

**Title Page**

**Manuscript Title**

*“Gynecology healthcare professionals towards safety procedures & measures in Operation Rooms aiming to enhanced quality of medical services in Greece”*

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*“Gynecology healthcare professionals towards safety procedures and measures in Operation Rooms aiming to enhanced quality of medical services in Greece”*

**Abstract and Keywords**

**Objective:** To investigate the attitudes of healthcare professionals in Greece towards safety practices in gynecological Operation Rooms (ORs). **Design:** An anonymous self-administered questionnaire was distributed to surgical personnel asking for their opinions on safety practices during vaginal deliveries (VD) and gynecological operations such as counting of sponges and sutures and counting documentation. **Setting & Participants:** The study took place in Hippokration Hospital of Thessaloniki in 2016 and included 227 healthcare professionals. **Intervention:** Our team assessed and statistically analyzed the questionnaires. **Main Outcome Measures:** Attitude towards surgical counts and counting documentation, awareness of existence and/or implementation in their workplace of other surgical safety objectives e.g. WHO safety control list. **Results:** 85.2% considered that counting after VDs is essential and 84.9% admitted to do so, while in terms of counting documentation, the relative numbers were far smaller (50.5% / 63.3%). Furthermore, while 86.5% considered that a documented protocol is necessary, only 53.9% admitted its implementation in their workplace. Remarkably, 53.1% were unaware of the WHO safety control list for gynecological surgeries. **Discussion:** Most Greek healthcare professionals are well-aware of the significance of surgical counting and counting documentation in gynecology ORs. However, specific tasks and assignments are unclear to them. **Conclusions:** Greek healthcare professionals consider surgical safety measures as important but there is a critical gap in knowledge when it comes to responsibilities and standardized processes during implementation. More effective implementation and increased personnel awareness of the surgical safety protocols and International Guidelines are necessary for enhanced quality of surgical safety in Greece.

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**Keywords:** Safety in Surgery, Surgical Counting, Counting Documentation Report, Surgical Safety Checklist

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### ***Introduction***

“Human error” is used to describe a situation in which a planned sequence of mental and/or physical activities by a person fails to achieve its intended purpose and as an outcome this individual is responsible for the consequences of that conduct [1]. Errors occur commonly in every sector involving human activity including Modern Healthcare [2]. Healthcare settings will always involve humans in both the mental decision-making and physical care delivery and thus will always be prone to human errors [3,4].

Medical errors include unintended acts or acts that fail to achieve their desired outcomes [5], failures of a planned action to be successfully done as intended (execution error), the use of wrong strategies to achieve aims (planning error) [6], or deviations from the process of care that may harm patients [7]. Surgical operations are therapeutic processes for many conditions, that despite their value, are still prone to medical errors having a potentially critical impact on patients’ health, even lethal sometimes [8,9]

Although leaving surgical objects inside patients is a rare phenomenon, it is considered as one of the most devastating errors that may accompany operations with impact on hospitalized patients. It is also regarded as the main basis for a malpractice claim on behalf of the patients against the surgical staff. In the field of obstetrics and gynecology, objects that are routinely used in relative operations such as sponges, sutures and needles are accidentally left inside a patient during gynecological surgeries or vaginal deliveries (VDs). Retained foreign objects (RFOs) typically occur in the abdomen or vagina and can cause infection, bowel obstruction,

sepsis, fistula, perforation, granuloma and sometimes even death [10,11]. These complications can occur early in the postoperative period, or even months or years later [10].

Given the severity of RFOs, World Health Organization (WHO) published specific recommendations for the prevention of risk of potential RFOs that were included as part of its official Guidelines for Safe Surgery in 2009 in terms of its initiative called “Safe Surgery Saves Lives”. In particular, in Objective 7, it is clearly stated that RFOs are considered a preventable occurrence, and careful surgical counts and relative documentation can act as an effective defense against inadvertent retention of instruments and sponges during surgeries, if not completely eliminate such adverse incidents [12].

Surgical counts are a standardized operating procedure through which prevention of RFOs is successfully achieved by counting sponges, sharps, and medical instruments in any surgical case in which a body cavity is opened. Counts are performed to account for all surgical items and to lessen the potential for injury to the patient as a result of RFOs [13]. Failure to account for all surgical items after an operation may lead to the inadvertent RFO which in turn may seriously harm patients. Surgeons and operating teams routinely rely on the practice of surgical counting to reduce the risk of RFOs. The WHO Surgical Safety Checklist released in 2008 requires surgical counts [12]. A case-control study of a total of 40 cases of RFOs, 11 of which VD-associated, revealed that in all of them cases the perioperative team skipped the surgical counting procedure [14].

Furthermore, the Association of periOperative Registered Nurses (AORN), in conjunction with the American College of Surgeons guided by the belief that perioperative team members are ethically and morally obligated to protect patients from RFOs, published eleven recommendations for prevention of RFOs in 2009 with an update in 2011 [15,16]. Their most significant recommendation was associated with the need for systematic surgical counts that should be performed at 5 different times during an operation [17]. An NHS review of retained

vaginal sponges between 2011 and 2013 found most retained sponge events occurred either before or at the perineal suturing stage [18].

In addition, there are cases in which surgical counts are performed under pressure and lack of time resulting in counting errors. Such errors are called discrepancies [19]. In another study, the odds of RFOs increased 100 times with a discrepancy in counts [20].

This study attempted to determine perioperative personnel's knowledge and attitude towards surgical counts in healthcare facilities in Greece.

## **Methods**

Our team conducted a qualitative survey during 2016 in which healthcare professionals including midwives, midwife interns, physicians and others, were recruited to express their opinions about surgical counts and surgical safety in general with the use of a well-designed questionnaire.

The initial version of the questionnaire was composed during a preparative period of 3 months (October-December 2015) during which our team, with the form of informal communications during normal working hours, discussed the nature of a possible questionnaire associated mainly with surgical safety that could be administered to surgery personnel asking for their opinions. During that period, the team members exchanged valuable information from their working experience in ORs and in agreement with the International Guidelines on Surgery Safety by WHO and AORN [12, 16,17], the first draft questionnaire was generated. Before its release, the draft questionnaire was pre-tested through a control group of healthcare professionals at one private hospital where surgical counting and documentation are common practices. This initial group of respondents, that was not included in this study, was asked to evaluate the comprehension level of the questionnaire and suggest possible modifications

leading at the end to some slight alternations were made to a few questions and available responses.

The final edition of this anonymous self-administered questionnaire was distributed to surgical personnel during staff meetings in Hippokration General Hospital of Thessaloniki, academic activities in Thessaloniki Medical School and nursing seminars where healthcare professionals from public and private hospitals in Greece participated. Before answering the questionnaire, each participant was asked to read and sign an informed consent form.

The introductory part of the questionnaire explored demographics characteristics of the respondents (age, educational level, profession, marital status, and numbers of deliveries). The main part was consisted of two group of questions investigating the respondents' attitude towards counting sponges and sutures and documenting the counting report after VDs or gynecological surgeries. Furthermore, the participants' knowledge of other objectives associated with surgical safety such as WHO safety control list and documented protocols in the gynecological ORs were also investigated mainly in terms of awareness of existence, awareness of implementation in their workplace and acceptance of relative implementation.

## **Results**

The questionnaire was administered to a total of 238 healthcare professionals and a total of 227 of them agreed to answer it (95.37% response rate). This final group of 227 respondents was consisted of 105 midwives, 104 midwife interns, 4 physicians and 14 other healthcare professionals (Table 1). It should be noted that: a) not all the 227 participants responded to all of the questions and b) some participants gave more than one correct answers in some questions. This explains why numbers in Table 1 do not sum up to the total number of participants in some questions (presented with \* or \*\* respectively).

Regarding the age, more than half of the respondents were in their early thirties (57.3%), one quarter of them were between 30 and 50 years old (26%) and only 16.7% were older than 50 years old. As a result of the relative low average age, more than 60% of the participants were single without any children.

Table 2 presents the questions that were asked to respondents about their opinions on counting of sponges and sutures after VDs along with the received answers. In particular, 85.2% considered that counting after VDs is essential and approximately an equal number of individuals admitted to do so (84.9%) despite the fact that only one in every two healthcare professionals (54.8%) stated that post-VD counting is a common practice in their workplace. As responsible of the counting process, according to nearly 50% of the respondents, this duty has to be assigned to both the surgeon and the assistant midwife while one third of them considered that it is exclusively midwife's duty. In terms of the counting report documentation, more than 50% of the participants reported that the counting of sponges and sutures is documented in their workplace and admitted to do so themselves (50.5% and 63.3% respectively). As the right person for the counting documentation, 88.1% were of the opinion that either midwife alone or together with the leading surgeon had to fill in the counting documentation report. Finally, 79.5% of the participants stated that counting report documentation should be performed on either the patient's obstetrical record or the record kept in the delivery room or on both records while the remaining participants rejected the process of counting documentation as not necessary at all.

Table 3 shows the questions associated with the respondents' attitude towards the counting of sponges and sutures after gynecological surgeries together with the received answers. For every 10 healthcare professionals who answered the questionnaire, about 7 of them stated that in their workplace there is always a scrub midwife and about 8 of them that there is always a circulating midwife. In addition, almost one in every two participants admitted that

the counting process is carried out by both midwives and considered this job assignment to be correct. When asked about the right time for surgical counts, according to most of the healthcare professionals, it should be either before or after the surgery and it should be repeated as many times necessary. Furthermore, the vast majority of them agreed that peritoneal closure should not start at any case before the counting process is completed. In terms of the relative counting report documentation, despite the fact that most respondents considered that the documentation should be reported officially, far less admitted that counting documentation is a common practice in their workplace while many respondents were totally unaware of any relative documentation procedure in their workplace.

In other questions not exclusively associated with surgical counts, while 86.5% considered that a documented protocol is necessary in the gynecological OR they work, only 53.9% admitted its relative implementation. Regarding their thoughts on safety control lists, 83.3% were of the opinion that they should be available in their workplace. However, for every 10 respondents there were approximately only 3 stating that such a list is printed in their workplace while there were 2 denying its availability and 5 completely unaware of its existence or absence. Remarkably, more than half of the respondents admitted that they did not know about the WHO recommendations for gynecological surgeries (53.1%). Finally, when asked about their opinions about potential RFO cases, the vast majority of the participants stated that in such cases it is most likely that the leading surgeon will be the one to be considered as responsible and that is what should really be done.

## **Discussion**

The aim of our study was to investigate the attitudes of healthcare professionals towards fundamental practices that ensure safety in gynecological ORs in Greece.

The questionnaire mainly focused on the surgical counting process and the relative counting documentation report. The 227 respondents were asked to express their thoughts about two



main categories of surgical counts: a) the ones after VDs and b) the ones after gynecological operations. It seems that most of the participating healthcare professionals are well-aware of the significance of sponge and suture counting and that explains why they carry out this task themselves or are willing to do it so. Also, it appears that the surgical counting is a common practice in most labor wards and ORs in Greece and is mostly performed by the midwives. However, when asked for the proper timing and number of repeats for surgical counts, most of the participants gave contradictive responses leading to the assumption that it is rather unclear to them when and how many times a surgical count should be executed.

Regarding the surgical count documentation, it is obvious from the received answers that documentation as a process is not as common as the counting process explaining why most healthcare professionals are unsure or even unaware of where the relevant counting documentation should be recorded and by whom. Low self-reported unawareness of the participants can be associated, to an extent, with the relative small average age of the participants since most of them were up to 30 years old (57.3% of the total participants) with only a few years of working experience in ORs.

Apart from the questions associated with surgical counts, the respondents expressed their opinions about other measures and objectives that aim to safety in surgeries. More specifically, in almost half the labor wards and gynecological ORs in Greece, there is not a standardized operating procedure with the form of an official documented protocol. Furthermore, only 3 out of 10 healthcare settings in Greece have included a safety control list in their surgical routine. In addition, 53.1% of the gynecological healthcare providers were completely unaware of the existence of a WHO safety control list which is in opposition to their self-reported behavior that highly approves surgical counts and other measures for surgical safety improvement.

This study had one important limitation associated with the “nature” of the participants. More specifically, 209 out of 227 participants were either professional midwives or midwife interns which basically makes it difficult to extract conclusion about the opinions and attitudes of other healthcare professionals that are directly associated with surgical safety such as surgeons and anesthesiologists. Also, the relatively small average age of the participants may be considered as a limitation as well. In addition, the self-reported nature of the questionnaire could possibly act as another limitation due to potential misunderstanding of questionnaire from participants who might be reluctant to request relative elucidations from our team when answering the questionnaire.

In conclusion, it seems that healthcare professionals in Greece consider the surgical safety measures and protocols to be highly important but there is a critical gap in knowledge when it comes to responsibilities, roles and standardized processes during the relative implementation. A more effective implementation of the International Guidelines is necessary in order to further enhance the quality level of surgical safety in Greece. Management and Administration Boards of Greek hospitals could contribute vitally to this direction with a well-organized educational program for its personnel, focusing on the understanding of the entire concept of surgical safety in everyday routine. Also, the methodological encouragement of multidisciplinary communication through interactions among different surgical professions in real-time situations could play a vital role. In the same context, older and more experienced healthcare professionals could become “real-time motivation trainers” for their younger less experienced colleagues providing useful guidance and training [21-23]. On the other hand, it has been suggested that younger healthcare professionals could act as “wind of change” in their workplaces with their energy and constant effort for overall improvement [24]. After all, the WHO Guidelines mention that interactive communication and effective team-work among surgical staff is essential to prevent possible complications and develop a patient safety culture [25,26] which is important since the attitudes of surgical teams reflect the

development of safety procedures in the OR [27]. Bad communication and ineffective interaction among the operating team usually act against surgical safety [28,29]. Finally, the quality and safety level of the surgical operations could be highly increased through the design and implementation of a well-organized Quality System and successful achievement of official accreditation status in the surgical clinic. Being accredited, basically means that a clinic has been evaluated according to international standards to demonstrate its competence, impartiality, credibility and professional capabilities. Accreditation will lead to the personnel's compliance to strict standards for staff, equipment, facilities, documentation and patient care resulting this way to a surgical facility of excellence, quality and, of course, surgical safety.

### **Conclusions**

In general, our study revealed that despite the fact that most of the healthcare professionals consider safety in ORs to be extremely important, it seems that there is an important gap in knowledge of the fundamental safety practices and protocols among surgical personnel in Greece. This can be explained by the limited implementation of safety standardized operating procedures in most of the ORs in Greece and the low personnel awareness of the WHO Guidelines and Checklist for Surgical Safety that were extrapolated from the self-reporting questionnaires. Methodological plans and effective strategies are required for a better implementation of surgical safety protocols and higher universal awareness of the surgical personnel towards fundamental standardized attitudes that focus on improved quality and safety of the provided healthcare services in ORs.

Future relative studies could target a larger number of respondents focusing on a more balanced composition of the responding subgroups that should include if possible equal numbers of midwives, surgeons, anesthesiologists, surgical technologists, nursing technicians and nursing assistants, doctors, medical and nursing students, as well as heads of medical and nursing services, while at the same time trying to achieve a wider variety in the respondents'

age and working experience, in order to extrapolate more universal results about surgical safety in ORs. Additionally, the self-administered questionnaire could be possibly replaced by individual or group interviews that may provide valuable assistance to the respondents when answering the proposed questions. Furthermore, qualitative studies focusing on the evaluation of safety culture in Greece through accurate assessment of patient safety perceptions and behaviors of the surgical personnel could be useful in the identification of the most vulnerable areas so that Hospital Management and Administration can promptly intervene in order to solve any issues with surgical safety.

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## Tables

**Table 1.** Demographic characteristics of women participating in the study. (\*) question not answered by every participant

Demographic characteristics	%	(n=227)
<b>Age (years)</b>		
<20	11.9	27
20-29	45.4	103
30-39	15.9	36
40-49	10.1	23
50-59	16.7	38
<b>Educational level</b>		
Technological Educational Institute	89.0	202
University	2.6	6

Post-Graduate (Msc)	7.9	18
Post-Graduate (PhD)	0.4	1
<b>Profession</b>		
Midwife	46.3	105
Midwife intern	45.8	104
Physician	1.8	4
other	6.2	14
<b>Marital status</b>		
Single	61.7	140
Married	33.0	75
Divorced	4.0	9
Widow	1.3	3
<b>Deliveries (*)</b>		
0	65.1	138
1	7.1	15
2	21.2	45
3	5.7	12
>3	0.9	237

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**Table 2.** Health-care professionals' attitude towards counting sponges and sutures after vaginal deliveries and documenting the counting report. (\*) question not answered by every participant



<b>Questions investigating attitude towards counting sponges and sutures after a VD and documenting the counting report</b>		<b>%</b>	<b>(n=227)</b>
<b>Do you think that sponges and sutures should be counted after vaginal delivery (VD)? (*)</b>			
Yes		85.2	190
No		11.2	25
Do not know		3.6	8
<b>The sponges and sutures after VD should be counted by (*)</b>			
The health care professional performing the delivery		4.0	9
The assistant midwife		32.7	73
Both		50.7	113
No-one		11.2	25
Do not know		1.3	3
<b>Are sponges and sutures counted after a VD at your workplace? (*)</b>			
Yes		54.8	121
No		23.5	52
Do not know		21.7	48
<b>Would you count sponges and sutures after a VD? (*)</b>			
Yes if I performed the delivery		6.8	15
Yes if I was the assistant		16.9	37
Yes, always		68.0	149
No		5.5	12
Do not know		2.7	6
<b>Do you count sponges and sutures after a VD? (*)</b>			
Yes		84.9	180
No, it is not useful		2.8	6
No, it is useful but it is not common at my workplace		12.3	26
<b>Concerning documentation on counting after VD do you believe that (*)</b>			
It is not needed since counting is not needed		5.0	11
It is not needed, only counting is needed		15.5	34
It should be performed on the woman's obstetrical record		8.7	19
It should be performed on the delivery room record		27.9	61
It should be performed on both the woman's obstetrical record and the delivery room record		42.9	94
<b>Is sponges and sutures counting report documented at your workplace? (*)</b>			
Yes		50.5	111
No		22.7	50

Do not know	26.8	59
<b>The sponges and sutures counting after VD should be documented by (*)</b>		
The health care professional performing the delivery	5.1	11
The assistant midwife	40.6	88
Both	47.5	103
Do not know	2.3	5
<b>Do you document the sponges and sutures counting report after a VD? (**)</b>		
Yes	63.3	124
No, it is not useful	9.2	18
No, it is useful but it is not common at my workplace	27.6	54

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**Table 3.** Health-care professionals' attitude towards counting sponges and sutures after gynaecological surgery and documenting the counting report. (\*) question not answered by every participant, (\*\*) question to which some participants responded with more than one correct answer

<b>Questions investigating attitude towards counting sponges and sutures after gynaecological surgery and documenting the counting report</b>		
	<b>%</b>	<b>(n=227)</b>
<b>At your workplace is there always a scrub midwife in the OR? (*)</b>		
Yes	83.8	181
No	4.2	9
Do not know	12.0	26
<b>At your workplace is there always a circulating midwife in the OR? (*)</b>		
Yes	71.8	155
No	12.5	27
Do not know	15.7	34
<b>At your workplace who performs counting of sponges and sutures during gynaecological surgery? (**)</b>		
Circulating midwife	17.6	40
Scrub midwife	18.5	42
Circulating and scrub midwife	51.1	116
Surgical team	1.8	4
All of the above	11.9	27
<b>Who do you think should perform counting during gynaecological surgery? (**)</b>		
Circulating midwife	10.1	23
Scrub midwife	12.8	29
Circulating and scrub midwife	49.3	112
Surgical team	3.5	8
All of the above	24.7	56
<b>When should counting be performed during a gynaecological operation? (**)</b>		
Before surgery	45.8	104
During surgery	18.1	41
At the end of surgery	44.1	100
Once	1.8	4
Twice	10.6	24
As many times as it is needed	56.4	128
Do not know	0.9	2
<b>Should peritoneal closure start before counting is completed? (*)</b>		
Yes, if the surgeon is sure	2.3	5
Yes, in any case	4.1	9
No, in any case	86.8	190

It is irrelevant since in case of disagreement the abdomen could be re-opened before the patient wakes up	2.7	6
Do not know	3.2	7

**Should counting of the sponges and sutures after gynaecological surgery be documented? (\*\*)**

Yes, in the patient's medical record	7.5	17
Yes, in the surgery logbook	30.8	70
Yes, in the surgical procedure description	28.2	64
Yes, in all of the above	37.4	85
No	3.1	7
Do not know	4.8	11

**At your workplace is the counting of sponges and sutures after gynaecological surgery documented? (\*\*)**

(\*\*)

Yes, in the patient's medical record	2.6	6
Yes, in the surgery logbook	24.2	55
Yes, in the surgical procedure description	17.6	40
Yes, in all of the above	15.0	34
No	5.7	13
Do not know	33.9	77

**At your workplace is there a documented protocol for the gynaecological OR? (\*)**

Yes	53.9	117
No	11.1	24
Do not know	35.0	76

**If not do you think that there should be one? (\*)**

Yes	86.5	154
No, the usual procedure is sufficient	1.1	2
No, it would be difficult to implement	2.8	5
No, it would increase workload	0.0	0
Do not know	9.6	17

**At your workplace is there a printed safety control list? (\*)**

Yes	31.5	67
No	19.2	41
Do not know	49.3	105

**If a safety control list is not available, you think that: (\*)**

It should be	83.3	155
It should not be since the usual procedure is sufficient	1.6	3
It should not be since it would be difficult to implement	3.2	6
It should not be since it would increase workload	0.5	1

**Who do you think should sign the safety control list? (\*\*)**

Circulating midwife	30.4	69
Scrub midwife	27.3	62
Head midwife	41.4	94
Surgical team	37.4	85
All of the above	24.7	56

**Do you know that WHO provides a protocol with safety control list for gynaecological surgery? (\*)**

Yes	46.9	99
No	53.1	112

**In case of a foreign body misplaced in the abdominal cavity after a gynaecological operation who will be considered responsible? (\*\*)**

Circulating midwife	45.4	103
Scrub midwife	68.3	155
Surgeon	75.3	171
No one	2.2	5

**In case of a foreign body misplaced in the abdominal cavity after a gynaecological operation who really is responsible? (\*\*)**

Circulating midwife	43.2	98
Scrub midwife	68.7	156
Surgeon	77.5	176
No one	1.3	3

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