

Surgical Count Implementations in the Operating Rooms: An Example from Turkey

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Abstract

Aim: Although retained foreign bodies are a rare and preventable problem, it is one of the medical errors in surgery can have heavy medico-legal consequences. Retained sponges can cause significant morbidity, prolonged hospital stay, postoperative complications, pain and disabilities. Also the costs associated with treatment of retained surgical items can be considerable. The study was undertaken to determine the current implementations related to instruments and sponges counts in the operating rooms in Turkey.

Method: This descriptive study was carried out with 261 operating room nurses. The data collection tool was a questionnaire which was designed on the Google Drive application using the internet. Thereafter its internet link was distributed throughout Turkey using nursing, surgical nursing and operating room nursing social media websites; the answers were gathered in the same way.

Results: Ninety-five percent of participants stated that instruments and sponges were usually counted by the scrub nurses (88.5%). Sponges (97.7%), pads (95.4%), tampons (89.2%), surgical instruments (88.1%) and needles (70.4%) were the items which were usually counted. According to 81.6% of the nurses, a written count protocol exists for their hospitals, however, they noted there was a significant difference in implementation among the various institutions ($p=0.026$). While 49.8% of participants stated that the count before surgery was done by nurses, 23.7% reported that the count was performed by operating room employees. Furthermore, 81.2% of the nurses noted that if the scrub nurses were replaced during surgery, the surgical count would be repeated. Nurses stated that last count was usually done just before applying skin sutures (72.7%), and if there were a problem with the count, radiological imaging would be done (73.5%) and the count irregularity would be signed by staff (31.0%).

Conclusion: Our results demonstrated that because surgical counts were generally done by the scrub nurses, changing of scrub nurse have high risk for surgical count error. In addition, although most of the hospitals have a count protocol, a serious issue concerns the use of unprofessional hospital employees who carry out this task, thus jeopardizing patient safety to be operating room employees join the count are other problems related to surgical count. There is not any comprehensive research related to surgical instrument and material count in Turkey. The current study enables us to obtain information concerning surgical count protocol in the operating rooms in Turkey.

Keywords: Foreign bodies; Surgical count; Skin sutures; Radiological imaging

Introduction

Operating rooms, due to their complex structure and crowdedness and cases that can change suddenly, are the surgical units where unwanted incidents can occur frequently [1]. Forgetting a sponges and instruments in the surgical field is one of these unwanted incidents that may occur in an operating room [2,3]. Forgetting a sponges and instruments inside patient's body, is not a medical error but a preventable incident [4,5]. Studies demonstrate that the rate of forgetting a surgical sponges and instruments inside a patient's body, ranges from 1/1,500 to 1/19,000 [5,6]. American Surgical Association stated that retained surgical instruments case is occurred at least once a year in each hospital and significant procedures are applied for 8,000 and 18,000 of these [7,8]. Retained surgical instruments cases mostly happens in the surgical field of abdomen (46-55%), but also pelvis, chest, and vagina can be included in this category [5,9]. The frequency of retained foreign objects cases ranges from 1/1,000 to 1/1,500 in abdominal and pelvic surgery. Although it is not frequent, retained foreign objects cases is found in orthopedics, urology and neurologic operations [5].

During the course of surgery, everything which can cause a reaction in patient, can be identified as foreign object. Within this scope, the most frequent retained surgical instruments are, sponge that ranks first and followed by surgical instruments, ecarteur, needle and compress [3,9,10]. Furthermore, broken surgical instruments, rubber tubes, and

irrigation materials are one of the most frequent instruments that are left [8]. A rate of most frequent retained surgical instruments that are reported in one is shown in (Figure 1) [11].

There are many factors that can cause foreign objects to be left in patient's body. These are shown in (Table I) [3,5-8,12-14]. The objects left inside a patient can cause certain adverse events result in negative outcomes. Some of these adverse events with rates listed in (Table II) [6,8,10,15].

Moreover retained surgical instruments and materials can lead to pain and disabilities [3,16]. These results cause legal problems, negative impression and stress on the patient-medical staff. Also, the complications results from retained surgical instruments or materials increase patient's health expenses [3,9]. The cost of one retained surgical

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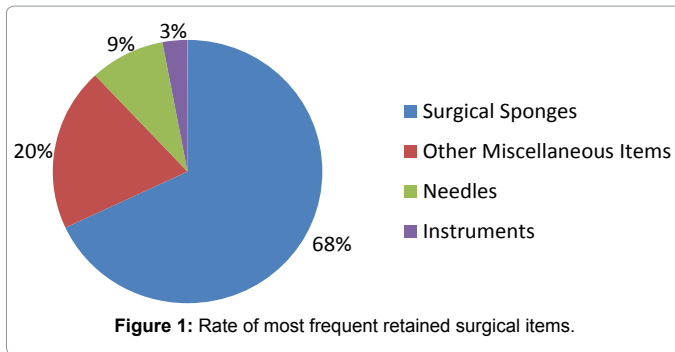


Figure 1: Rate of most frequent retained surgical items.

Table I: Factors that can cause foreign objects to be left in patient's body.

High body mass index
Emergency surgery
Lack of interaction between surgical team
Presence of only one scrub and circulating nurse
Presence of more than one surgical teams
Long duration of surgery
Unexpected change in the procedure such as, turning of a laparoscopic surgery into an open surgery

Table II: Adverse events related to retained surgical items.

Adverse event	Percentage (%)
Reoperation	69-83
Readmission and prolonged hospital stay	30-59
Sepsis and infection	43
Fistula or bowel obstruction	15
Mortality	11-15
Visceral perforation	7

instrument case ranges from 37,041 to 2,350,000 dollars [2]. Centers for Medicare and Medicaid Services (CMS) stated that 63,631 dollars were spent per case in 2007 [6]. Nowadays, it is estimated that this cost ranges from 150,000 to 500,000 for hospital and 30,000 dollars are lost within this process [6].

A standard way to prevent the retention of foreign objects inside patient, is to count each instrument and material as soon as they are taken into sterile field and to recount them at the end of the operation. It is suggested that a white board should be provided in operation room, a nurse should write down each instrument and material on the board or ensure that somebody do it [12]. As counting process depends on the human factor, it has high probability of error. However, nowadays technological methods such as barcoding and numerating sponges and compresses, x-ray and detectors are employed [3,5]. Moreover, post-operative radiography is used in some institutions [3]. As stated by Steelman and Alasagheirin in a study retained surgical objects were detected in 62% of the patients through radiography although post-operative count was verified [10,16]. If a counting error is noticed during operation, intraoperative radiography is employed. However, Steelman and Alasagheirin stated that intraoperative radiography showed 33% failure rate [10]. Current approaches supports that each foundation should form its own counting procedure in accordance with the directories formed by the Association of Perioperative Registered Nurses (AORN). Although implementing count protocols gains importance with each passing day, retained surgical instrument cases continue to happen [5].

Although there are many reviews provide information about surgical instrument and material count implementations in hospitals, there are limited research in literature. Also it isn't found any comprehensive research which demonstrates surgical instrument and material count in Turkey. This study aimed to demonstrate how surgical instrument and material count was performed across in Turkey.

Methodology

Research type

Descriptive research method is used in this study and it aims to determine the situation with regard to counting surgical instrument and material in operation rooms across the country.

Sample size

The nurses who are over 18 and working as scrub nurses in Turkey participated in the study. Regardless of the sample size, 261 nurses who meet the acceptance criteria, are included in this study.

Data collection and analysis

A Questionnaire formed by researchers using relevant sources [3,6,9,12] and consisting of 23 questions was used as data collecting instrument. The questionnaire was formed online, using Google Drive. Research questions was prepared in accordance with socio-demographic characteristics of participants and their opinions about surgical instrument and material counting and determining their association procedures. After the questionnaire was formed, its link was shared on the web pages on social media related to nursing, surgical nursing, and operation room nursing.

Data carried out online on the operation room nurses between the dates January 2015 and June 2015. For analysis of the data, The Edition Google Drive Response Analysis and IBM SPSS Statistics 22 software were used.

Ethics

Permission granted for the research by the chairperson of Clinical Studies Ethics Board.

Findings

This study was completed with the participation of 261 operation room nurses. 89% of the individuals within the scope of the study, were college graduates and 50.2% of them were the ones who was working at the hospital that were subjected to public hospitals and 20.7% of them were the ones who were working at private hospitals. Participants had average 9.0 ± 7.4 (min: 1.0; max: 35.0) years of professional experience and they were working in operation rooms for 11.5 ± 8.0 (min: 1.0; max: 33.0) years.

Within the scope of research, 81.7% of operation nurses stated that there was a protocol for counting in institutions. As a result of the statistical analysis carried out, a statistical difference was detected between the institutions with regard to count protocol they had ($p=0.026$). 38.1% of the nurses who stated the presence of count protocol, was nurses who were working at the hospital that were subjected to public hospitals.

The surgeries in which surgical items were counted according to the statements of nurses, are shown in Table III. 64% of the participants stated that only the abdomen was opened and 40.2% of them stated that surgical items were counted during surgeries. It is shown that among the counted items, sponge ranks first (97.7%). Sponge followed by compress (95.4%), then tampon (89.2%), suture needle (88.1%) and pad (70.4%).

The instruments and materials which participants thought counting errors made, are shown in Table IV. Participants particularly stated that at emergency patients (61.6%), when not requiring count surgery turned into a requiring one (57.4%), when the scrub nurse shifted during the surgery (44.4%), when the patient lost much blood (29.1%) and when the duration of surgery took longer (25.2%), complications happened during the process of counting instruments and materials.

Table III: The surgeries that were counted in institutions.

Type of surgery	*N (%)
Open abdomen surgeries	167 (64.0)
All surgeries without distinction	105 (40.2)
The surgeries in which surgeon asked for counting	83(31.8)
Mastectomy surgeries	51(19.5)
Thyroidectomy surgeries	49 (18.7)
Laparoscopic surgeries	44 (16.8)
Stabilization surgeries	32 (12.2)
Other (Cardio-vascular Surgeries, hip surgeries, tonsillectomy, adenoidectomy, thoracotomy)	13 (5.0)

* Participants stated more than one response.

Table IV: The surgical instruments and materials counting errors made most.

Instruments and Materials	*N (%)
Sponge (gauze bandage)	166 (63.6)
Suture Needle	70 (26.8)
Surgical instrument	61 (23.3)
Compress	36 (13.7)
Tampon (Hazelnut, chestnut etc.)	32 (12.2)
Pad	18 (6.9)

* Participants stated mo.

Table V: Recording methods of counting before surgical cut.

Methods that are carried out to record	*N (%)
Circulating nurse takes note	130 (49.8)
Staff who is not a health care professional takes note	62 (23.7)
Scrub nurses' herself takes note	53 (20.3)
Circulating nurse writes on the board	44 (16.8)
Staff who is not a health care professional writes on the board	39 (14.9)
Surgery technician writes on sponge counting form	2 (0.8)

* Participants stated mo.

Nearly all of the participants (95.0%) stated that instruments and materials were counted before the surgical cut in their institutions and most of the participant (88.5%) said scrub nurses were the ones who counted items. Circulating nurses rank second with the rate of 21.4%.

Statements of the participants with regard to counting record methods are shown in Table V. The half of the individuals within the scope of this study, stated that the counting before the surgical cut was performed by circulating nurse.

81.2% of the operation room nurses stated that item counting was performed during the surgery. The individuals who said mid-term count was performed stated that count was performed, particularly when the team members were shifted (32.9%), when the used materials increased (18.6%) and in the cases that took long time (15.3%) and when the surgery was proceeding. It was pointed out that the counts that was performed during the surgery was in control of circulating and scrub nurse (39.1%) or performed by the scrub nurses' herself (26.6%).

While 72% of the participants stating that final count was performed before the skin suture; 13.4% of them after skin clousure but before the sterility was lost, and 13.0% of them expressed that it was performed before the fascia clousure. 88.5% of nurses stated that final count was performed by the scrub nurse, 21.0% of them stated that it was performed by hospital staff.

73.5% of the participants expressed that in the case of missing surgical item, radiological monitoring was performed. It was expressed that other applications were skin clousuring by keeping a record (31.0%) and completing the surgery without doing nothing (1.9%).

Discussion

Leaving foreign objects inside a patient, is not frequent medical error but an incident which may cause serious complications. Thus, the issue of retained surgical instruments has significance in providing safe surgery which is a part of patient safety. This study aimed to determine the applications of counts of surgical instruments and materials in the surgeries performed in Turkey.

The great majority of scrub nurses (81.6%) stated that the protocols with respect to counts of surgical instruments and materials, existed in institutions. It was found that protocol of counting surgical instruments and material, was more common in public hospitals ($p=0.026$). It was considered that quality determination studies conducted in public hospitals, were the reason of their eminence with regard to count protocol.

More than half of the participants stated that counting was performed in open abdomen surgeries. It is considered that count is performed in the open abdomen surgeries, because abdomen's size can lead to retained surgical item cases.

It is found out in our studies that sponge is the most counted item. Sponge followed by compress, tampon, sutur needle and pads rank among the most counted items. It is believed that the reason why sponge is the most counted item is that sponge is used in emergency cases during surgeries.

The individuals within the scope of this research states the most common reasons that causes surgical count errors as, emergency of cases, turning of operation from not requiring count case into a requiring one, scrub nurse shift during the surgery, massive blood loss of patient and the prolonged operative duration. Similarly, Stawicki et al., determined that blood loss over 500 ml, duration of surgery, team member shift during operation, high body mass index, occurring of unwanted events during the operation and presence of more than one surgical team within the process, were among the causes of errors of surgical instrument and material counting [17]. According to Rowlands unplanned surgeries, presence of too many perioperative personnel and complicated cases were among the reasons. Due to the fact that counting was generally performed by scrub nurse, it is believed that misinformation during the shifts of scrub nurse, leads to count errors. Moreover, unwanted events such as emergency cases and blood loss, leads to moving fast and count errors. Prolonged surgery duration also leads to distractibility and it effects counting negatively [18].

In this study, it is clear that when the item counting errors happened most are examined, sponge and suture needle rank first. The studies of Greenberg et al. show parrallelism to our study in determing the sponge as leading item in incorrect counts. In the same study, incorrect count of surgical instruments and needles was observed. In emergency cases which are encountered during the surgeries, sponge use may increase. Swift actions taken in these cases, leads to the idea that sponge count is incorrect [19].

Nearly all of the nurses stated that count was performed before the surgical cut, during surgery and after the surgery and it was written by circulating nurse. There are many studies which indicates that surgical count was performed operation room nurses and supports our findings in literature [20,21]. Moreover it is emphasized that circulating nurse shoud write standardized count records on a white board in every operation rooms [22]. Our study is consistent with the literature.

According to our study, in the case of a missing detected in the count process, radiological monitoring is performed most frequently. In a study conducted by Cima and Ark it is detected that x-ray is executed on patients before they are sent to reanimation unit.

This study has some limitations. It was conducted by online. So only the nurses who used internet were participated in the study.

Participating of all operating room nurses would provide more accurate information about surgical count.

Conclusion and Recommendations

Besides it is not a frequent medical error, retained surgical items is an issue that can lead to severe complications and it stays up-to-date. This study demonstrates application in accordance with surgical count across in Turkey. It is the significance of this study that it presents the data regarding the count across the country. It is also important that it indicates the gaps with respect to count. When findings are analyzed, it is seen that the responsibility with regard to count, is in the hands of scrub nurse and her shift during the surgery leads to incorrect count. This outcome indicates that operation room nurses play a vital role in patient safety. In accordance with these outcomes, we can recommend institutions to plan training programs periodically in order to raise awareness and to improve the applications regarding count. Furthermore, institutions should be in cooperation with the surgical staff and develop specific count protocols and control the application of protocol by following it. In conclusion, it is necessary to remove the human factor from surgical instrument and material count process, to develop technology assisted methods and to increase team communication.

Conflict of Interest

Authors have no conflict of interest to disclose.

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