

Sources and Coping Mechanisms of Anxiety and Stress among Surgeons – A Qualitative Study

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Abstract

Medical professionals are often exposed to demanding work conditions which may affect their mental as well as physical health. The aim of this study is to find out the various sources of anxiety and stress as well as the coping mechanisms among surgeons using qualitative approach of descriptive phenomenology. This study provides analysis of rich textual description of individual experiences of nine surgeons including six orthopaedic surgeons, two general surgeons and one plastic surgeon. In-depth qualitative interviews are conducted and transcribed. Thematic analysis is carried out on the text i.e. identification of codes, themes and sub-themes. A total of twenty-one sub-themes emerged under the three themes of 'sources of anxiety', 'sources of stress' and 'coping mechanisms'. The study attempts to find out how these developed coping strategies have an impact on the ability of participants to deal with the problems in their personal life. The sources of anxiety and stress vary according to the phase in the profession such as medical training and practice as well as according to the economic, psychological and social state of the individual. Coping strategies developed by the participants help them to sustain and stand in the field. The study implies that there is a need of regular formal stress and anxiety management training for surgeons which eventually can help to increase longevity and quality of their work life.

Keywords: anxiety, stress, sources, coping mechanisms, surgeons, phenomenology

Introduction

Human emotions have been studied by the researchers in numerous behavioural studies. Behavioural researchers and clinicians have been studying many healthy and unhealthy emotions in order to study the underlying complexities of such emotions and their cognitive, neurobiological and behavioural aspects. Most of these researches have been done on animals before, as it was difficult to study anxiety among humans. Moreover, there have been many ways in which the term anxiety has been defined in the field of Psychology, Psychopathology and research. The most widely accepted definition of anxiety is given by American Psychiatric Association (2013), as 'a negative mood state characterized by bodily symptoms of physical tension and by the apprehension about the future'. It is also considered as a subjective experience of unease, thus its nature is unpleasant. It is a set of behaviours or a physiological response that originates in our brain and is reflected in elevated heart rate and muscle tension.

Social, physical and intellectual performances are driven by anxiety. This idea was first proposed by Howard Liddell (1949) where he called anxiety the 'shadow of intelligence'. Liddell proposed that human ability to plan in some detail for the future was connected to some gnawing feeling that things could go wrong and we had better be prepared for them. This makes anxiety a future-oriented mood state as we cannot control or predict upcoming events.

According to Lazarus and Folkman (1984), psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being.

Anxiety, stress and depression among medical professionals has been studied with a quantitative approach in numerous studies so far. Especially among the pandemic situation, the importance of mental health among medical professionals was discussed and studied a lot due to tremendous pressure on healthcare system. For example, a bunch of 29 studies conducted on

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22,000+ sample found that prevalence of depression among hospital's staff during the pandemic was 24.3%, prevalence of anxiety was 25.8% and prevalence of stress was 45%. Although this issue was constantly discussed among the pandemic, there have been efforts by many researchers prior to pandemic to examine the levels of anxiety and stress among physicians like surgeons and ward staff. The extensive body of research recognizes some common stressors among surgeons like technical complications, time pressure, distractions and interruptions, the greater duration of the operation that can be physically and mentally challenging, and overall workload.

Increased prevalence of psychological problems and burn-out among medical professionals in India shows high number of individuals experiencing depression and suicidal ideation and thus, significantly high levels of stress. The main sources or causes for these psychological problems have been also identified as, 'not being able to attend recreational activities, stress and anxiety due to the behaviour of patients and their caregivers, lack of empathy, negative outcomes, etc.

There are certain studies that show how anxiety can also be good for us. Psychologists have known for a century that we perform better when we are little anxious (Yerkes & Dodson, 1908).

According to Folkman and Lazarus (1980), coping refers to cognitive and behavioural efforts to master, reduce or tolerate the internal and/or external demands that are created by the stressful transaction. Medical professionals use different coping strategies in order to deal with the anxiety and stress associated with their profession like Cognitive self-control, regaining self-composure by using the mechanism of 'Stop, Stand back, and re-assess' and team work with adequate communication (Arora, 2009).

Overall the growing body of research shows the need to assess the adverse effects of work and lifestyle in medical profession, which makes it a demanding field, and the need for training for their mental and physical stability to a largest extent in order to practise well. Otherwise, the stress, anxiety and burnout associated with the profession may act as a discouraging factor to those who wish to enter the field.

Surgery as a profession

The surgical science is one of the branches of medical sciences, which was called as "*Shalya Tantra*" in Ancient times. This comprises of: "All processes aiming at the removal of factors responsible for producing pain or misery to the body and mind." It

has developed as a refined scientific skill. The Vedas also contained detailed description of teachings and practices of the great ancient surgeon *Sushruta*, considered as '*Father of Surgery*' and his surgical knowledge that is relevant even today. *Sushruta* defines an ideal surgeon as, "A person who possesses courage and presence of mind, a hand free from perspiration, tremor-less grip of sharp and good instruments and who carries his operations to the success and advantage of his patient who has entrusted his life to the surgeon. The surgeon should respect this absolute surrender and treat his patient as his own son." (Singh, 2017)

Rationale of the topic and significance of the current study

Anxiety and stress in its excessive form can be distressful and can lead to impairment in functioning. Physicians in the medical field deal with different levels of anxiety and stress coming from different sources which are part and parcel of their profession. These experts take care of health and well-being of common citizens, thus, managing their own anxiety and stress effectively is highly important. Performance anxiety, lifestyle, work-life balance, carrying out surgical operations, handling urgent medical and life-threatening conditions among patients, etc. may add to the stress experienced. Moreover, there can be gender differences in the sources and coping strategies used by the male and female surgeons. Thus, first identifying the prevalent sources of anxiety and possible stressors that may have ill-effects on their practise and overall life and later exploring the different coping mechanisms they use for managing it, is the need of the hour. It will give an insight towards how developing a formal training for these professionals is the need of the hour to help them deal with such by-products of their profession.

Current research, thus, focuses on finding out the sources and coping mechanisms of anxiety and stress among surgeons with a qualitative approach of phenomenology. It goes beyond the traditional hypothesis testing and generalization and provides major descriptive themes summarizing the textual description of individual experiences. It explores the effect of the coping mechanisms on the areas other than medical practise in a professional's life and attempts to identify gender differences regarding the profession of surgery, the *lived experience* of anxiety and stress as well as the coping strategies used.

Method

A qualitative research design was used with the framework of Phenomenology. Data was collected by conducting in-depth qualitative individual interviews.

Sampling strategy

The purposive sampling method was used. Considering 'Professional general or orthopaedic surgeons' as a criterion, six orthopaedic surgeons, two

general surgeons and one plastic surgeon were selected as participants with varied age, years of work experience and gender.

Table 1
Relevant information of participants

Participant	Educational Qualification	Gender	Years of work experience
<i>Orthopaedic surgeons</i>			
Participant 1	D.N.B, D. Ortho, M.Ch Ortho	Male	14 years
Participant 2	MBBS, Diploma in Orthopaedics	Male	15 years
Participant 3	MBBS, D. Ortho, FCPS Ortho	Male	10 years
Participant 4	MS Orthopaedics	Male	30+ years
Participant 5	MS Orthopaedics	Male	11 years
Participant 6	MS Orthopaedics	Male	24 years
<i>General surgeons</i>			
Participant 7	MS General Surgery	Female	30+ years
Participant 8	MS General Surgery	Male	15-17 years
<i>Plastic surgeon</i>			
Participant 9	MS General Surgery, M.Ch Plastic Surgery	Female	1 year

Ethical concerns

An informed written as well as digital consent was taken from the research participants. Participants agreed to take part in research freely with the knowledge about what the research was about. They were not placed under pressure to participate in the research. They understood the purpose, procedures and approximated duration of their commitment to the research clearly. They understood that they have the right not to take part in the research and to withdraw from the research at any stage.

Participants were made aware of the features of the research which could have influenced their decision of participating in the research i.e. the step of audio-recording the qualitative interviews. They were made aware of the permission granted from the authority to audio-record the interviews for the transcription and qualitative analysis of the textual data. Respect for participants' rights and dignity was strictly maintained throughout the process of data collection, transcription, analysis, and report writing by keeping complete confidentiality and privacy.

Data collection

Data collection was done by conducting semi-structured qualitative interviews of the participants. The

preparation of a schedule of around 14 questions for the interviews allowed to set an agenda to anticipate potential sensitive issues, and to frame questions in suitably open forms. The interviews were recorded on the android phone device audio recorder. This device and the method of data collection was the same throughout the process. The recordings were removed from the device immediately after the data collection and were secured.

The interviews of the sample participants were transcribed word-to-word manually. These transcripts were then read and re-read. The data was entered in the excel sheets by entering questions, complete answers, meaning units. Then the initial codes were generated.

Data Analysis

Using the qualitative approach of Amedeo Giorgi's descriptive phenomenology, the excerpts of the interviews were analysed using thematic analysis, a fairly generic qualitative data analysis method for coding, categorising the data into a number of major themes or descriptive categories (Howitt, & Crammer, 2005).

The six steps of data analysis included data familiarisation, initial coding generation; search of

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themes based on initial coding, review of themes, theme definition and labelling and report writing. The data and the data analysis juxtaposed to check the adequacy of the analysis and thus, to encourage its refinement.

Results

With the help of thematic analysis, three themes were generated. A total of 21 sub-themes were generated in these three themes.

Table 2
List of themes and sub-themes

No.	Themes	No.	Subthemes
1.	Sources of Anxiety	1	Medical training
		2	Professional practise
		3	Pre-operative period
		4	The surgical process
		5	Anxiety post-surgery
		6	Other miscellaneous sources of anxiety
2.	Sources of Stress	1	Medical training
		2	Patient and relative management
		3	Influence of social media
		4	Professional Practise
		5	Physiological health conditions of surgeons
3.	Coping mechanisms	1	Hard-core training & knowledge
		2	Pro-active coping
		3	Meditation and spiritual practices
		4	Music
		5	Support of a good team of surgeons
		6	Sports
		7	Recreational activities
		8	Effective communication
		9	The 'Self' aspect of coping
		10	Other coping mechanisms

Theme 1: Sources of anxiety

In medical training, completion of work in time (“I could complete my training by God’s grace because with my one mark, there were..there were almost 160 students.”), and being answerable to the authority (“The level of stress and anxiety, no doubt it is there because boss is always there on your top and you’re answerable to him”) made participants experience anxiety. ‘Beginning consultancy’ was another source (“In beginning of the practice, there are lots of anxiety, for small, small cases. When I was starting my practice, uh, the night before the surgery, I was, I was like unable to sleep.”).

Pre-operative anxiety (“90% of my anxieties are pre-operative. Preoperatively, there are so many

things you keep thinking of the worst of worst of complications that can happen. What if this happens? What if I break an artery? What if I not able to get an alignment? So there are a lot of questions which come up to your mind.”), and the surgical process have also been the sources of anxiety (“If you’re operating on a malignant disease, many a times, it starts oozing from multiple points and it gets very difficult, uh, to stop the bleeding.. Or you accidentally create some problem inside when you are operating. So that these are the times when you can really panic. Your heart races very fast. You start sweating, you start getting palpitations.”).

Participants also experienced anxiety post-surgery (“You keep thinking like did I do this, did I do that,

was the dressing proper?... and what if there is some bleeding now?...99% these thoughts won't trouble you, but if there is even 1% chance, it is literally disturbing.."), and other sources included financial pressures ("everybody who comes to the medical field doesn't have rich background. The fees and the instruments and the things, they are really costly.")

Theme 2: Sources of stress

Medical training was also a source of stress (*"When I was a resident, uh, we worked in wards, which had more than 80 patients at a time. Surgical residency is an extremely demanding, physically demanding, mentally demanding work. It used to take long hours..the emergency work was extremely difficult, but, we cont..we did it".*) Handling patients and relatives was a major source for almost all participants (*"somehow society has become so prejudiced about the doctors, even if you advice some surgery, they feel that it is for money. And then you get irritated."*).

One of the female participant mentioned how the perceptions of the patients and relatives have been stressful for her saying, *"first of all, if it's a female doctor she'll be sister, but they won't naturally assume that this is a doctor. This is a lady. Then when it comes to a surgeon, they'll always assume you ought to be the trainee surgeons, they won't assume you to be with the faculty by default."*

Other sources are 'influence of social media' (*"because of this social media impact, people are getting aggressive. And which is very wrong thing. So, I would suggest, social media and other.all other medias, they should focus on a good things.. So that people will respect and at least co-operate with the doctor."*), professional practise (*"Now there are medico-legal issues coming in. Everybody is worried that if you do one wrong thing after doing, having, having done hundred good surgeries, you do one wrong thing somewhere, it can end your career there. People will come and break your hospital. They'll burn you down and they'll do all sort of negative publicity. So that stress is tremendous"*), and physiological health (*"It can cause physical illnesses.. it can be, it can express as various diseases, especially hypertension, diseases, acidities, heart, uh, problems, heart disease, all these things can be quite, uh, they can be expresse dratheras uncontrolled anxiety."*)

Theme 3:Coping mechanisms

It includes hard-core training and knowledge (*"So as we grow older and as we get more professionally trained, so the anxiety, goes on decreasing...Definitely training is the key to reduce the stress"*), pro-active coping (*"Take the proper history of the patient, take proper, uh, knowledge of the surgery. If I have plan it properly, if my preoperative planning means planning before the surgery is perfect, so I think the eleventh hour anxiety and the complication rate is definitely, um, declined."*), problem focused coping (*"Go in action mode. If you know, you messed up, do everything in your power and beyond to fix it. If you put any, uh, lesser efforts in that no, that anxiety will creep up"*), effective communication (*"you may be the best in the whole world, but, uh, still there may be such a problem inside the patient that you may not be able to save the patient's life. So in that case, continuously communicating with the patient, telling them with the relatives, being absolutely honest with them"*), meditation and spiritual practices (*"I think meditation helps, since last few years because of my wife being, uh, she is into meditation and into Pranayams and breathing exercises. So I've been doing it with her. And that has really helped"*), music (*"I play music of Kishore Kumar or any other things or Bhajans in my OT. That makes environment stress free and relaxing."*), and support of a good team of surgeons (*"You can ask the colleagues to come and help you during the surgery. That is ultimately important."*)

Sports and physical exercise (*"I'm doing regular exercise. Now we are playing badminton. So uh, playing some game or doing some exercise, So while playing badminton, I'm very calm. And, the people say, you are very calm. Means even you never get stressful while you are losing the match."*) recreational activities (*"now in our Orthopaedic Society, we take some trips, family trips, get-togethers, sports events, social events, as a social activity, so this helps to decrease the stress, basically"*), writing (*"for me, writing has been cathartic"*) and the 'Self' aspect of coping were also some of the coping strategies.

Discussion

The aim of the research was to find out the sources and coping mechanisms of anxiety and stress among surgeons. The qualitative interviews of 9 surgeons and thematic analysis of this data revealed three prominent

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themes as 'Sources of anxiety, sources of stress and prevalent coping mechanisms'.

'Medical training' was one of the sources of anxiety. Medical education is one of the competitive career-streams as a huge chunk of young aspirants are willing to come into the field. As a trainee, a student is answerable to senior students, professors about submissions and academic performance. Completing assigned work in time and assisting senior doctors while training are multiple tasks at the same time may be burdensome. Two of the participants reported of the anxiety as a trainee. These findings are consistent with Ahmad et al. (2009).

Professional practise was another source where participants reported that stress and anxiety caused minor errors like accidentally cutting a blood vessel, cutting a nerve in patient's body. It may also lead to forgetting and thus can affect surgical performance. Lengthy surgeries, technical issues like power cut during the surgery and failure of equipment like 'the surgical saw' during surgery were also prominent sources of intra-operative stress. These findings are consistent with previous finding that stress impairs psychomotor performance in novice surgeons (Arora et al., 2010). It is also consistent with how anxiety and stress led to cognitive impairments like forgetting (Wetzel et al. 2006).

The pre-operative period and intra-operative period involves facing the patients and relatives and OT consent. Anxiety also emerged from the intentions of patients and how they perceive doctors. Stipulated time for the surgery, anomalies, panics, equipment failures and technical issues, making complications due to low confidence are some of the sources of experience of anxiety during surgery. Losing a sense of control over operative procedures was a prominent source of stress among participants. This is consistent with the previous finding of Hotton, Miller and Chan 2019, that 'at cognitive level, when anxious, greater attention is given to worrying thoughts and catastrophic thoughts about performance. Thus, worry becomes a distracter, and reduces the ability to have attention control. Anxiety leads to cognitive bias i.e. more attention to negative consequences of making a mistake'.

One of the participants reported to be having somatic symptoms of anxiety and stress during surgery like sweating and palpitations. This finding is consistent with Hotton, Miller and Chan, 2019, that higher heart rate among surgeons is associated with greater number of

errors showing how anxiety-related autonomic arousal impacts surgical performance.

Two of the participants talked about the financial burden as a source of stress. Unpaid internships, low initial salaries, late self-sufficiency and load of loans taken for education and consultancy becomes troublesome for the practising surgeons. This finding is consistent with previous finding which identifies financial aspects as one of the contributing causes to physician's burnout (Balch and colleagues, 2008).

Anxiety about patient's recovery post-surgery, post-surgery complications, facing patients and relatives with the undesired outcome, life time loss/change in patients, ill effects and aggression, suspicion and disrespect towards doctors. Acceptance of the outcome of a surgery by patients & relatives is crucial, if not, can be a huge source of anxiety and stress for the surgeon.

One of the participants protested against the cases of vandalism and aggression towards doctors. Moreover, practising in a periphery and managing consultancy are the stressors related to consultancy. Fatigue due to staff unavailability, time and energy invested in one case, indefinite hours of work and uncertain schedules of emergency calls are prominent sources of stress among the participants. They reported that handling severe trauma and malignancy cases can be emotionally over-whelming. Serious nature of work led to emotional exhaustion among participants. This sense of overwhelming work leading to increased levels of emotional exhaustion is consistent with previous findings (Balch and colleagues, 2008).

Among the coping strategies, hard-core training and knowledge, and pre-operative preparation were evident among almost all 9 surgeons. This included rigorous surgical training under skilled doctors, being good with technical skills, knowledge and understanding of Anatomy, having good infra-structural set-up, having back-ups ready, and having alternative tools ready. This gave participants confidence to handle serious intra-operative and post-operative complications.

Five out of nine participants reported that meditation and spiritual practices help them for coping. These practices included meditational exercises, having spiritual faith, chanting and deep breathing, practicing Pranayama, and practicing Yoga. Many scholarly articles show how meditation effectively helps to regulate stress levels (Manocha R, 2000).

Nearly seven out of nine participants used music as one of the coping strategies. This included playing

music intra-operatively. Three participants reported that this keeps the OT environment light and happy. This result is consistent with previous findings that music in the operating theatre gives immeasurable effects. It can prevent distraction, minimize annoyance, reduce stress and diminish the anxiety of patients, staff and users (Makama & Colleagues, 2010). Moreover, listening to specific genres of music was reported to be stress-relieving for the participants. These genres included songs by Kishore Kumar, Sai Bhajans, Hindustani Classical Vocal music and ninety's pop songs. It was also reported by one of the participants that playing musical instruments like Tabla made the fingers rest, comfortable and flexible which helped in doing good surgeries. Music intervention in the preoperative setting is known for its beneficial effects (Nilsson, 2008, Yehuda, 2011.).

Guidance from colleagues and support from seniors have been one of the most prominent coping strategies in the participants. This coping strategy helped all 9 participants to reduce the amount of stress and anxiety experienced. This finding is consistent with previous findings that showed team-working and adequate communication and seeking help from seniors under stressful conditions as coping strategies (Arora, 2010).

Sports and physical exercises such as playing Badminton, Table Tennis, walking, and jogging helped participants to maintain physical fitness and thus to maintain energy for long difficult surgeries and hectic schedules.

Effective communication helped all the participants to reduce the amount of anxiety and stress experienced. Communicating about the high risk factors to the patients and relatives, communicating purpose of the surgery, communicating the risk-benefit ratio as per the health and situational factors of patient's life, counselling the patient and relatives about the whole treatment process increases awareness among patients and helps to build rapport. According to the participants, communicating well with the team inside the OT led to good intra-operative co-ordination, good OT environment and eventually to a desirable outcome.

Recreational activities reported by the subjects help them to cope with the stress and anxiety. This included mental exercises such as reading, playing Sudoku and Chess, and going for long drives. According to the participants, the health initiatives and activities arranged by the hospitals and surgical societies also contribute to their well-being and the well-being of their families.

Taking time for oneself to relax with the help of hobbies and having a mindful approach towards daily

small activities like meal preparations, doodling and taking care of household plants also helped participants for the coping.

The findings also show how personal factors like optimistic outlook towards the surgery, self-confidence, keeping oneself calm, having presence of mind, hard work, ability to accept the outcomes, ability to give time to things to become normal especially after an undesirable outcome, allowing oneself to explore, decision making ability, courage and dare, self-awareness, the non-verbal aspects like maintaining eye contact, and habits like choosing healthy diet were found to be helpful to the participants in the coping.

Gender-based observations

Being honest with the patients regarding treatment and its effects, effective communication, guidance and support of a good team of surgeons, pro-active coping in terms of pre-operative planning, reading, upgrading knowledge, music, and problem-focused coping are some of the common coping strategies among both male and female participants.

Seeking perfectionism in practice that does not let one compromise on treatment-care and thus further leads to second-guessing every step of one's advice, staying up-to the mark with respect to patient's satisfaction and being one of a kind, bad work-place environment in terms of name calling and blaming, and people's assumptions of lady surgeons being trainees and not the faculty by default are some of the aspects of anxiety and stress found to be unique to the female participants.

For one of the female participants, writing was a way of catharsis and reported to be writing books & blogs to express. Long term benefits of expressive writing are seen in physical health outcomes (Pennebaker, Sandra, & Beall, 1986, Pennebaker, 1997, King, & Kathi, 2000), like blood pressure (Davidson et al., 2002) and also the immune system functioning (Petrie, Roger, & Pennebaker, 1998). In addition, writing about emotional topics changes the way of interaction with others and may impact the objectively assessed social and linguistic behaviour (Pennebaker, & Graybeal, 2001). In comparison, no male participant reported expressive writing as a coping strategy.

Avoiding deep conversations but at the same time communicating well with the patients, letting the tears out, expressive writing, avoiding disappointments by reducing demanding, e.g. reducing the thinking like 'how can this be missing in my OT?', and self-awareness are strategies unique to the female participants.

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On the other hand, going for long drives and engaging in mental exercises such as Chess and Sudoku are unique to the male participants.

Impact of developed coping strategies on personal life

Participants reported that the strengths and coping strategies developed throughout the period of their training and consultancy has led to their better mental state and stability in daily emergencies. Their attitude towards unpredictable, uncontrollable situations changed. Handling surgical complications led to enhanced quality of communication with the people around, with the family members, and thus it has enhanced their social acumen. It increased their ability to keep calm in stressful circumstances. This experience and practise helped participants to get more clarity over personal issues. It increased self-assurance and assertiveness in them.

Implications

The study identifies the sources of anxiety and stress among surgeons and thus identifies the areas for which

the prospective students aspiring to enter the field of surgery need to prepare and train themselves for. It also reveals a variety of ways reported by the participants in which students and practising surgeons can deal with the anxiety and stress associated with their profession. All nine participants reported that it is very necessary to take more constructive efforts to maintain physical and mental health of the healthcare professionals. Thus, practising surgeons and medical trainees need a formal stress and anxiety management training in order to prevent severe implications of excessive anxiety and stress like suicide and early death due to burnout.

Limitations

The sample of the study was small. All the participants of the research practised in a common geographical region. Therefore, the findings may not be generalized.

Declaration of Interests Statement

We hereby declare that no authors have any conflicts of interests to disclose

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