



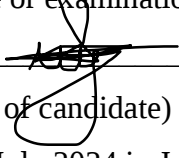
**BURNOUT AMONG OBSTETRICS AND GYNAECOLOGY
CONSULTANTS AND SENIOR MEDICAL OFFICERS AT
TEACHING HOSPITALS FOR THE UNIVERSITY OF THE
WITWATERSRAND IN THE TIME OF COVID-19**

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*A research report submitted to the faculty of Health Sciences, University of the
Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master of
Medicine.
Johannesburg, 2024*

Declaration

I, S'vuyile Manana, declare that this Research Report is my own, unaided work. It is being submitted for the Degree of Master of Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



(Signature of candidate)

09 day of July 2024 in Johannesburg.

To my Lord and Saviour, Jesus Christ, without whom this research report would not have
been possible.

To my Father, Bongani Mawethu Mayosi, who first showed me the way.

To my Husband, Ndumiso Manana, who supported me and kept me sane.

Thank You.

Abstract

Background: There is limited data regarding impact of the COVID-19 pandemic on the prevalence of burnout among consultants and senior medical officers in the department of Obstetrics and Gynaecology. There is an increasing prevalence of burnout among healthcare professionals and an increasing awareness regarding its risk factors and need for intervention. Understanding these risk factors could ensure better support for health care providers in future pandemics and outbreaks.

Objectives: To determine the prevalence of burnout among consultants and senior medical officers in the department of Obstetrics & Gynaecology during the COVID-19 pandemic. To identify the associated risk factors.

Methods: A quantitative, analytical cross-sectional study conducted by means of an electronic survey. A convenience sample was used of all consultants and senior medical officers (66) in all the teaching hospitals affiliated with the University of the Witwatersrand during the period April to May 2022. The Maslach Burnout Inventory was used to evaluate burnout. The domains included depersonalisation, emotional exhaustion and personal accomplishment.

Results: There was a 65% response rate. Fifty- two percent of the participants felt that their level of burnout was worsened by the COVID-19 pandemic. This feeling was significantly associated with a feeling of having a lack of personal protective equipment (PPE). Increased feelings of burnout were significantly associated with white race.

Conclusion: Burnout among consultants and senior medical officers was worsened by the COVID-19 pandemic. This finding was significantly associated with the feeling of lack of PPE. Therefore, providing adequate PPE in future for infection control practices can protect the mental health of healthcare workers.

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Abbreviations

MBI	Maslach Burnout Inventory
PPE	Personal Protective Equipment
SADAG	South African Depression and Anxiety Group
USA	United States of America
WHO	World Health Organization

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Introduction

Burnout is defined by the World Health Organization (WHO) as a syndrome characterised by feelings of low energy or exhaustion, feeling distant from one's work and having increased feelings of being negative or cynical, as well as decreased professional productivity.[1] It is not considered a medical condition. It is, however, considered to influence one's health, including the need to access health services. It refers, specifically, to occupation and does not apply to other areas of life, though it may have an impact on other areas of life.[1] The Maslach Burnout Inventory (MBI) is the leading instrument used to measure burnout.[2] The MBI measures burnout as defined by the WHO. It has been validated by extensive research that has been done over 35 years. The MBI addresses three scales: Emotional Exhaustion- "Measures feelings of being emotionally overextended and exhausted by one's work."

Depersonalisation- "measures of unfeeling and impersonal response toward patients."

Personal Accomplishment- "measures feelings of competence and successful achievement in one's work".[2]

In lower-middle income countries such as South Africa, health workers are at risk of burnout due to staff shortages. There are few Government hospitals leading to high patient volumes. Chris Hani Baragwanath Academic Hospital, for example, is a tertiary level, academic hospital that services at least 1.895 million people in the Soweto Township in Johannesburg. This can be a challenge, particularly at academic hospitals where a focus on teaching is required. The workforce tends to be strained and academia can be deprioritised as a result. The Obstetrics and Gynaecology specialists and trainees are under enormous pressure to meet both clinical and academic demands. There are not any studies found to date on the burnout rates of consultants and senior medical officers in the department of obstetrics and gynaecology in South Africa, during the COVID-19 pandemic. There are similar studies however in other parts of the world and in obstetrics and gynaecology registrars prior to the COVID-19 pandemic.

On the 11th of March 2020, the WHO declared SARS-COV-2 (COVID-19), a global pandemic.[3] At the time, Obstetrician- Gynaecologists lacked clear guidelines regarding how to adapt clinical care.[4,5] Obstetrician-Gynaecologists are already known to be at risk of burnout as patients tend to require complex emergency care that often needs to involve the specialist obstetrician- gynaecologist at the highest levels.[6] The objective of this study was

to determine the prevalence of burnout among Obstetrics & Gynaecology consultants and senior medical officers at Teaching Hospitals affiliated with the University of the Witwatersrand in the time of COVID-19 pandemic.

Methods

Data Collection

A quantitative, analytical cross-sectional study conducted by means of an anonymous electronic survey. A convenience sample was used of all consultants and senior medical officers in all the teaching hospitals affiliated with the University of the Witwatersrand during the period April to May 2022. Senior medical officers were defined as medical officers who have completed their four-year registrar training, who were functioning as consultants whilst awaiting graduation, preparing to write part 2 examinations for the Fellowship of the College of Obstetrics and Gynaecologists, or were completing their Master of Medicine required for graduation. The survey was circulated to a list of 66 consultants and senior medical officers provided by the different hospitals via email. The electronic survey had two sections, a demographic questionnaire section, including questions specific to the COVID-19 pandemic and the MBI questionnaire section. The survey was circulated anonymously, using Survey Monkey and responses were sent to the principal investigator.

Data Analysis

The Maslach Burnout Inventory is divided into three parts with use of a Likert scale for each category, reflected as percentages. For section A, the Emotional Exhaustion section, a score of 17 or less indicates low burnout, a score of 18-29 indicates moderate burnout, and a score of 30 or more indicates a high level of burnout. For Section B, the Depersonalisation section, a score of less than 5 indicates low burnout, a score of 6-11 indicates moderate burnout and a score of 12 or more indicates high burnout. For Section C, Personal Achievement, a score of 33 or less indicates low burnout, a score of 34-39 indicates moderate burnout, and a score of 40 or more indicates high levels of burnout. Both parts of the questionnaire were analysed with help of a statistician. The Fisher's Exact tests were used to determine the association between burnout category scores and socio-demographics variables. Data was inputted in excel and exported to SPSS version 2. Precision was verified using a 95% confidence interval, as well as p-value of (less than/equal to) 0.05.

Study Approval and Ethics

Ethics approval and permission to conduct the study was obtained prior to data collection.

The approval was provided by the University of the Witwatersrand Human Research Ethics Committee (Ref: M211197) and the Head of Clinical Medicine at the University of the Witwatersrand. An information sheet was emailed to each participant, which explained that commencing the survey meant that they consented to being a part of the study. Resources were provided to the participants regarding where help is available, such as the South African Depression and Anxiety Group (SADAG).

Results

Participant Demographics

Burnout data was obtained for 43 consultants and senior medical officers (65%). The majority of the participants were between the ages of 35-45 (49%) and nearly two-thirds were female (58%). Regarding ethnicity, 56% identified as Black, 19% as White, 5% as Coloured, 9% as Indian and 12% as other. There were 88% South African participants and 12% non-South African participants. Regarding marital status, two-thirds of participants were married (65%), 23% were single, 7% divorced and 5% in a long-term relationship. Most of the participants had children (74%) and 67% of the participants had children under the age of 18. A large proportion of the participants, 40%, had been practising as consultants and senior medical officers for less than 5 years; 35% for 5-10 years and 26% for more than 10 years. Fifty six percent of the participants worked more than 10 hours after hours a week and 95% of participants took work home to do after hours such as hospital administration. Of all the hospitals affiliated with the University of the Witwatersrand, 49% of participants came from Chris Hani Baragwanath Academic Hospital. Fifty eight percent of participants had social support in Johannesburg and 42% of participants did not. Pertaining to the COVID-19 pandemic, nearly half of participants had tested positive for COVID-19 at some stage (49%) and just over half had not (51%). Thirty seven percent of participants had a pre-existing medical condition, and 88% had no pre-existing psychiatric condition. A total of 7% of the participants had a psychiatric condition diagnosed during the COVID-19 pandemic. In total 81% of the participants had a family member test positive for COVID-19. Of the study participants, 65% admitted to thinking their level of burnout was influenced by the COVID19

pandemic and 51% felt that their level of burnout was worse than before the COVID-19 pandemic.

The prevalence of burnout among consultants and senior medical officers during the time of the COVID-19 pandemic in Obstetrics and Gynaecology

Figure 1 displays the MBI scores, broken down into the questionnaire's 3 subsections: Emotional Exhaustion, Depersonalisation and Personal Achievement. Just under half the participants (49%) experienced a low-level of burnout on the Emotional Exhaustion and Depersonalisation sections of the MBI. This was compared to only 7% of participants experiencing a low-level of burnout on the Personal Achievement section of the MBI. Roughly 40% of participants experienced a high level of burnout on the Emotional Exhaustion and Personal Achievement sections of the MBI, compared to only 19% experiencing high levels of burnout on the Depersonalisation sections. Two-thirds of participants experienced a medium level of burnout on the Personal Achievement section, one-third experienced a medium level of burnout on the Depersonalisation section, and only 7% experienced a medium level of burnout on the Emotional Exhaustion section (see Figure 1).

According to the original developers of the MBI, “a high score in the first two sections and a low score in the last section may indicate burnout”. According to this classification, only one participant in our sample would be classified as having burnout. However, 16 participants (37% of the sample) had a medium-high level of burnout on all three sections, and could be considered as having burnout.

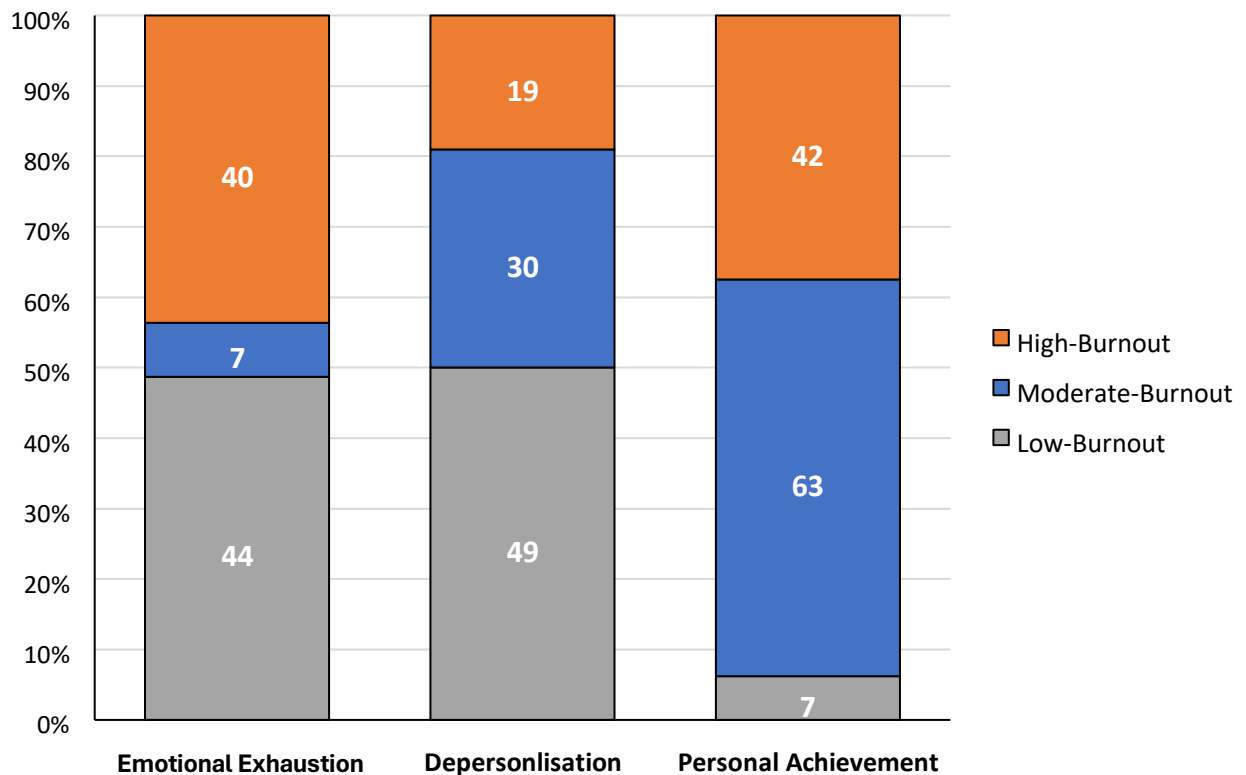


Figure 1: Maslach Burnout Inventory Scores

Risk factors of burnout

Fisher's Exact tests were used to determine the association between burnout category scores and socio-demographics variables (see Table 1). Ethnicity was significantly associated with the Emotional Exhaustion subsection ($p = 0.008$). Those with medium burnout on this section were least likely to be white, and those with high levels of burnout were most likely to be white. Having adequate PPE was significantly associated with the Emotional Exhaustion subsection ($p = 0.024$). Everyone with a high level of burnout felt they did not have adequate PPE. Believing that burnout was influenced by the COVID-19 pandemic was significantly associated with scores on the Depersonalisation subsection ($p = .013$). A higher proportion of those with a high level of burnout on Depersonalisation, felt that the level of burnout was influenced by the COVID-19 pandemic. Believing that burnout was influenced by the COVID-19 pandemic was significantly associated with scores on the Personal Achievement subsection ($p = .036$). A higher proportion of those with a low level of burnout on Personal Achievement, felt that the level of burnout was not influenced by the COVID-19 pandemic.

Table 1. Association between MBI scores and socio-demographic variables (p-values)

	Section A: Emotional Exhaustion	Section B: Depersonalisation	Section C: Personal Achievement	Overall MBI Score
Age (25-35, 36-45, 46-55, 56-65,>65 years)	.491	.087	.213	.692
Gender (male, female)	.361	.697	1.00	.755
Ethnicity (black, white, coloured, Indian, other)	.008*	.717	.241	.276
Nationality (South African, non-South African)	.552	.116	.092	1.00
Marital Status (single, married, divorced)	.904	.117	.860	.517
Children (yes, no)	.175	.868	1.00	.719
Children < 18 years (yes, no)	.609	1.00	.760	1.00
Number year in profession (<5, 5-10, >10 years)	.983	.559	.298	.923
Hours of afterhours work (<5, 5-10, >10 hours)	.773	.657	.166	.256
Take work home over weekend (yes, no)	1.00	1.00	.332	.522
Type of work over weekend	.405	.902	.951	.242
Performs RWOPS (yes, no)	.441	.547	.788	.755
Place of work	.179	.207	.196	.225
Social Support (yes, no)	.272	.697	.922	.348
Medical Condition (yes, no)	.785	.544	.381	.209
Psychiatric Condition				
Pre-existing	.434	1.00	.827	1.00
Diagnosed during COVID	1.00	.052	.789	1.00
Tested Positive COVID (yes, no)	.441	.547	.255	1.00
Severity COVID (mild, severe, not tested positive)	.684	.432	.328	1.00
Family/close Contact had COVID (yes, no)	1.00	1.00	.196	.443
Loss loved one due to COVID (yes, no)	.785	.248	.393	.752
Adequate PPE (yes, no)	.024*	.255	.588	.509
Trained to use PPE (yes, no)	1.00	1.00	.661	.133
COVID Vaccination (yes, no)	.087	.372	.581	1.00
Other contributing factors to burnout (yes, no)	.163	.057	1.00	.512
Level burnout influenced by COVID (yes, no)	.284	.013*	.036*	.110
Level burnout changed due to COVID (less, the same, worse than before pandemic)	.469	.462	.536	.532

Note. ^aCategories for this variable included: studying for higher degree, preparation for undergraduate training, own research, postgraduate supervision, postgraduate training, hospital administration. ^bCategories for this variable included: Charlotte Maxeke Academic Hospital, Chris Hani Baragwanath Academic Hospital, Rahima Moosa Mother and Child Academic Hospital, Klerksdorp Hospital, Sebokeng Hospital, and Edenvale Hospital.

* $p < .05$.

Has burnout improved, remained the same or worsened because of the COVID-19 pandemic? Majority of participants (65%) felt that the COVID-19 pandemic influenced their level of burnout (see Figure 2). Just over half (52%) of participants felt their level of burnout was worse after the pandemic and one-third felt it was the same. On the contrary, 19% felt their level of burnout was less after the pandemic (see Figure 3).

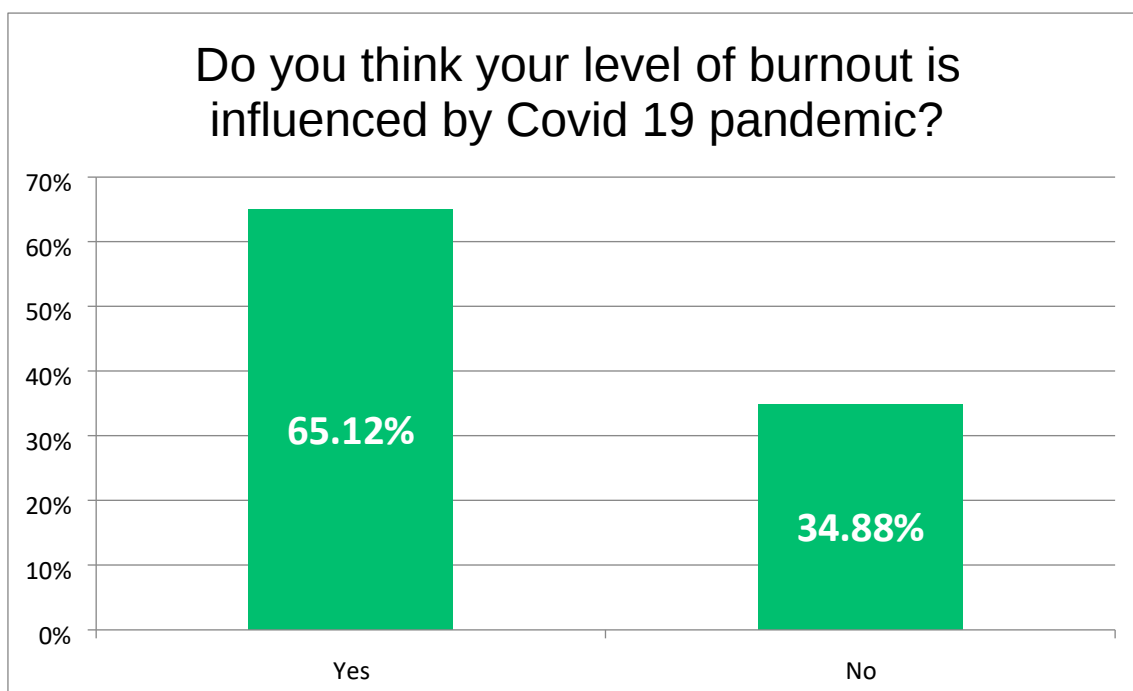


Figure 2. Perceptions of whether levels of burnout are influenced by the Covid-19 pandemic.

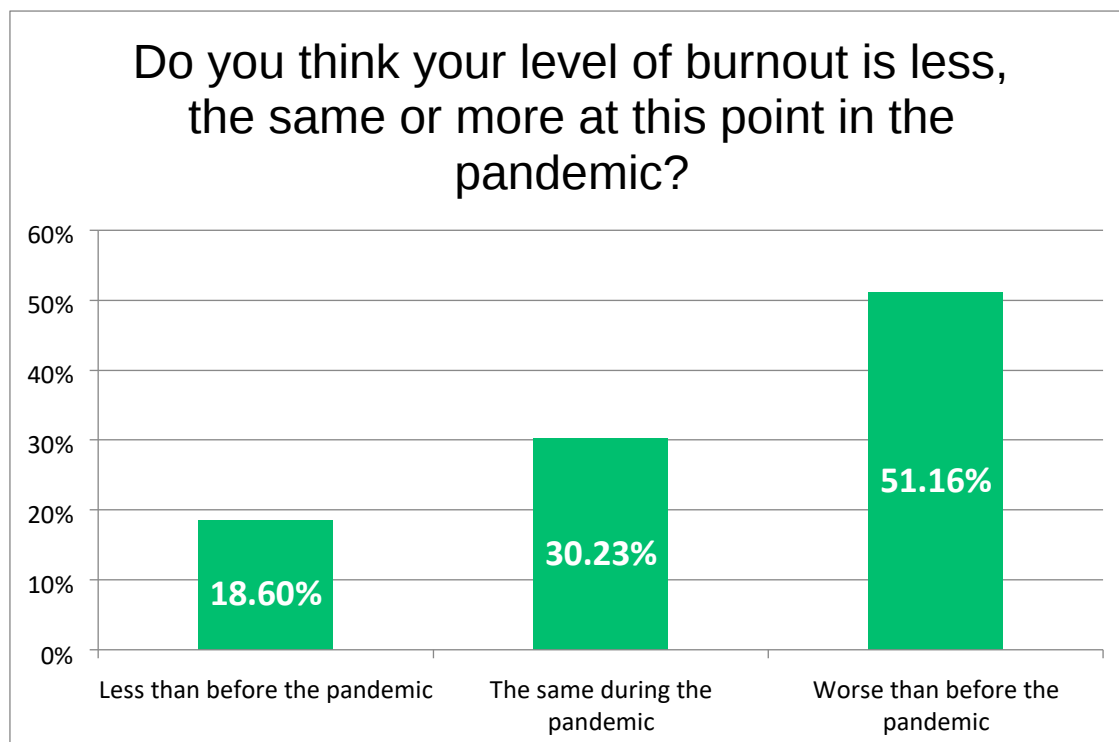


Figure 3. Levels of burnout during the pandemic.

Discussion

Since the COVID-19 pandemic, there have been a number of studies that have been published, looking into the frequency of burnout among health care professionals. There have been few studies particularly looking at obstetrician-gynaecologists. One such study was done by Iqbal, et al in Pakistan.[6] They used the Copenhagen Burnout Inventory, which looks at personal burnout, work-related burnout and client-related burnout and found that personal burnout was the highest 54%, followed by work-related burnout 49.7%, and client-related burnout was the lowest 37%. This showed that the dominant concern among obstetrician-gynaecologists during the pandemic was fear of transmission to family and friends, rather than patient care itself.[6] Inadequate provision of personal protective equipment (PPE) and COVID testing and increased mood irritability were found. Another study looking at the prevalence of burnout among obstetrician-gynaecologists in the USA by Riggan, et al, showed that policy changes, limited PPE availability, patient compliance with safety protocols and PPE use, staff shortages, and concerns about COVID-19 exposure were primary stressors related to the pandemic.[7] Participants felt that the pandemic had a negative impact on their relationships with patients and colleagues. Workplace and pandemic

stressors resulted in feelings of anxiety and frustration; physical effects were also reported. Some participants said that they were considering early retirement or leaving the profession as a result of the pandemic, which may suggest that obstetrician-gynaecologists are at increased risk for burnout. [7] This finding is comparable to the present study that shows that the inadequate provision of PPE was significantly associated with feelings of burnout. Another cross-sectional study by Jalil, et al looking at burnout among unspecified healthcare workers in university affiliated hospitals in Iran, found that 53% of participants experienced high levels of burnout [8]. The level of burnout in the three subscales varied based on the personal as well as work-related factors. Gender was the only variable that was associated with high levels of burnout in all three domains.[8] This is a contrast to the present study, which shows no significant association between gender and burnout. Amanullah, et al conducted a systematic review which showed that the introduction of COVID-19 has heightened existing challenges that physicians face such as increasing workload, which is directly correlated with increased burnout.[9] However, exposure to COVID-19 does not necessarily correlate with increased burnout and is an area for more research.[9] Results in our cohort were mixed, for example. Although 51% of the participants felt that their levels of burnout were worse than before the pandemic, 30% felt that they were just as burned out as before the pandemic and 18% felt that in fact their levels of burnout had decreased during the pandemic. Treyuler, et al, did a study in France during the COVID-19 pandemic among paediatric residents.[10] There was no association found between burnout and the exposure to the consequences of COVID-19. This may be related to the low incidence of severe COVID19 disease among patients. The hours worked per week and the anxiety scores, however, were significantly associated with burnout.[10]

In the present study, feelings of burnout were significantly associated with lack of PPE, which is comparable to the study by Iqbal, et al which reported similar findings (Table 1). Higher levels of burnout were also significantly associated with white race. Interestingly, gender was not associated with increased levels of burnout in this study as has been shown in others. Balie et al, which looked at registrars in the department of Obstetrics and Gynaecology, pre-pandemic, showed that female gender was significantly associated with the risk of emotional exhaustion in the burnout subtype.[11] This is similar to the abovementioned study by Jalil et al, that found that gender was the only variable that was associated with high levels of burnout in all three domains.[8] Age, number of children and additional workload after work did not seem to have an impact on the participants feelings of burnout. In the present study, 65% of the participants felt that their level of burnout has been

influenced by the COVID-19 pandemic (fig 2) and 51% of the participants felt that the level of burnout was worse than before the pandemic (fig 1). This is a contrast to Treyeler et al's study, which may indicate increased burden of disease and patient load in the South African context. In the present study, having a psychiatric condition diagnosed during the COVID-19 pandemic was associated with feelings of depersonalisation, although this finding was borderline statistically significant ($p=.052$). Participants also felt that there were other contributing factors to burnout that were otherwise not specified and this too was borderline statistically significant ($p=.057$). These findings suggest that a further inquiry is needed regarding the other risk factors that may be associated with burnout that are not specified in this study, including specific psychiatric illnesses.

Study Limitations

The study limitations include the small sample size, which restricts meaningful interpretation of the outcomes. Some of the participants may have been reluctant to participate because of the risk of being identified. There was a risk of recall bias as the questionnaire was sent out between April and May 2022 when the severity of the pandemic had subsided. There was also a risk of bias in feeling that the pandemic worsened burnout, as media coverage of the pandemic and perhaps colleagues and family may have repeatedly stressed how awful the pandemic was to medical staff. Qualitative data conveying the feelings of the participants may have aided interpretation of the quantitative data.

Conclusion

The problem of burnout among healthcare providers is well established. This problem has been shown to be exacerbated by the COVID-19 pandemic, in the specialist Obstetrician-Gynaecologist, that works in the hospitals affiliated with the University of the Witwatersrand. The importance of adequate personal protective equipment has been shown to be a risk factor for burnout in this study and therefore providing adequate PPE in future for infection control practices may protect the mental health of healthcare workers. More studies with larger cohorts are needed to better assess the risk factors for burnout and effective management protocols required, for employers to support their staff, fostering a healthy environment for both patient and clinician.

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Appendices

Appendix A: Maslach Burnout Inventory

Burnout Self-Test Maslach Burnout Inventory (MBI)

The Maslach Burnout Inventory (MBI) is the most commonly used tool to self-assess whether you might be at risk of burnout. To determine the risk of burnout, the MBI explores three components: exhaustion, depersonalization and personal achievement. While this tool may be useful, it must not be used as a scientific diagnostic technique, regardless of the results. The objective is simply to make you aware that anyone may be at risk of burnout.

For each question, indicate the score that corresponds to your response. Add up your score for each section and compare your results with the scoring results interpretation at the bottom of this document.

Questions	Never	A few times per year	Once a month	A few times per month	Once a week	A few times per week	Every day
SECTION A	0	1	2	3	4	5	6
I feel emotionally drained by my work.							
Working with people all day long requires a great deal of effort.							
I feel like my work is breaking me down.							
I feel frustrated by my work.							
I feel I work too hard at my job.							
It stresses me too much to work in direct contact with people.							
I feel like I'm at the end of my rope.							
Total score – SECTION A							

Questions	Never	A few times per year	Once a month	A few times per month	Once a week	A few times per week	Every day
SECTION B	0	1	2	3	4	5	6
I feel I look after certain patients/clients impersonally, as if they are objects.							
I feel tired when I get up in the morning and have to face another day at work.							
I have the impression that my patients/clients make me responsible for some of their problems.							
I am at the end of my patience at the end of my work day.							
I really don't care about what happens to some of my patients/clients.							
I have become more insensitive to people since I've been working.							
I'm afraid that this job is making me uncaring.							
Total score – SECTION B							

Questions	Never	A few times per year	Once a month	A few times per month	Once a week	A few times per week	Every day
SECTION C	0	1	2	3	4	5	6
I accomplish many worthwhile things in this job.							
I feel full of energy.							
I am easily able to understand what my patients/clients feel.							
I look after my patients'/clients' problems very effectively.							
In my work, I handle emotional problems very calmly.							
Through my work, I feel that I have a positive influence on people.							
I am easily able to create a relaxed atmosphere with my patients/clients.							
I feel refreshed when I have been close to my patients/clients at work.							
Total score – SECTION C							

SCORING RESULTS - INTERPRETATION

Section A: Burnout

Burnout (or depressive anxiety syndrome): Testifies to fatigue at the very idea of work, chronic fatigue, trouble sleeping, physical problems. For the MBI, as well as for most authors, "exhaustion would be the key component of the syndrome." Unlike depression, the problems disappear outside work.

- Total 17 or less: Low-level burnout
- Total between 18 and 29 inclusive: Moderate burnout
- Total over 30: High-level burnout

Section B: Depersonalization

"Depersonalization" (or loss of empathy): Rather a "dehumanization" in interpersonal relations. The notion of detachment is excessive, leading to cynicism with negative attitudes with regard to patients or colleagues, feeling of guilt, avoidance of social contacts and withdrawing into oneself. The professional blocks the empathy he can show to his patients and/or colleagues.

- Total 5 or less: Low-level burnout
- Total between 6 and 11 inclusive: Moderate burnout
- Total of 12 and greater: High-level burnout

Section C: Personal Achievement

The reduction of personal achievement: The individual assesses himself negatively, feels he is unable to move the situation forward. This component represents the demotivating effects of a difficult, repetitive situation leading to failure despite efforts. The person begins to doubt his genuine abilities to accomplish things. This aspect is a consequence of the first two.

- Total 33 or less: High-level burnout
- Total between 34 and 39 inclusive: Moderate burnout
- Total greater than 40: Low-level burnout

A high score in the first two sections and a low score in the last section may indicate burnout.

Appendix B: Ethics Clearance



R49 Dr S Manana

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL) CLEARANCE CERTIFICATE NO. M211197

NAME: Dr S Manana
(Principal Investigator)

DEPARTMENT: School of Clinical Medicine
Department of Obstetrics and Gynaecology
Medical School
University

PROJECT TITLE: Burnout amongst Obstetrics & Gynaecology consultants and Senior Medical Officers at teaching hospitals for the University of the Witwatersrand in the time of Covid-19

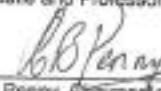
DATE CONSIDERED: 2021/11/26

DECISION: Approved unconditionally

CONDITIONS:

NOTE: If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>

SUPERVISOR: Dr G Bale and Professor H Lombard

APPROVED BY: 
Dr CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 2022/03/16

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and ONE COPY returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized 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 submit details 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 when the study was initially reviewed. In this case, the study was initially reviewed in November and therefore reports and re-certification will be due in the month of November each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).


Signature of Principal Investigator

2022/03/17
Date

Appendix C: Plagiarism Declaration



PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I, S'vuvile Manana (Student number: 549822) am a student registered for the degree of Masters of Medicine in the academic year 2024.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witw Text Effects like disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature:

A handwritten signature in black ink, appearing to be 'S'vuvile Manana', written over a horizontal line.

Date: 20/04/2024