Scopus with search criteria were "SSC" or "Surgical Safety Checklist". Subject area of this study are medicine, nursing and health profession. We restricted the search to articles and papers, published in English, open access and published between 2017 - 2022. Papers published in 2023 were excluded.

The searched equation was used based on predefined criteria, (TITLE-ABS KEY (surgical AND safety AND checklist) AND (LIMIT TO (PUBSTAGE , "final")) AND (LIMIT-TO (OA , "all")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (SUBJAREA , "MEDI") OR LIMIT-TO (SUBJAREA , "NURS") OR LIMIT-TO (SUBJAREA , "ENGI")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j")) AND (EXCLUDE (SUBJAREA , "SOCI") OR EXCLUDE (SUBJAREA , "ENGI") OR EXCLUDE (SUBJAREA , "NEUR") OR EXCLUDE (SUBJAREA , "COMP") OR EXCLUDE (SUBJAREA , "ENVI")) AND (EXCLUDE (LANGUAGE , "Portuguese") OR EXCLUDE (LANGUAGE , "Spanish") OR EXCLUDE (LANGUAGE , "French"))).

We downloaded data on 13 June 2023, resulting in 1761 documents. To obtain accurate results, data preparation and cleaning were performed. We omitted data when no author information was available. A total of 1469 documents were eliminated, leaving 292 documents in the dataset. We performed data cleaning to ensure that the source, author, country, and author keywords of each

document according to the inclusion criteria. To examine the data, we used Microsoft Excel 365 to generate descriptive statistics and VOSviewer software to do bibliometric analysis and graphically depict associations.

We performed citation analysis on sources, authors, and documents, country, year, and author keyword co-occurrence analysis. The flow of the research approach used in this study is depicted in Figure 1.

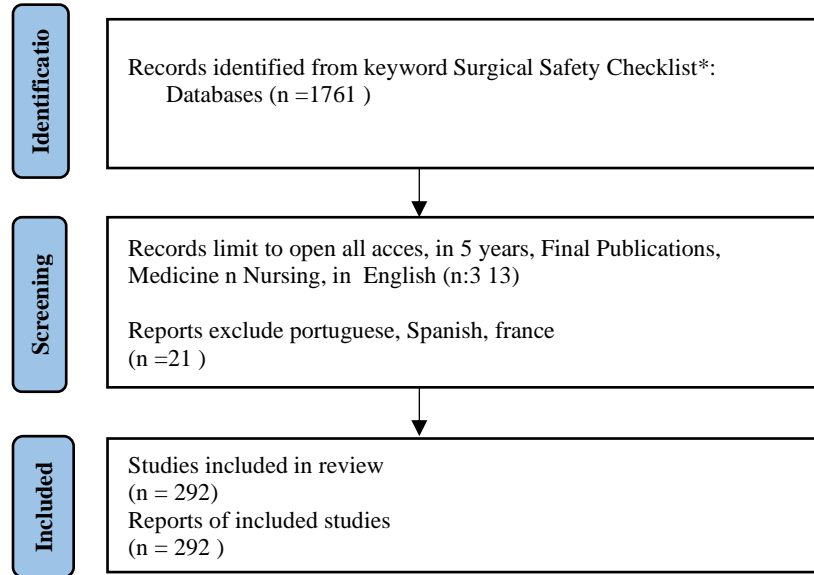


Figure 1. Flow of Research Methode

RESULTS AND DISCUSSIO

Growth of Annual Publication / Published by Year

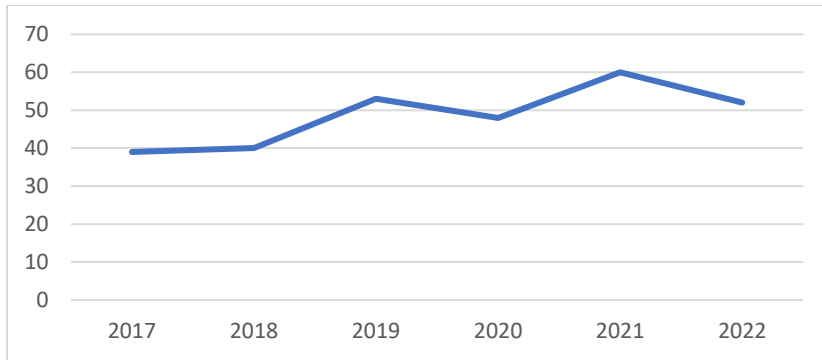


Figure 2. Published by Year

Research on surgical safety checklists has increased year by year, from 2017 to 2022. It has decreased in 2020; this was made possible due to the COVID-19 pandemic, which has had an impact on studies where services in hospitals focus on patient care, but increased again in 2021 and slightly decreased again in 2022.

Publication by Countries

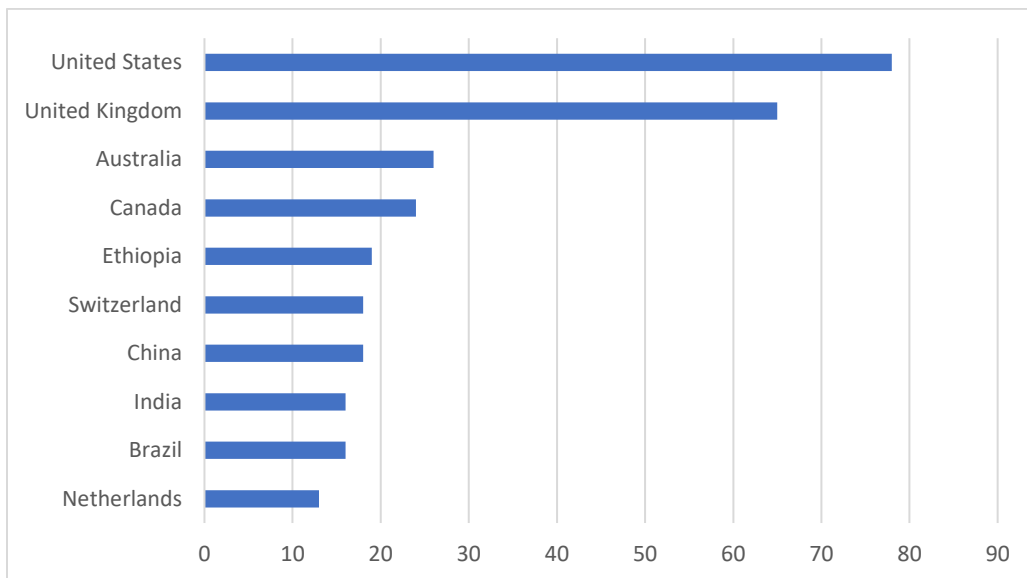


Figure 3. Publication by Countries

Trends, Impact and Future Directions of Research on Surgical Safety Checklist was mostly carried out in the United States with 78 studies, United Kingdom with 65 studies, Australia with 26 studies, Canada with 24 studies, Switzerland and China with 18 studies, India and Brazil with 16 studies, and the Netherlands with 13 studies. This research is spread across continents, showing interest and opportunity for research surgical safety checklist, which is still widely open for research and will be beneficial for the development of this research. Most of the research on the safety checklist

for surgery is still being carried out in America and Europe. We hope that in the future similar studies can be carried out in Asia and especially in Indonesia.

Publication by Subject

According to the research boundaries that have been selected, most research on the surgical safety checklist is carried out in the fields of Medicine (81%), nursing (15%), Pharmacology, toxicology, and pharmaceuticals (2%), Biochemistry, genetics, and Molecular Biology (1%), and Health Professions (1%). The Surgical Safety Checklist is used in only 15% of nursing research. This can yet be developed with additional detailed research on the surgical safety checklist.

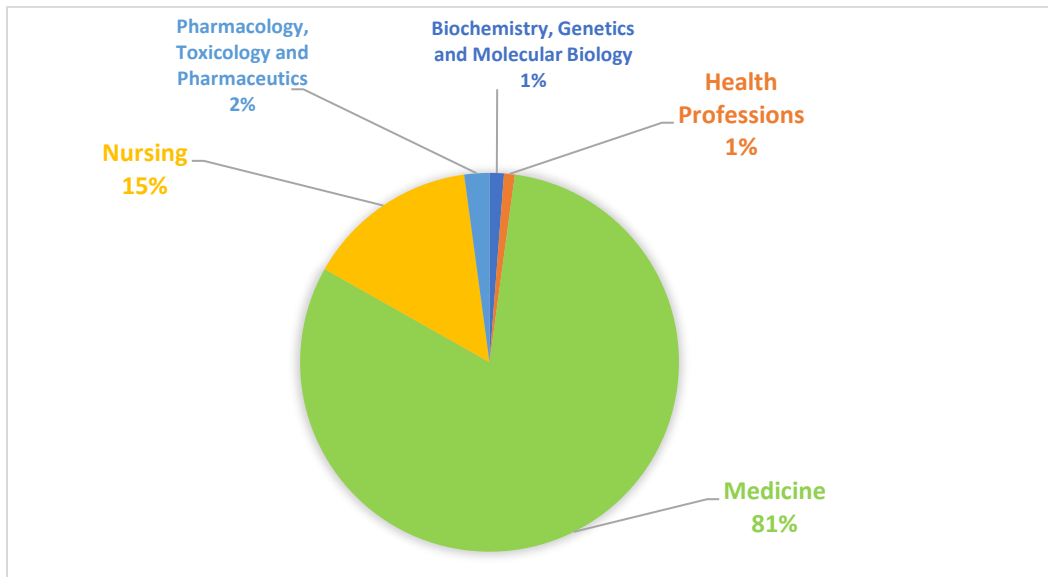


Figure 4. Publication by Subject

Publication by University

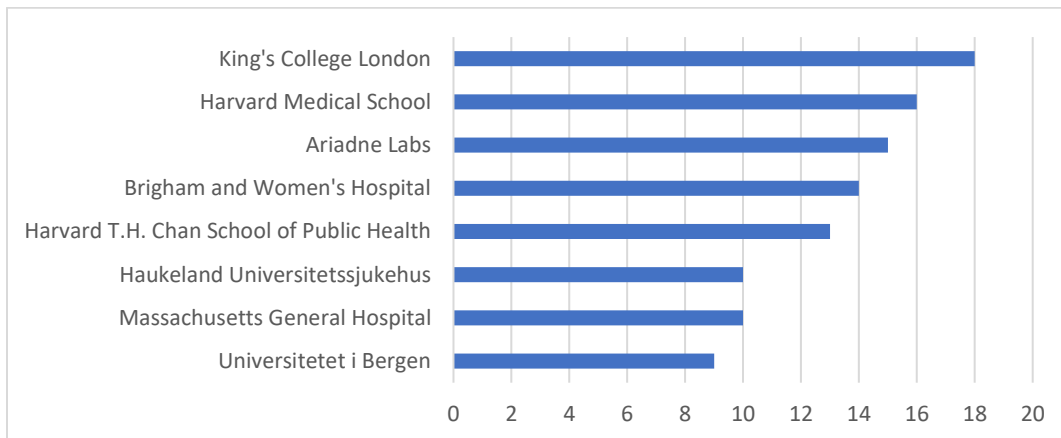


Figure 5. Publication by University

According to the limitations mentioned about surgical safety checklists, the three major studies on surgical safety checklists were conducted by King’s College London, Harvard Medical School, and Ariadne Labs; there were eighteen, sixteen, and fifteen studies, respectively. Further, there were fourteen studies conducted by Brigham and Women’s Hospital, thirteen studies by Harvard, T.H. Chan School of Public Health, and ten studies by Heukeland Universitetssjuehus and Massachusetts General Hospital. And in eighth place, there are nine studies conducted by Universitet i Bergen.

Publication by publisher

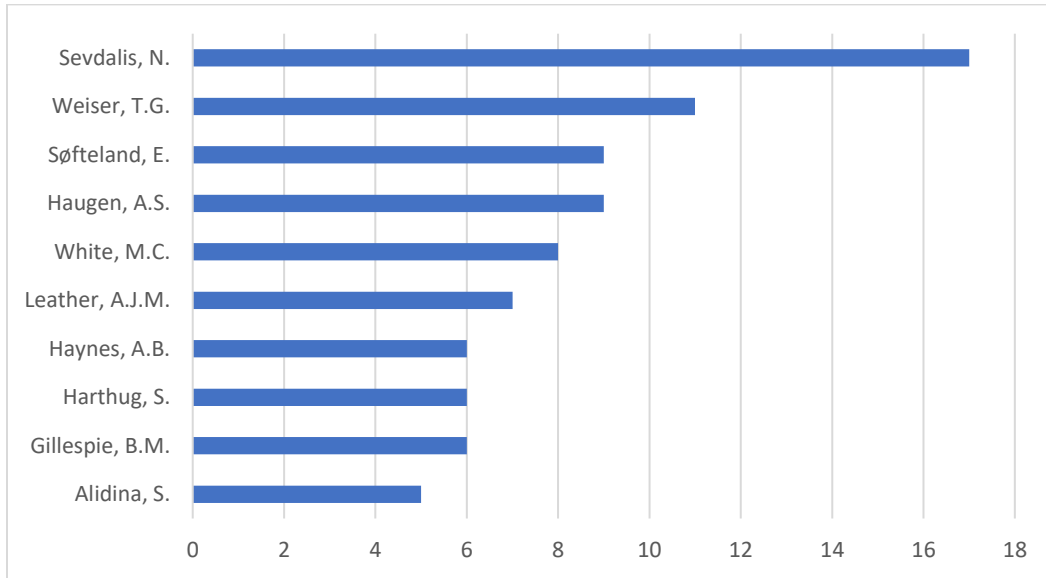


Figure 6. Publication by publisher

Research on the surgical safety checklist in the period 2017–2022, according to predetermined limits, included at most seventeen Sevdalis. N, eleven studies carried out by Weiser, T.G., and nine studies carried out by researchers Softeland, E.,E. and Haugen,A.S. Eight studies carried out by White, M.C., and seven studies carried out by Leather, AJM The studies carried out by Haynes, A.B., Harthug, S., and Gillespie, B.M. Five studies were carried out by Alidine, S. From 2017 through 2022, research on surgical safety checklists has increased year by year.

Network Visualization

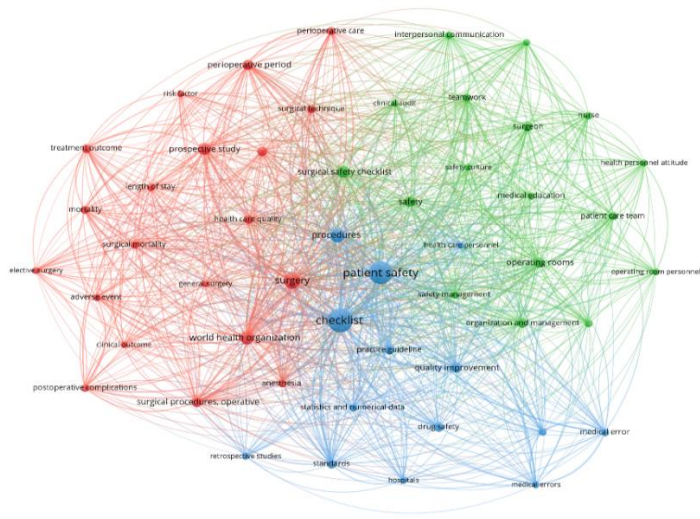


Figure 7. Network Visualization

The relationship between research elements in the study of surgical safety checklists illustrates the strong relationship between checklists, procedures, and patient safety. Using a surgical safety checklist, doctors, anesthesiologists, nurses, and surgical staff must communicate and comply with the procedure during a surgical procedure. Given the importance of this Patient Safety Checklist, there is the term no SSC, no knife. If this has become a culture, then the use of a surgical checklist will become a safety culture in the hospital.

Based on network visualization, three research clusters on surgery safety checklists were identified: cluster 1 has 14 items, cluster 2 has 10 items, and cluster 3 has 9 items.

Cluster	Contains	Color	Connected	Thema
1	20 item	Red	Adverse event, Anaesthesia, clinical outcome, elective surgery, general surgery, healthcare quality, length of stay, mortality, outcome assessment, perioperative care, perioperative periode, post operative complications, retrospective study, risk factor, surgery, surgery mortality, surgical procedure operative, surgical complications, surgical technique, treatment outcome, world health organization	Procedure
2	17 item	Green	Clinical Audit, communication, education, health personal attitude, interpersonal communication, medical education, nurse, operating room personal, operating rooms, organization and management, patient care teams, safety, safety culture, safety management,	Checklist

			surgeon, surgical safety checklist, teamwork	
2	17 item	Green	Clinical Audit, communication, education, health personal attitude, interpersonal communication, medical education, nurse, operating room personal, operating rooms, organization and management, patient care teams, safety, safety culture, safety management, surgeon, surgical safety checklist, teamwork	Checklist
3	14 item	Blue	Patient safety, procedure, checklist, healthcare personal, practice guideline, quality improvement, statistic and numerical data, drug safety, retrospective study, standart, hospitals, medical error, medical errors	Patient Safety

Table 1. Surgical Safety Checklist Cluster

Adverse event, Anaesthesia, clinical outcome, elective surgery, general surgery, healthcare quality, length of stay, mortality, outcome assessment, perioperative care, perioperative period, postoperative complications, retrospective study, risk factor, surgery, surgery mortality, surgical procedure operative, surgical complications, surgical technique, treatment outcome, The World Health Organization is depicted in red, which describes the surgical procedure.

Clinical audit, communication, education, personal health attitude, interpersonal communication, medical education, nurse, personal operating room, operating rooms, organization and management, patient care teams, safety, safety culture, safety management, surgeon, surgical safety checklist, teamwork Describe SSC activities in the operating room as a medium of interpersonal communication that carries out operational activities that require organization, which has an impact on creating a safety culture. Something that becomes a culture will always be carried out because the whole person will feel that something is missing if this is not done.

Patient safety, procedure, checklist, healthcare personnel, practice guideline, quality improvement, statistics and numerical data, drug safety, retrospective study, standards, hospitals, medical errors, and medical errors are interconnected to demonstrate that patient safety procedures are standards that must be carried out continuously, which can prevent medical errors during surgical procedures performed in the operating room. This is not a one-time activity but rather one that will continue as long as the operation is being performed.

Most Citation of Surgical Safety Checklist

Here, most citations of publication of surgical safety checklist;

Author	Title	Publication	Cite
(Nitecki et al. 2020)	<u>Survival after Minimally Invasive vs Open Radical Hysterectomy for</u>	<u>AMA Oncology</u> 6(7), pp. 1019-1027	103

	<u>Early-Stage Cervical Cancer: A Systematic Review and Meta-analysis</u>		
(Kunst et al. 2019)	<u>2019 EACTS/EACTA/EBCP guidelines on cardiopulmonary bypass in adult cardiac surgery</u>	<u>British Journal of Anaesthesia</u> 123(6), pp. 713-757	80
(Ramsay et al. 2019)	<u>Reducing surgical mortality in Scotland by use of the WHO Surgical Safety Checklist</u>	<u>British Journal of Surgery</u> 106(8), pp. 1005-1011	59
(Hübner et al. 2017)	<u>Pressurized IntraPeritoneal Aerosol Chemotherapy – Practical aspects</u>	<u>European Journal of Surgical Oncology</u> 43(6), pp. 1102-1109	58
(Haugen, Sevdalis, and Søfteland 2019)	<u>Impact of the World Health Organization Surgical Safety Checklist on Patient Safety</u>	<u>Anesthesiology</u> 131(2), pp. 420-425	43
(Shalaby et al. 2019)	<u>Systematic review of endoluminal vacuum-assisted therapy as salvage treatment for rectal anastomotic leakage</u>	<u>BJS Open</u> 3(2), pp. 153-160	41
(Weiser and Haynes 2018)	<u>Ten years of the Surgical Safety Checklist</u>	<u>British Journal of Surgery</u> 105(8), pp. 927-929	41

Table 2. Most Citation of Surgical Safety Checklist

The number of citations to research on surgical safety checklists illustrates that many people want to learn and develop SSC in surgical services. The interest in referencing SSC research is very great; among the ten largest data sets on SSC citations, the ten lowest orders still receive 41 citations.

Overlay Visualization

Density Visualization

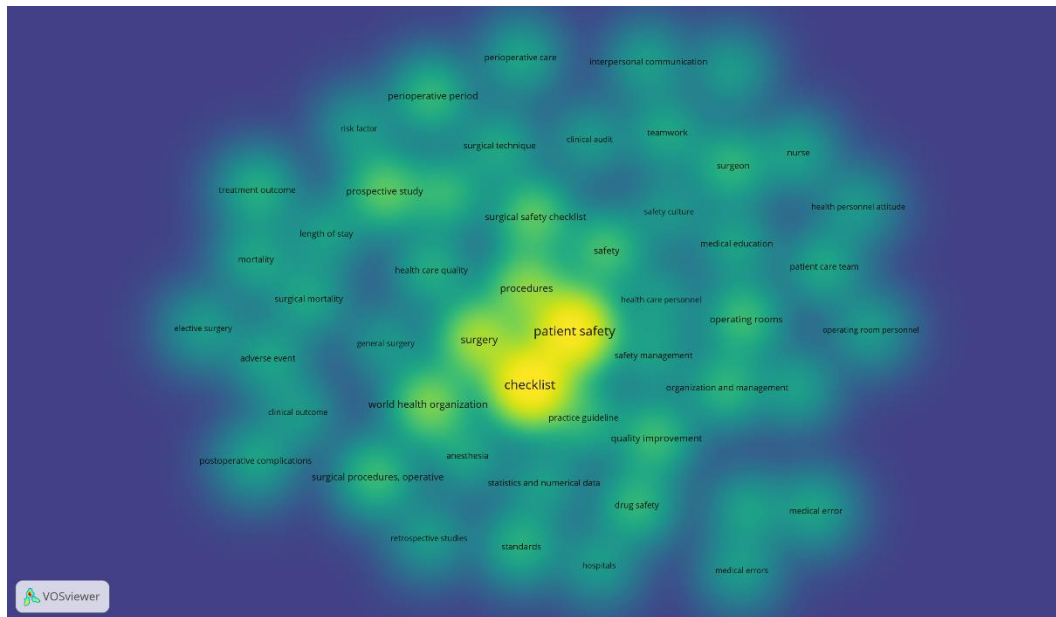


Figure 9. Density Visualization

Density visualization of the surgical safety checklist helps us understand the extent to which this checklist is applied consistently and thoroughly in clinical practice, including patient safety, the checklist, procedures, and surgeries. This information can be used to identify areas for improvement, develop more effective interventions, and improve patient safety during surgical procedures.

Discussion

Based on the 292 paper surgical safety checklist, although the surgical safety checklist is a procedure that must be done during an operating procedure, there is an urgent need to raise awareness about the safety checklist, and one method to do so is through demonstration papers at international conferences (Malhotra et al. 2017).

A surgical safety checklist is a protocol that must be followed at all times during an operation to ensure the patient's surgical safety. There is a Team timeout, which has proven useful in improving patient safety with minimal effort. Despite various preoperative safeguards, errors can occur and can be detected by performing a team timeout (Weingessel et al. 2017).

This research is inline with the research by Kisacik and Cigerci (2019) that surgical safety checklist enhancements focusing on the formation of a culture of patient safety and team collaboration in operating rooms are essential in order to use surgical safety checklist on a regular and proper basis (Kisacik and Cigerci 2019). Any research conducted by Gillespi et al (2018) that's The advantage of having a surgical checklist is that it has the ability to improve team communication and establish a team culture in which safety is prioritized (Gillespie et al. 2018).

The result of Gong research found that Surgeons' awareness was lower than that of operating room nurses, especially in the Time-Out section. The majority of participants stated that operating room nurses had the highest level of protocol adherence, while surgeons had the lowest. Positive

elements for effective adoption include active leadership by experienced operating room nurses, good training for surgical team members, and the simplicity of the checklist. Although the Surgical Safety Checklist has widespread acceptability and acceptable self-reported awareness, it is not always possible to adequately implement it. Our findings imply that implementation difficulties can be overcome with experienced and competent leadership. With positive perception and commitment, the Surgical Safety Checklist is simple to apply and can significantly enhance patient safety (Gong et al. 2021).

Tully et al. find that the ideal sign-out time was determined to be shortly following ultimate wound closure and before unwrapping the patient (Tully et al. 2021)

In Scotland, perioperative mortality has decreased since the checklist was implemented as part of a larger national safety policy. There were 12 667 926 hospital admissions, with 6 839 736 requiring surgery. In the surgical cohort, the inpatient mortality rate in 2000 was 0.76 (95 percent c.i. 0.68 to 0.84%), while it was 0.46 (0.42 to 0.50) in 2014. The checklist was linked to a 36.6 (95 percent confidence interval -5.52 to -1.79) percent relative reduction in mortality ($P < 0.001$). Before implementation, mortality rates were decreasing by 0.03 (95 percent c.i. -0.017 to +0.012) percent per year; annual decreases of 0.069 (-0.092 to -0.046) percent were seen during, and 0.019 (-0.038 to +0.001) percent after differences were used to estimate the balance of demographics over time, after which interrupted time-series (segmented regression) analyses were performed (Ramsay et al. 2019).

Research by Barbanti et al. found that the SSC appears to be a useful technique for reducing problems in spine surgery. To further reduce the occurrence of problems, we advise extending the usage of the checklist system to the preoperative and postoperative periods (Barbanti-Brodano et al. 2020).

The SSC implementation quality was determined to be unsatisfactory, with significant room for improvement. Compliance with all criteria on the checklist, as well as active engagement by all team members, are critical for the checklist's successful implementation (Ambulkar et al. 2018). A qualitative study by Harris et al. found that a wide range of risk elements were discovered for a patient safety checklist. Creating a surgical safety checklist based on these risk factors may help to avoid complications and unintended errors (Harris et al. 2020).

CONCLUSIONS

A study discovered low levels of compliance with the WHO SSC. There was a statistically significant link between this level of compliance and the occurrence of discomfort and loss of consciousness postoperatively. (Igaga et al. 2018).

In another study, the process of handing over pre-operative patients was completed rather successfully, but there were still flaws to be addressed. Nurses regarded the use of the handover checklist for preparing pre-operative patients positively. (Nhut, Xuan, and Einhellig 2020).

Although SSC implementation remains inadequate in this comprehensive analysis, the surgical safety checklist implementation reduced patient mortality in surgery (Ramsay et al. 2019), reduced the occurrence and problem in surgery (Barbanti-Brodano et al. 2020), avoid complications and unintended errors (Harris et al. 2020), despite several preoperative protections, errors can occur

and can be caught by performing a team timeout. (Weingessel et al. 2017) and become a simple technique that can considerably improve patient safety.

Even though it was launched by WHO more than 10 years ago, the SSC will never become an outdated procedure. It will be used today and will continue to be used in the future, just like patient safety impact, which we must prioritize as part of patient health services in hospitals, it will be always part of hospital safety culture.

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Conflict of Interest Statement

The authors have no conflict of interests to declare.

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