

Performance anxiety – prevalence amongst otolaryngologists

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Abstract

Objectives To establish the prevalence of operating anxiety amongst otolaryngologists. **Background** Performance anxiety is a reaction to performing a task under pressure, and is linked to worse outcomes in professional sport. Awareness of the negative impact that performance anxiety can have on both surgical outcomes and the mental health of surgeons is increasing. The Royal College of Surgeons has recommended further evaluation of anxiety amongst surgeons so that we can greater understand its implications. **Design** The Sport Competition and Anxiety Test (SCAT) is a validated questionnaire used to assess anxiety in professional athletes. A modified version was distributed via the Association of Otolaryngologists in Training mailing list. **Responses** were accepted September-November 2019. **Statistical analysis** was carried out using SPSS. **Participants Information** was collected on the grade and sex of respondent. **Main outcome measures** Anxiety levels were calculated using SCAT guidelines. **Results** 106 questionnaires were returned 67M:38F (1 unspecified). 22 consultants, 72 registrars and 11 core trainees completed the questionnaire (1 unspecified). 6% of otolaryngologists were identified as having high levels of anxiety. Male trainees were less anxious than female trainees, mean score 15 vs 18 (range 10-27 vs 11-29, $p<0.05$). 6% of senior registrars and 9% of junior registrars had high anxiety compared to 0% consultants. **Conclusion** This data suggests high levels of performance anxiety exist amongst ENT surgeons. Interestingly, the highest anxiety levels were found in females and registrar level surgeons. With increasing levels of pressure and higher burn-out rates amongst surgeons, the need to understand the relationship between anxiety and surgical performance has never been so important.

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A national cross-sectional study investigating the prevalence of performance anxiety amongst otolaryngologists with a range of different experience.

Structured Abstract

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Key Words

Performance anxiety, medical education, otolaryngology, psychological burnout, occupational stress, surgeons, psychological support system

Background

Stress is an adaptive response that has evolutionary advantages with regards to survival. However, these autonomic and somatic responses have long been considered to have a detrimental impact on information processing leading to impairment of function (1). One area that has been studied is performance anxiety (PA), which is the reaction to performing a task under a perceived pressure (2).

PA has been researched widely within professional sports and amongst musicians for many years and is perceived to be an unpleasant emotion that can negatively affect self-esteem, self-confidence and ultimately subsequent performance (3). The necessary skills of dedication, focus and ability to perform under pressure have lead to comparisons between surgery, professional athletes and musicians (2). In recent times surgeons have become more interested in the effects PA can have on operative skills. (4). Athletes often have coaching and training specifically on the mental aspects of performance as this positively impacts on self-confidence and increase competitive ability (3).

The Royal College of Surgeons have released a series of articles investigating the effects performance anxiety can have on surgeons and technical outcomes (2). However this is still a relatively new field and more

research is required to investigate its prevalence amongst surgeons and whether intervention is required to optimize levels of PA amongst surgeons.

There is very little data available in relation to the prevalence of performance anxiety amongst otolaryngologists. Quantifying this effect is important to raise awareness of the issues associated with PA and to consider what training may be instigated so as to reduce its burden.

The aim of this study was to investigate the prevalence of performance anxiety amongst otolaryngologists and whether this is affected by grade or sex of surgeon.

Materials and Methods

Participants

Participants were recruited by a questionnaire sent out via the Association of Otolaryngologists in Training mailing list, a national group.

The questionnaire was created with Google forms. Completed questionnaires were accepted between September and November 2019. Information was collected on the participant's grade and sex but was otherwise kept anonymous.

Grade of participant was split into consultant, SAS grade (which includes staff grade, specialty doctor and associate specialist with at least 4 years experience since medical school), Senior STR (ST7-8), Junior STR (ST3-6) and core trainee/ core trainee equivalent doctor.

Inclusion Criteria

Actively practicing otolaryngologists were invited to complete the study.

Assessment of Performance Anxiety

An adapted version of the Sport Competition and Anxiety Test (SCAT) was sent out to surgeons (5). This questionnaire has been validated for athletes and is used in professional sports to assess anxiety levels.

The SCAT questionnaire consists of fifteen questions related to the performance and anxiety levels in athletes (see Table 1). We supplemented the word compete with operate so as to make the questionnaire applicable to surgeons. Answers were returned as either rarely/ sometimes/ often and were scored as either 1/2/3 depending on the question. Five questions within the questionnaire are not used to calculate total anxiety so as to reduce the likelihood of an internal response-set bias. The SCAT test captures a snapshot of the subjective reporting of stress.

The ten included questions are summed in order to provide an overall anxiety score. A score of <17 is classed as low anxiety, 17-24 normal anxiety and >24 high level anxiety.

Statistical analysis

IBM SPSS v 25.0 was used to analyse the statistical significance of the data. Unpaired student's T test was used to assess statistical difference between independent samples. P was assumed to be significant at <0.05 .

Results

106 questionnaires were returned using the online response form out of a possible 320, giving a response rate of 33%. In order to be submitted, forms required all sections to be completed including grade and sex, therefore no responses were excluded due to insufficient data.

Anxiety Scores

In total 63/106 (59%) respondents had low level anxiety, 37/106 (35%) had average level anxiety scores and 6/106 (6%) had high-level anxiety scores. The mean anxiety score was 16. Anxiety scores were further broken down by grade and sex.

Anxiety scores by Grade of Respondent

In total 22/106 consultants, 10/106 SAS-grade, 17/106 senior STR, 46/106 junior STR and 10/106 core trainee/ equivalent completed the questionnaire. For consultants the mean SCAT score was 15 (range 10-24), for SAS grade doctors the mean score was 16 (range 10-23), for senior STR the mean score was 16 (range 10-29), for junior STR mean score was 16 (range 10-27) and for CT/CT equivalent doctors the score was 19 (range 13-23) see Table 2 for data. The 6 otolaryngologists with high anxiety were in the Senior STR group (2/6) and Junior STR group (4/6). There was no significant difference in anxiety between different grades of otolaryngologist.

Anxiety Scores by Sex of Respondent

In total 67/106 (63.2%) respondents were male, 38/106 (35.8%) were female and 1/106 (0.9%) preferred not to say. The females had a statistically significantly higher mean score of 18 than the males of 15 ($p=0.006$).

This was further broken down by grade of respondent. 16/22 consultants were male, 5/22 consultants were female and 1/22 preferred not to say. Male consultants had a statistically significantly lower mean SCAT score of 14 (range 10-21) compared to 19 for females (range 14-24) ($p=0.01$). Combining all middle-grade doctors (SAS, senior STR and junior STR) consisted of 73 doctors, of these 45/73 were male and 28/73 were female. Male middle grade otolaryngologists had a statistically significantly lower mean SCAT score of 15 (range 10-27) compared to 18 for females (range 11-29) ($p=0.01$). In the CT/CT equivalent group 5/11 were males and 6/11 were females. Male CT/CT equivalent mean SCAT score was 16 (range 13-22) compared to 19 for females (range 13-23), this was not statistically significant. See Table 3.

Discussion

Key findings

This is the first study that we are aware of that looks at PA levels amongst otolaryngologists. Our results suggest that performance anxiety does exist amongst otolaryngologists, regardless of level of experience.

Our results have shown that female otolaryngologists are more likely to have higher anxiety scores compared to males and this was statistically significant. We did not find a difference in anxiety scores between grade of surgeon. Furthermore this study highlights that whilst PA is prevalent throughout otolaryngologists the effects it may have on outcomes are unclear.

Comparisons with existing literature

Gender and Performance Anxiety

Our study found that females were more likely to have higher anxiety scores than their male counterparts. Studies investigating PA in musicians and professional athletes have alluded to similar results (3,6,7). Although, similar to in our study they acknowledge there are lower numbers of female professional athletes in studies than males. Interestingly a study of professional athletes suggested that whilst females had a higher perceived level of PA this didn't impact on their overall performance (3). Suggesting that females may be more likely to identify as having higher levels of PA, but have improved coping strategies.

Within medicine, studies in Serbia and the UK have found that female medical students are more likely to rate their general stress status as higher than males (8,9). Reasons suggested include lack of female role models and conflict of interests with home life. It is not clear whether having higher general levels of stress are transferable to a higher level of PA and vice versa.

Effects of Performance Anxiety

Physiological effects of PA can include rapid heart rate, tremor, sweating and dry mouth meaning that PA experienced during surgical procedures may result in physiological arousal (1). We are unable to say what effects PA may have on performance outcomes, as there is very little information available on this. One study investigating the effects of PA amongst professional rock climbers suggested that those participants with higher PA put in more effort and therefore performed better (10). Furthermore an investigation within netballers suggested that higher perceived PA levels were linked to improved performance (12). However, an experiment involving laparoscopic operating showed that a higher heart rate was associated with a greater number of errors amongst novice surgeons (13).

There may be a peak performance area that is linked to a certain level of PA. This is supported by the Yerkes-Dodson law which suggests that the link between physiological arousal and performance is an inverted U shape (11), implying there is worse performance at times of low and high arousal. Understanding how to achieve this optimal level of PA may allow us to target this area, improving surgical outcomes and training. Qualitative research amongst musicians suggests that those who manage their PA best accepted it as a positive aspect of performing and used pre-performance visualisation and aspects of cognitive behavioural therapy to manage it (14). Wetzel et al found that with experience surgeons developed sophisticated coping strategies for managing PA (15) and can be taught to others

We know that there is a link between anxiety and burn out amongst medical professionals but it is not clear whether PA in surgeons may also contribute to stress and burn out (16). Amongst musicians it has been shown that PA may cause significant stress and affect career outcomes (7).

Strengths and limitations

We accept there are limitations within this study. These include low sample size, which may result in a sampling bias. However, this research is the first of its kind to review PA amongst otolaryngologists and provides a snapshot of prevalence. Respondents might not have answered honestly, as this was an online questionnaire it would be difficult to ascertain this. However the questionnaire has 5 questions that aren't counted towards the final SCAT score, which would reduce the internal response-set bias making this less likely.

Finally, there are no questionnaires validated within surgery to evaluate PA and therefore we have adapted a sports PA questionnaire. Within this study we highlight that PA is prevalent within otolaryngology, a relatively unknown issue that is only recently being considered as an issue for surgeons.

Implications for research/ practice

There is a growing body of research suggesting that stress and psychological symptoms can lead to reduced morale and burn out amongst healthcare workers (17). Working out how PA may contribute to external stress and burn out amongst surgeons may help us to better support these doctors.

Research is needed to further understand the relationship between PA and surgical outcomes. Research suggests that female professional athletes are more likely to be negatively impacted by the perceived motivational climate created by their coach (3). Understanding how different surgeons react to their environmental climates, whether they are male or female, may help to identify how they prefer to operate, which would have implications for optimal teaching methods.

Finally, we did not draw any differentiation between elective and emergency procedures within our questionnaire. It is well understood that emergency scenarios may cause more stress and anxiety to the surgeon (15) and therefore further research is required to investigate how PA may affect this.

Conclusions

This study highlights PA is prevalent amongst otolaryngologists, regardless of experience. We have identified that females are more likely to have higher levels of anxiety compared to males.. We advocate that training and discussion of coping strategies for managing the effects of PA should be incorporated into training and continuing professional development.

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Table 1 Sport Competition and Anxiety Test. Questions removed from final SCAT score - "operating with others is enjoyable", "I feel I am a good surgeon when I operate", "setting a goal is important when operating", "I like to perform technically demanding procedures" and "operating in a team is more enjoyable than operating alone". The word "compete" was replaced with "operate" to make the test applicable to surgeons.

Question	Rarely	Sometimes	Often
Operating with others is enjoyable			
Before I operate, I feel uneasy			
Before I operate, I worry about not performing well			
I feel I am a good surgeon when I operate			
When I operate, I worry about making mistakes			
Before I operate, I am calm			
Setting a goal is important when operating			
Before I operate, I get a queasy feeling in my stomach			
Just before I operate, I notice my heart beats faster than usual			
I like to perform technically demanding procedures			
Before I operate, I feel relaxed			
Before I operate, I am nervous			
Operating in a team is more enjoyable than operating alone			
I get nervous waiting to start an operation			
Before I operate I usually get uptight			

Table 2 Breakdown of SCAT score by grade of otolaryngologist

Consultant	Low	14	64%	Range	(10-24)
	Average	8	36%	Mean	15

Consultant	Low	14	64%	Range	(10-24)
	High	0	0%		
SAS grade	Low	8	80%	Range	(10-23)
	Average	2	20%	Mean	16
	High	0	0%		
Senior Spr (ST7-8)	Low	11	65%	Range	(10-29)
	Average	4	24%	Mean	16
	High	2	12%		
Junior Spr (ST3-ST6)	Low	26	57%	Range	(10-27)
	Average	16	35%	Mean	16
	High	4	9%		
CT/ CT equivalent	Low	3	27%	Range	(13-23)
	Average	8	73%	Mean	19
	High	0	0%		

Table 3 Mean SCAT score of males and females by grade of otolaryngologist

Grade	Mean SCAT Score	Mean SCAT Score	P value
	Male	Female	
Consultant	14 (range 10-21)	19 (range 14-24)	0.01
Middle grade (SAS/SpR)	15 (range 10-27)	18 (range 11-29)	0.01
CT/CT equivalent	16 (range 13-22)	19 (range 13-23)	0.9