# Depressive symptoms among anaesthetists in a department of anaesthesiology

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg in partial fulfilment of the requirements for the degree of Master of Medicine in the branch of Anaesthesiology.

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## Declaration

I, Caryn Margaret Lake declare that this research report is my own unaided work. It is being submitted for the Degree of Master of Medicine in the branch of Anaesthesiology at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

*CM Lake*

7 August 2020

# Abstract

## Background

Depression has been shown to be more prevalent among doctors than people within the general population. The aim of the study was to determine the prevalence of depressive symptoms as well as the coping mechanisms used to manage these symptoms among anaesthetists in the Department of Anaesthesiology at Wits.

## Methods

A prospective, contextual, descriptive study using convenience sampling was carried out. The self-administered nine question Patient Health Questionnaire was adapted to determine the presence of depressive symptoms and coping mechanisms.

## Results

It was found that 22.2% of participants have depressive symptoms. Significantly more females were depressed (p-value= 0.027). There was no significant difference between single and married participants or participants with a life partner (p-value= 0.4929), between participants with children and those without (p-value= 0.5070), or between senior and junior anaesthetists (p-value= 0.5147).The most commonly used coping mechanism in our study is talking to family and friends (67.5). Only 21.4% of all participants see a therapist or counsellor and of the participants who had a score of 12 or more on the PHQ-9, 39.3% see a therapist or counsellor.

## Conclusion

The level of depressive symptoms in the Department of Anaesthesiology at Wits is 22.2% and this is double that of the general South African population. Significantly more females are depressed and the most commonly used coping mechanisms are talking to family, friends or a partner, exercise, and alcohol use. Only a small proportion (39.3%) of depressed participants seek help from a professional.

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# Abbreviations

| | |
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| BDI | Beck Depression Inventory |
| DSM | Diagnostic and Statistical Manual of mental disorders |
| MPS | Medical Protection Society |
| PHQ-9 | Patient health questionnaire 9 |
| SASA | South African Society of Anaesthesiologists |
| Wits | University of Witwatersrand |

## Statement

The Research Report consists of a literature review, draft article, study proposal and appendices. The study proposal is included for background reference and is not for examination.

The formatting of this Research Report complies with the University of the Witwatersrand's Style Guide for Theses, Dissertations and Research Reports. The formatting of the draft article may differ from the rest of the Research Report in order to comply with the author guidelines of the Southern African Journal of Anaesthesia and Analgesia, the journal to which it is intended to be submitted.

# Section 1: Review of the literature

## 1.1 Introduction

There has been a surge in the number of newspaper articles and television programs highlighting mental illness, especially depression, among doctors. Doctors face numerous stressors every day and are taught to accept them and toughen up, or they risk being perceived as not good enough by colleagues (1). Dealing with death daily, with the knowledge that the decisions one makes affect patients' lives is a major stressor and not something doctors should be expected to cope with alone. Moreover, the stressors doctors face can result in higher levels of depression within the medical community (2-5). It is important that the rate of depression, as well as the potential causes and consequences are identified and understood so that they can be addressed and treated (1). This is important because depression not only affects the doctor who has depression but also their patients, colleagues and family (5-7). Doctors will often down play their symptoms, not admit them or may not even realise that they need professional help (8). The ease of access to self-prescribe medications is another factor that contributes to them not receiving the appropriate treatment they need (8).

Depression is an important mental health issue. Even though there are high rates of depression among doctors (9), the stigma attached to mental illnesses prevents individuals identifying the symptoms within themselves and results in them not seeking treatment (8). There can be a number of negative consequences for the doctors who have depression as well as for the patients that are under their care (6, 7).

This literature review will give an overview of depression among doctors. It will review the continuum of stress, burnout and the relationship to depression; definitions of depression, burnout and stress; the incidence of depression; appropriate screening tools that can be used; the consequences of depression; the effect of the work environment on depression; coping mechanisms that can be used and the barriers doctors face to seeking help.

## 1.2 Continuum of stress, burnout, and the relationship to depression

Dissanaike (10) suggests that stress, burnout, and depression should be considered as a continuum. On this continuum, stress leads to burnout if it is not kept under control. In addition burnout left untreatesd can lead to depression which can eventually lead to suicide (10). Stress needs to be managed before it leads to burnout in order to help reduce the incidence of depression.

According to Iacovides et al. (11), job related stresses mainly develop from a number of minor incidences rather than a single major event. If an individual is able to cope with the stress, or their work environment provides them with sufficient positive feedback or resources, they will not necessarily develop burnout (11). When the stress becomes overwhelming, however, or there is a lack of positive feedback from their job, then there is a higher likelihood of developing burnout which further reduces coping skills. (11). In terms of the hospital as a workplace, registrars face stress due to the work environment which has been found to increase the risk of depression and suicide (12).

A positive association between depression, burnout and suicidal thoughts has been established (9, 13). Individuals who are suffering from burnout are two to three times more likely to have suicidal thoughts (9). Since there is a high association between depression and suicide (13), it is important to improve awareness around depression and its treatment in order to try and prevent this dire consequence. Doctors are notorious for not seeking help when they are ill and often they will choose to treat themselves and to continue work despite being ill (14). As inferred by Baldwin et al.(14), this dysfunctional behaviour will be carried throughout their professional years and will result in them not seeking the appropriate treatment when they suffer from mental health related illnesses.

In the study by Dyrbye et al. (9), the rate of burnout among doctors was 49.6% in America in 2008, indicating that a high proportion of doctors are likely to have suicidal thoughts. A 2009 Japanese study by Tokuda et al. (5) looked at how difficulties such as long shifts, night calls, and heavy workload within hospitals have been associated with higher levels of depression and burnout. The higher

rates of depression and burnout identified in the study were suspected to have led to an increased rate of suicides. Interestingly, the hospitals were made to compensate the families of the deceased as it was seen that the suicide was a result of depression that arose from the excessive workload and associated stress. The heavy workload and increased levels of depression have also resulted in many doctors leaving the hospitals in Japan and there have been incidences where hospitals have had to close due to lack of doctors which negatively impacts patient care by reducing their access to health care (5). Thus, poor work environments not only negatively impact doctors' mental health and quality of life but also have an effect on patient wellbeing.

High levels of stress within the work place and uncertainty about future job prospects lead to higher rates of depression amongst employees (3). Factors within medical specialties that cause stress include work factors such as:

- having to find time to study for exams while working (8),
- being unsure about what work possibilities there are after specialising due to the potential lack of specialists posts (8, 15),
- long work hours as well as after-hour shifts (15),
- not having adequate support from seniors (16),
- time constraints to attend to as many patients as possible within a minimal time (17),
- not getting adequate sleep (17),
- not being able to make one's own decisions (1, 16),
- being intimidated and harassed by patients and colleagues (17),
- not being able to find a balance between work and life outside of work (17, 18).

There are also patient related factors that cause stress such as:

- adverse outcomes with regard to poor patient care,
- being afraid of miss-managing patients,
- having to deal with difficult patients (8).

Another major source of stress which is a result of working weekends and night shifts is missing family events which leads to conflict as family members may feel neglected (17). Some doctors may view themselves as failures in this aspect of their lives as they are unable to cope with what is expected of them and they may perceive themselves as being a bad spouse or parent (17). The conflict arising from this can create or aggravate depressive symptoms (19).

## 1.3 Definition of depression, burnout and stress

The American Psychiatric Association (20) defines depression as “a common and serious medical illness that negatively affects how you feel, the way you think and how you act. Depression causes feelings of sadness and/or loss of interest in activities once enjoyed. It can lead to a variety of emotional and physical problems and can decrease a person’s ability to function at work and at home.” It has been proven that being depressed can have a negative impact on one’s work performance which, in the medical field, can mean detrimental outcomes for patients due to a higher incidence of medical errors (21).

Burnout as defined by Hakanen and Schaufeli (22) is “a negative, job related psychological state comprising a set of symptoms such as physical fatigue, emotional exhaustion, and loss of motivation”. It can occur when an individual is over worked for an extended period of time and their job resources become progressively exhausted, resulting in them losing their ability to cope with stress (22). This can result in individuals having a negative outlook and developing symptoms of depression (22).

Stress has been defined as “a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering his or her well-being” (23). Similar to burnout, the individual lacks the appropriate resources to cope with the requirements placed on them within their environment and this leads to stress having a negative effect on the individual (24). According to Kinman and Jones (24) it can affect work productivity and physical health. The authors state that some amount of stress is needed to motivate individuals to be more productive, but when a person lacks the ability to cope with the demands, stress can have a negative effect.

## 1.4 Incidence of depression

In a 2015 meta-analysis by Mata et al. (25), the occurrence of depression and its symptoms in registrars in America, Europe, Asia, and Africa was reviewed. The authors found a prevalence of 28.8%, with a range of 20.9% – 43.2% in the 54 different studies conducted in different countries. Rossouw et al. (26) conducted a study assessing the rate of depression among medical doctors in the Western Cape and found the prevalence of mild depressive symptoms was 70%, moderate depression was 27% and severe depression was 3%. Embriaco et al. (27) found the level of depression among French intensive care unit doctors to be 23.8%. The most recent statistics on the incidence of depression in the general population of South Africa showed a incidence of 9.8% in 2008 (28). In a 2018 report by Medscape (29) the rate of self-reported depression among doctors was 15%.

A South African study by Van Niekerk et al. (30) in 2012 evaluated the incidence of suicidal thoughts and suicidal attempts among medical students and they found the incidences to be over 30% among participants in this study. The authors stated that it was three times higher than the incidence in the general population of South Africa. Dyrbye et al. (31) highlight that those within the medical fraternity face higher stressors or perceived stress even before they begin working as doctors and have an increased risk of depression and its associated consequences such as suicide. Comparison of this data to the anaesthesiology fraternity in South Africa is difficult because no studies could be identified which investigate the level of depression within this specific group.

Studies have been conducted that have looked at stress and burnout within the Department of Anaesthesiology at the University of the Witwatersrand (Wits). The incidence of burnout within this department was found to be 21% (32). Stress was assessed using the Perceived Stress Scale. It was found that there was a higher score among Wits anaesthetic doctors (score of 21.48) as compared to the general South African population (score of 18.6 – 18.9) (33). Both burnout and stress can potentially lead to depression (10) and given the high rate of burnout and stress identified among the anaesthetic doctors there is a potential for higher incidence of depression in this department.

There have been studies that look at the prevalence of depression among medical professionals working within anaesthesiology in other countries. In an Australian study, anaesthetists were shown to have the second highest rate of suicidal ideation (13%), and the third highest rate of diagnosis of depression (7%) in comparison to other medical specialties (8). Another Australian study showed that 26% of anaesthetists had presented to their family physician for mental health related issues (15). An American study of medical students and registrars showed rates of 12% for major depression and 9,2% for mild to moderate depression (34). Bernburg et al. (16) found that among German medical residents, there is a higher level of depression and a lower level of work performance among anaesthetic residents compared to other specialties. In their study, 17% of the residents who took part in the study had high levels of job-related stress, 9% had depression, and 11% scored low for productivity at work. Thus, there has been found to be a positive association between work stress and depression and a negative association between work stress and work productivity (3, 16). In line with this, it has been found that individuals with highly demanding jobs, who do not have significant control of their .situations and feel that there are relatively low rewards are at a higher risk of becoming burnt-out, depressed and, of being less efficient at work (16).

There are a number of variables that are unrelated to work that could potentially play a role in the incidence of depression among doctors such as sex, marital status, age, and whether or not they have children. In a study by Downey et al. (8) it was demonstrated that the rate of mental health issues, as well as treatment for these issues, was double for female doctors compared to male doctors. Goebert et al. (34) confirm this in their study showing that the rate of major depression among female medical students was 15.2% compared to 7.9% among the males. In addition, the rate for mild to moderate depression was 6.4% for females and 7.7% for males. Females most often assume a greater responsibility in caring for children and the household than their male counterparts and this can place them under more stress predisposing them to a higher risk of developing depressive symptoms (35). The rate of depression among single compared to married or divorced medical residents has been proven to be higher (19). Marriage is seen as having being protective against mental illness as it provides a source of emotional,

social, and monetary support (19). The authors did acknowledge that marriage could also be a potential source of additional stress if there is conflict within the relationship. There have been studies that did not find marriage to be beneficial (36). A study by Lloyd et al. (37) found that levels of depression decrease with age and it was assumed this was due to having an improved ability to cope with the stresses they face as doctors. Heads of departments were also found to have lower levels of depression which could be relate to having better control over ones work environment (37). The lower levels of psychological distress associated with increased age has been supported by another study and it has been suggested that this may be due to seniors having better working environments and better job satisfaction (38). Erdur et al. (36) found the rate of depression was lower among doctors with children (8%) compared to doctors without children (21%). According to the authors this may be because having children could give a greater sense of meaning to the lives of the doctors.

Having such high rates of depression among doctors is concerning given the requirements and demands of patient management and the fact that depressed individuals have been shown to have reduced cognitive skills, concentration and memory (20). Depression can have a negative impact on the health and outcomes of patients being managed by the depressed clinician (7). It is, therefore, necessary to be aware of the extent of depression within a speciality and what specific stressors or factors contribute to it in order for these to be addressed. Doctors with depression (or those at risk) need to be identified and treated before adverse outcomes affecting patients or the doctors themselves occur.

## 1.5 Screening tools for depression

A number of different tools have been used in studies that have screened for depression among healthcare workers, such as the Kessler Psychological Distress Scale (8, 15), Beck Depression Inventory (BDI) (26), and the Patient Health Questionnaire 9 (PHQ-9) (39-41). The ideal screening tool is one that is brief, easy to administer and easy to interpret (42). The Kessler Psychological Distress Scale screens for both depression and anxiety and is therefore not specific for screening for depression alone (43). Both the BDI and PHQ-9 can be self-administered (44) and have been proven to yield comparable results (45). Compared to the BDI, the

PHQ-9 has fewer questions (9 compared to 21 for BDI) and is available free of charge (44). It is based on the fourth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for depression and is, therefore, a better tool to use when screening for depression (46).

PHQ-9 involves asking nine questions each scored between 0 (not at all) and 3 (almost every day) (47). The nine questions pertain to loss of interest in usual activities, feeling sad, change in sleep patterns, increased fatigue, change in eating habits, loss of self-esteem, difficulty concentrating, restlessness or slowed speech or movements, and suicidal thoughts (42). Once completed a final score of 1 – 4 indicates minimal depression, 5 – 9 indicates mild depression, 10 – 14 indicates moderate depression, 15 – 19 indicates moderately severe and, 20 – 27 indicates severe depression (47). PHQ-9 is based on the primary care evaluation of mental disorders (PRIME-MD) and was developed by Kroenke, Spitzer, Williams, and colleagues at Columbia University (42). The PHQ-9 was developed as a shorter version of the PRIME-MD, can be self-administered rather than requiring a physician to ask and evaluate all the questions, and it has been proven to be as reliable as the PRIME-MD in diagnosing depression (42). The PHQ-9 was validated in two studies carried out between 1997 – 1999 involving 3000 patients at primary care facilities and 3000 at several obstetric and gynaecological facilities (47).

A meta-analysis by Manea et al. (48) reviewed the validity of the PHQ-9 to diagnose depression. They concluded that the test was useful to screen for depression but not to diagnose it when used in isolation (48). The meta-analysis also evaluated different studies to determine the appropriate cut off score for depression. According to the review by Manea et al. (48) the sensitivity of a score of 10 is not better than a score of 11 or 12. A study by Lowe et al. (49) suggested using a cut-off score of 12 or more when conducting research to screen for depression as it provides a better compromise between false positive and false negative results. The cut-off score of 12 or more is also suggested by a study done by Gilbody et al. (50). Al- Ghafri et al. (51) validated the PHQ-9 among medical trainees in Oman and showed that a cut off score of 12 or more had a

sensitivity of 80.6% and specificity of 94% which was again the better compromise between false positive an false negative results.

The PHQ-9 appears to be a good screening tool for research purposes as it is a short questionnaire, not taking a long time to complete or analyse, and does not require special training to administer or interpret (52).

## 1.6 Consequences of depression

The association between depression and suicide has been discussed in section 1.2 but there are a number of other consequences for doctors with depression. Depression amongst anaesthetists and other doctors leads to a higher incidence of medical errors (6, 7, 21) and to doctors having a poor attitude towards their patients (6). Depression impairs one's ability to concentrate or retain information which can lead to mistakes being made when administering drugs, or making decisions about patient management (7). Anaesthetists who are depressed have admitted to not adequately following up on their patients. They may forget to review x-rays, fail to do pre-operative visits with their patients, be less likely to perform an adequate machine check when starting shifts or to read up on upcoming cases presenting on their surgical lists thus resulting in them not complying with "best practice principles" (7). This can result in negative patient outcomes (7, 21).

Drug and alcohol abuse affects between 10% – 12% of doctors and is most likely to occur within the first five years post-graduation (53). The higher levels of depression among anaesthetists as well as easy access to drugs has been found to be associated with higher levels of drug abuse within this speciality (15). In particular, anaesthetists have been found to be more likely than other doctors to abuse opioids (54). It is speculated that the high levels of drug abuse within anaesthesiology are not only due to easy access to scheduled drugs but also due to the highly stressful environment anaesthetists face, the sense of loneliness associated with the job, the presence of related mental illnesses, and the need to self-medicate (53). This drug abuse can lead to death either by suicide or overdose (55). Moreover, the abuse of drugs and alcohol can impair thinking and reasoning skills, placing patients' lives in danger, and may contribute to

absenteeism (53). Anaesthetists who go for rehabilitation and get treated may find it difficult, if not impossible to return to their jobs due to the constant temptation and easy access to the drugs that they are addicted to (2).

## 1.7 Work environment and effects on depression

The Job-Demand Control Model developed by Karasek in 1979 (56) demonstrates that jobs associated with high demand and limited autonomy are associated with greater risk of depression among the employees. Job demands refer to the amount of work that is required to be carried out and the time constraints in which it needs to be completed (57). Job demands can include shift work and long hours and these can also lead to a higher incidence of depression (58). Registrars within anaesthetics have to contend with shift work, long hours, large number of patients, and time limitations. Job control refers to the ability of individuals to make their own decisions with regards to their work and greater control can help to reduce the negative effects of high job demands and reduce the risk of depression as control allows them to adjust their environment in order to cope better with their demands (59). Work environments that have seniors who are demeaning and not supportive of the juniors result in a higher prevalence of depression (60). Allowing individuals to use their skills optimally helps to reduce depression (60).

## 1.8 Coping mechanisms for managing depression

There are a number of different ways doctors try to cope with depression. Some find it helpful to talk to family and friends about their work experiences or the adverse incidences they deal with; others take time to exercise or speak to mentors (8). Exercise has been proven to help reduce the level of depression (61). However, time limitations make it difficult for doctors to make this a priority, but it could be beneficial to emphasise the use of exercise to treat depression as it would be cost effective and improve their overall health. Chronic illnesses increase the level of depression but the use of exercise can help to reduce this as well as prevent the development of chronic illnesses that are associated with a sedentary lifestyle (61). Downey et al. (8) looked at a number of different coping mechanisms used by anaesthetic trainees. The proportion participants who used talking to family and friends as a coping mechanism was 71% - 72%, exercise 57.8%,

alcohol 24%, prescription drugs 2.6% and illicit drug use was 0.2%. Counselling, prayer and hobbies were included in the other group and used by 46.6% of the participants in the study (8). In an Australian study that reviewed the mental health of and support systems for anaesthetists the use of alcohol to cope with stress and depression was reported to be 17% and self-prescription of medications was 25% (15). Consultations with a general practitioner with regards mental health related problems was 26%, and 7% had been prescribed treatment. The rate of use of illicit substances was 3% among the participants (15).

Downey et al. (8) suggest that it is important to have social support structures as well as to take leave in order to be relieved from the stress placed on individuals at work so that they can cope better with subsequent stressors. The colleagues doctors work with during registrar time can become like family as they spend a substantial amount of time with each other, making them another important source of support (19). If individuals in the registrar training program help and support each other, it may reduce stress, burnout and symptoms of depression and consequently suicide or drug abuse (12).

Daskivich et al. (12) stated that symptoms of depression and suicidal thoughts or acts are “occupational hazards for physicians” emphasising the importance of the need to address and find ways to reduce depression among health care professionals. Increasing awareness of depression within the department and providing more support to the registrars can assist with this (62). Increasing individuals’ independence at work can help to reduce the levels of stress at work and consequently reduce depressive symptoms (3).

Departments need to have interventions that assist individuals in coping with and preventing depression. Daskivich et al. (12) suggest the implementation of mentorship programs which encourage junior staff to turn to someone who is more senior and who has been through the system and dealt with a number of issues they may be facing (12). These senior mentors can offer advice on how to cope during registrar time and how to deal with the stressors that can lead to one becoming depressed (12). Baker et al. (1) suggest setting up programs where anaesthetists are able to come together and talk openly about the issues they face as they may then realise they are not suffering alone and this can help them to

come up with ways to solve or deal with the problems they are facing. Another suggested intervention involves instituting a program whereby all the doctors have their mental health assessed at regular intervals and ensuring that any issues that may arise are addressed (16). It is important for doctors to acknowledge their humanity and the vulnerability that comes with it (1, 63). This also needs to be taught to medical students who adopt the belief from their seniors that they need to be infallible and should continue despite any illness they may be facing as they unfortunately carry this false belief into their post graduate years (1).

There needs to be efforts and structures in place to encourage doctors to seek care for themselves and to recognise when they are ill and may be in need of help (1). Directing efforts towards preventing or treating depression can help to potentially decrease the incidence of drug and alcohol abuse among anaesthetists (7). Interventions are needed to try to identify the causes or triggers of depression within the department in order for these to be addressed with the objective of preventing depression from occurring rather than treating it after it has already developed (1).

## 1.9 Barriers to seeking help

There are a number of barriers that prevent doctors from seeking appropriate care for mental health issues. A study by Guille et al. (40) identified what some of the barriers that prevent doctors from seeking appropriate treatment for mental health related conditions. These include long shifts that may make it impossible to organise or attend appointments with the appropriate mental health professionals; fear of what others would think of them; being unsure of where or how to get help; and the belief that they can treat themselves. Additionally, some doctors fear that their confidentiality will not be maintained should they request time off, disclose their feelings or be given a diagnosis of depression, and they fear that this could impact future jobs opportunities (15, 64). This perceived job insecurity adds stress which worsens depressive symptoms and perpetuates this vicious cycle (63, 64). There is also a belief that counselling is not effective and fellow colleagues may lose faith in their abilities if they admit they have depression (40). There is still a lot of stigma within the medical profession associated with having a mental illness and this prevents doctors admitting they have symptoms of depression or trying to

seek help (63). This again highlights the importance of the need to be aware of depression within the anaesthetia department.

## 1.10 Summary

The deaths of seven anaesthetists due to suicide within an 18 month period in South Africa has raised a concern about the state of wellness among this group (62). Brannigan and Beeton (62) stated that it is important to understand that the ill health of one within the department does not only affect that individual but has an effect on the whole department . According to the authors this number only specifies the most extreme outcome of those suffering from depression indicating that it is likely there is a much greater number of anaesthetists who experience depressive symptoms but not to the same extent. The authors believe that it is necessary to know what the extent of the problem is in order to understand the magnitude of the problem and why it is necessary to be addressed. There is a need to promote discussion about depression within the department and to provide support to each other. As stated by the authors “perhaps the first, seemingly unimportant, step is to begin today to view our colleagues as important and necessary parts of our lives and to treat each other in such a way that engenders a state of open communication and support. Each and every one of us is an incredibly important part of the future success, of not just our fraternity, but our country as a whole” (62).

There is thus a need to improve awareness of and discussion around depression in order to move forward with implementation of programs that will address the problem as well as to promote the development of an anaesthetic community that is more caring and encouraging to the members that are an integral part of this community (62). This is because the creation of awareness and open discussion of depression within the anaesthesiology department could help to reduce the stigma attached to it and encourage a culture of seeking appropriate treatment and help timeously.

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## Article sections and length

The following contributions are accepted (word counts exclude abstracts, tables and references):

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### Title page

All articles must have a title page with the following information and in this particular order: Title of the article; surname, initials, qualifications and affiliation of each author; The name, postal address, e-mail address and telephonic contact details of the corresponding author and at least 5 keywords.

### Abstract

All articles should include an abstract. The structured abstract for an Original Research article should be between 300 words and should consist of four paragraphs labeled Background, Methods, Results, and Conclusions. It should briefly describe the problem or issue being addressed in the study, how the study was performed, the major results, and what the authors conclude from these results. The abstracts for other types of articles should be no longer than 230 words and need not follow the structured abstract format.

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All articles should include keywords. Up to five words or short phrases should be used. Use terms from the Medical Subject Headings (MeSH) of Index Medicus

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## Acknowledgements

In a separate section, acknowledge any financial support received or possible conflict of interest. This section may also be used to acknowledge substantial contributions to the research or preparation of the manuscript made by persons other than the authors.

## References

Cite references in numerical order in the text, in superscript format (Format> Font> Click superscript). Please do not use brackets or do not use the foot note function of MS Word.

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The style for references should follow the format set forth in the Uniform Requirements for Manuscripts Submitted to Biomedical Journals (http://www.icmje.org) prepared by the International Committee of Medical Journal Editors. Abbreviations for journal titles should follow Index *Medicus* format. Authors are responsible for the accuracy of all references. Personal communications and unpublished data should not be referenced. If essential, such material should be incorporated in the appropriate place in the text.

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## The following are sample references:

1. Jun BC, Song SW, Park CS, Lee DH, Cho KJ, Cho JH. The analysis of maxillary sinus aeration according to aging process: volume assessment by 3-

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Tables should be self-explanatory, clearly organised, and supplemental to the text of the manuscript. Each table should include a clear descriptive title on top and numbered in Roman numerals (I, II, etc) in order of its appearance as called out in text. Tables must me inserted in the correct position in the text. Authors should place explanatory matter in footnotes, not in the heading. Explain in footnotes all non-standard abbreviations.

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Authors must declare all financial contributions to their work or other forms of conflict of interest, which may prevent them from executing and publishing unbiased research. [Conflict of interest exists when an author (or the author's institution), has financial or personal relationships with other persons or organizations that inappropriately influence (bias) his or her opinions or actions.] **Modified from: Davidoff F, et al. Sponsorship, Authorship, and Accountability.

(Editorial) JAMA 2001: 286(10) The following declaration may be used if appropriate: “I declare that I have no financial or personal relationship(s) which may have inappropriately influenced me in writing this paper.”

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7. References must strictly be in Vancouver format. (Reference numbers must be strictly numerical and be typed in superscript, not be in brackets and must be placed AFTER the full stop or comma.)
8. It must be clear where every figure and table should be placed in the text. If possible, tables and figures must be placed in the text where appropriate. If too large or impractical, they may be featured at the end of the manuscript or uploaded as separate supplementary files.
9. All photographs must be at 300dpi and clearly marked according to the figure numbers in the text. (Figure 1, Table II, etc.)
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11. Figure numbers: Arabic, table numbers: Roman

# Section 3: Draft article

## Depressive symptoms among anaesthetists in a department of anaesthesiology

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**Key words:** Depessive symptoms, coping mechanisms, anaesthesia

**Abstract**

**Background**

Depression has been shown to be more prevalent among doctors than people within the general population. The aim of the study was to determine the prevalence of depressive symptoms as well as the coping mechanisms used to manage these symptoms among anaesthetists in the Department of Anaesthesiology at Wits.

**Methods**

A prospective, contextual, descriptive study using convenience sampling was carried out. The self-administered nine question Patient Health Questionnaire was adapted to determine the presence of depressive symptoms and coping mechanisms.

**Results**

It was found that 22.2% of participants have depressive symptoms. Significantly more females were depressed (p-value= 0.027). There was no significant difference between single and married participants or participants with a life partner (p-value= 0.4929), between participants with children and those without (p-value= 0.5070), or between senior and junior anaesthetists (p-value= 0.5147).The most commonly used coping mechanism in our study is talking to family and friends (67.5). Only 21.4% of all participants see a therapist or counsellor and of the participants who had a score of 12 or more on the PHQ-9, 39.3% see a therapist or counsellor.

**Conclusion**

The level of depressive symptoms in the Department of Anaesthesiology at Wits is 22.2% and this is double that of the general South African population. Significantly more females are depressed and the most commonly used coping mechanisms are talking to family, friends or a partner, exercise, and alcohol use. Only a small proportion (39.3%) of depressed participants seek help from a professional.

**Introduction**

Depression is a prevalent mental health issue within the healthcare community, including doctors. In a review article the prevalence was found to range from 20.9% to 43.2% among doctors.[1] In a study done in 2010 by Rossouw et al.[2] it was shown that the rate of depression was three times higher for doctors in the Western Cape as compared to that within the general South African population. Differences in the incidence of depression have been found between gender,[3] marital status,[4] and those with and without children.[5] Depression can be related to stress and burnout on a continuum where stress that is left untreated leads to burnout, and burnout that is untreated will lead to depression.[6] Factors causing stress need to be identified and addressed to help prevent the development of depression.

Depressed doctors are not always willing to seek help due to a number of factors. These include stigma associated with having depression,[7] potential effects on future job prospects,[8] and how others perceptions of them may be altered.[9] Doctors may also be unwilling to miss work as it could place a greater burden on their colleagues and the long shifts also make it difficult to find an appropriate time to make appointments with psychologists.[9] The barriers to seeking help for depression need to be identified, addressed, and solutions put in place to improve the treatment of depression.

Doctors work within a highly stressful environment and have to take the responsibility of other people's lives into their hands.[10] This stress, as well as having to prepare for exams, work long hours and balance work, family, and social commitments can place an added burden on individuals.[3] Furthermore, factors that cause increase stress have been shown to increase the risk of individuals becoming depressed.[11] Given that many of these factors are often faced by anaesthetists there is a high potential for depression to be a prevalent issue within the department. Depressed individuals are more inclined to have suicidal thoughts[12] and anaesthetists have been shown to have higher rates of suicide as compared to other physicians.[13]

Anaesthetists who are depressed have an inferior work performance[10] and are prone to making more medical errors compromising patient safety.[14] Depression is also associated with substance abuse[8] and absenteeism from work,[10] resulting in reduced work productivity and a greater burden on colleagues.[15]

In a letter to the editor of the Southern African Journal of Anaesthesia and Analgesia the importance of the need to improve the wellness of the doctors working within anaesthesia was highlighted after seven anaesthetists committed suicide over an 18 month period.[16] It is possible that this number of suicides is only a

small indication of the magnitude of the actual problem of the state of wellness within the anaesthetic departments.[16] The aim of this study was to describe the prevalence of depressive symptoms among anaesthetists working in the Department of Anaesthesiology at Wits.

**Methods**

A prospective, contextual, descriptive research design was used in this study. Approval to conduct the study was obtained from the Human Research Ethics Committee (Medical) of the University of Witwatersrand and other relevant authorities.

The study population consisted of all anaesthetists working within the Department of Anaesthesiology. A convenience sampling method was used and the response rate determined the sample size. The Department of Anaesthesiology consisted of 208 anaesthetists at the time the study was conducted. A minimum response rate of 60% (125) was considered acceptable.[17] Incomplete questionnaires were excluded. Junior anaesthetists included mediacl officers, first, second, and third year registrars and senior anaesthetists included registrars in their fourth year and consultants.

A self-administered questionnaire, the Patient Health Questionnaire (PHQ-9), was identified following a comprehensive literature review. The PHQ-9 is a validated questionnaire consisting of nine questions that was developed by Kroenke et al.[18] at Columbia University with an educational grant from Pfizer. The PHQ-9 is based on the fourth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for depression,[18] which has not been changed in the recently updated DSM V.[19] The nine questions relate to loss of interest in usual activities, feeling sad, change in sleep patterns, increased fatigue, change in eating habits, loss of self-esteem, difficulty concentrating, restlessness or slowed speech or movements, and suicidal thoughts.[20] Each question is given a score of between zero and three allowing for a maximum of 27.[18] A score of 0 – 4 indicates minimal depression, 5 – 9 mild depression, 10 – 14 moderate depression, 15 – 19 moderately severe depression, and 20 – 27 indicates severe depression.[18] The PHQ-9 was chosen as it is a short questionnaire, can be self-administered, and is free of charge.[21] In the instruction manual it is stated "no permission is required to reproduce, translate, display or distribute".[22] The questionnaire used for this study was adapted from the PHQ-9 and a section on coping mechanisms was added.

The questionnaire, together with an information letter was handed out to those who were willing to participate. It took approximately 10 minutes to complete the questionnaire. The researcher was present

during the time of completion of the questionnaires to answer any questions. The completed questionnaires were folded and placed in a sealed box. Data collected from the surveys was captured by the researcher onto Microsoft Office Excel ® 2007 spread sheets for analysis. A score of 12 or more was used as the cut-off to say depressive symptoms are present.[23]

Data were analysed in consultation with a biostatistician using STATA® version 15 (StatCorp, USA). Descriptive and inferential statistics were used. Categorical data was described using numbers and percentages. Comparisons between groups was be made using Fishers exact tests. A p-value of $<0.05$ was considered statistically significant.

**Results**

Of the 134 questionnaires handed out 126 (94%) were returned completed which represents 60.6% of anaesthetists in the Department of Anaesthesiology. Characteristics of the participants are shown in Table I.

**Table I: Characteristics of participants**

| Characteristic | Number | Percentage |
|---|---|---|
| Sex | | |
| Male | 45 | 35.7 |
| Female | 81 | 64.3 |
| Age in years | | |
| <30 | 28 | 22.2 |
| 31 – 40 | 76 | 60.3 |
| 41 – 50 | 10 | 7.9 |
| >50 | 12 | 9.5 |
| Years of experience | | |
| <1 | 9 | 7.1 |
| 1 – 5 | 70 | 55.6 |
| 6 – 10 | 26 | 20.6 |
| >10 | 21 | 16.6 |
| Designation | | |
| Medical officer | 21 | 16.7 |
| Registrar year 1,2,3 | 57 | 45.2 |
| >3 year registrar | 10 | 7.9 |
| Consultant | 38 | 30.2 |
| Marital status | | |
| Single | 39 | 31.0 |
| Married or life partner | 83 | 65.9 |
| Missing | 4 | 3.2 |
| Children | | |
| Yes | 47 | 37.3 |
| No | 75 | 59.5 |
| Missing | 4 | 3.2 |
| Previously diagnosed with mental illness | | |
| Yes | 17 | 13.5 |
| No | 105 | 83.3 |
| Missing | 4 | 3.2 |
| Within six months of writing exams | | |
| Yes | 40 | 31.7 |
| No | 81 | 64.3 |
| Missing | 5 | 4.0 |
| Trauma or bereavement in the last 6 months | | |
| Yes | 35 | 27.8 |
| No | 86 | 68.3 |
| Missing | 5 | 4.0 |

The number of participants who had a score of 12 or more on the PHQ-9 questionnaire was 28 (22.2%). The scores obtained from the PHQ-9 questionnaire are shown in Table II.

**Table II: PHQ-9 questionnaire results**

| Score | Number | Percentage |
|---|---|---|
| Minimal (0 – 4) | 52 | 41.3 |
| Mild (5 – 9) | 38 | 30.2 |
| Moderate (10 – 14) | 26 | 20.6 |
| Moderately severe (15 – 19) | 9 | 7.1 |
| Severe (20 – 27) | 1 | 0.8 |

Table III shows the coping mechanisms used by participants. Not all participants indicated a coping mechanism and numerous participants selected multiple options. Additional coping mechanisms listed were gardening (n=1, 0.8%), sleep (n=1, 0.8%), spending time with pets (n=2, 1.6%), gambling (n=1, 0.8%), watching television (n=2, 1.6%), eating (n=3, 2.4%), listening to music (n=1, 0.8%) and traveling (n=1, 0.8%). Of the 28 participants who had a score of 12 or more on the PHQ-9 only 11 (39.3%) see a therapist or counsellor.

**Table III: Participants' coping mechanisms**

| Coping mechanisms | Number | Percentage |
|---|---|---|
| Drink alcohol | 31 | 24.6 |
| Take recreational drugs | 2 | 1.6 |
| Take medication for depression | 10 | 7.9 |
| Talk to a partner | 75 | 59.5 |
| Talk to family or friends | 85 | 67.5 |
| See a therapist | 24 | 19.0 |
| Talk to a counsellor | 3 | 2.4 |
| Exercise | 77 | 61.1 |
| Religion | 5 | 4.0 |
| Other | 12 | 9.5 |

Table IV shows the comparison of depressive symptoms between males and females, marital status, children versus no children and junior and senior anaesthetists. Of note four participants did not complete the part for marital status or children versus no children and were excluded from the analysis. The only comparison with a significant difference in depressive symptoms was between males and females. There were significantly more females that were depressed compared to males.

**Table IV: Comparison of depressive symptoms**

| | **Depressed** | **Not depressed** | **P-value** |
|---|---|---|---|
| Sex | | | |
| Male | 5 | 40 | 0.0270 |
| Female | 23 | 58 | |
| Marital status | | | |
| Single | 7 | 32 | 0.4929 |
| Married | 20 | 63 | |
| Children | | | |
| Yes | 12 | 35 | 0.5070 |
| No | 15 | 60 | |
| Designation | | | |
| Junior | 19 | 59 | 0.5147 |
| Senior | 9 | 39 | |

**Discussion**

This is the first study looking at the level of depressive symptoms and coping mechanisms among anaesthetists in the Department of Anaesthesiology at Wits. The occurrence of depressive symptoms was 22.2% in our study. This is more than double the level of depression of the general population of South Africa, which was 9.8% in 2008.[24] The occurrence of depressive symptoms in this study is similar to other studies. A meta-analysis by Mata et al.[1] showed that the rate of depression and related symptoms among registrars in 54 different countries was 28.8% with a range of 20.9 – 43.2%. Embriaco et al.[25] showed that the level of depression among French intensive care doctors was 23.8%. The high level of depressive symptoms

in our study is of concern. Dissanaike[6] suggests that stress, burnout, and depression should be considered as a continuum. On this continuum, stress leads to burnout if it is not kept under control. In addition burnout left untreated can lead to depression which can eventually lead to suicide.[6] A previous study within the Department of Anaesthesiology at Wits showed the occurrence of burnout to be 21% among the anaesthetists.[26]

The most commonly used coping mechanisms for depressive symptoms in our study were talking to family and friends (67.5%) or a partner (59.5%), exercise (61.1%), and alcohol use (24.6%). Many participants use more than one coping mechanism. Similar coping mechanisms were identified among anaesthetists in Australia, with more than 70% of participants talking to family and friends, 57.8% using exercise, and 24% using alcohol.[3] Only a small proportion of participants (1.6%) in our study reported using recreational drugs as a coping mechanism, which was similar to findings of 0.2% in a study by Downey et al.[3] and 3% in a study by McDonnell et al.[8] It is possible this could be underreported due to fear of admitting to the use of illegal substances. Less than a quarter (21.4%) of all the participants in our study see a counsellor or therapist as a coping mechanism and of those who scored high for depressive symptoms, only 39.3% see a counsellor or therapist. It would be advisable to encourage individuals who are feeling depressed to seek counselling early before depressive symptoms overwhelm them. Prescription medication for depression is taken by 7.9% of participants in our study which was similar to the findings of 7% of the participants in the study by McDonnell et at 8 but higher than the 2.6% of participants in the study by Downey et al.[3]

It was found that there was a significantly higher rate of depression among female anaesthetists in our study. Higher rates of depression among females was also found in studies by Downey et al.[3] where females had a rate of 21.3% and males 10.5% and Goebert el al.[27] where 15.2% of females were depressed and 7.9% of males. This could be related to females being more open to admitting they have depressive symptoms as well as having a higher rate of stress related to balancing work and family life.[28] Females often undertake a greater responsibility when it comes to caring for children and dealing with family matters compared to their male counterparts.[28]

In our study the difference in comparison of depressive symptoms between single and married anaesthetists or anaesthetists with a life partner was not significant. A study by Lin et al.[4] found the rate of depression to be higher among the single doctors. According to the authors marriage can be a protective factor against depression as it can provide a source of emotional, social and financial support. However, there may be a

higher occurrence of work-life conflicts among married people or those who have a life partner. This could be related to working long hours, after hour shifts and weekends resulting in the individual missing family events and making their significant other feel neglected.[29]

No significant difference in the level of depressive symptoms was found between those with and those without children in our study. A study by Loosely et al.[30] found having children to put one at a lower risk of developing depression. In their study 10% of participants with children had a high risk of depression versus 23% of participants without children. According to the authors, having children could be a protective factor against depressive symptoms as it can potentially prevent the individual becoming more hardened and less compassionate and it may indicate that the individual has a good home support system.[30] However, similar to married participants, there could be considerable stress related to having to balance work-life challenges and this could overshadow the protective benefit that having children offers.

Studies have found that higher levels of experience and increasing age are associated with lower levels of depression and psychological issues.[31, 32] This has been assumed to be due to better coping mechanisms and possibly improved working environments for seniors.[31] However, there was no significant difference found in the level of depressive symptoms between junior and senior anaesthetists in our study. This could be as a result of including participants into the senior category who were in their fourth year of training as registrars. These registrars are preparing for their final exams and are given more clinical responsibilities and may therefore be experiencing more psychological distress.

The results of this study highlight the importance of the need to improve awareness and discussion around depression. Depression is associated with a number of adverse events and in order to reduce these it is necessary to ensure those who are at risk of or who are experiencing depressive symptoms receive support and appropriate treatment. However, this will not occur without reducing the stigma associated with depression. Individuals who are depressed are less likely to perform optimally at their jobs,[33] have a higher rate of drug errors, inadequately assessing patients prior to surgery,[34] and have impaired memory, concentration and cognitive skills.[35] As a result, patients may not be receiving treatment within a safe environment and are at a higher risk of adverse events. Depression is associated with suicide[12] which is a devastating consequence and affects the entire department.

Future studies could be done to identify the stressors within the department that predispose individuals to developing depressive symptoms so that these can be addressed before adverse events occur. Limitations of the study are that the results may not reflect the true level of the presence of depressive symptoms within the department as the participants may have been reluctant to answer the questionnaire truthfully. The study was also done contextually in the Department of Anaesthesiology at Wits and the results may not be generalisable to other departments.

**Conclusion**

The level of depressive symptoms in the Department of Anaesthesiology at Wits is 22.2% and this is double that of the general South African population. Significantly more females are depressed and the most commonly used coping mechanisms are talking to family, friends or a partner, exercise, and alcohol use. Only a small proportion (39.3%) of depressed participants seek help from a professional.

**Conflict of interest**

The authors declare that we have no financial or personal relationships which may have inappropriately influenced us in writing this paper.

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## Section 4: Proposal

# Depressive symptoms among anaesthetists in a department of anaesthesiology

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## 4.1 Introduction and problem statement

Depression is a prevalent mental health issue within the healthcare community, including among doctors. In a review article the prevalence was found to range from 20.9% to 43.2% among doctors (1). In a study done in 2010 by Rossouw et al. (2) it was shown that the rate of depression was three times higher for doctors in the Western Cape as compared to that within the general South African population. Differences in the incidence of depression have been found between gender (3), marital status (4), and those with and without children (5). Depression can be related to stress and burnout on a continuum where stress that is left untreated leads to burnout, and burnout that is left untreated will lead to depression (6). Factors causing stress need to be identified and addressed to help prevent the development of depression.

There are a number of different tools that can be used to screen for depression, some commonly used ones include the Patient Health Questionnaire 9 (PHQ-9) (7), the Beck Depression Inventory (8), and the Kessler Psychological Scale (9) . The PHQ-9 has been validated by a study involving 6000 participants (7). It consists of nine simple questions that do not take much time to complete and requires no special training to administer or interpret the results (10).

Depressed doctors are not always willing to seek help due to a number of factors. These include stigma associated with having depression (11), potential effects on future job prospects (12), and how others perceptions of them may be altered (13). Doctors may also be unwilling to miss work as it could place a greater burden on their colleagues and the long shifts also make it difficult to find an appropriate time to make appointments with psychologists(13). The barriers to seeking help for depression need to be identified, addressed, and solutions put in place to improve the treatment of depression.

Doctors work within a highly stressful environment and have to take the responsibility of other people’s lives into their hands (14). This stress, as well as having to prepare for exams, work long hours and balance work, family, and social commitments can place an added burden on individuals (3). Furthermore, these factors have been shown to increase the risk of individuals becoming depressed

(15). Given that many of these factors are often faced by anaesthetists there is a high potential for depression to be a prevalent issue within the department. Depressed individuals are more inclined to have suicidal thoughts (16) and anaesthetists have been shown to have higher rates of suicide as compared to other physicians (17).

Anaesthetists who are depressed have an inferior work performance (14) and are prone to making more medical errors thus compromising patient safety (18). Depression is also associated with substance abuse (12) and absenteeism from work, (14) resulting in reduced work productivity and a greater burden on colleagues (19).

A study by Bernburg et al. (20) conducted between 2011 and 2014 shows that anaesthetists have one of the highest rates of depressive symptoms among the medical specialties. In a letter to the editor of the Southern African Journal of Anaesthesia and Analgesia the importance of the need to improve the wellness of the doctors working within anaesthetia was highlighted after seven anaesthetists committed suicide over an 18 month period (21). It is possible that this number of suicides is only a small indication of the magnitude of the actual problem of the state of wellness within the anaesthetic departments (21) and it is therefore necessary to investigate the prevalence of depressive symptoms among anaesthetists in order for it to be addressed. The prevalence of depressive symptoms among anaesthetists in other countries has been studied (12, 20) but no studies from South Africa were identified.

There have been previous studies within the Department of Anaesthesiology at the University of the Witwatersrand (Wits) that have shown that 21% of anaesthetists have significant levels of burnout (22) and have higher levels of stress compared to the general population (23). The incidence of depressive symptoms among anaesthetists in the Department of Anaesthesiology at Wits is not known..

## 4.2 Aim and objectives

### 4.2.1 Aim

The aim of this study is to describe the prevalence of depressive symptoms among anaesthetists working in the Department of Anaesthesiology at Wits .

### 4.2.2 Objectives

The primary objectives of this study are to:

- describe the prevalence of depressive symptoms using the PHQ-9 questionnaire
- categorise the level of depressive symptoms according to the PHQ-9 questionnaire
- describe coping mechanisms for dealing with depressive symptoms.

The secondary objectives of this study are to compare the prevalence of depressive symptoms between:

- sex
- marital status
- anaesthetists with and without children
- junior and senior anaesthetists.

## 4.3 Research assumptions

The following definitions will be used in this study.

**Anaesthetist**: is any qualified doctor working in the Department of Anaesthesiology including medical officers, registrars and consultants**.**

**Medical officer:** is a qualified doctor practising in the Department of Anaesthesiology under specialist supervision**.** Medical officers with more than 10 years of experience are career medical officers and are regarded as consultants.

**Registrar:** is a qualified doctor who is registered with the Health Professions Council of South Africa as a trainee anaesthetist**.**

**Consultant:** is a specialist anaesthetist or career medical officer**.**

**Junior anaesthetist:** will be medical officers, and first, second or third year registrars.

**Senior anaesthetist:** will be registrars with four or more years of training or consultants.

**PHQ-9:** is a 9 item Likert scale questionnaire that can be used to screen, monitor and assess the degree of depression (7).

**Depressive symptoms present:** PHQ-9 score of 12 or more will be used as suggested in a study by Al-Ghafri et al. (24).

**Incomplete questionnaire:** when not every question of the PHQ-9 has been answered.

## 4.4 Demarcation of study field

The study will be conducted in the Department of Anaesthesiology, affiliated to the Faculty of Health Sciences at Wits. The staff complement of the department is 74 consultants, 112 registrars, and 22 medical officers. The following hospitals affiliated to the department will be included in this study:

- Charlotte Maxeke Johannesburg Academic.
- Chris Hani Baragwanath Hospital.
- Helen Joseph Hospital.
- Rahima Moosa Mother and Child Hospital.
- Wits Donald Gordon Medical Centre.

## 4.5 Ethical considerations

Approval to conduct the study will be obtained from the Human Research Ethics Committee (Medical) and the Graduate Studies Committee of Wits. Permission to distribute the questionnaires will be obtained from the head of the Department of Anaesthesiology (Appendix 1).

The study will be conducted by using a self-administered questionnaire (Appendix 2) that will be handed out at academic meetings. The study will be explained to the anaesthetists and they will be invited to take part. Those who agree to participate will receive an information letter (Appendix 3) and a questionnaire. Completion of the questionnaire will be voluntary. Consent will be implied by completing and returning the questionnaire.

Questionnaires will be completed anonymously and no identifying information will be on the questionnaire, only a study number will be assigned to the questionnaires. The completed questionnaires will be folded and placed into a sealed box at the exit of the meeting room upon completion. Only the researcher and supervisors will have access to the raw data thereby ensuring confidentiality. The raw data collected will be stored securely in a locked cupboard for six years after the study is completed.

The information letter will contain the contact details of the Department of Anaesthesiology Wellness Committee, South African Society of Anaesthesiologists (SASA), Lifeline, Medical Protection Society (MPS), the South African Depression and Anxiety Group, and a registered psychologist, Dr Christine Laidlaw (letter of agreement appendix 4) for any anaesthetist who feels they may need to seek help. Should a high prevalence of depressive symptoms be identified, the results will be communicated to the Head of Department and the Department of Anaesthesiology Wellness Committee.

The study will be conducted according to the principles of the Declaration of Helsinki (25) and the South African Guidelines for Good Clinical Practice (26).

## 4.6 Research methodology

### 4.6.1 Research design

A prospective, contextual, descriptive research design will be used in this study.

A prospective study is one in which the information is collected over a specific period of time and then the outcomes are measured after the collection of the

information is completed (27). This study is prospective as the data will first be collected and then the prevalence of depressive symptoms described.

A contextual study is one that looks at populations within their environment (28). This study will be conducted among anaesthetists within the Department of Anaesthesiology.

A descriptive study is one that describes the relevant characteristics of the study population as a means to find the answer to the proposed question and can assess the relationship between different variables in the study but does not try to ascertain if there is a cause-effect relationship (27). This study will describe the prevalence of depressive symptoms among anaesthetists.

### 4.6.2 Study population

The study population will consist of all anaesthetists working within the Department of Anaesthesiology.

### 4.6.3 Study sample

#### Sample size

The response rate will determine the sample size. The questionnaires will be given to the entire accessible population. The Department of Anaesthesiology currently consists of 208 anaesthetists. A minimum response rate of 60% (125) will be considered acceptable (29).

#### Sampling method

In this study a convenience sampling method will be used. Convenience sampling is the use of participants that are easily available to the researcher (27). All anaesthetists attending the academic meetings will be approached to take part in the study.

#### Inclusion and exclusion criteria

Anaesthetists working within the Department of Anaesthesiology will be included in the study.

The exclusion criteria of this study are:

- anaesthetists who refuse to take part in the study
- interns
- incomplete questionnaires

### 4.6.4 Data collection

#### Questionnaire development

The questionnaire consists of a demographic section, the PHQ-9, and coping mechanisms. The PHQ-9 will be the core of this study. The PHQ-9 is a validated questionnaire that was developed by Kroenke et al. (7) at Columbia University with an educational grant from Pfizer. The PHQ-9 is based on the fourth version of the Diagnostic and Statistic Manual of Mental Disorders (DSM-IV) criteria for depression (7), which has not been changed in the recently updated DSM V (30). The nine questions relate to loss of interest in usual activities, feeling sad, change in sleep patterns, increased fatigue, change in eating habits, loss of self-esteem, difficulty concentrating, restlessness or slowed speech or movements, and suicidal thoughts (10). The PHQ-9 was chosen as it is a short questionnaire, can be self-administered, and is free of charge (31). In the instruction manual it is stated “no permission is required to reproduce, translate, display or distribute” (32).

#### Data collection

The convenor of the meeting will be approached by the researcher and asked to address the meeting. Information about the questionnaire will be provided to the attendees at the academic meetings. The questionnaire (Appendix 2), together with an information letter (Appendix 3) will be handed out to those who are willing to participate. It will take approximately 10 minutes to complete the questionnaire. The researcher will be present during the time of completion of the questionnaires to answer any questions. The completed questionnaires will be folded and placed in a sealed box.

Data collected from the surveys will be captured by the researcher onto Microsoft Office Excel 2007 spread sheets for analysis.

### 4.6.5 Data analysis

Data will be analysed in consultation with a biostatistician using STATA version 15 (StatCorp, USA). Descriptive and inferential statistics will be used. Categorical data will be described using numbers and percentages. Comparisons between groups will be made using Fishers exact tests. A p value of <0.05 will be considered statistically significant.

## 4.7 Significance of the study

Brannigan and Beeton (21) have stated that it is important to understand that the ill health of one anaesthetist does not only affect that individual but also all those who work with them within the department. It is necessary that wellness programs are implemented and a greater emphasis is placed on the need to address and improve the wellness of everyone within the department (21). The authors are of the opinion there should be more of an emphasis on identifying and treating doctors who have depressive symptoms rather than only reacting when tragic events such as suicide have occurred. It is therefore important to know what the prevalence of depressive symptoms is in order to understand the magnitude and significance of the problem. The creation of awareness and open discussion of depression within the Department of Anaesthesiology could help to reduce the stigma attached and encourage a culture of appropriate treatment and possible prevention of adverse events such as suicide.

The Department of Anaesthesiology could assist in providing strategies to help anaesthetists to cope with depression or to implement programs to help reduce the level and incidence of depressive symptoms within the department. Some suggestions include setting up mentorship programs (33), encouraging open discussions among individuals who have suffered with depressive symptoms, and how they managed to cope with the symptoms in order to increase the awareness of depression and reduce the stigma (34). It could also be beneficial to encourage the anaesthetists within the department to have regular mental health check-ups (20).

The prevalence of depressive symptoms within the Department of Anaesthesia at Wits has not been studied before. By doing a study describing the prevalence of

depressive symptoms within the department, the importance of mental health among anaesthetists will be highlighted and the magnitude of the problem identified. Future studies can then be done to identify specific stressors within the department. Once identified, these stressors can be addressed and strategies implemented to alleviate the factors leading to depressive symptoms.

## 4.8 Validity and reliability of the study

Validity of a study refers to how the outcomes are a true representation of the characteristic being measured and reliability of a study refers to the consistency of the measure implemented (35).

Validity and reliability of the study will be ensured by:

- using the appropriate study design
- having a representative study sample
- using the validated PHQ-9 questionnaire
- completing the questionnaires anonymously
- the researcher being available to answer any questions
- analysing data in consultation with a biostatistician.

## 4.9 Potential limitations

The study will be carried out contextually within the Department of Anaesthesiology and the results may not be generalisable to other departments or institutions. Convenience sampling will be used and this may result in the sample not being representative of all the individuals within the department.

## 4.10 Project outline

### 4.10.1 Time frame

| Activity | July 2018 | Aug 2018 | Sept 2018 | Oct 2018 | Nov 2018 | Dec 2018 | Jan 2019 | Feb 2019 | Mar 2019 | Apr 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Proposal preparation | | | | | | | | | | |
| Literature review | | | | | | | | | | |
| Proposal submission | | | | | | | | | | |
| Ethics approval | | | | | | | | | | |
| Postgraduate approval | | | | | | | | | | |
| Data collection | | | | | | | | | | |
| Data analysis | | | | | | | | | | |
| Draft article | | | | | | | | | | |
| Submission | | | | | | | | | | |

### 4.10.2 Budget

| Item | Number of pages | Cost | Total |
|---|---|---|---|
| Printing | 1200 | R1/page | R1200 |
| Binding/printing completed report | 4 | 200 | R800 |
| Total | | | R2000 |

The Wits Department of Anaesthesiology will incur the costs of paper and printing.

## 4.11 References


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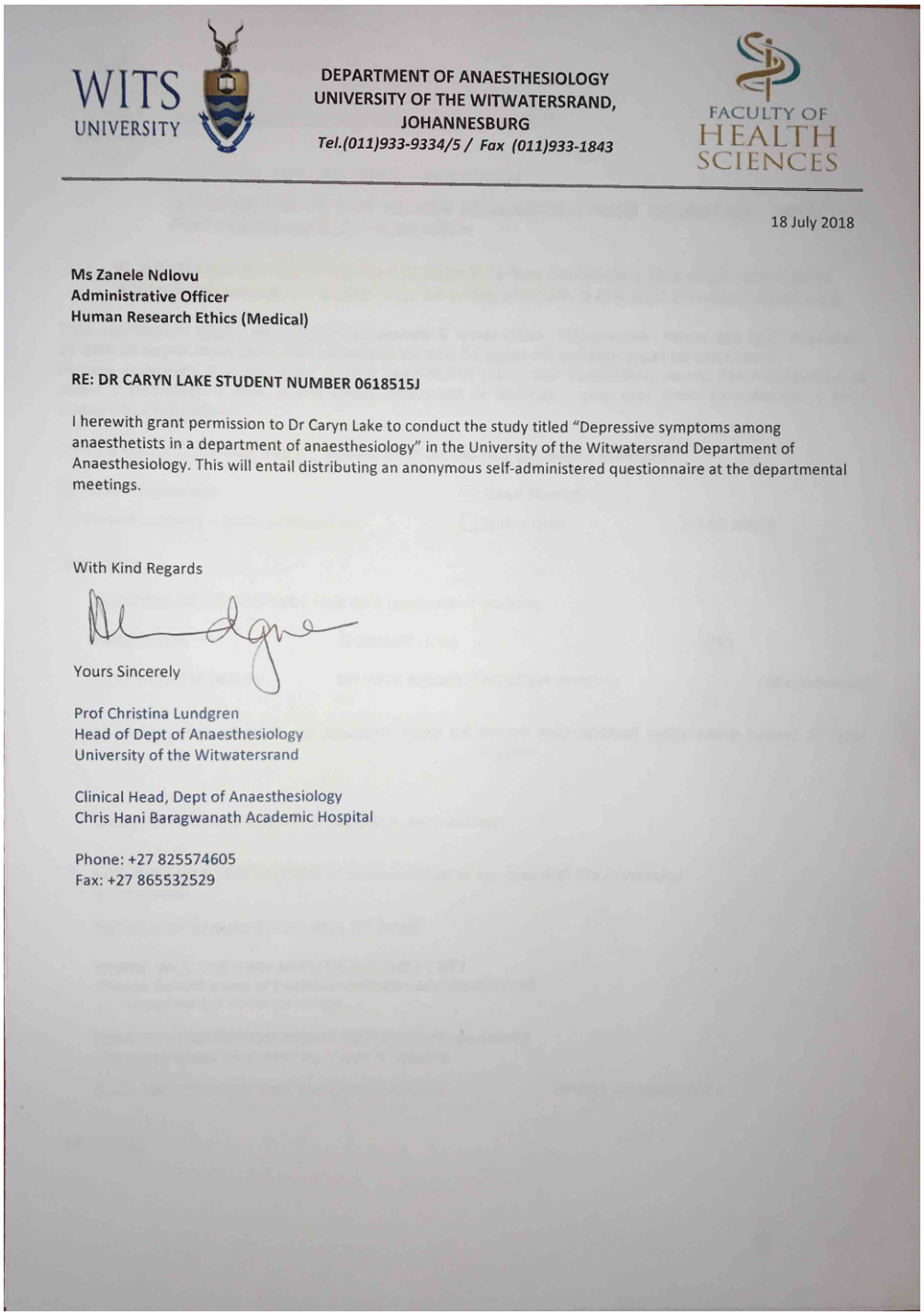
## 4.12 Appendices

### 4.12.1 Appendix 1: Head of Department of Anaesthesiology approval



WITS UNIVERSITY

DEPARTMENT OF ANAESTHESIOLOGY
UNIVERSITY OF THE WITWATERSRAND,
JOHANNESBURG
*Tel.(011)933-9334/5 / Fax (011)933-1843*

FACULTY OF HEALTH SCIENCES

18 July 2018

**Ms Zanele Ndlovu**
**Administrative Officer**
**Human Research Ethics (Medical)**

**RE: DR CARYN LAKE STUDENT NUMBER 0618515J**

I herewith grant permission to Dr Caryn Lake to conduct the study titled "Depressive symptoms among anaesthetists in a department of anaesthesiology" in the University of the Witwatersrand Department of Anaesthesiology. This will entail distributing an anonymous self-administered questionnaire at the departmental meetings.

With Kind Regards

Yours Sincerely

Prof Christina Lundgren
Head of Dept of Anaesthesiology
University of the Witwatersrand

Clinical Head, Dept of Anaesthesiology
Chris Hani Baragwanath Academic Hospital

Phone: +27 825574605
Fax: +27 865532529

### 4.12.2 Appendix 2: Questionnaire

## Depressive symptoms among anaesthetists in a department of anaesthesiology

Please mark the appropriate box with X.

**Section 1- Demographic information**

| **1.1 Sex** | |
|---|---|
| Male | |
| Female | |

| **1.2 Age** | |
|---|---|
| <30 years | |
| 31 – 40 years | |
| 41 – 50 years | |
| >50 years | |

| **1.3 Years of experience** | |
|---|---|
| <1 year | |
| 1 – 5 years | |
| 6 – 10 years | |
| >10 years | |

| **1.4 Designation** | |
|---|---|
| Medical officer | |
| 1st , 2nd, or 3rd year registrar | |
| 4th year registrar | |
| Consultant | |

| **1.5 Marital status** | |
|---|---|
| Single | |
| Married or life partner | |

| **1.6 Children** | |
|---|---|
| Yes | |
| No | |

| **1.7 Have you previously been diagnosed with a mental illness** | |
|---|---|
| Yes | |
| No | |

| **1.8 Are you within 6 months of writing your next exam** | |
|---|---|
| Yes | |
| No | |

| **1.9 Have you experienced any trauma or bereavement in the last 6 months?** | |
|---|---|
| Yes | |
| No | |

**Section 2- Patient Health Questionnaire-9**

Over the last two weeks, how often have you been bothered by any of the following problems? Please mark the appropriate box with an X.

| | Not at all | Several days | More than half the days | Nearly every day |
|---|---|---|---|---|
| 1.Little interest or pleasure in doing things | 0 | 1 | 2 | 3 |
| 2.Feeling down, depressed, or hopeless | 0 | 1 | 2 | 3 |
| 3.Trouble falling asleep, staying asleep, or sleeping too much | 0 | 1 | 2 | 3 |
| 4.Feeling tired or having little energy | 0 | 1 | 2 | 3 |
| 5.Poor appetite or overeating | 0 | 1 | 2 | 3 |
| 6.Feeling bad about yourself- or that you are a failure or have let yourself or your family down | 0 | 1 | 2 | 3 |
| 7.Trouble concentrating on things, such as reading the newspaper or watching television | 0 | 1 | 2 | 3 |
| 8. Moving or speaking so slowly that other people could have noticed. Or, the opposite - being so fidgety or restless that you have been moving around a lot more than usual | 0 | 1 | 2 | 3 |
| 9.Thoughts that you would be better off dead or of hurting yourself in some way | 0 | 1 | 2 | 3 |

| Score | Interpretation |
|---|---|
| 0 – 4 | Minimal depression |
| 5 – 9 | Mild depression |
| 10 – 14 | Moderate depression |
| 15 – 19 | Moderately severe depression |
| 20 – 27 | Severe depression |

**Section 3- Coping mechanisms**

If you do ever feel you have a low mood or are depressed, how do you cope with that feeling? (Mark with an X if yes)

| | |
|---|---|
| Drink alcohol | |
| Take recreational drugs | |
| Take medication for depression | |
| Talk to a partner | |
| Talk to other family or friends | |
| See a therapist | |
| Talk to a counsellor | |
| Exercise | |

Other

How would you suggest that the department can proceed to help you when you are experiencing depressive symptoms?

**Thank you for taking time to complete this questionnaire.**

### 4.12.3 Appendix 3: Information sheet

Dear colleague

My name is Caryn Lake, and I am a registrar within the Department of Anaesthesiology at Wits. I would like to invite you to participate in my MMed research titled “Depressive symptoms among anaesthetists in a department of anaesthetics”. The study is approved by the Human Research Committee (Medical) (Number M180803)

The aim of the study is to identify the presence of depressive symptoms within the Department of Anaesthesiology. It is important to highlight the prevalence of depressive symptoms in order to create greater awareness of depressive symptoms and to reduce the stigma associated with depressive symptoms. This will help to have a positive impact on the wellness of anaesthetists as well as the standard of health care services provided.

Participation in the study is voluntary. Consent will be implied by completing and returning the questionnaire. Information will remain confidential and anonymous as no personal details will be required on the questionnaire. Only the researcher and supervisors will have access to the raw data. There is no penalty for not participating in the study.

No incentives will be provided for completing the questionnaires. The questionnaire should not take longer than 10 minutes to complete. All questionnaires, whether completed or not, should please be returned and placed in the sealed box marked “return survey”.

This study does not offer any direct benefit to the participants but it may help to identify a potential problem within the Department of Anaesthesiology and lead to changes that can have a positive impact on those within the department.

Please ensure you understand the above information prior to completing the survey.

Your time is greatly appreciated. If you have any questions please to not hesitate to contact us:

Caryn Lake (Researcher): 0845544891

HREC (Medical) Chairperson: Prof Clement Penny

- 011 717 2301
- Clement.Penny@wits.ac.za

Administrator Officer: Human Research Ethics Committee (Medical):

- Tel: 011 717-1234/2656/2700
- Zanele.Ndlovu@wits.ac.za / Rhulani.Mkansi@wits.ac.za / Charmaine.Khumalo@wits.ac.za / Josh.Ndlangamandla@wits.ac.za

Yours Sincerely

Caryn Lake

Where to get help:

Lifeline: 0861 322 322

MPS members: 0800 982 766

The South African Depression and Anxiety Group: 011 234 4837 (08:00 to 20:00), 0800 567 567(emergency number)

Clinical Psychologist- Dr Christine Laidlaw 0794348444

SASA wellness counsellors:

Ms Natalie Zimmelman 082 331 7846

Dr Caroline Lee 082 777 2136

Dr Allan Hold 082 655 7792

Dr Bhavika Daya 083 787 1177

Dr Megan Jaworska 082 371 2382

Department of Anaesthesiology Wellness Committee

Dr Blaise Bayingana 072 226 9633

Dr Elizabeth Semenya 082 441 7574

Dr Lizil Gilliland 072 259 3971

Dr Paul Abrahams 083 600 6754

Dr Sameerah Mahommed 083 356 8462

Dr Saweda Cuthbert 072 409 1973

Dr Thenjiwe Hlongwane 084 684 3654

Dr Tracy Kallenbach 072 200 3676

Dr Tristan Leonard 083 863 5855

## 4.12.4 Appendix 4: Letter of agreement from clinical psychologist


DR CHRISTINE LAIDLAW

Clinical Psychologist (MA.ClinPsych, NMMU, *cum laude*, PhD, Unisa)

Practice No: 0451592
HPCSA: PS 011 2887
christinelaidlaw@gmail.com
079 434 8444


Dear Dr Lake

**RE: Research debriefing for participants**

This letter serves to confirm my willingness to provide debriefing sessions to any of your research participants should they be in need of it.

Should any of the participants in the Department of Anaesthesia at the University of Witwatersrand need to have a confidential session to discuss personal aspects or distress that may have come up during the questionnaire they are more than welcome to contact me.

Kind regards,


**Johannesburg** 279 Bryanston Drive, Sandton, 2191
**Pretoria** 866 Rubenstein Drive, Moreleta Park, 0181

# Section 5: Annexures

## 5.1 Ethics approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Dr C Lake et al

**HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)**
**CLEARANCE CERTIFICATE NO. M180803**

| | |
|---|---|
| **NAME: (Principal Investigator)** | Dr C Lake et al |
| **DEPARTMENT:** | School of Clinical Medicine<br>Department of Anaesthesiology<br>Charlotte Maxeke Johannesburg Academic Hospital |
| **PROJECT TITLE:** | Depressive symptoms among anaesthetists in a Department of Anaesthesiology |
| **DATE CONSIDERED:** | 31/08/2018 |
| **DECISION:** | Approved unconditionally |
| **CONDITIONS:** | |
| **SUPERVISOR:** | Professor J Scribante |
| **APPROVED BY:** | Dr CB Penny, Chairperson, HREC (Medical) |
| **DATE OF APPROVAL:** | 16/10/2018 |

**This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.**

**DECLARATION OF INVESTIGATORS**

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date of the meeting when the study was initially reviewed. In this case, the study was initially reviewed in **August** and will therefore reports and re-certification will be due early in the month of **August** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature _____ Date _____

**PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES**

## 5.2 Graduate studies approval

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

12 September 2018
Person No: 0618515J
PAG

Dr CM Lake
34 Elder Street
Fairland
Fairland
2195
South Africa

Dear Dr Caryn Lake

**Master of Medicine in Anaesthesia: Approval of Title**

We have pleasure in advising that your proposal entitled *Depressive symptoms among anaesthetists in a department of anaesthesiology* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

## 5.3 Turnitin report

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | FACULTY OF HEALTH SCIENCES

18th September, 2019

The Chairperson
Graduate Studies Committee
Faculty of Health Sciences
University of the Witwatersrand

Dear Madam,

Re: M Med: **Depressive symptoms among anaesthetists in a department of anaesthesiology**

Dr Caryn Lake, student number: 0618515J, has submitted her research report to Turnitin which revealed a similarity index of 14%. These similarities appear not to be plagiarism but mainly the use of common terminology and phrases specific to the topic of the research.

Yours sincerely,

Juan Scribante
Supervisor

1