Sağlık Akademisyenleri Dergisi
http://dergipark.gov.tr/sagakaderg

Araştırma / Research Article

Güvenli cerrahi kontrol listesi uygulamasına insan faktörleri yaklaşımı

Human factors approach to surgical safety checklist implementation

Özlem Soyer[1], Meryem Yavuz van Giersbergen[2]

[1]Afyonkarahisar Sağlık Bilimleri Üniversitesi, Sağlık Bilimleri Fakültesi, Hemşirelik Bölümü, Afyonkarahisar.
[2]Ege Üniversitesi, Hemşirelik Fakültesi, Hemşirelik Bölümü, Cerrahi Hastalıkları Hemşireliği Anabilim Dalı, İzmir.

Anahtar Kelimeler:
Cerrahi Güvenlik Kontrol Listesi,Hemşirelik,Odak Grup

Key Words:
Surgical Safety Checklist,Nursing,Focus Group

Yazışma Adresi/Address for correspondence:
Özlem Soyer,
Afyonkarahisar Sağlık Bilimleri Üniversitesi, Sağlık Bilimleri Fakültesi, Hemşirelik Bölümü, Afyonkarahisar,
ozlemm_soyer@hotmail.com

Gönderme Tarihi/Received Date:
12.03.2019

Kabul Tarihi/Accepted Date:
22.08.2019

Yayımlanma Tarihi/Published Online:
06.10.2019

ÖZET

Giriş ve Amaç: Güvenli cerrahi kontrol listesi kullanımındaki amaç, hasta bakımında kritik güvenlik süreçlerini takip etmek ve önlenebilecek riskleri en aza indirmektir. Önlenebilir hatalardan kaçınmak için güvenli cerrahi kontrol listesinin uygulanmasında etkili kolaylaştırıcı ve engelleyici faktörlerin sistematik bir yaklaşımla değerlendirilmesi önemlidir. Bu çalışmanın amacı, hasta güvenliğinde kullanılan SEIPS 2.0 modeline göre güvenli cerrahi kontrol listesinin uygulanmasında kolaylaştırıcı ve bariyer faktörlerinin belirlenmesidir. **Gereç ve Yöntem:** Bu araştırmada, nitel araştırma yöntemi kullanıldı. Çalışmanın örneklemini cerrahi kliniklerde ve ameliyathanede çalışan 32 hemşire oluşturdu. Üç odak grup görüşmesi yapıldı. Yarı yapılandırılmış görüşme verilerini toplamak ve analiz etmek için temellendirilmiş kuram yaklaşımı kullanıldı. Görüşme sonuçları SEIPS 2.0 modeline göre değerlendirildi. **Bulgular ve Sonuç:** Kolaylaştırıcı faktör temaları, olumlu hasta algısı, yasal yükümlülükler ve hataların önlenmesi olarak belirlendi. Engelleyen faktör temaları ise, ekip üyelerinin direnci, hemşire sayısının ve zamanın sınırlılığı, hastaların yoğunluğu, iş yükü ve ekip çatışması olarak belirlendi. Tüm hemşireler güvenli cerrahi kontrol listesinin hasta güvenliği açısından önemli olduğunu belirtti. Tüm ekip üyelerinin güvenli cerrahi kontrol listesinin uygulanmasında sorumluluklarını yerine getirmeleri önemlidir.

ABSTRACT

Introduction and Purpose: The goal of using a surgical safety checklist is to monitor critical safety processes in patient care and minimize the risks that can be avoided. In order to avoid preventable errors, it is important to systematically evaluate the effective facilitator and barrier factors in the implementation of the surgical safety checklist.. The aim of this study was to determine the facilitatorand barrier factors of applying the surgical safety checklist according to the SEIPS 2.0 model. **Material and Method:** A qualitative research method was used in the study. The sample of the study consisted of 32 nurses working in surgical ward and operating room. The three focus group interview was used. A grounded theory approach was used to collect and analyze semi-structured interview data. Interview results were evaluated according to SEIPS 2.0 model. **Results and Conclusion:** The facilitating themes were determined to be positive patient perception, legal liabilities and prevention of mistakes. The barrier themes were determined to be the resistance of the team members, the scarcity of nurses and time, the intensity of patients, the work load and team conflict. All of nurses explained that surgical safety checklist was important on patient safety. All team members to fulfill their responsibilities in the implementation of the surgical safety checklist is important.

INTRODUCTION

For the year 2012, a total of 312.9 million surgical operations were performed and 4469 surgical procedures per 100,000 people per year are estimated (1). In 14 studies involving 16.424 surgical patients, adverse events occurred in 14.4% of patients and potentially preventable adverse events occurred in 5.2%. 3.6% of the adverse events were fatal, 10.4% were severe, 34.2% were moderate, and 52.5% were mild. It is estimated that one out of 20 patients who have surgery have a preventable adverse event that is not associated with the surgical technique (2).

The World Health Organization (WHO) safe surgery saves lives project created by the reduction of the number of surgical deaths across the world is part of efforts. The purpose of this project, the identification of important safety issues and policies that inadequate anesthetic safety practices, avoidable surgical infection and poor communication between team members. The operating room team to help in the reduction of

these cases, WHO for safe surgery has defined ten main purposes. These purposes have been compiled in WHO Surgical Safety Checklist (SSC) (3).

The SSC that was employed in the study consisted of three main sections, which are;

1. Sign In: In this period, patient identity, surgery site and procedure confirmed. The consent for the surgery is reviewed. The nurse checks whether the patient is hungry, the shaving of the surgery area, the presence of any foreign objects on the body of the patient (make-up, nail-polisher, prosthesis, etc.), and whether the patient is ready to go to the surgery room together with his/her examination results (3).

2. Time Out: In this period, the identity of the patient, surgery, surgery area, the consent for the surgery, the mark in the surgery area, and functional pulse meter on the patient are checked. Meanwhile, the blood loss risk, air way difficulty, allergic reaction and full anesthesia safety check are reviewed with the anesthesia expert verbally; and if necessary, imaging device is obtained. The estimated blood loss, critical events, prophylactic antibiotic use, the sterility of the materials, blood sugar check, anticoagulant use, and deep vein thrombosis prophylaxis are reviewed (3).

3. Sign Out: In this period, the identity, surgery, and surgery area are confirmed. The devices, tamp/compress, and needle counts are checked. The labeling of the surgical samples taken is reviewed. Finally, the team reviews the key points and considerations on the postoperative management before taking the patient out of the surgery room. If required, specific notes may be added in a written manner (3).

In Turkey, SSC has been in use since 2009 (4). In 2013 X University adapted the SSC. For now, how much the SSC are applied and the barriers for applying these lists in hospitals are not clarified. It has been aimed that the Systems Engineering Initiative for Patient Safety-SEIPS is applied as a socio-technical system model to evaluate the factors that facilitate or barrier the use of SSC and to understand the structures, proceedings and outcomes about the patient safety, healthcare and relevant relations. This model defines the components that affect the medical errors, the reasons of unwanted events and accidents and their controls (5). The components of the SEIPS 2.0 model are given in Figure 1.

In SEIPS Work System, ***the person*** refer to the patients, their families and/or caretakers and healthcare staff; ***the tasks*** refer to the target-focused activities in the process; ***the technology and tools*** refer to the healthcare technology and other tools and technologies used in the process; ***the organization*** refers to features like culture, rules, procedures, management and leadership; ***internal environment*** refers to the residence, lighting, noise and distractors; ***external environment*** refers to the care, payment and legal and reporting systems In SEIPS model, ***the process*** includes maintenance process and other processes that support the maintenance process. In the SEIPS model, ***the outcomes*** emphasize the links between patient outcomes and employee/organization outcomes (7).

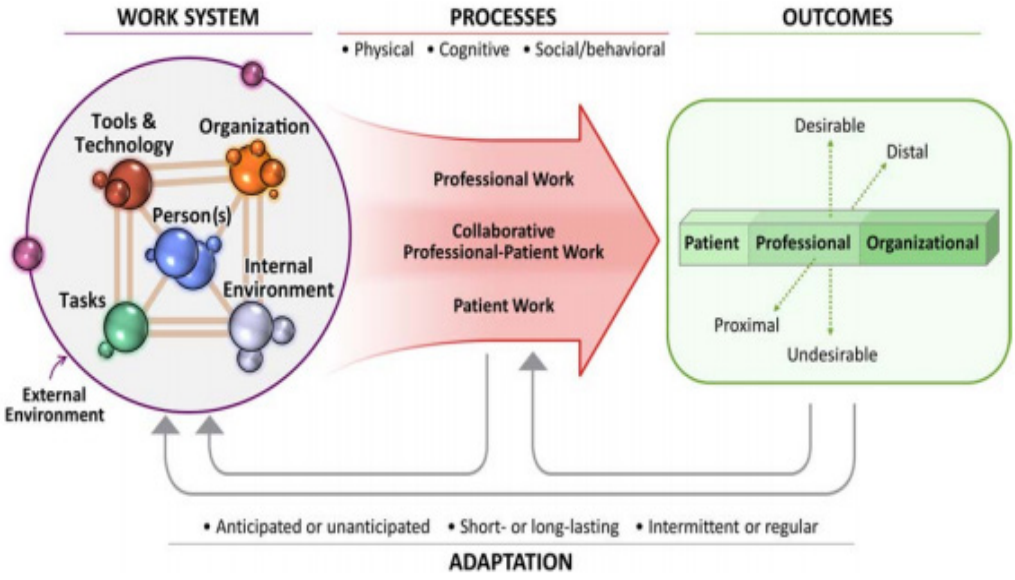

Figure 1. SEIPS 2.0 model (6).

AIM

The aim of this study was to determine the facilators and barriers of the nurses applying the surgical safety checklist according to the SEIPS 2.0 model

METHODS

Study design and sample

The study is a qualitative study which involved 3 focus groups. Interviews were held with a total of 32 surgical ward and operating room nurses. A purposeful sample of nurses who working surgical ward and operating room in a tertiary hospital at least one year was chosen. 23 nurses, including two independent groups from each sample consisting of nurses working in operating rooms (First group n=13; Second group n=10), Nurses who has been a group of nurses working surgical ward (Third group n=9).

Data collection and analysis

All interviews were performed by the second author in a quiet room and lasted between 60 and 120 minutes. Data were collected between March and April 2015. A qualitative approach using the grounded theory method. The data were collected by using a semi-structured interview from developed by the researchers. The nurses were asked the following questions:

1. What are the positive experiences you've had when using the SSC?

2. What are the challenges you experienced when using the SSC?

The interviews were recorded by taking notes and using a tape recorder. One of the researchers conducted the interviews (moderator), and the other researcher (observer) participated by taking notes and as observes. Continued to interview until there is new information. At the end of the interview, additional questions were asked about nurses' characteristics. Recorded interviews is transformed into text in Microsoft Word without modification by the researchers. Observational data held by the researcher have been added. Audio data and observer data were used for the analysis. Interview data were analyzed using the classic Glaserian method. Analysis began with the first episode of data gathering. Using constant comparison, data were analyzed sentence by sentence as they were coded. Authors began with open coding, which led to theoretical sampling and generation of memos. The authors meet several times until agreement about the findings was reached. During the meeting, subcategories and categories appeared that determinate the experience of nurses. Throughout the process, the authors avoided theoretical influences, maintained openness to the data, and allowed new aspects of the experience of using SSC.

ETHICAL CONSIDERATIONS

Written permission to conduct the research was obtained from X University Ethics Committee (no:2015/41) as well as from X University Hospital. The purpose and methodological details of the study were explained to the nurses and written consent was provided by all participants.

RESULTS

A total of 32 samples were nurses, including three independent groups in total. The mean age of the nurses was 37.21 ± 4.71 (min.25-max.46) years. 31 of the participating nurses were women and undergraduate. Their average length of service in the profession was 14.53±4.79 (min.5-max.27) years, and their average length of service in a surgery was 10.34±5.91 (min.2-max.26) years.

A total of 3 different group interviews were made 2 of which were made with surgery clinical nurses and 1 of which was made with surgery nurses. In the light of the data obtained in the interviews, the components were defined according to the SEIPS Model in the application of the SSC. Content analysis revealed may themes that characterized the barriers and facilitating factors in the function of the hospital. The themes were defined in each of the 5 components of the SEIPS Model. The facilitating factor themes that were obtained as a result of the focal group interviews in the defined components were determined to be positive patient perception, legal liabilities and prevention of mistakes; and the barrier factors were determined to be the resistance of the team members, the scarcity of nurses, the intensity of patients, the work load of nurses, the scarcity of time, and team conflict. The facilitators and barriers of the implementation of SSC according to the SEIPS Model were shown in Figure 2.

The themes that were determined according to the SEIPS Model, and the summary of the quotations about the themes are given in Table 1.

DISCUSSION

Using of SSC is associated decreasing complications and mortality rates.[3] SSC decrease mortality and complication rate (8-17). As well as, due to decreasing unplanned return to operating room for any reason, reducing surgical reoperation associated with preventable complications, increasing the frequency

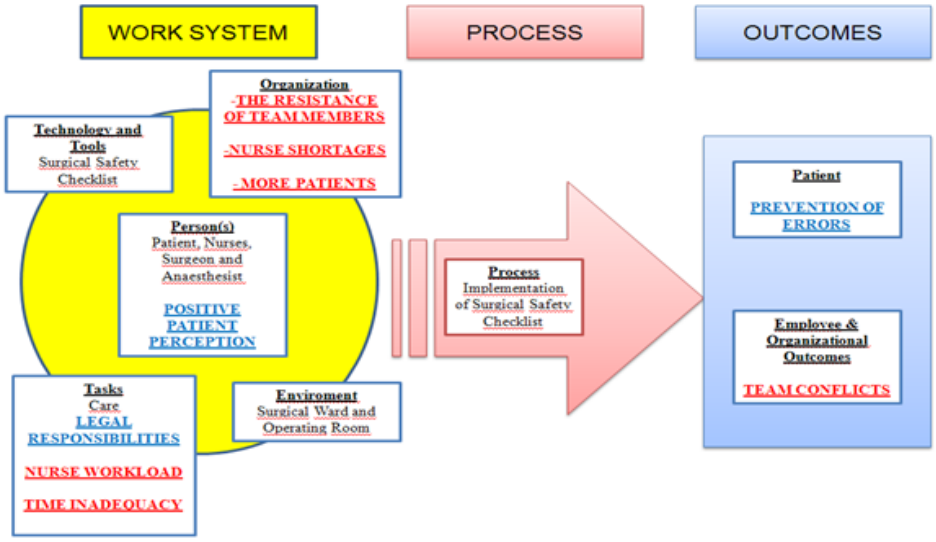

Figure 2: The facilitators and barriers of the implementation of SSC according to the SEIPS Model

of confirm of patient and reducing the surgical adverse events SSC improve patient safety (18-23). Bashford et al. conducted a study and examined the satisfaction of employees who used SSC, and reported that the satisfaction of the employees was high, and the willingness in using it continued (24). Many employees believe that the application of SSC is beneficial, and that this application is a good decision (25). A total of 93.4% of the employees want to use SSC in surgery rooms (26). After SSC usage, 50% of the employees evaluated SSC as positive. This percentage decreased after three months, and at the end of one year, this rate has increased to 85.0% (27). The team members expressed their satisfactions with the content and application of SSC (28). Four of the five operating room nurses reported that they faced difficulties in completing SSC (29). A total of 95% of the employees found SSC positive, and stated that they would use it in their departments (23). Adaptation to SSC is the most frequently investigated subject in studies. In simultaneous studies, it was reported that the recorded adaptation was unrealistic and was higher than the current adaptation situations at a significant level (30). So, what are the barriers that cause this adaptation difference?

The experiences in using the SSC in countries with high-income and low-income were examined, and it was determined that hierarchical relations pose barriers in practice in all units in all countries; however, this is more prevalent in low-income countries. The introduction of SSC in professional environment where accountability is weak may cause that the administrators feel in danger in legal terms, and encourage the incorrect registration of actual records (31).

They pointed out that most of the barriers in the use of SSC were related to SSC (for example, the perception problem); however, they also pointed out that the problematic transition process was also included among these barriers. The most common obstacle is the resistance of upper-level clinicians (32). The main obstacle in practice was determined to be 70% for employee resistance; and it was determined that the use of SSC was not a priority issue in all hospitals. The main obstacle is related to the organizational and cultural reasons. A certain follow-up mechanism is needed to talk about the application with regular rules (33).

Fourcade et al. (2012) reported 11 barriers about the application of SSC, which were repeating the existing process (control of patient ID and number of sponges, repetition of the mistake reports), poor communication between anesthetist and surgeon (not filling in the same SSC for postoperative check), being time-consuming (too long to fill in, its being time-consuming especially when busy), the insensitivity of the employees about SSC use (employees are not used to count the tools in some surgeries, counting is improper when the tools are not placed in proper containers during surgery), the filling-in of this being in improper times (if pathology is to be sent in the surgery, this is difficult to verify after the process), ambiguity (asking again although the allergy risk of the patient is known), unpredicted risks (SSC risk preparation does not include postoperative pain and nausea prevention), verbal confirmation of

Table 1. Summary of the quotations about the themes

SEIPS MODEL COMPONENT	THEMES	EXAMPLE QUOTES
WORK SYSTEM		
Person(s)	Positive Patient Perception	"Provides relief for patients…One of the patients for the patient interested in him to know that it's a good situation"(Operating Room Nurse 23-ORN-23). "When a loss of organ, I have observed that patients feel more confident as a challenge team. (ORN-15). "The patient feels better. I'm in the right place, I will be true surgery. The right people is the thought that greets me there." (Surgical Ward Nurse 29-SWN-29).
Tasks	Legal Responsibilities	"The legal basis of the nurse. unclear who controls and obviously received. Everything writes openly. Before who previously took the patient, who welcomed what hand will be operated always uncertain. This work always remained ours. At least now it's obvious. Best of all, I think the legal basis" (SWN-10).
	Nurse Workload	"Day surgery patients come to us without the service. Surgical ward nurses cannot deliver. we have to fill ourselves SSC for this patients" (ORN-15). "We receive patients from neurology ward and the children's hospital. Nurses are not informed from this form of internal medicine clinic, not in the hands of the checklist. We say to the nurses in intensive care, is filling this checklist. So for them the extra job. They do not know the patient" (ORN-22). "It has increased our workload. You know we have to fill our part but. I shouldn't control anyone else" (ORN-19).
	Time Inadequacy	"SSC extend the exit of the arrival of the patient at the time of course invited. After they began to call out safe surgical patients even earlier. A case starts when other patients are being invited. Incoming patients waiting in the corridor" (ORN-23). "When you went to the operating room are becoming fully discharge it was being made cleaning. Someone needs to come to the door to pick me, patient. Sometimes we wait ten minutes. We have to press a few times a ring. I expect to leave the empty ward. Our biggest problem is that" (SWN-6).
ORGANIZATION		
	The Resistance of Team Members	"Most surgeons will not sign. The surgeon gets a little angry when saying patient does not accept marking. Didn't accept the patient at the door of operating room during the delivery the physician did not want to do this" (SWN-2). "At no time does the anesthetist agree with us…Returning us non-completed checklist. The anesthesiologist did not sign it saying they did not want anesthesia. Nurses are calling, they say that there are unfilled forms. If we follow it, we will have no problem. There is a problem if we do not follow it" (ORN-20).
	Nurse Shortages	"The cause of our difficulty is that we are outnumbered in the ward" (SWN-6). "I wish us well enough though numbers… Plus our staff shortages are already on the agenda and in line stage" (SWN-2). "When one nurse is on the night shift, ward is empty" (SWN-7). "If I see him looking at an hour which he views nurse in the operating room if I can, and sometimes I do not even see it" (SWN-9).
	More Patients	"Focus on the problem of too many patients is that a small number of nurses" (ORN-23). "The number of inpatients too much. The problem is actually not about the SSC, about people… I was patient in the operating room, I put it to bed just another patient already. The patient will come back, even then I will not schedule. How long I do not plan on it, but I am taking all of the patients" (SWN-6).
OUTCOMES		
Patient	Prevention of Errors	"SSC important for double organ and extremity surgeries. Marking is not usually made. Usually, the patient comes without marking. I determinate wrong-site error when I was asking to the patient" (ORN-17). "Patients with the same name accept to the operating room on the same day, at the same time, using SSC is a big advantage" (SWN 25).
Employee & Organizational Outcomes	Team Conflicts	"About the checklist anesthesiologists, technicians, all of us have been trained, but only us is perceived as training is given… that rushing around, you remind me a lot of extras them… (ORN-21). "Marking is not so. We're experiencing a glitch in the direction already, but we warn come for marking, we open the phone if they do not like that we're taking to operating room" (SWN-2). "Sometimes the doctor puts a sign. Signature is not even. Which it is not even certain doctors" (SWN-24).

the items (seeing it unnecessary to read them), defining the roles and responsibilities of the employees (having difficulty in recognizing employees who apply SSC during urgent and short interventions), the attitude of the patient to questions (asking the name of the patient twice or three times causing anxiety in the patient), and checking the items that are not controlled (checking the uncontrolled items at the end of the day) (34).

Bergs et al. (2015) conducted a study and investigated 18 qualitative studies and reported that employing SSC required that the safety of patients and the change in the perception of SSC required also changes in workflow. The factors that avoid this change focus on the SSC, the implementation process and the institution. It was found that the necessary safe controls disrupted the routine functioning of the surgery room employees. In addition, the conflicts between the priorities and different viewpoints and the motivation of employees who use SSC make the application difficult. When SSC is approached as a simple technical intervention, the cooperation between the surgeon, anesthesiologist and nurse cannot be managed, and the marking of the checklist decreases (35).

In the application of SSC, in a study that was conducted in 15 hospitals, the lack of a high level leader in the hospitals, resistance of team members, inadequate time in using SSC, and using SSC being not considered as a priority were determined as barriers (33). As a result, the development status of the country, hierarchical structure, SSC items, transition process to SSC, resistance of team members, regular follow-up system, number of staff, patient density, status of finding SSC useful, training on SSC, communication between team members, SSC fill-in time affect the use of SSC. These factors must be considered in the process of transition, adaptation, and sustaining the use of SSC before it is put into practice. Despite all these positive effects, many barriers were detected in the use of safe surgery list. The development status of the country, hierarchical structure, SSC items, transition process to SSC, resistance of team members, regular follow-up system, number of staff, patient density, finding SSC useful, training on SSC, communication between team members, SSC fill-in time affect the use of SSC. These factors must be considered in the process of transition, adaptation, and sustaining the use of SSC before it is put into practice.

REFERENCES

1. Weiser, T.G., Haynes, A.B., Molina, G., Lipsitz, S.R., Esquivel, M.M., Uribe-Leitz, T., Fu, R., Azad, T., Chao, T.E., Berry, W.R., Gawande, A.A. (2016). Size and distribution of the global volume of surgery in 2012. Bulletin of the World Health Organization, 94(3), 201-209.
2. Anderson, O., Davis, R., Hanna, G.B., Vincent, C.A. (2013). Surgical adverse events: a systematic review. The American Journal of Surgery, 206(2), 253-262.
3. World Health Organization-WHO. WHO Guidelines for Safe Surgery, Safe Surgery Saves Lives. Retrieved April 12, 2015 http://whqlibdoc.who.int/publications/2009/9789241598552_eng.pdf.
4. The Ministry of Health of Turkey. Performance Management and Quality Improvement Department. Retrieved April 23, 2016.
5. https://kalite.saglik.gov.tr/content/files/duyurular_2011/2011/09_ocak_2011/0901guvenlicerrahi.pdf.
6. Carayon, P., Hundt, A.S., Karsh, B.T., Gurses, A.P., Alvarado, C.J., Smith, M., Flatley Brennan, P. (2006). Work system design for patient safety: The SEIPS model. Quality & Safety in Health Care, 15(suppl I), 50-58.
7. Holden, R.J., Carayon, P., Gurses, A.P., Hoonakker, P., Hundt, A.S., Ozok, A.A., Rivera-Rodriguez, A.J. (2013). SEIPS 2.0: a human factors framework for studying and improving the work of healthcare professionals and patients. Ergonomics, 56(11), 1669-86.
8. Wooldridge, A.R., Carayon, P., Hundt, A.S., Hoonakker, P.L.T. (2017). SEIPS-based process modeling in primary care. Applied Ergonomics, 60(2017), 240-254.
9. de Vries, E.N., Prins, H.A., Crolla, R.M., den Outer, A.J., van Andel, G., van Helden, S.H., Schlack, W.S., van Putten, M.A., Gouma, D.J., Dijkgraaf, M.G., Smorenburg, S.M., Boermeester, M.A. (2010). Effect of a comprehensive surgical safety system on patient outcomes. The New England Journal of Medicine, 363(20), 1928-37.
10. van Klei, W.A., Hoff, R.G., van Aarnhem, E.E., Simmermacher, R.K., Regli, L.P., Kappen, T.H., van Wolfswinkel, L., Kalkman, C.J., Buhre, W.F., Peelen, L.M. (2012). Effects of the introduction of the WHO "surgical safety checklist" on in-hospital mortality: A cohort study. The Annals of Surgery, 255(1), 44-49.
11. Urbach, D.R., Govindarajan, A., Saskin, R., Wilton, A.S., Baxter, N.N. (2014). Introduction of surgical safety checklists in Ontario, Canada. The New England Journal of Medicine, 370(11), 1029-38.
12. Haugen, A.S., Søfteland, E., Almeland, S.K., Sevdalis, N., Vonen, B., Eide, G.E., Nortvedt, M.W., Harthug, S. (2015). Effect of The World Health Organization checklist on patient outcomes: a stepped wedge cluster randomized controlled trial. Annals of Surgery, 261(5), 821-8.
13. Sewell, M., Adebibe, M., Jayakumar, P., Jowett, C., Kong, K., Vemulapalli, K., Levack, B. (2011). Use of The WHO surgical safety checklist in trauma and orthopaedic patients. International Orthopaedics, 35(6), 897-901.
14. Rosenberg, N.M., Urman, R.D., Gallagher, S., Stenglein, J., Liu, X., Shapiro, F.E. (2012). Effect of an office-based surgical safety system on patient outcomes, Eplasty, 12(e59), 493-99.
15. Askarian, M., Kouchak, F., Palenik, C.J. (2011). Effect of surgical safety checklists on postoperative morbidity and mortality rates, Shiraz, Faghihy Hospital, a 1-year study. Quality Management in Health Care, 20(4), 293-7.
16. Haynes, A.B., Weiser, T.G., Berry, W.R., Lipsitz, S.R., Breizat, A.H., 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. (2009). A surgical safety checklist to reduce morbidity and mortality in a global population. The New England Journal of Medicine, 360(5), 491-9.

17. Kwok, A.C., Funk, L.M., Baltaga, R., Lipsitz, S.R., Merry, A.F., Dziekan, G., Ciobanu, G., Berry, W.R., Gawande, A.A. (2013). Implementation of The World Health Organization surgical safety checklist, including introduction of pulse oximetry, in a resource-limited setting. Annals of Surgery, 257(4), 633-9.
18. Weiser, T.G., Haynes, A.B., Dziekan, G., Berry, W.R., Lipsitz, S.R., Gawande, A.A. (2010). Effect of a 19-item surgical safety checklist during urgent operations in a global patient population. Annals of Surgery, 251(5), 976-80.
19. Lübbeke, A., Hovaguimian, F., Wickboldt, N., Barea, C., Clergue, F., Hoffmeyer, P., Walder, B. (2013). Effectiveness of the surgical safety checklist in a high standard care environment. Medical Care, 51(5), 425-9.
20. Lepänluoma, M., Rahi, M., Takala, R., Löyttyniemi, E., Ikonen, T.S. (2015). Analysis of neurosurgical reoperations: Use of a surgical checklist and reduction of infection-related and preventable complication-related reoperations. Journal of Neurosurgery, 123(1), 145-52.
21. Takala, R.S., Pauniaho, S.L., Kotkansalo, A., Helmiö, P., Blomgren, K., Helminen, M., Kinnunen, M., Takala, A., Aaltonen, R., Katila, A.J., Peltomaa, K., Ikonen, T.S. (2011). A pilot study of the implementation of WHO surgical checklist in finland: improvements in activities and communication. Acta Anaesthesiologica Scandinavica, 55(10), 1206-14.
22. Helmiö, P., Blomgren, K., Takala, A., Pauniaho, S.L., Takala, R.S., Ikonen, T.S. (2011). Towards Better Patient Safety: WHO Surgical Safety Checklist in Otorhinolaryngology. Clinical Otolaryngology, 36(3), 242-7.
23. Rodrigo-Rincon, I., Martin-Vizcaino, M.P., Tirapu-Leon, B., Zabalza-Lopez, P., Zaballos-Barcala, N., Villalgordo-Ortin, P., Abad-Vicente, F.J., Gost-Garde, J. (2015). The effects of surgical checklists on morbidity and mortality: a pre- and post-intervention study. Acta Anaesthesiologica Scandinavica, 59(2), 205-14.
24. Fargen, K.M., Velat, G.J., Lawson, M.F., Firment, C.S., Mocco, J., Hoh, B.L. (2013). Enhanced staff communication and reduced near-miss errors with a neurointerventional procedural checklist. Journal of Neurointerventional Surgery, 5(5), 497-500.
25. Bashford, T., Reshamwalla, S., McAuley, J., Allen, N.H., McNatt, Z., Gebremedhen, Y.D. (2014). Implementation of the WHO Surgical Safety Checklist in an Ethiopian Referral Hospital. Patient Safety in Surgery, 8(16), 1-11.
26. Delgado Hurtado, J.J., Jiménez, X., Peñalozo, M.A., Villatoro, C., de Izquierdo, S., Cifuentes, M. (2012). Accaptance of the WHO surgical safety checklist among surgical personnel in hospitals in Guatemala city. BMC Health Services Research, 12(169), 1-5.
27. Haynes, A.B., Weiser, T.G., Berry, W.R., Lipsitz, S.R., Breizat, A.H., Dellinger, E.P., Dziekan, G., Herbosa, T., Kibatala, P.L., Lapitan, M.C., Merry, A.F., Reznick, R.K., Taylor, B., Vats, A., Gawande, A.A. (2011). Changes in safety attitude and relationship to decreased postoperative morbidity and mortality following implementation of a checklist-based surgical safety intervention. BMJ Quality and Safety, 20(1), 102-7.
28. Omi, A., Terai, Y., Muro, D. (2014). Successful trial for introduction of the WHO surgical safety checklist. Masui, 63(1), 105-11.
29. Norton, E.K., Rangel, S.J. (2010). Implementing a pediatric surgical safety checklist in the OR and beyond. AORN Journal, 92(1), 61-71.
30. Paugam-Burtz, C., Guerrero, O. (2011). French surgical checklist in a universitary hospital: achievements one year after implementation. Annales Francaises D'anesthesie Et De Reanimation, 30(6), 475-8.
31. Saturno, P.J., Soria-Aledo, V., Da Silva Gama, Z.A., Lorca-Parra, F., Grau-Polan, M. (2014). Understanding WHO surgical checklist implementation: Tricks and pitfalls. An observational study. World Journal of Surgery, 38(2), 287-95.
32. Aveling, E.L., McCulloch, P., Dixon-Woods, M. (2013). A qualitative study comparing experiences of the surgical safety checklist in hospitals in high-income and low-income countries. BMJ Open, 3(8), e003039.
33. Russ, S.J., Rout, S., Caris, J., Moorthy, K., Mayer, E., Darzi, A., Sevdalis, N., Vincent, C. (2014). The WHO surgical safety checklist: survey of patients' views. BMJ Quality and Safety, 0, 1-8.
34. Kariyoi, P.C., Hightoweri, J., Ndihokubwayoi, J.B., Tumusiimei, P., Mwikisa C. (2013). Challenges facing the introduction of the WHO surgical safety checklist: a short experience in African countries. African Health Monitor,16, 36-39.
35. Fourcade, A., Blache, J., Grenier, C., Bourgain, J.L., Minvielle, E. (2012). Barriers to staff adoption of a surgical safety checklist. BMJ Quality and Safety, 21(3), 191-197.
36. 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, 776-778.