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Research Paper

Do we really collaborate effectively in the operating theatre? A cross- sectional study in two hospitals in Greece

Athina E. Patelarou [1]*, Aggelos Laliotis [2], Dimitra Sifaki Pistola [3], Sofia Marinaki [4], Zacharenia Androulaki [5], Chrysoula Tsiou [6], Hero Brokalaki [7]

[1] RN, MPH, Department of Anaesthesiology, University Hospital of Heraklion, Crete, Greece
[2] MD, Department of Surgery, St Thomas' Hospital Guy's & St Thomas' NHS Foundation Trust
[3] Statistician, MPH, Department of Social Medicine, University of Crete, Crete, Greece
[4] RN, Independent researcher, Crete, Greece
[5] RN, PhD, Department of Nursing, Technological Institute of Nursing, School of Health Science, Crete, Greece
[6] RN, PhD, Department of Nursing, Technological Institute of Athnes, School of Health Science, Crete, Greece
[7] RN, PhD, Department of Nursing, University of Athens, Athens, Greece
**Corresponding author E-mail: athina.patelarou@gmail.com*

Abstract

The aim of this study was to translate the Disagreement and Aggression in the Operating Theatre Scale (DAOTS) into Greek and investigate the frequency of perceived conflicts, the sources of disagreement and the suggested methods of coping with them within and among professional groups in operating theatres in Greece. The results of this study support the reliability and validity of the DAOTS. The majority of the respondents had witnessed episodes of aggressive behaviour and/or disagreement during the last six months. Physicians more frequently revealed an aggressive behaviour towards a colleague, while nurses were found to be witnesses of a conflict between different professional teams. Daily/weekly disagreements among respondents about availability of equipment, theatre time, changes in the list order and availability of surgical staff were reported. Additionally, hospital type and years of professional experience are considered to affect the prevalence of exposure to a disagreement.

Keywords: *Aggression, Disagreement, Nurse, Operating Theatre, Teamwork.*

1. Introduction

Communication among the team members is essential as it promotes work coordination and makes adaption to change possible (Brannick 1997). The operating theatre has been described as the most typical example of an interdisciplinary team working in healthcare, as well as being a particularly demanding work environment (Gillespie 2003, Timmons 2005). Admittedly, effective multidisciplinary communication is essential for cohesive teamwork perioperatively. Any disruption of the effective interaction and collaboration may have devastating consequences on service delivery and patient safety (Schaefer et al. 1995). Under this perspective, concerns have been raised in the literature regarding the effects of disagreement and aggression among different health care professional groups (Lingard et al. 2004, Moss 2004). There is significant amount of evidence that factors most frequently identified as contributing to aggression and disagreement incidents are high workload, the ineffective management style and the interprofessional conflict between health care workers (Beardwood et al. 1999, Weinberg 2000).

Moreover, the fact that patient safety and quality of care rely on an effective teamwork has been emphasized extensively in the literature (Kohn et al. 1999). Particularly, a number of studies have investigated the role of teamwork issues in the prevention of adverse events in the operating room. The consequences of suboptimal teamwork may be devastating for patients, caregivers and institutions. Retained sponges, wrong-site operations, mismatched organ transplants or blood transfusions can be the result of a breakdown in communication and collaboration among the operating team members (Gawande et al. 2003).

Research findings highlight that there are numerous accounts of conflict among professional groups in healthcare settings, as well as in European and non-European settings (Lambert et al. 2004, Almost 2006), resulting in the breakdown of successful interprofessional relations (Hudson 2002). In detail, in the operating theatre, Lingard and colleagues (2004) observed a 30% communication failure during surgical procedures, accounting for a 36% rate of observable consequences, such as delay, tension among team members or procedural error (Lingard et al. 2004). These results are also supported by another observational study focusing on the effects of disruption on the surgical process (e.g. communication failure, equipment problems) (Wiegmann et al. 2007). The study found that increased disruption was significantly associated with high percentage of surgical errors, whereas teamwork and communication problems were the strongest predictors of surgical errors (Wiegmann et al. 2007). In Australia, about 50% of adverse events in hospitals are the result of communication problems among healthcare professionals, especially between nurses and doctors (AIHW 2007). Communication failures represent the gap among the particular communication practices used across professional disciplines and the specific collaborative expectations and improvements of the work reality (Bleakley et al. 2006).

Most sociological studies on professional boundaries in healthcare have focused on the boundary between nursing and medicine

(Wicks 1998, Svensson 1996), while most of the work on boundaries in the operating theatre (Collins 1994, Pope 2002) has focused on surgeons and anaesthesiologists. A surgical team consists of surgeons, anaesthesiologists, nurse anaesthetists and theatre nurses. In Greece, physicians complete a 6-year university curriculum and a 5 to 7-year specialty programme before they register either as anaesthetists or specialists of any surgical specialty. On the other hand, theatre nurses, who constitute a basic part of the surgical team, have different educational backgrounds. This means that a theatre nurse might have graduated from university (normally with strict admission criteria) or from the technologically-orientated Technological Educational Institutes (Patelarou et al. 2009).

Although a number of studies have investigated the work relations between the medical and the nursing staff in other countries (Wicks 1998, Walby et al. 1994), no previous studies have examined interprofessional relationships in Greek clinical settings. As a result, the primary aim of this study was to highlight the surgical team members' perceptions towards conflict, the causative factors of aggression among different professional groups in the operating theatre and the frequency of perceived aggressive behaviour in a sample of surgeons, anaesthesiologists, theatre nurses and nurse anaesthetists in Greece. The secondary aims of the present study were to:

1) Develop the Greek version Disagreement and Aggression in the Operating Theatre Scale (DAOTS) by translation and back- translation procedure.
2) Test the reliability and validity and examine the factorial structure of the Greek DAOTS

2. Methods

2.1. Participants sampling study design

A cross- sectional survey design was adopted in 2012 among the two national healthcare hospitals on the island of Crete, namely the University Hospital of Heraklion and the Venizeleio – Pananeio General Hospital. The study participants came from diverse disciplines, specifically surgeons, anaesthesiologists, theatre nurses and nurse anaesthetists. The sample was determined according to the clustered sampling technique. Two stages of subgroups (clusters) were set. Specifically, each hospital (the University and the Regional hospital) was examined separately, while two clusters per hospital (one for physicians and one for nurses) were created. After having created the clusters, the participants were randomly selected. Surveys were administered during pre-existing departmental and staff meetings, with a pencil and a return sealable envelope to maintain confidentiality. Individuals not captured in pre-existing meetings were hand-delivered a survey, pencil, and return envelope. All surveys were anonymous with regard to the caregiver's name, but not to the caregiver's professional role or hospital.

2.2. Questionnaire

An approval to translate and use the DAOTS developed by the copyright owner was obtained. A detailed description of the questionnaire's structure is presented elsewhere (Coe 2008). In summary, the questionnaire was divided into seven main sections and consisted of 31 questions. The first section gathered demographic information, the second section asked respondents to indicate the staff groups perceived to be involved in episodes of disagreements, the third section asked them to indicate the frequency of their attendance at multidisciplinary departmental meetings, while the fourth and fifth sections asked them to give their perceptions of the topics and frequency of disagreement, and of episodes of aggressive behaviour within and between professional groups. Finally, the sixth section invited respondents to identify their preferred method of dealing with aggressive behaviour from others, while the seventh section asked them to rate how well they felt their role to be understood by colleagues in other professional groups, and the degree to which they perceived that a shared goal for patient care existed between those groups.

The original version of the questionnaire was translated into Greek using the back-translation strategy for cross-cultural research (Flin et al. 2006). Two experienced bilingual translators performed forward translation from the original English version independently. Both forward versions were then conciliated and incorporated into the Greek version by an expert panel using a consensus procedure. Back translation was carried out by an English teacher who understands the Greek language, but who has no knowledge of the version of the questionnaire or access to the original version in English. The semi-final version was derived from the reconciliation of the original, back, and forward translations. As this was in agreement with the English original, the translation was considered to be correct.

2.3. Ethical consideration

The study was approved by the Medical Ethics Committee of University Hospital of Heraklion, Greece. A written explanation of the study and a form to obtain consent were provided to all participants.

2.4. Internal consistency and construct validity

The coefficient Cronbach's alpha was performed in order to estimate the reliability and internal consistency of the questionnaire in the sample (Cronbach 2004). Cronbach's a was estimated both for the whole sample and the two clusters of professionals (physicians and nurses). Additionally, construct validity was assessed with the use of the factor analysis and the nearest neighbours for the two parts of the questionnaire (parts II and III). Specifically, factor analysis was performed in order to create the groups of questions that were strongly correlated and to exclude certain questions that could probably be unable to capture the dynamics in the Greek population. Furthermore, the nearest neighbours methodology was used for the information that were gathered in the Part I of the questionnaire in order to test which of them could identify similar trends in the answers that followed, creating K-clusters based on the nearest centroids (Polit 2012).

2.5. Face and content validity

The meaning and acceptability of the items by the caregivers were investigated by the first author during the administration of the scale in semi-structured interviews in order to assess whether, on the face of it, the questionnaire appeared to be measuring the desired conceptual domains (face validity) and to assess whether the questionnaire attempts to measure all of the relevant and important elements of complex conceptual domains that do not lend themselves to being measured directly (content validity).

2.6. Statistical analysis

The tool's validity was tested with the use of Cronbach's a (internal consistency), the factor analysis and the nearest neighbours methodology (construct validity). Descriptive data were expressed as a number of cases and percentages with the use of tables and graphs (population pyramids, histograms and bar charts). Kruskal-Wallis H and non-parametric chi-square were used to test the variance in the responses between physicians and nurses (and subspecialties within these groups), between hospitals and hospital departments (surgery and anaesthesiology). Non-parametric methods were employed as the data were not judged to be normally distributed (Kolmogorov-Smirnov test, p value>0.05) (Corder 2009). All tests were performed using the SPSS version 20.0, at a confidence level of 0.05, while the presented results were exported after bootstrapping (for a population of 200).

3. Results

3.1. Sample synthesis

Our study population consisted of 139 healthcare professionals, among who were 63 physicians and 76 nurses. 66.7% of the physicians and 64.5% of the nurses were working at the University hospital. The majority of the physicians were men and the majority of the nurses were women (57.1% and 67.1%, respectively). More than half of the nurses (60.5%) were found to have spent more than 14.7 years in that specific role, while the same percentage for physicians was calculated at 46%. Nurses and doctors across hospitals were not found to differ in relation to their demographic characteristics, the years of experience and their experiences/ witnesses of aggression (Table 1).

Table 1: Frequency of Being Aware or Having a Personal Experience of an Aggressive Behaviour [a].

	Total n (%)	Physicians n (%)	Nurses n (%)	p-value
Are you aware of any disagreements between the following?				
Surgeons and theatre nurses	100 (71.94)	40 (63.5)	60 (78.9)	0.02
Anesthetists and theatre nurses	54 (38.84)	14 (22.2)	40 (52.6)	0.03
Surgeons and nurse anesthetists	26 (18.70)	7 (11.1)	19 (25.0)	0.02
Anesthetists and nurse anesthetists	67 (48.20)	25 (39.7)	42 (55.3)	0.04
Medical staff	83 (59.71)	41 (65.1)	42 (55.3)	0.04
Theatre nurses and nurse anesthetists	20 (14.38)	7 (33.3)	14 (18.4)	0.03
Theatre staff and ward staff	39 (28.05)	18 (28.6)	21 (27.6)	0.02
Others	131 (94.24)	59 (93.6)	72 (94.7)	0.01
Have you experienced aggressive behaviour from the following?				
Consultant surgeons	107 (76.97)	41 (65.10)	66 (86.84)	<0.001
Surgical registrar	17 (12.23)	4 (6.34)	13 (17.10)	<0.001
None of the above	24 (17.22)	13 (20.63)	11 (14.47)	0.02
Consultant anesthetist	86 (61.87)	43 (68.25)	43 (56.57)	<0.001
Registrar in anesthetics	15 (10.79)	5 (7.93)	10 (13.16)	<0.001
None of the above	27 (19.42)	10 (15.87)	17 (22.37)	0.01
Staff nurses	51 (36.69)	17 (26.98)	34 (44.74)	<0.001
Nurse anesthetists	38 (27.33)	11 (17.46)	27 (45.53)	<0.001
Other nurses	10 (7.19)	6 (9.52)	4 (5.26)	0.02

[a] Percentages represent positive answers

3.2. Internal consistency, face and content validity

The Greek version of the DAOTS was well accepted by the caregivers. It was simple and quick, approximately 15 min of completion. The questionnaire appeared to be measuring the desired conceptual domains and attempted to measure all of the relevant and important elements of domains of the disagreement and aggression scale.

Strong positive consistency was found for the questionnaire, as Cronbach's alpha coefficience for the whole sample and for nurses and physicians individually was equal to 0.82 and 0.74 and 0.80 (p value<0.001), respectively. Construct validity was also assessed with the factor analysis and the nearest neighbours' analysis. The KMO for the part II of the questionnaire was estimated to be equal to 0.89 (DF=4.2; p- value<0.001), while KMO for the part III was equal to 0.84 (DF=6.9; p- value<0.001). All questions of Parts II and III of the questionnaire were found to have a strong positive correlation (correlation r<0.50, p value<0.05). Furthermore, we managed to identify the parameters (questionnaire Part I) that could create groups of similar trends in the answers of the professionals in Parts II and III by the use of the nearest neighbours. Three parameters were finally included (K=3 predictors out of the 6 predictors; predictors refer to questions 1 to 4 in Part I as well as the two variables of type of hospital and profession): professional group, type of hospital and working years. Conclusively, the current form of the questionnaire was found to be functional and sufficiently reliability for our study population.

3.3. Perceived frequency and personal experience of disagreement

Fig. 1 depicts the high percentages of both physicians and nurses that reported to be aware of an aggressive behaviour (92.0% and 96.0%) and to have experienced a disagreement during the last six months (83.0% and 90.0%). Overall, high percentages among different professional groups including the theatre nurses (94.0%), the nurse anesthetists (100.0%), the surgeons (94.0%) and the anesthesiologists (91.0%) have been witnesses to an episode of disagreement during the last six months. Differences among groups were found to be statistically significant.

Detailed information regarding the perceived frequency and personal experience of a disagreement for nurses and physicians are depicted in Table 2. Frequent disagreement between a surgeon and a theatre nurse, between physicians of different specialties, between an anesthesiologist and a nurse anesthetist and between other healthcare professionals were reported in high percentages (71.9%, 59.7%, 48.2%, and 94.2%, respectively). In addition, physicians (77.0% of the consultant surgeons and 61.9% of the consultant anesthesiologists) more frequently revealed an aggressive behaviour towards a colleague compared to nurses (36.7% of the theatre nurses and 27.3% of the nurse anaesthetists). When considered by professional group, nurses were found to be witnesses of a conflict between different professions, with a total personal experience of an aggressive behaviour in higher percentages when compared to the physicians (Table 2). Some 63.5% of the physicians and 78.9% of the nurses reported a surgeon-theatre nurse disagreement and 22.2% of the physicians and 52.6% of the nurses reported an anesthesiologist-theatre nurse conflict. A similar pattern was observed for nurses who reported witnessing of a conflict between anesthesiologists and nurse anesthetists in higher percentages compared to physicians (55.3% vs. 39.7%). On the other hand, physicians were found to be more frequently witnesses of conflicts than nurses between medical staff of all specialties (65.1% vs. 55.3%). Additionally, physicians witnessed conflicts between surgeon nurses and anesthesiologist nurses more frequently than nurses (33.3% vs. 18.4%). Almost all physicians (94.0%) and all nurses (95.0%) were witnesses to an episode of a conflict between other professionals in the operating room.

All respondents reported that they had experienced aggressive behaviour from consultant surgeons and from consultant anesthesiologists in high percentages within the last six months (77.0% and 61.9%, respectively). In contrast, 36.7% of all respondents reported an experience of an aggressive behaviour from a theatre nurse and 27.3% from a nurse anaesthetist. Among different occupational groups, nurses also reported high percentages of experiencing an aggressive behaviour during the last six months from both physicians and nurses. The only exception to this is that physicians reported experiencing an aggressive behaviour from an anesthesiologist most commonly when compared to nurses (68.3 vs. 56.6%).

The frequency of being a witness to a conflict and having a personal experience of an aggressive behaviour during the last six months according to the type of the hospital is depicted in Fig. 2. Overall, higher percentages of staff working at the University hospital compared to those working at the Regional hospital were found to be aware of an aggressive behaviour (66.0% vs. 34.0%, p-value= 0.004) or having a personal experience of an aggressive behaviour (67.0% vs. 33.0%, p-value=0.01). In addition, aggressive behaviour was found to be more frequent among consultant anesthesiologists and theatre nurses in the University hospital when compared to the reported percentages in the regional hospital (61.9% vs. 38.1% for consultant anesthesiologists and 63.3% vs. 36.7% for theatre nurses).

Total years of experience were also found to affect both the frequency of being a witness and of having a personal experience of an aggressive behaviour (Fig. 3). The majority of the physicians reported that they had been witnesses of an aggressive behaviour or had a personal experience of an aggressive behaviour during their early stages of work, while nurses reported higher percentages of being aware and having a personal experience of a disagreement during the later stages of work (comparison between <14.7 vs. ≥14.7 years of experience provided with a p-value equal to 0.01 and 0.03, respectively). In contrast, 40% of the physicians had experienced an aggressive behaviour during the first eight years of work, whereas 40% of nurses experienced an aggressive behaviour mainly between the 15th and 28th year of work.

3.4. Sources and methods of coping with disagreement

The main sources of disagreement and conflict between healthcare professionals concerned availability of equipment (84.6%), availability of theatre time (74.8%), changes in list order (71.4%), and availability of precautionary measures (71.2%). Less frequently reported sources of disagreement were the availability of the surgery staff (65.6%) and the skills of the surgeons (66.7%). Comparisons between professional groups were also made regarding the reported sources of disagreement, the results of which are presented in Table 3. Availability of theatre time and staff were perceived as a more frequent reason for disagreement (more than once per month) among nurses when compared to physicians (84.8% vs. 62.3% and 66.7% vs. 60.9%, respectively). In addition, nurses were also found to report in higher percentages the availability of equipment, the overrunning lists and the changes in list order as other common sources of disagreement among staff compared to physicians, but the results were not statistically significant.

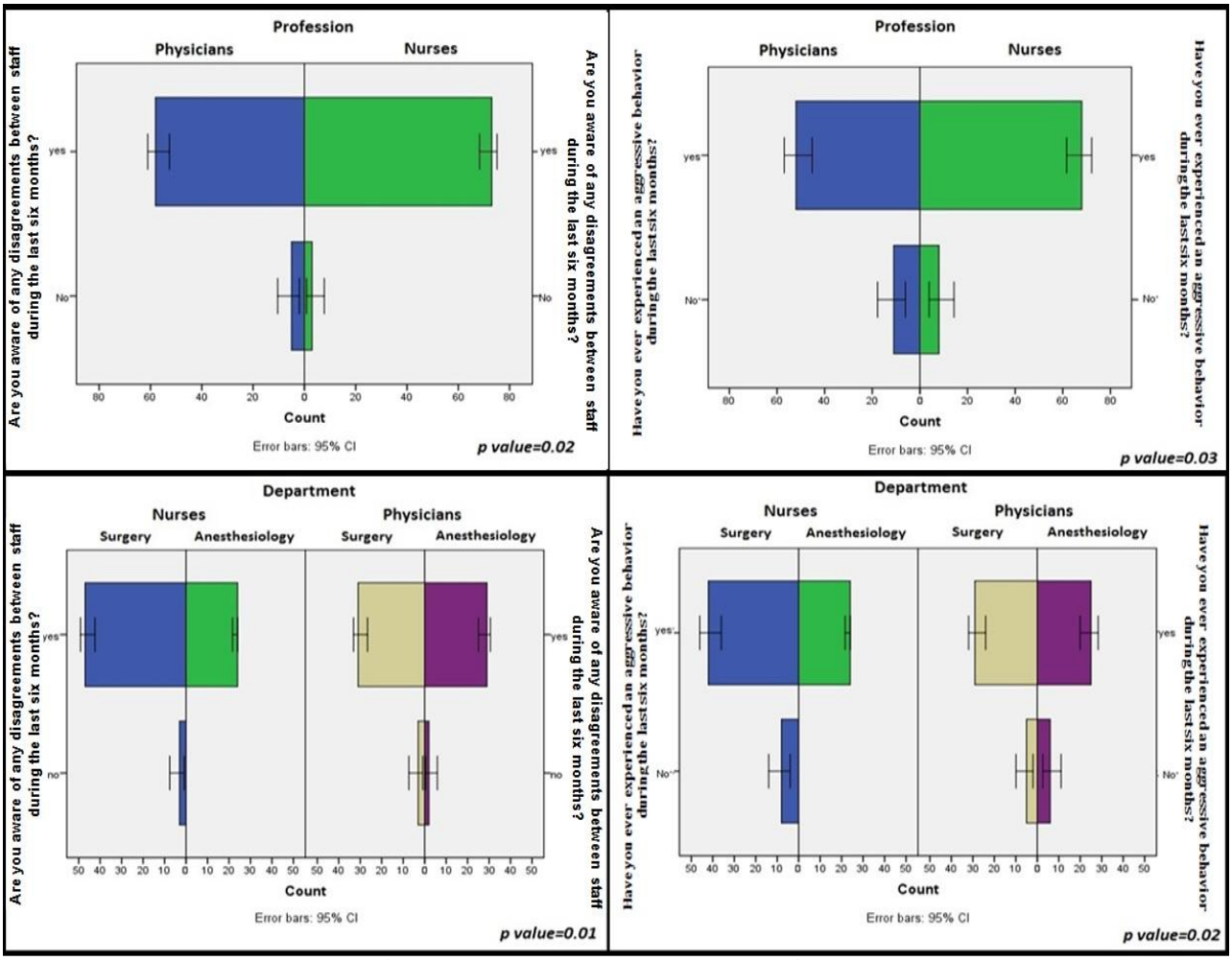

Fig. 1: Frequency of Being Aware or Having a Personal Experience of an Aggressive Behaviour

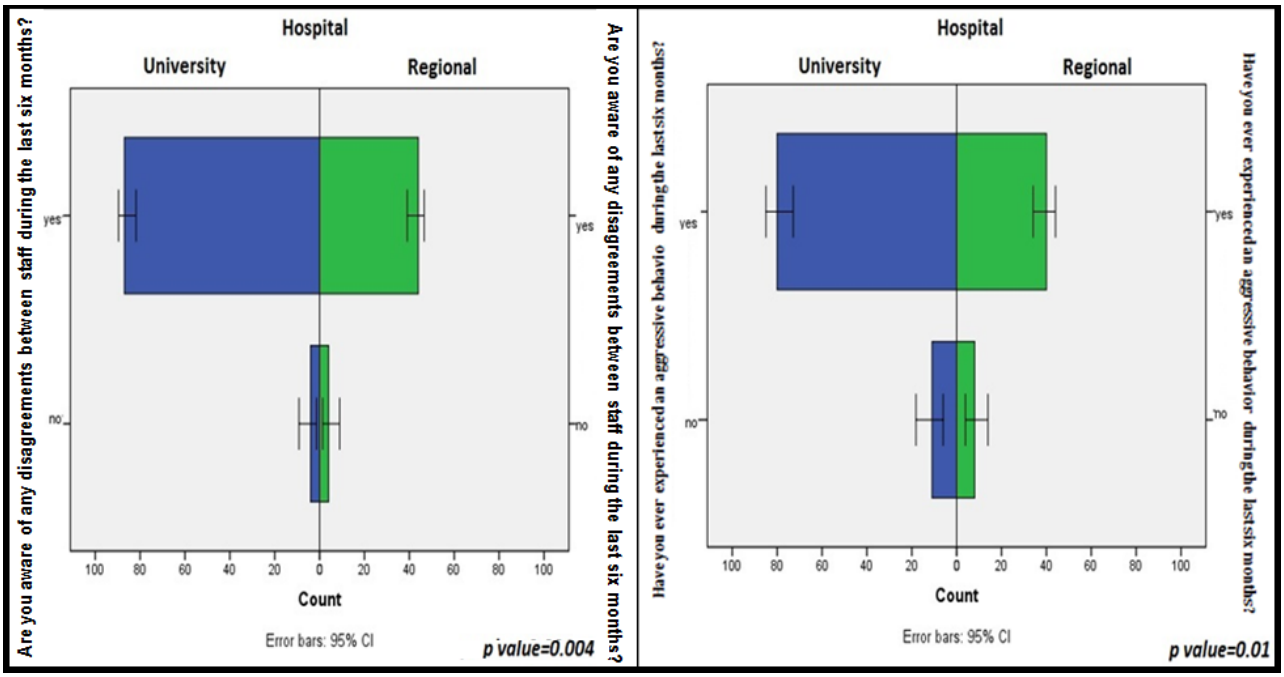

Fig. 2: Frequency of Being Aware or Having a Personal Experience of an Aggressive Behaviour between a University and a Regional Hospital

Table 2: Subjects of Perceived Disagreement Reported by All Professional Groups

Common reasons of conflict	Total N(%)	Physicians n (%)	Nurses n (%)	p-value
Availability of theatre time				0.017
Daily or weekly	89 (74.78)	33 (62.26)	56 (84.84)	
Monthly or yearly	30 (25.22)	20 (37.74)	10 (15.16)	
Availability of theatre staff				0.048
Daily or weekly	62 (63.91)	28 (60.86)	34 (66.66)	
Monthly or yearly	35 (36.09)	18 (39.14)	17 (33.34)	
Availability of equipment				0.345
Daily or weekly	104 (84.55)	44 (78.57)	60 (89.55)	
Monthly or yearly	19 (15.45)	12 (92.5)	7 (10.45)	
Overrunning of lists				0.321
Daily or weekly	60 (63.15)	27 (55.10)	33 (70.21)	
Monthly or yearly	35 (36.85)	22 (44.90)	13 (29.79)	
Changes in list order				0.177
Daily or weekly	75 (71.42)	23 (56.09)	52 (81.25)	
Monthly or yearly	30 (28.58)	18 (43.91)	12 (18.75)	
Availability of the surgical staff				0.446
Daily or weekly	32 (34.40)	12 (28.57)	20 (39.21)	
Monthly or yearly	61 (65.60)	30 (71,43)	31 (60.79)	

Table 3: Methods of Coping with Aggression and Contribution to the Multidisciplinary Team

	Total n(%)	Physicians n (%)	Nurses n (%)	p-value
Methods of dealing with conflicts				
Avoid	53 (38.12)	24 (38.09)	9 (11.84)	0.08
Confront with a view to resolution	63 (45.32)	28 (44.44)	15 (19.73)	0.493
Discuss with the manager	73 (52.51)	7 (11.11)	30 (39.47)	<0.001
Discuss with colleague	62 (44.60)	4(6.34)	22 (28.94)	0.041
Frequency of meeting for resolving conflicts				<0.001
Often	20 (14.38)	16 (25.4)	4(5.2)	
Rarely	49 (35.25)	27 (42.8)	22 (28.9)	
Once	10 (7.19)	5 (7.9)	5 (6.6)	
Never	60 (43.16)	15 (23.8)	45 (59.2)	
Value of meetings for resolving conflicts				0.026
No	19 (13.66)	4 (0.6)	15 (19.7)	
Yes	120 (86.34)	59 (90.4)	61 (80.3)	
Effectiveness of educational seminars				0.523
Moderate	28 (20.14)	14 (22.2)	14 (18.4)	
Much	53 (38.12)	26 (41.3)	27 (35.5)	
Extremely	58 (41.72)	23 (36.5)	35 (46.1)	
How well do you feel colleagues outside your professional group understand your role?				<0.001
Fully or partly	87 (62.58)	54 (85.0)	33 (43.4)	
Not well or not at all	52 (37.42)	9 (14.3)	43 (56.5)	
Do you feel you have the same goal for patient care as your colleagues outside your professional group?				0.05
Always	45 (32.37)	21 (33.3)	24 (31.6)	
Mostly	67 (48.20)	30 (47.6)	37 (48.7)	
Sometimes	23 (16.54)	11 (17.5)	12 (15.8)	
Never	4 (2.87)	1 (1.6)	3 (3.9)	

High percentages of professionals reported confrontation (45.3%), discussion with the manager (52.5%) and discussion with colleague (44.6%) as efficient ways of coping with disagreement. On the other hand, a significant percentage of the population (38.1%) regarded avoidance of any confrontation as the preferred method of coping with disagreement. In general, a significant variation in the preferred methods of coping between nurses and physicians was observed. Specifically, physicians indicated both confrontation and avoidance of confrontation as an effective means of coping with disagreement in higher percentages when compared to nurses (38.1% vs. 11.8% and 44.4% vs. 19.7%, respectively). In contrast, nurses perceived conversation either with the departmental manager or with other colleagues as a preferable means to cope with disagreement (39.5% vs. 11.1% and 28.9% and 6.3%, respectively). A variation was also observed between physicians' and nurses' responses regarding the frequency of disagreement-resolving meetings within their department. Physicians tended to report more frequent occurrence of such meetings, but still the percentages were low (68% of the physicians vs. 34% of the nurses replied often/rarely to this question, p-value< 0.001). A rate of 86.3% found that meetings were really valuable for resolving disagreements, although physicians were more positive towards this perception (90.4% vs. 80.3%). The majority of both physicians and nurses considered educational seminars related to the nature, theory and management of conflicts as an important tool for future management of a disagreement. Across all the professional groups, 63.0% of the respondents considered that their own contribution to the multidisciplinary team was fully understood by colleagues in the other professional groups. Medical staff compared to nurses was most likely to perceive their contribution to be fully or partly explicit (62.3%). Additionally, more than half of the nurses (56.5%) thought that their role was poorly understood or not understood by others. The majority of the professionals thought that they always or almost always shared a common goal for patient care with other professional groups in the operating theatre. To this question, no differences between the answers of physicians and nurses were observed.

Furthermore, nurses were asked to answer an open-ended question about their suggestions of the most suitable method to cope with disagreements, and the findings are summarised in Fig. 4. Both nurses and physicians were found to report good cooperation between the staff (19.4%), discussion with colleagues (14.6%), staff's responsibility and effectiveness (12.6%), frequency of interprofessional meetings in the operating theatre department (14.6%), as well as climate of mutual respect and trust (16.5%) as the most efficient ways of dealing with conflicts. Compliance with the rules, penalties adaptation, physiological support, and educational seminars related to the theory and management of conflicts were, in lower percentages, suggested as methods of coping with aggression (10.7% 1.0%, 1.9% and 8.7% respectively).

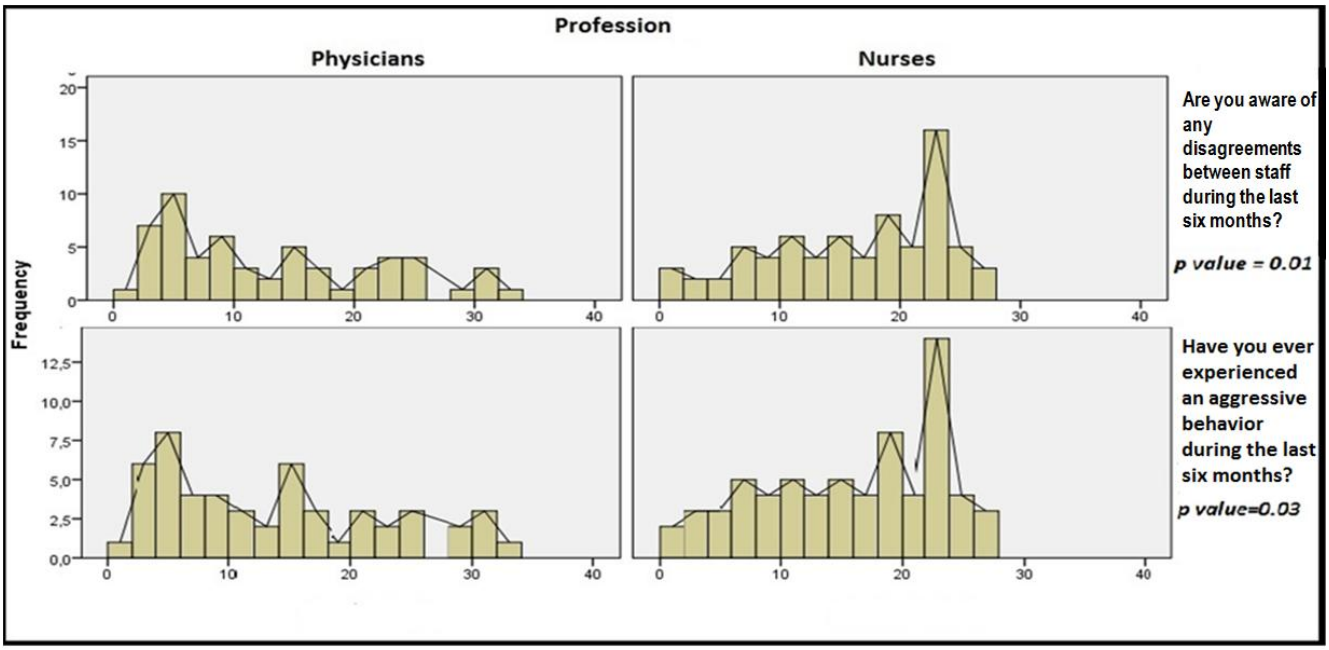

Fig. 3: Frequency of Being Aware or Having a Personal Experience of an Aggressive Behaviour per Years of Experience

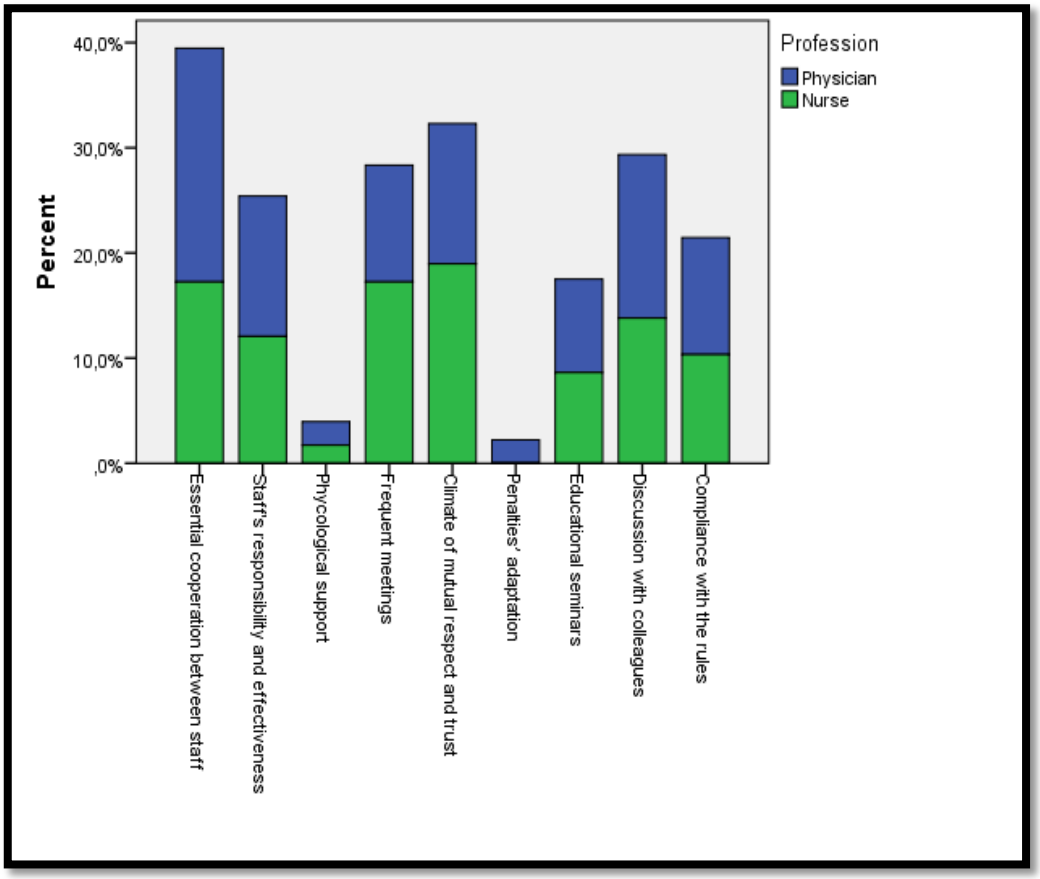

Fig. 4: Healthcare Professionals Suggestions for Disagreements' Resolving

4. Discussion

4.1. Main findings

This study evaluated the psychometric properties of the Greek version of the DAOTS developed by Cole et al. The results of this study supported the reliability and validity of the DAOTS in Greek. The majority of respondents were aware of an aggressive behaviour and have experienced a disagreement during the last six months. In general, physicians more frequently revealed an aggressive behaviour towards a colleague. Nurses were found to be witnesses of a conflict between different professions and, additionally, they seem to have a personal experience of an aggressive behaviour in higher percentages when compared to the physicians. As an unexpected finding, perceptions of lack of understanding of their role were reported from more than half of the nurses and 14% of the physicians. The type of hospital and years of experience also affected the prevalence of exposure to a disagreement and aggressive behaviour. In addition, availability of equipment, availability of theatre time, changes in list order and availability of surgical staff were indicated as the main sources of disagreement and conflict between healthcare professionals.

Most of the respondents were aware of an aggressive behaviour and have experienced a disagreement during the last six months. In general, physicians more frequently revealed an aggressive behaviour towards a colleague, while nurses were found to be witnesses of a conflict between different professions and to have a total personal experience of an aggressive behaviour in higher percentages when compared to the physicians. Differences in the responses between nurses and physicians might have their roots in the different perceptions of the meaning of a good collaboration and their different educational background (Makary et al. 2006). The high percentages of physicians that revealed an aggressive behaviour towards a nurse can be partly explained by the fact that nurses are often hesitant to confront a surgeon on issues of patient care because they might have less training or experience in dealing with a patient's medical condition (Makary et al. 2006).

A study by Coe and colleagues (2008) showed that 69% of the respondents reported a disagreement between surgeons and theatre nurses, which is similar with our finding (72%). In addition, 77% of our respondents reported an experience of an aggressive behaviour by consultant surgeons and 62% by consultant anaesthesiologists within the last six months, which is much higher compared to the percentage reported in the UK-based study (62% and 34.5% respectively) (Coe 2008). The finding, that junior doctors were showing an aggressive behaviour in lower rates (11%), corroborate earlier studies in the UK and other countries (Coe 2008, Rowe 2005).

Furthermore, 45% of nurses had experienced aggressive behaviour from other nurses (either nurse anaesthetists or staff nurses), while physicians remained the main sources of aggression. In a study carried out among nurses, 82.5% indicated other nurses as the most common source of an aggressive behaviour, followed by physicians (22%) (Rowe 2005). Among nurses we found that anaesthetist nurses and staff nurses (46% and 45%) had mostly revealed an aggressive behaviour towards other nurses. This finding is further supported by the existing literature. Indeed, Rowe et al. (Rowe 2005) found that staff nurses (80%) were the most frequent nursing source of aggression towards nurses.

In addition, regarding sources of disagreement, the availability of equipment (85%) followed by availability of theatre time (75%) and changes in list order (71%) were indicated as the main sources. Our finding also provided further support to the UK study performed in a sample of operating departments in England with the use of the same instrument, which showed that over-running of operating lists (91%) followed by theatre time (87%) and the order of the operating list (88%) were main sources of disagreement (Coe 2008). Coe & Gould also found that nurses were much more likely than medical staff to report disagreements arising from late-running operating lists, which was similar to our findings (2008).

Half of our sample reported no regular attendance of team meetings and 86% had a positive view of the value of these meetings.

A study performed by Wiles and Robinson (1994) found also that three quarters of their participants reported not having regular meetings and Borrill and colleagues (2000) highlighted the importance of regular team meetings associating them with effective teamwork and with greater levels of innovation. The values of meeting among staff has been recognized also by other studies including the one by Rutherford and McArthur (2004) that showed that team meetings were particularly important for the effective working of the group.

Discussion with the manager (53%) and confrontation with a view to resolution (45%) were the preferred methods of coping with aggression and disagreement as suggested by our respondents. However, these claims were not borne out in another study among nurses that addressed as preferred and most effective ways of coping with aggression the effort to clarify misunderstanding and the direct deal with nurses (Rowe 2005). On the other hand, the UK study by Coe & Gould found that the most favoured approach of dealing with aggressive behaviour for the sample overall was stated to be confrontation with a view to resolution (65.5%) (Coe 2008). Moreover, in our sample, physicians were less positive towards discussion either with the manager or with other colleagues compared to nurses, which was in line with the findings by Coe and Gould (2008) who found that that medical staff would be less likely to discuss receiving aggression than other groups.

In our sample, 57% of the nurses and 14% of the physicians reported perceptions of lack of understanding of their role, which is in line with findings by Coe and Gould (2008) who found that over half of their sample thought that others partly understood their role and 19.3% thought their role was poorly understood or not understood by others. Similarly, they reported that, among respondents, medical staff, compared with nurses, was most likely to perceive their contribution to be explicit (37%). This finding is very important, as a lack of clear understanding for each professional's role and responsibility has been identified as an important barrier to effective teamwork, and was also found to promote professional conflict and intractable personality differences amongst team members (Wiles 1994). Moreover, our respondents suggested mutual respect and interprofessional trust as a resolving method. Indeed, the literature underlines the fact that a climate of mutual respect and trust was fundamental for effective teamwork to exist (Dieleman et al. 2004, Cashman et al. 2004).

Years of exposure were also found to affect the prevalence of aggressive behaviour among peers, which is in line with a study conducted in Philadelphia among 213 registered and licensed practical nurses employed at a teaching hospital, who found that burnt-out nurses burn their young (Rowe 2005). Similarly, another study among 72 surgeons showed that junior personnel were frequently or very frequently afraid to express disagreement with more senior personnel (O'Connor et al. 2012).

4.2. Strengths and limitations

To our knowledge, this is the first study to report the prevalence of disagreement and aggressive behaviours among healthcare professionals in a Greek setting. On the other hand, the results of this study should be interpreted in light of the potential limitations. This is a national cross- sectional study and, therefore, we are aware of the fact that staff perceptions can vary over time and can be influenced by acute events within the operating room. Also, as this study was based on self-report measures, we are aware that some nurses may not have felt completely free to honestly express displeasure with other nurses, despite reassurances of confidentiality and anonymity. Moreover, it is evident that more research in this area is necessary in order to combat this difficult problem; as a result, this research should be replicated using a larger sample size and various types of hospital settings across the country. Further studies, should also aim to examine the aggression and disagreement prevalence in other settings, including private hospitals and hospitals that cover both rural, semi-rural and urban areas across the country. Finally, further research findings may also be of interest beyond the realm of the operating department, as disruptive events of team working and multi-professional collaboration have also been reported in other healthcare settings.

4.3. Recommendations and implications

Disagreement and aggression in the operating room have implications for patient care, but also contribute to job dissatisfaction and turnover of healthcare professionals (Posner 1979). Teamwork is an integral part of patient safety in the operating room and our findings comprise a starting point for further research. The promotion of teamwork spirit and a culture of safety will enhance job satisfaction and, for this reason, specific interventions with the aim to improve patient safety should be implemented. In addition, resolving team conflicts and the promotion of equality of team members could be a responsibility of a skilled facilitator in every setting. Moreover, further interprofessional education and training needs that may enhance professionals' knowledge and skills required for effective team working should be increased (Leathard 2003). Education of both newly licensed and more experienced staff with respect to direct communication and immediate diplomatic response to aggression is indicated. Moreover, confidence training and support groups for self-esteem enhancement may be beneficial.

5. Conclusions

All in all, our results supported the commonly held assumption that healthcare workers employed in operating departments frequently experience disagreement and aggression from their colleagues. Besides, professional group, type of hospital and years of experience were found to affect the frequency of both awareness and personal experience of an aggressive behaviour among healthcare professionals. Also, educational seminars, interprofessional meetings, discussion with colleagues and psychological support were raised as possible methods of coping with aggressive episodes. Taking all into consideration, governmental support for teamwork spirit cultivation in healthcare is vital and further work needs to be conducted at both a team and organisation level. To this direction, specific interventions should be adopted from stakeholders and policy-making authorities with the aim to cultivate respect and peaceful collaboration between healthcare professionals, to prevent disruption of the smooth running of the operating department and to foster high standards of patient safety and quality of care.

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