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The Relationship Between Mental Distress and Somatization in Hospital-Based Health Care Workers in Gauteng During the COVID-19 Pandemic (2020)

Ramuedi, Ntsako Khosa

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UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

FACULTY OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

THE RELATIONSHIP BETWEEN MENTAL DISTRESS AND SOMATIZATION IN HOSPITAL BASED HEALTH CARE WORKERS IN GAUTENG DURING COVID-19 PANDEMIC IN 2020.

Name: Ntsako Khosa Ramuedi

Student no: 2485660

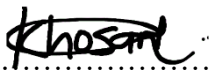
A Research Report submitted to the faculty of Health Sciences, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Epidemiology.

Supervisor: Dr Kerry Wilson, NIOH

Johannesburg, August 2023

DECLARATION

I Ntsako Khosa Ramuedi declare that this Research Report is my own unaided work. It is being submitted for the Degree of Master of Science in Epidemiology 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

10th day of August 2023 in PRETORIA ……

DEDICATION

I am dedicating this research report to the almighty God for granting me the strength to complete my master's degree. I am also dedicating it to my husband Takalani Ramuedi for the support throughout the journey, Tlangelani Loneck Makamu for encouraging to enrol for master's when I was no longer considering going back to school. Lastly I would also dedicate this degree to my supervisor Dr. Kerry Wilson for all the guidance and always channelling me to the right direction on the writing of my research report.

ABSTRACT

Background

Mental distress among Health Care Workers (HCWs) is an urgent health concern, and somatization is a known outcome of mental distress. The Covid-19 pandemic increased stress for HCWs globally due to working with Covid-19 patients and resource limitations. Although there was already a lot of mental distress in HCWs in prior years, the coronavirus pandemic made matters worse, with 45% of people reporting that the pandemic had a significant negative impact on their lives. Somatization can lead to increased use of health services, sick leave and poor health. Service delivery is also impacted negatively if the service providers are not well or are suffering from the mental distress and are also showing symptoms.

Aim

To identify if a relationship exists between mental distress and somatization symptoms in Gauteng hospital-based health care workers in 2020.

Objectives

1. To describe the prevalence of mental distress and somatization among health care workers by socio demographic status.
2. To identify the somatization symptoms associated with high GHQ-12 scores in health care workers during Covid-19.
3. To describe the association between mental distress and somatization among health care workers during covid-19 adjusting for demographic variables.

Methods

Health care workers can be described as anyone working in the health sector or at a health facility. All staff in the three selected hospital facilities in Johannesburg, were given the opportunity participate in the study. The PHQ-15 and GHQ-12 tools were used to collect information on HCWs somatization and mental distress after the first wave of the Covid-19 pandemic in South Africa. The anonymous questionnaire consisted of the two tools and demographic questions was used. The responses to each question on the tools were summed in order to determine severity of mental distress and somatization in HCWs, a higher score indicating more stress and or more somatization. Logistic regression was used to determine the adjusted relationship between somatization and mental distress.

Results

The study had a sample size of 295. A large proportion of participants (52%) reported suffering somatic symptoms. Males mean somatization score was significantly lower than the females. The majority (62%) of HCWs were troubled indicating a high burden of mental distress in the health care sector. The most commonly reported symptoms were back pain, headaches and being tired or low energy, all three were significantly associated with mental distress among others. There was a positive moderate correlation between PHQ-15 and GHQ-12 scores (0.30592) ($p < 0.0001$).

Logistic regression indicated somatization was significantly associated with mental distress with a significant OR 2.14 (p = 0.0029) adjusted for demographic factors in these workers.

Conclusions

There was a statistically significant positive relationship between somatization and poor mental health. Health care workers with mental distress may be at risk of somatization, particularly specific symptoms such as back pain, headache and having low energy. Females were more bothered by most of the somatoform symptoms as compared to their male counterparts. Support for health care worker's mental health is required as well as increased awareness of somatization linked to mental distress. Policies and services need to be developed to protect and support HCWs mental health during times of stress in the sector.

Keywords: Mental health, Covid-19, Health Care Workers, PHQ-15, GHQ-12

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I would like to thank my family, my husband, daughter, sister and parents for their faith in me and for supporting me. My study Supervisor Dr. Kerry Wilson for sharing her wisdom and offering herself as a guide on this journey. I would also like to thank the Health Care Workers who participated in the study.

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DEFINITIONS

Health Care Workers – can be described as anyone working in the health sector or at a health care facility.

Somatization – is the manifestation of psychological distress by the presentation of physical symptoms.

"Somatization is the tendency to experience psychological distress in the form of symptoms" **(Merriam-Webster dictionary, 2021).** Somatic symptoms are mainly associated with anxiety, stress disorders and depression.

General Health Questionnaire-12 – is a self-administered questionnaire designed to detect persons that are symptomatic or at risk of developing the common, non-psychotic mental health problems associated with depression, anxiety, somatic symptoms and social dysfunction **(Jackson, 2007)**

Patient Health Questionnaire-15 – is a self-administered somatic symptoms subscale, derived from the full Patient Health Questionnaire that is relatively brief, it screens for 15 somatic symptoms that account for more than 90% of the physical complaints **(Kroenke, 2003)**

Mental distress – is a major public health problem which includes anxiety, depression and somatic symptoms such as sleeping problems, fatigue and headache (Mboya et al. 2020).

Mental exhaustion – is a psychological state caused by prolonged periods of demanding cognitive activity shown to negatively influence physical performance (Russell et al. 2019)

Psychological distress – refers to non-specific symptoms of stress, anxiety and depression, and it is more common in women.

ABBREVIATIONS AND ACRONYMS

Covid-19 – Coronavirus disease 2019

GHQ-12 – General Health Questionnaire-12

GHQ-20 – General Health Questionnaire-20

GHQ-28 – General Health Questionnaire-28

GHQ-30 – General Health Questionnaire-30

GPS – Global Psychotrauma Screen

HCWs – Health Care Workers

ICUs – Intensive Care Units

ICTV – International Committee on Taxonomy of Viruses

MERS – Middle East Respiratory Syndrome

NHLS – National Health Laboratory Services

NICD – National Institute of Communicable Disease

PHQ-9 – Patient Health Questionnaire-9

PHQ-15 – Patient Health Questionnaire-15

PTSD – Post-Traumatic Stress Disorder

PSS – Posttraumatic Stress Symptoms

SA – South Africa

SARS – Severe Acute Respiratory Syndrome

SARS-Cov-2 – Severe Acute Respiratory Syndrome Coronavirus 2

WHO – World Health Organization

1. INTRODUCTION

1.1. Background

Following the 1918 flu pandemic, the unique human corona virus illness (Covid-19) became the fifth known pandemic. The first Covid-19 reports came from Wuhan, China, in late December 2019. The earliest date of recognized symptom onset was 1 December 2019 (Liu et al., 2020). The International Committee on Taxonomy of Viruses, gave coronavirus the name severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (ICTV) (Chen et al., 2020). The coronavirus disease 2019 (Covid-19) was an infectious disease which resulted in severe outcomes for a few such as death or prolonged ICU hospitalization. The pandemic affected every country and resulted in government measures to control spread to reduce pressure on health care systems.

The extent of the pandemic globally and locally, with data from the NICD According to the WHO (2022), there have been confirmed instances of Covid-19 in 651,918,402 people over the world as of December 23, 2022, with 6,656,601 deaths being recorded to the World Health Organization. Africa was among the last continents to be affected by Covid-19, which spread quickly around the world and reached every continent that was affected by the virus, with the first case of Covid-19 reported in Egypt on February 14, 2020, it had more than 34000 confirmed cases by the end of April (BBC coronavirus in Africa, 2020). The first Covid-19 case was reported in South Africa on March 5, 2020, and the country has one of the highest case incidences on the continent (Sekyere *et al*., 2022). As of 28 December 2022, the NICD reported total numbers of confirmed Covid-19 cases at 4,048,580 with 145 new Covid-19 cases in the previous 24 hours (NICD, 2022).

Although all workers were affected by Covid-19 some were particularly affected due to the nature of their jobs. According to Asnakew et al., (2021) some workers critically affected by the pandemic were essential services such as health care workers, food production, medical laboratory services and police. Some were exposed to Covid-19 and others were overwhelmed with work. Asnakew et al., (2021) further asserts that this may lead to burnout or stress which may in turn result in

mental health problems such as depression and anxiety. Many authors are in agreement that health care workers were under stress due to Covid-19 (The Lancet, 2020).

A general understanding of mental health is that it relates to one's psychological, emotional and social well-being, it is about how people think, feel, behave and how a person adjusts to normal stresses of everyday life (Johns, 2019). In the event of global public health concern such as covid-19; HCWs suffer increased exposure to physical and mental exhaustion caused by the hurt of losing patients and colleagues; the fear of infection for themselves and their loved ones; and work overload (Lancet, 2020; Søvold *et al.*,2021). With that said the enormous number of cases and deaths raise awareness of the challenging working conditions for HCWs. Frontline HCWs managing and diagnosing Covid-19 are under tremendous pressure, which leads to psychological stress. (Denning et al., 2021). According to Liu et al (2020) the prevalence of mental exhaustion was found to be more in intensive care units (ICUs) for both patients and nurses.

HCWs suffering from mental exhaustion or poor mental health may not be able to provide quality healthcare services, take more unnecessary risks, pay less attention to details and in the other way, exposure to unfavorable occurrences and awareness of poor quality care may worsen psychological distress.

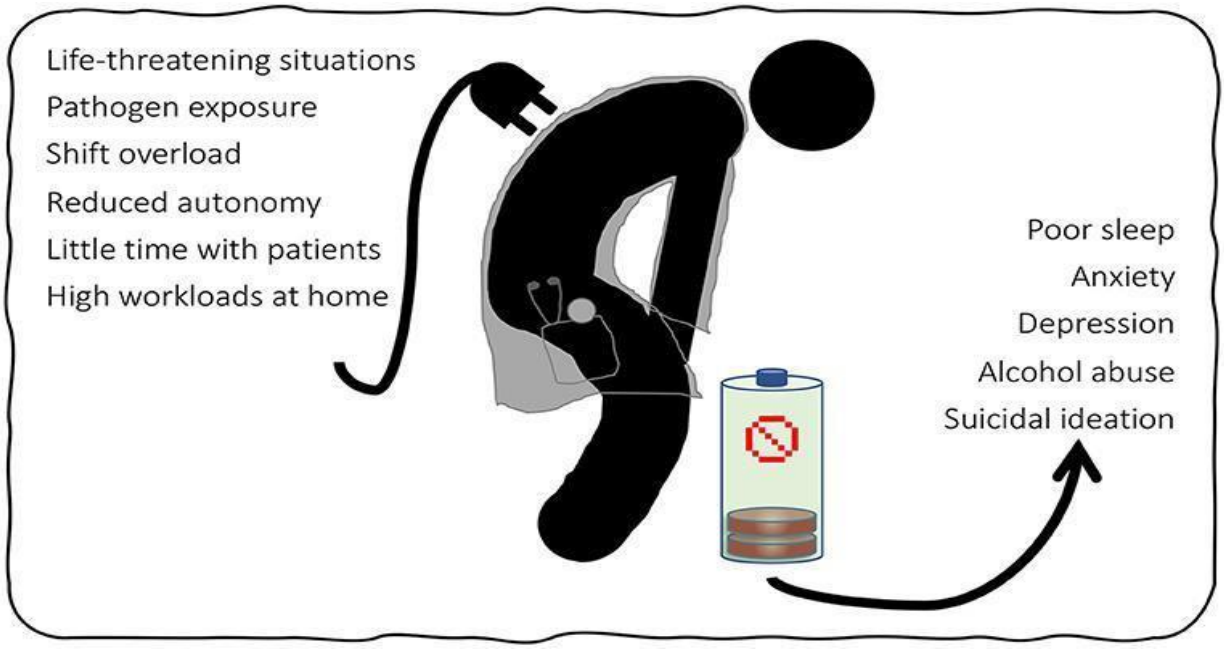


Figure 1. Covid-19, Mental health and its consequences (Leo *et al.,* 2021)

1.2 Literature review

1.2.1. Covid-19 and mental health/psychological distress in general

Towards the end of 2019, Wuhan, China, experienced the emergence of a novel coronavirus illness pandemic, which has since spread quickly throughout the world. WHO declared a public health emergency of international concern on Jan 30, 2020. The Covid-19 has had a significant global influence and is still evolving. According to a scientific brief released by the World Health Organization (WHO) on the 2nd of March 2022, it is reported that Covid-19 pandemic triggered 25% increase in prevalence of anxiety and depression worldwide. The pandemic has had various effects on the global population, more especially the health care workers and people having other diseases (Bhat et al., 2022)

1.2.2. The impact of Covid-19 on mental health in South Africa (SA)

Since the first positive test in March 2020, Covid-19 has become part of everyday life in South Africa. SA, as compared with other developed and developing countries has improved legislations around mental health and the provision of mental health services (Nguse and Wassenaar 2021). According to Kim *et al.,* (2020), mental health is significantly impacted by Covid-19. and health care workers are part of the people affected mentally by Covid-19. In a study conducted in Soweto, Gauteng province, there was a huge impact of Covid-19 in adults with traumatic childhood experiences and they were also at high risk of contracting Covid-19 (Pillay & Barnes, 2020). According to the South African College of Applied Psychology (2018), their data indicated that one in six (16%) of South Africans suffered from anxiety, and depression during Covid-19. In addition, the study done in South Africa by the Human Sciences Research Council (2020), 33% of the general population were depressed, 45% were fearful and 29% encountered loneliness at the time of the first lockdown.

Prior to the Covid-19 pandemic clinical health care workers in South Africa had been shown to suffer from mental health issues. Data for SA in 2010 showed of the 132 primary care doctors in Western Cape province studied, 27% reported moderate depression and 3% presented severe

depression (Rossouw *et al*., 2013). In addition, Govender *et al.,* (2012) indicates that in the North West province from 167 doctors, 51% of doctors were found to be stressed and 27% were highly stressed. This indicates health care work in South Africa may be stressful.

1.2.3. Covid-19 is having a destructive impact on health-care workers' mental well-being

Health care workers are praised as heroes for their dedication and tenacity in delivering patient care throughout the COVID-19 pandemic. Being a frontline worker however, comes with a price. According to Vanhaecht *et al.,* (2020) when compared to before Covid-19, the signs of poor mental health worsened. For example, during Covid-19, 57.5% of respondents gave a score of 7 or higher for feeling pressured, compared to 25.1% under normal conditions, while the equivalent percentages for doubting knowledge and skills were 23.4 and 10.0%, respectively (Dewey *et al*., 2020). There is evidence to support that there is an association of Covid-19 correlations with poor mental health symptoms were substantial across all age groups, genders, occupations, and care sectors, whereas relationships with favorable symptoms were only significant in a subset of these groups. (Kim et al., 2020).

Zhang et al. (2020) further asserts that Covid-19 pandemic has had severe impact on health care professionals negatively, decreasing productivity at work due to the amount of stress experienced, the uncertainty around contracting Covid-19, and the risk of dying from the virus. Furthermore, they indicate that, in the course of the outbreak of Covid-19 in China, over 33% of health care workers experienced symptoms of insomnia for at least 6 days since the emergence of Covid-19. Starting from the "29th January to 3rd February 2020, the prevalence rates of distress symptoms such as: depression, anxiety and insomnia were 71.5%, 50.4%, 44.6% respectively" (Lai et al., 2020).

According to Dewey *et al*., 2020, some of the recommendations state that organizations must provide a clear message to health care workers that they are valued and that managing the pandemic together is the ultimate goal and organizations should use the Covid-19 pandemic as an opportunity to create focused plans to reduce the main stresses that affect the mental health of health care professionals even under normal circumstances.

1.2.4. Results of the Coronavirus Disease 2019 (COVID-19) Pandemic in Italy on the mental health of front- and second-line healthcare workers.

The Global Psychotrauma Screen (GPS) Italian version was used to measure Posttraumatic Stress Symptoms (PTSS), symptoms of sadness, anxiety, sleeplessness, and perceived stress, as well as the 9-item Patient Health Questionnaire (PHQ-9) in 681 individuals (49.38%) of the 1379 health care employees who completed the questionnaire had signs of PTSS; There were 114 (8.27%) cases of sleeplessness, 341 (24.73%) cases of depression, 273 (19.80%) cases of anxiety, and 302 (21.90%) cases of highly felt stress (Rossi *et al*., 2020). Multivariable logistic regression was used to evaluate the results and it confirmed that health care workers have mental health issues. These findings call for additional surveillance and targeted interventions for HCWs during the Covid-19 pandemic in order to prevent long-term disability caused by mental health issues.

The front-line employees in the health care industry appear to be the most vulnerable (e.g., doctors and nurses). Research demonstrates that this strain increases the risk of psychological discomfort for them. According to research, they are more likely to experience psychological pain as a result of the Covid-19 crisis. Doctors and the healthcare sector as a general are under increased stress as a result of the Covid-19 problem (Galbraith et al., 2021). Moreover, Rossi et al. (2020) reinforced the idea that nurses are handling additional heightened sources of stress while they deal with Covid-19, which has an impact on their mental health.

1.2.5. The Mental Health of doctors during the Covid-19 pandemic.

According to Galbraith et al., (2021), the Covid-19 crisis puts additional strain on medical professionals, nurses, and the healthcare system as a whole. Research demonstrates that this pressure increases medical professionals' risk of psychological distress. in Europe. Hassan et al., (2009) further adds that, for doctors, nurses, and other medical professionals, such pressure increases the risk of psychological distress and raises the amount of work stress. The availability of training and equipment during pandemics, competent leadership, and management support for HCWs and their families are all factors that healthcare professionals hold in high regard as being

extremely protective against adverse psychological effects. In their argument, the authors urge initiatives to lessen stigmatization of with mental illness in clinical settings as well as strong leadership and support from the government and top healthcare executives for doctors and their families during the Covid-19 pandemic. According to Hassan *et al.*, (2009) Since they fear stigma and wish to avoid having their career prospects impacted, many professionals find it difficult to disclose to their coworkers or employers that they are experiencing mental health issues.

1.2.6. Mental health in HCWs studies from previous pandemics e.g. SARS and MERS and even HIV

Three coronavirus epidemics, including Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Disease (MERS), and Covid-19, have occurred since the beginning of the twenty-first century. According to Fan *et al.,* (2020), During the SARS and MERS-related coronavirus outbreaks, there were respective pooled incidences of depression of 19.4% and PTSD of 26.8%. However, during the covid-19 period, the overall prevalence of depression was slightly greater at 27.0%. Research revealed that both HCWs and the general public experienced mental health conditions, such as PTSD during SARS (Kwek *et al.*, 2006; Lee *et al*., 2019; Maunder *et al*., 2003). Furthermore, during the SARS and MERS epidemics, persons who were isolated at home were also more likely to experience mental health issues. (Jeong *et al*., 2016; Hawry *et al*., 2004; Kim *et al.*, 2019).

1.2.7. Mental health and somatization/physical symptoms of stress

Experiencing somatization can cause people to seek excess medical help and cause frustration to affect their daily lives. Presenting with somatic symptoms as physical symptoms can also delay or reduce treatment for anxiety and depression. According to Han *et al.,* (2009) the General Health Questionnaire 12 (GHQ-12) and Patient Health Questionnaire (PHQ-15) are used to check depression and somatic symptoms respectively. The PHQ-15 score ranges from 0 to 30 and scores of equal or less than 5 represent mild, between 5 and 10 is moderate, equal to or greater than 15 indicates severe somatization. According to Kroenke *et al* (2010) higher PHQ-15 score is associated with worsening quality of life and increased depression

1.2.8. Mental health and somatization/physical symptoms in HCWs

Mental Health America (MHA) conducted a survey from June to September 2020, this was done to better understand the experiences of healthcare professionals during Covid-19 and to provide resources to assist their mental health as they continue to deliver care. Health care workers with psychological distress may be at risk of somatization. This can affect the work performance and increase the health care utilization (use of health care services). Somatization can also result in increased use of sick leave, which can in turn result in a negative impact on productivity at a work place. Systemic problems and their effects on the mental health of HCWs lead to persistently high levels of stress, worry, and exhaustion, which could affect their productivity negatively, make mistakes more likely, and increase their risk of burnout and disease (Gray *et al*., 2019). The lack of money, personnel, and necessary facilities, as well as the sizeable population of patients suffering from Human Immunodeficiency Virus (HIV), Tuberculosis, malnutrition, and diabetes, placed the South African health care system under significant strain even before the Covid-19 outbreak. (George, Quinian, Readon, Aguilera, 2012).

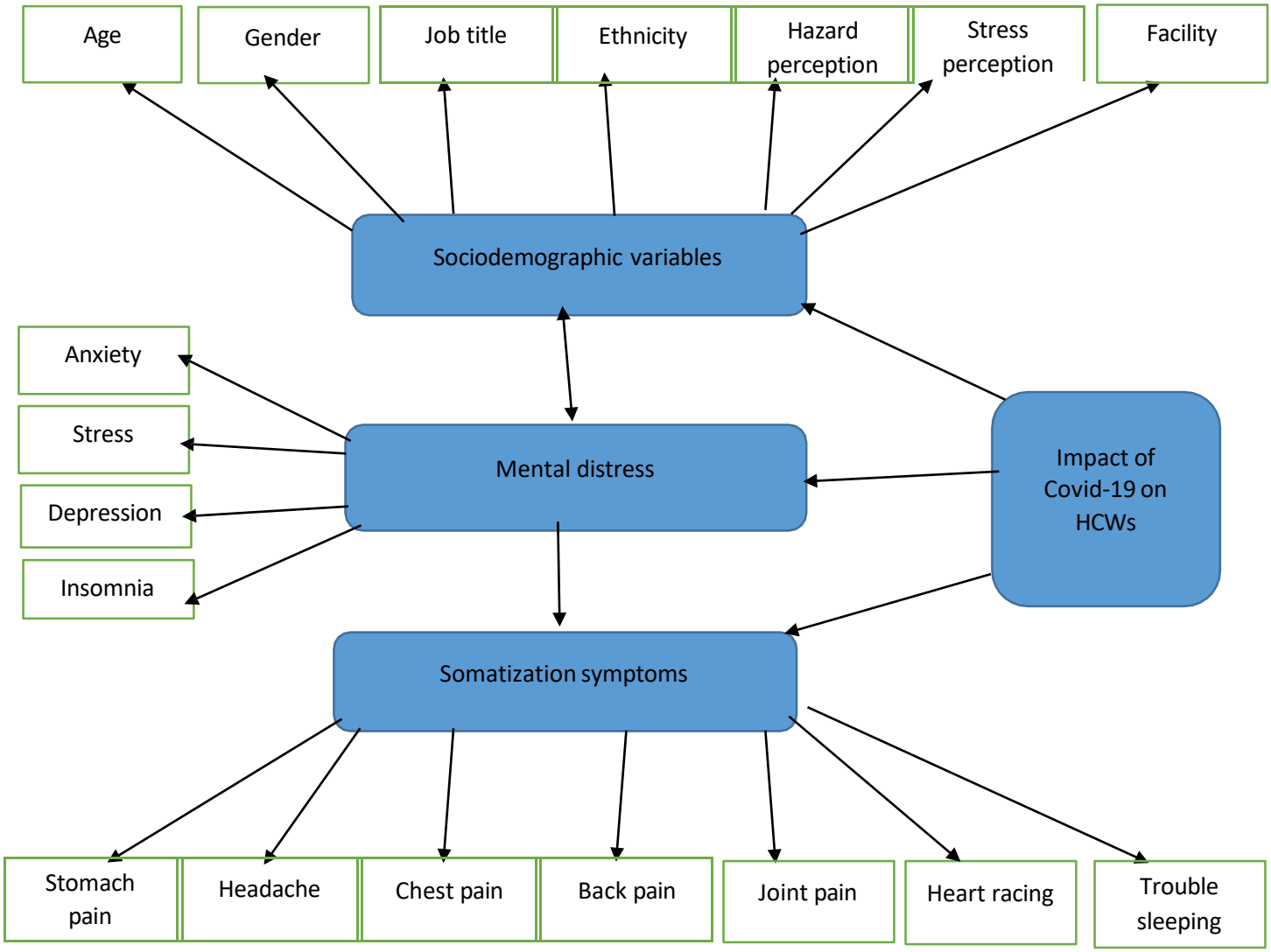
1.2.9. The GHQ-12 and PHQ-15 it's validation and use of the tools

To identify mental health problems without a professional diagnosis the 12 item General Health Questionnaire (GHQ-12) is used for self-reported screening in many languages and different groups. (Liang et al., 2016). The GHQ was developed by British scholar Goldberg in the 1970s as a screening tool for common psychiatric conditions and the questionnaire originally consisted of 60 questions but currently there are shortened versions of the questionnaire such as the GHQ-30, GHQ-28, the GHQ-20 and lastly the GHQ-12 it was validated in different groups such as the French and Swedish (Anjara *et al.*, 2016). The 12 item version was developed in 1972, it is scored using four indices, with the bi-modal (0-0-1-1) and Likert scoring systems being the two most used scoring kinds (0-1-2-3) (Lesage *et al*., 2011). The scale describes whether the participant has any symptoms or behaviors related to mental stress or mental health issues. Responses from the participants on the GHQ-12 are categorized based on a 4-point scale using the Likert scoring

method of 0 to 3 in order to check the extent of mental stress reported. Liang *et al* (2016) and Anjara *et al* (2020) both support Likert scoring for GHQ-12 results**.**

From the reviewed literature, particular sources for healthcare personnel concerns about the Covid19 epidemic were raised, including: access to personal protective equipment (PPE); spreading Covid-19 to family members; inability to meet other obligations, such as those to one's family and friends, as demands from work grow; restricted access to modern communications and information; and insufficient staffing and long working hours as a result of the epidemic's increased workload. Moreover, methods for coping with Covid-19's psychosocial impacts were given. According to Sasaki et al. (2020), more thorough deployment of workplace measures in response to Covid-19 lowers psychological distress among employees while maintaining job performance. Galbraith *et al.,* (2020) supports that help-seeking behaviour and attitudes may be improved by workplace interventions that minimize stigma associated with mental illness and encourage sharing and support among co-workers who are experiencing psychological issues.

1.2.10. Conceptual Framework



1.2.11 Problem statement

The Covid-19 pandemic is presenting pressure and psychological challenges globally to health care workers (Albott, 2020). Nurses and clinicians represent most of the providers of health care systems (Jamali & Ayatollahi, 2015), and their poor mental distress can result in a compromised quality of care offered along with a decrease in patients' satisfaction. For health care workers to keep delivering good quality care they must be healthy both mentally and physically. Health care workers are significantly impacted by the Covid-19 pandemic physically and when it comes to

their mental health. There is little research done on mental di stress and somatization among health care workers during Covid-19 pandemic in South Africa. The aftermath of Covid-19 pandemic may not only cause health care workers to suffer physical consequences of the virus but also result in mental stress and amongst health care workers. Somatization can cost the health care system money as the mental health nature of the complaints is not realized.

1.2.12 Justification

Mental health is well known to be associated with physical symptoms. Some people can present with somatic symptoms but not be aware that they need mental health support, so the use of GHQ12 and PHQ-15 will assist in identifying if more support is needed in public health institutions before the situation becomes severe. This study aims to close the gap by exploring the relationship between mental stress and somatization using the GHQ-12 and PHQ-15 respectively in hospital based health care workers during the Covid-19 pandemic. The two tools used with health care that workers can quantify the burden of mental stress and indicate where support may be needed. Being able to verify mental stress from the somatization presented by the health care workers, will assist in minimizing high risk of mental health and the burden on health care because if support is provided to deal with stress before it becomes severe the consequences can be minimized. The mental health impact of Covid-19 is recognized across the globe, Heale and Wray (2020) suggest that in response to COVID-19, there is a need for support, care, awareness, and financial investment in mental health for healthcare professionals.

1.2.13 Research question

What is the relationship between mental distress and somatization in health care workers in Gauteng during Covid-19 in 2020?

1.2.14. Aim

To identify if a relationship exists between mental distress and somatization symptoms in Gauteng hospital-based health care workers in 2020.

1.2.15. Objectives

1. To describe the prevalence of mental distress and somatization among health care workers by socio demographic status.

2. To identify the somatization symptoms associated with high GHQ-12 scores in health care workers during Covid-19.

3. To describe the association between mental distress and somatization among health care workers during covid-19 adjusting for demographic variables.

2. METHODS

Introduction to the chapter

This chapter presents a summary of the research methodologies employed in the study. It provides information on the study's participants, including their identities and the sampling methods used, as well as the requirements for inclusion in the study.

2.1. Description of the primary study

The primary cross-sectional study aimed to describe and investigate mental stress in Gauteng Health Care Workers during the COVID-19 pandemic, and use the study to identify areas for intervention within the resource constraints of the South African Public Health Service.

2.1.1. Objectives of the primary study

- To describe mental distress of selected HCWs in selected hospitals, community health centers and clinics in Johannesburg during the Covid-19 pandemic.
- To determine the predictors of mental stress in HCWs.
- To describe the knowledge, attitudes, perceptions and behavior of the selected staff towards Covid-19 and its prevention.
- To provide simple interventions to help manage or reduce stress.

2.1.2. Primary study sites

Selected public hospitals, CHC’s and clinics in Gauteng in 2020.

2.1.3. Primary study population

For the study, the broader definition of health care workers was used. This was defined as anyone who works in a health care facility. All staff of the selected facilities were invited to participate, irrespective of their job description.

2.1.4 Sampling Technique

The primary study used convenience sampling with wellness coordinators in each facility providing the questionnaire to a selection of staff, it focused on a range of health care facilities, both clinics and hospitals and the current study will take the entire hospital sample and leave out the clinics and CHCs.

This study

2.2. Study design

This is a secondary data analysis study, the data that will be analyzed comes from a primary cross-sectional study that was conducted in Gauteng public health care facilities in 2020 by the National Institute for Occupational Health.

2.3. Study setting

This study was based in South Africa, in the Gauteng province. This study included all consenting participants from all hospital units in Bheki Mlangeni district hospital, Rahima Moosa mother and child hospital, and Helen Joseph hospital. These are all large public facilities offering specialized care and thus will have similar jobs and working conditions.

2.4. Study population

All male and female workers employed in public hospitals and who participated in the primary study with complete data were the study population for this analysis. All consenting workers both clinical and non-clinical from the selected facilities above 18 years of age were included.

2.5. Sampling Technique

The primary study used convenience sampling, it focused on a range of health care facilities, both clinics and hospitals and the current study will take the entire hospital sample and leave out the clinics and CHCs. Everyone who was enrolled at the selected hospitals in the primary study will be included for this secondary analysis, the primary study had over 700 responses. All participating staff from the selected facilities will be included. Post hoc power calculation was be done to determine the power to detect specified outcomes. A power calculation was calculated to ensure there is sufficient power on the sample size. Power calculation, with prevalence of 42% distressed and an error of 5% the sample size 295 gave a power of greater than 90%. Any participant missing 50% or more of their responses for the two tools used will be excluded from the study.

2.6. Data collection

Data was collected during the primary study in selected health care facilities using a paper self-completed questionnaire and which was collected and then captured into a Redcap database at the NIOH to ensure confidentiality. Data was collected from August to October 2020. The questionnaire collected socio-demographic information as well as the responses to the GHQ-12 and PHQ-15 a question on stress perception and one on workplace hazard perception were also asked. For this analysis data will be exported from the REDCap software as a CSV file and imported into STATA for analysis. The data available from the GHQ12 and PHQ15 and demographic information was used in this analysis.

2.7. Limitations

There is no baseline information available on the mental stress of health care workers in Gauteng public health facilities prior to the Covid-19 pandemic. Thus it is not known for sure if they developed mental stress in 2020 or they suffered from mental stress before the pandemic. Secondly no information about the family mental history or stressors was collected, this was omitted to avoid stigmatizing mental health as the participant's problem. The sampling method (convenience sampling) used for the primary study is a limitation because the population studied might not be

representative of the whole of Gauteng health care workers. Causal associations between mental distress and somatization cannot be determined using cross sectional study design. Non response is anticipated amongst those who experience mental distress and somatization because not all people want to share how they feel with other people, more especially health care workers since they feel that they are the ones who should be helping people with mental distress.

2.8. Data management and analysis

Permission to access the data to be analyzed was obtained from the NIOH custodian of the data. Data obtained was described, checked for missing values that were present in the data provided. Imputation was used for incomplete GHQ12 and PHQ15 questionnaires, a mean value was imputed for all missing values, for example for each column a missing value was replaced with a mean value. A key assumption that needed to be met before multiple imputation can be done is that data is missing at random. For the variables where 50% of responses were missing from either tool that observation was dropped from the analysis. The total score for each tool was calculated by adding the numbers for each response together. A binary variable based on the GHQ-12 score was created and coded 0 1 based on the cut off of 16 as recommended in the literature for high GHQ score (Govender *et al.,* 2012). GHQ12 scoring (0,1) was used. The responses to each question were summed in order to determine the severity of mental stress, a higher score indicated more stress. A similar process was followed to calculate the PHQ-15 score where the Likert coding was added for each question to provide a total score.

2.9. Study variables

Demographic data

Age – continuous

Gender – Binary

Job title – Groups

Facility – Groups

Ethnicity – Groups

Exposure variables

PHQ-15 – Groups

Outcome variable (s)

GHQ-12 – Groups

Confounders

Previous occupational illness

2.10. Statistical analysis

Descriptive statistics, means and medians along with proportions were used to describe the data. To test for significant differences between mean scores Students t test and Wilcoxon rank sum were used. Where there were more than two groups Anova and Kruskal Wallis were used to test for differences. Frequencies of somatization symptoms was described for those with high and low GHQ-12 scores. Pearson's chi-square analyses were conducted to test for significant differences in proportions of reported symptoms between each group. Spearman's Correlation of the GHQ-12 and PHQ-15 scores was conducted based on their distributions. As well as linear regression for somatization using the scores of the GHQ-12 as the outcome and demographic information and PHQ-15 score. A second adjusted linear regression was conducted because the first indicated a relationship between the two tools to determine the number and which somatic symptoms were significantly associated with an increase in GHQ-12 score. Other variables were added to the linear regression model because of the relationship from the first linear regression model. Information on confounders such as family history of mental illness was not collected. So the regression was adjusted using the information available.

2.11. Ethical considerations

Ethics approval was obtained from the Wits Human Research Ethics Committee before the commencement of data analysis. A letter of permission from the National Institute of Occupational Health (NIOH) was obtained from the principal investigator in order to present to the ethics

committee to prove that the student was given permission to use data from the primary study conducted by the NIOH along with the original ethics clearance certificate for the primary study.

3. Results

The data analyzed had 295 observations from the three hospitals with 176 variables. Of the 295 participants, 203 were females, 42 males and 2 described themselves as other. Which makes females (82%) the most common gender who participated on the study. The highest percentage (26%) of participants were between the ages of 41 to 50 years, followed by those between 31 and 40 years (24%). Those above 60 years were the least common participants in the covid-19 study for HCWs. On average HCWs had 7.5 years of experience in their current role. With regards to the job title variable, most respondents were professional, enrolled and staff nurses. Approximately 21% of HCWs reported a previous occupational illness.

Table 1: Descriptive table of demographic factors and crude association with mean PHQ15 score

Demographics	**N (%)**	**PHQ-15 Mean (sd)**	**P value***
Age group (in years)	**295**	**7.53 (6.19)**	0.43
<=30	63 (21)	8.58 (6.21)	
31-40	72 (24)	7.37 (6.01)	
41-50	75 (26)	6.71 (6.27)	
51-60	48 (16)	8 (6.60)	
>60	37(13)	5.63 (5.55)	
Gender	**247**	**7.70 (6.08)**	0.09
0-Female	203 (82)	8.06 (5.81)	
1-Male	42 (17)	6.12 (7.03)	
Job title	**244**	**7.74 (6.32)**	0.02
Head of Unit	7 (3)	9.5 (8.66)	
Intern	2 (1)	16 (7.07)	
Community service MO	6 (2)	11 (3.55)	
Medical Officer	8 (3)	5.62 (4.17)	

Registrar	3 (1)	6.5 (4.94)	
Consultant/Specialist	4 (2)	6 (4.54)	
Professional Nurse	44 (18)	7.89 (5.57)	
Enrolled Assistant Nurse	31 (13)	8.22 (6.15)	
Enrolled / Staff nurse	21 (9)	6 (6.32)	
Radiologist	2 (1)	7 (4.24)	
Physiotherapist	8 (3)	8.75 (4.39)	
Pharmacist	11 (5)	11.87 (8.39)	
Janitor	16 (7)	12.92 (8.13)	
Clerk	20 (8)	3.55 (2.18)	
Delivery	2 (1)	7 (0)	
Other	59 (24)	6.32 (6.12)	
Length worked	**199**	7.52 (6.05)	0.63
Prev occupational illness	**226**	7.73 (6.35)	<0.001
1-Yes	47 (21)	13.42 (6.93)	
0-No	179 (79)	6.27 (5.30)	

*Students t test and Kruskal Wallis tests used

Pearson's chi2 test was used to test for association of PHQ15 score with demographic variables. There was no association between age group and mean somatization score although those greater than 60 years tended to a lower PHQ15 score. Males showed a significantly lower score than females. A significant difference was seen in mean scores between job titles although some jobs had very few participants. Length of work experience was not significantly associated with PHQ15. This finding is supported by the lack of association with age. Suffering a previous occupational illness was associated with a significant increase in PHQ15 score.

Table 2: GHQ-12 measuring psychological distress

The GHQ-12 tool is used to measure the psychological distress of individuals. We are using the GHQ-12 summed score per question as a measure of mental distress in our study. The total is the overall mean score for all individuals.

Items	N	Mean (sd)	%Troubled
1. Have you been able to concentrate well on what you were doing?	261	0.37 (0.48)	37.9
2. Have your worries made you lose lots of sleep?	258	0.39 (0.48)	39.5
3. Have you felt that you are playing a useful role in life?	260	0.21 (0.40)	21.2
4. Have you felt capable of making decisions?	256	0.32 (0.46)	32.4
5. Have you felt constantly overwhelmed or stressed?	257	0.50 (0.50)	51.0
6. Have you had the feeling that you cannot overcome your difficulties?	254	0.38 (0.48)	38.2
7. Have you been able to enjoy your normal daily activities?	248	0.48 (0.50)	48.8
8. Have you been able to adequately cope with your problems?	260	0.31 (0.46)	31.9
9. Have you felt unhappy or depressed?	262	0.40 (0.49)	40.8
10. Have you lost confidence in yourself?	265	0.29 (0.45)	29.1
11. Have you thought that you are person worthless?	263	0.26 (0.44)	26.2
12. Do you feel that you are reasonably happy considering all the circumstances?	256	0.39 (0.48)	39.1
Total mean score		**0.62 (0.49)**	**61.7**

From the results displayed on the table above, it shows that more than 60% of participants felt constantly overwhelmed or stressed with a mean of 0.62. While 40.8% of the participants have reported to have been bothered by feeling unhappy or depressed. Also 39.5% of participants reported that their worries made them lose sleep. Overall 62% of participants indicated more than

two items were worse or much worse than usual. Playing a useful role, and feeling worthless had the lowest proportions of people feeling worse than usual.

Using the Patient Health Questionnaire-15 to record somatoform symptoms, in order to describe somatization, we found some symptoms were very common in HWCs during the early pandemic. The proportions of those troubled by individual symptoms are described in Table 3.

Table 3: PHQ-15 measuring Somatization in HCWs

During the past 4 weeks, how many times have you been bothered by any of the following problems?

Item	N	Mean (sd)	% Troubled
Stomach pain	233	0.39 (0.68)	28%
Back pain	243	0.96 (0.82)	64%
Pain in your arms, legs, or joints (knees, hips, etc)	240	0.74 (0.82)	50%
Headaches	251	1.11 (0.78)	74%
Chest pains	234	0.48 (0.73)	34%
Dizziness	236	0.34 (0.63)	25%
Fainting spells	229	0.08 (0.35)	6%
Feeling your heart pound or race	236	0.43 (0.70)	31%
Shortness of breath	238	0.36 (0.66)	27%
Pain or problems during sexual intercourse	233	0.12 (0.41)	9%
Constipation, loose bowels, or diarrhoea	239	0.46 (0.67)	36%
Nausea, gas or indigestion	224	0.46 (0.70)	34%
Feeling tired or having low energy	249	1.04 (0.79)	71%
Trouble sleeping	242	0.81 (0.83)	54%
Overall mean		0.56	52.2%

The majority of people reported to have suffered worse than usual from a headache (74%), followed by those who felt tired or had low energy (71%) and back pain (64%). Over 60% complained to have suffered from back pain in the previous 4 weeks from the day of data collection. Participants troubled with pain in arms, legs or joints and trouble sleeping were just over 50% respectively. Out of the 233 responses only 28% were troubled with stomach pain. The least common symptoms that participants reported suffering from was fainting spells and pain or problems during sexual intercourse with 6% and 9% troubled respectively. The mean overall for PHQ15 measuring somatization for HCWs is 0.56 with 52.2% overall suffering somatization.

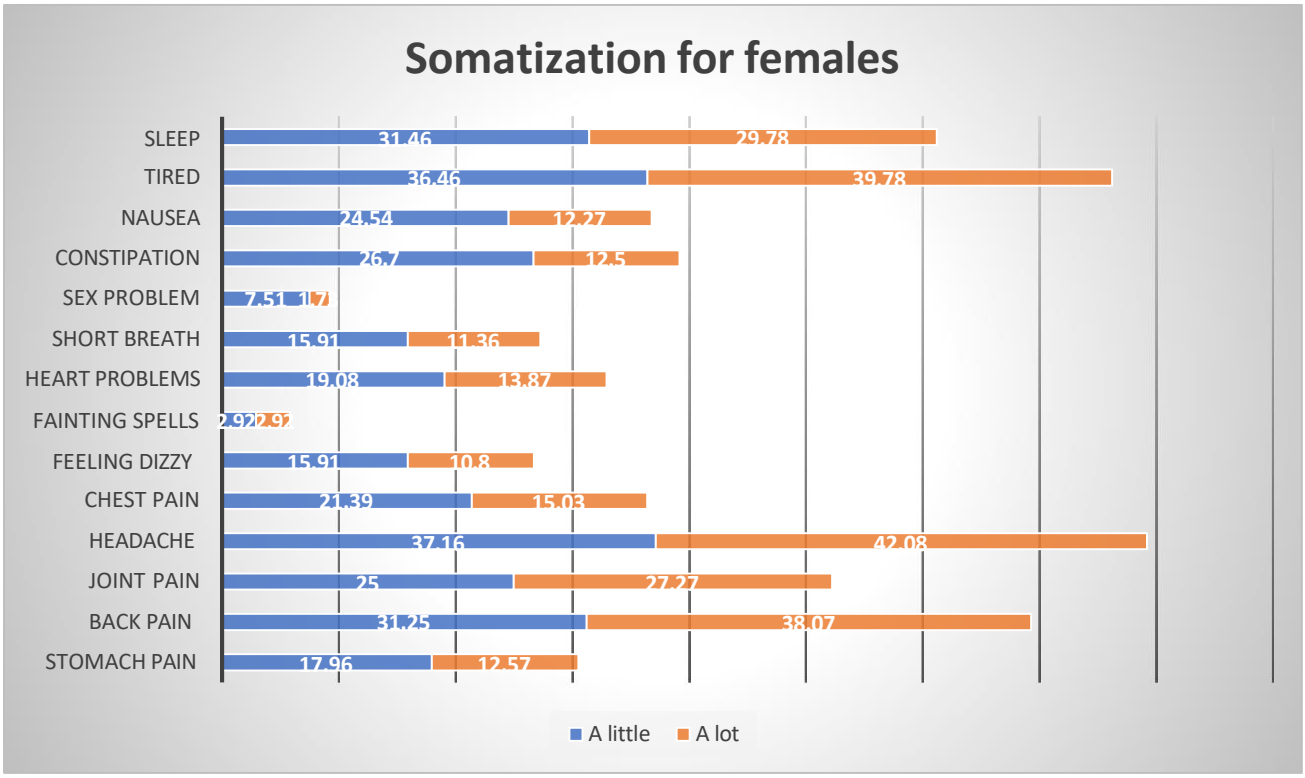


Figure 2: Proportion of bothered a lot and bothered little for females for each of the symptoms in the PHQ

Symptoms which the participant had been bothered a lot are indicated by the orange part of the bar and is defined as severe and for the participants who were bothered a little are indicated by the blue part of the bar. When looking at the somatization graph for females we can see that most women were bothered by headache, back pain, joint pain, tiredness and disturbed sleep. Females were not severely bothered by nausea, constipation, sex problems, shortness of breath, heart problems, chest pain and stomach pain.

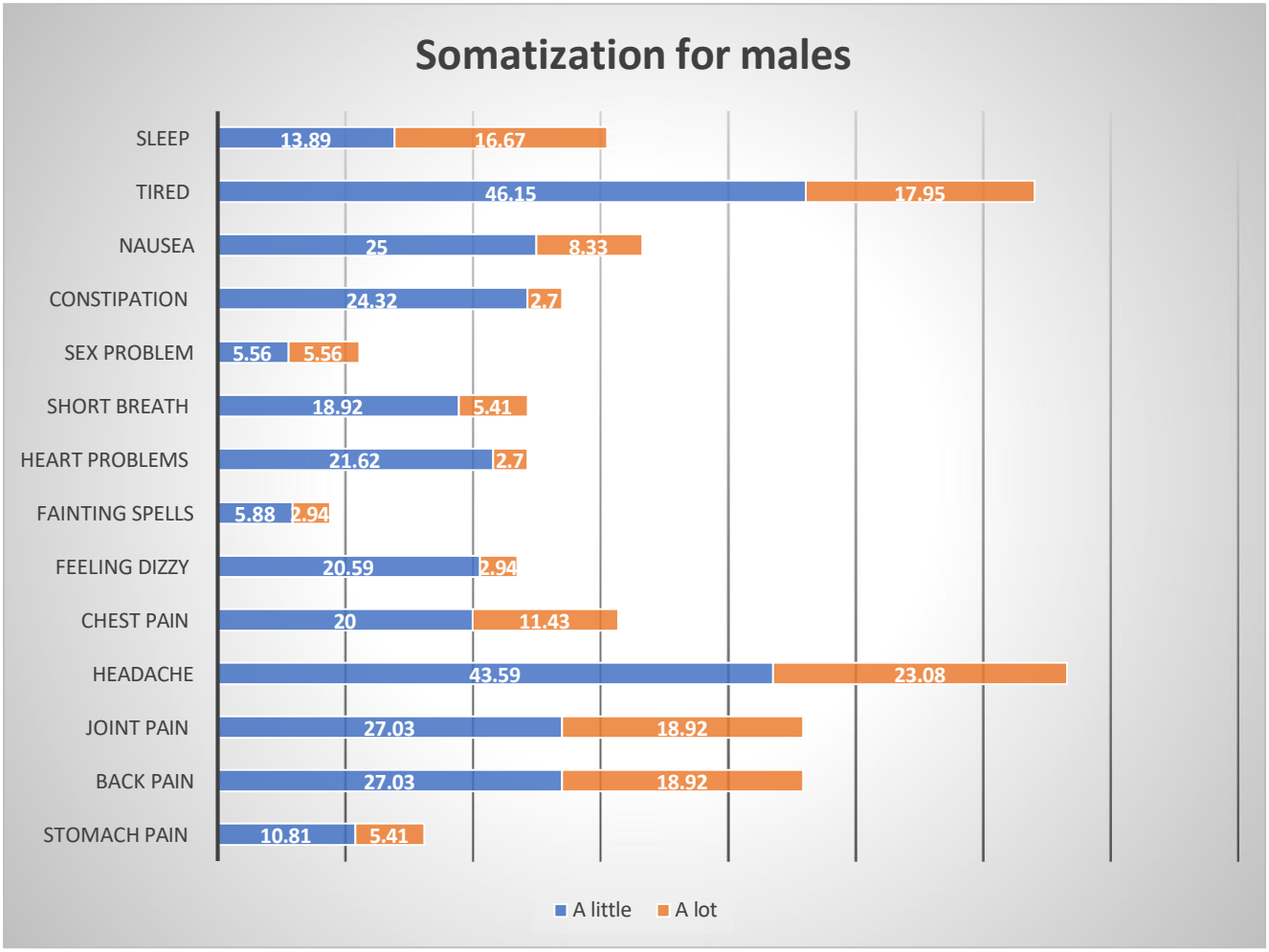


Figure 3 Proportion of bothered a lot and bothered little for males for each of the symptoms in the PHQ

With the somatization graph for males, it shows that men were bothered a lot by sleep, tiredness back pain and joint pain and headaches similar to women although at lower proportions for bothered a lot. Sex problems had the same scores for both bothered a little and bothered a lot not in keeping with women who had a higher bothered a little proportion. Males were bothered a little with the rest of the symptoms. More males reported being bothered a little by symptoms than a lot.

Table 4: Levels of somatization experienced by staff (HCWs) across sex age and previous occupational illness

	None N(30.4%)	**Mild 88(28.8%)**	**Moderate 31(10%)**	**Severe 91(30.8%)**	**Total 210 (100%)**
Gender					
Female	49 (24)	77 (38)	24(12)	53 (26)	203
Male	22 (52)	4 (10)	3 (7)	13 (31)	42
Age group					
≤ 30	18 (20)	23(27)	14(44)	8(9)	63
31- 40	23 (26)	25(29)	9(29)	15(16)	72
41-50	23 (26)	24(28)	3(10)	25(27)	75
51-60	12 (14)	12(14)	4(13)	20(22)	48
60 +	12(14)	1(1)	1(3)	23(25)	37
Prev occ illness					
Yes	5 (7)	15(20)	7(28)	20(35)	47
No	64(93)	60(80)	18(72)	37(65)	179

Males reported less somatic symptoms than females forming 27% of the reported proportion with somatization. The older three age groups (from 41 to 60+years) showed higher proportions in the severe group compared to the younger groups < 40.

Table 5: Somatization prevalence and Pearson's chi square for association with raised GHQ-12 scores

Item	Not Stressed N(%)	Stressed N(%)	P value
Stomach pain	**90**	**143**	0.572
Yes	22 (24)	44 (31)	
No	68 (76)	99 (69)	
Back pain	**94**	**149**	0.008
Yes	50 (53)	105 (70)	
No	44 (47)	44 (30)	
Pain in your arms, legs, or joints (knees, hips, etc)	**90**	**150**	0.005
Yes	35 (39)	85 (57)	
No	55 (61)	65 (43)	
Headaches	**94**	**157**	0.002
Yes	64 (68)	123 (78)	
No	30 (32)	34 (22)	
Chest pains	**86**	**148**	0.087
Yes	22 (26)	58 (39)	
No	64 (74)	90 (61)	
Dizziness	**88**	**148**	0.897
Yes	21 (24)	39 (26)	
No	67 (76)	109 (74)	
Fainting spells	**85**	**144**	0.435
Yes	3 (4)	10 (7)	
No	82 (96)	134 (93)	
Feeling your heart pound or race	**86**	**150**	0.008
Yes	17 (20)	56 (37)	
No	69 (80)	94 (63)	
Shortness of breath	**87**	**151**	0.149
Yes	17 (20)	47 (31)	

No	70 (80)	104 (69)	
Pain or problems during sexual intercourse	**87**	**146**	0.036
Yes	3 (3)	19 (13)	
No	84 (97)	127 (87)	
Constipation, loose bowels, or diarrhoea	**90**	**149**	0.146
Yes	25 (28)	60 (40)	
No	65 (72)	89 (60)	
Nausea, gas or indigestion	**86**	**138**	0.166
Yes	25 (29)	52 (38)	
No	61 (71)	86 (62)	
Feeling tired or having low energy	**93**	**156**	0.000
Yes	60 (65)	117 (75)	
No	33 (35)	39 (25)	
Trouble sleeping	**90**	**152**	0.000
Yes	35 (39)	97 (64)	
No	55 (61)	55 (36)	
Total	**1246**	**2081**	
Yes	399 (32)	912 (44)	
No	847 (68)	1169 (56)	

Statistically significant symptoms associated with mental distress.

From the Pearson's chi square results, we see that reporting of seven (50%) of the symptoms were significantly increased with mental distress in HCWs with p values of less than 0.05. The symptoms were back pain; headaches; pain in arms, legs or joints; and feeling heart pounding, feeling tired or having low energy and trouble sleeping.

Correlation between somatization and GHQ-12

The Shapiro Wilk test for normal data was used and it showed the data was not consistent with a normal distribution, thus Spearmen’s correlation was used and we see that the correlation between PHQ-15 and GHQ is spearman’s rho 0.3577 (p value of 0.000). We determined what percentage

of the variables were shared, by squaring the correlation and then multiplying by 100. Let's round 0.3577 to 0.4 which when squared would be 0.16, multiplied by 100 would be 16%. Hence PHQ-15 total score shares about 16% of its variability with GHQ. There is a significant correlation but it was not high, so there is no strong correlation between PHQ-15 and GHQ-12. When creating a score based on only the significant symptoms the correlation did not improve, Spearman's rho = 0.3615 p-value <0.0001. Thus the original score was used for further analysis.

After conducting logistic regression between PHQ-15 and GHQ we see that the relationship between PHQ-15 and GHQ is positive with a coefficient of (0.306) and based on the t-value (4.86) and p-value (0.000), we would conclude that the relationship is statistically significant. Hence, we would say that there is statistically significant positive linear relationship between somatization and GHQ.

Table 6: Logistic regression of mental distress with severity of somatization

Item	Odds ratio	Std. err.	P value
PHQ15 severity			
None	ref		
Mild	2.1	0.74	0.037
Moderate	4.3	2.38	0.008
Severe	2.2	0.89	0.048
Previous occupational illness	2.0	0.89	0.078
Age	1.0	0.79	0.194

Any level of somatization was significantly associated with poor mental health. Other diseases in these respondents have not been ruled out, so for some participants, they may have had undiagnosed chronic diseases. Previous illness was not associated with mental distress but somatization was associated with mental health. When we add previous illness to the model there is association between somatization and mental health. Previous illness is accounting for mental

health. After adjusting for age and previous illness, all three levels remained statistically significantly associated with mental distress.

Somatization was coded as 1 if the level was mild, moderate or severe and no somatization was coded as 0. The model showed that the prob>chi2 is 0.0003 with a pseudo R2 of 0.0722, which confirms that somatization is significantly associated with poor mental health.

Table 7: Logistic regression of factors associated with somatization

	Odds ratio	**Std err**	**P value**
GHQ12	2.14	0.75	0.029
Gender	0.23	0.10	0.001
Previous occupational illness	5.17	3.07	0.007
Age	0.98	0.02	0.380
Job title	1.03	0.03	0.342

Mental distress increased the odds of suffering somatic symptoms 2.1 times p-vale 0.029. Somatization of any degree of severity was also significantly associated with gender and previous occupational illness. An interaction term was tested and it was not significant, GHQ-12 is a predictor for somatization, and female gender is still a predictor of somatization. We improved the model by adding job title, age and length worked and all the variables were all highly correlated to somatization.

4. Discussion

Covid-19 has had a severe detrimental impact on people's mental health, particularly in those who must directly confront the virus in healthcare facilities (Mental Health America, 2020). Little work has been done on mental health during COVID19 in health care workers in South Africa. This study describes the association between reported mental distress in the GHQ12 and somatization in the PHQ15 in Gauteng public health care workers. The study found a high prevalence of mental distress and somatization and a significant association between the two in Gauteng public health care workers.

Demographics

Observation from the analysis showed that more females participated in the study as compared to the men in the same positions. This was not unexpected as health care is a female dominated industry (Russell *et al*, 2019). According to US labor statistics, 77% of the health care workforce was female, much higher than in other industries. From the hospital sample that was analyzed in this study the Health Care Workers who were above 60 years of age did not respond well to the Covid-19 survey. The middle aged group (40-50) formed a large number of those who participated. When compared to other studies our distribution was similar as the majority (76%) of healthcare workers who participated in the Mental Health America (MHA) survey 2020 were young adults aged (18-44). All the job title categories in the facilities were included in this study but those who were working closely with patients on an everyday basis (i.e. Professional, staff and enrolled nurses) dominated the study (39.4%). The next largest group of respondents was other healthcare staff 24%.

GHQ-12 measuring psychological distress

The self-reported screening using the 12 item General Health Questionnaire was used to identify mental distress amongst the HCWs working at the Gauteng hospitals (namely Hospital 1, 2 and 3) during the Covid-19 pandemic in 2020. The majority (62%) of HCWs were troubled indicating a possible high burden of mental distress in the health care sector.

The HCWs reported having worries that made one overwhelmed and stressed, losing sleep, feeling like you cannot overcome difficulties, feeling unhappy and depressed, during the early Covid-19 pandemic. Mental Health America asked HCWs 'in the last 3 months, which of the following feeling have you been regularly experiencing?" and stress was the most commonly reported, 93% of HCWs indicating that they had regularly experienced stress between June and September 2020. HCWs were less likely to report feelings of worthlessness and uselessness along with loss of confidence. Gallup in a State of the Global Workplace 2021 Report further asserts that HCWs report that they have difficulty focusing on tasks at work and they tend to make errors or miss deadlines because of stress, resulting in lower employee performance and a reduction in service quality. The question "have you been able to enjoy your normal daily activities?" May have been biased due to the lockdown level at the time limiting social interactions. Thus the reported lack of enjoyment may have been due to restrictions affecting mental health rather than work stress alone.

PHQ-15 measuring Somatization

Patient Health Questionnaire consisting of 15 questions was used to measure Somatization in Gauteng hospital-based HCWs, 52% of staff scored as possibly suffering from somatization during the COVID-19 pandemic. Somatization was seen in a Belgian study which described reduced distress and somatization in those using concrete coping behavior (Frank et al., 2021). No crude or adjusted association was seen with age group in this study, while Helderink (2013 noted that somatoform diseases are widespread in later life, and that the prevalence rates appear to drop around the age of 65 years, However, Greenberg does not agree to that theory. According to Greenberg (2014) somatization disorder tends to present before 30 years of age and is more common in women, males and females had significantly different scores of somatoform symptoms in this study with females suffering more somatization. In a South African study, Makhubela and Debusho (2016) discovered that women rate somatic problems associated with depression higher than males do. The current study supports the study because the findings were the same, females reported to have been bothered by a number of physical symptoms (namely back pain, headache, joint pain lack of sleep and tiredness) as compared to their male counterparts, where males reported to have been bothered mainly by loss of sleep, tiredness and nausea.

According to Staiger et al., 2020, men are more reluctant to seek help for mental health problems than women. Staiger et al., 2020 further asserts that receiving support or asking for assistance came with the possibility of being alienated or teased and labelled as "unmanly" by others. Research often indicates that men help-seeking conduct involving depression is linked to traditional masculine traits including strength, success, independence, control, and capability alongside with an emphasis on warding off emotions (Moller-Leimkuhler, 2009). Barsky et al., 2001 attribute the differences commonly seen in reporting of somatization between men and women as multifactorial such as innate differences in somatic perception, socialization, sex differences in the prevalence of anxiety and depression.

The individual symptoms significantly associated in this HCWs group with mental distress were back pain; headaches; pain in arms, legs or joints; and feeling heart pounding, feeling tired or having low energy and trouble sleeping. Individually these symptoms have been associated with stress or mental distress. Musculoskeletal disorders have been associated with stress and work stress (National Research Council (US) 2001) this supports our findings of back pain and pain in arms, legs or joints being associated with mental distress in HCWs. Headaches, low energy and trouble sleeping are commonly identified symptoms of poor mental health (American Psychiatric Association. 2013). Elevated heart rate has been shown to be associated with stressful life events (Schneider et al., 2021). Other symptoms that were not associated with mental distress may have also been due to previous occupational disease as reported, acute or chronic disease.

The association between somatization and mental distress

From the linear regression analysis to determine the association between the reported physical symptoms and mental distress of the HCWs in Gauteng province during Covid-19 pandemic in 2020, we see that the relationship between PHQ-15 and GHQ is positive (0.3059211) and significant (0.000). Hence, we would say that there is statistically significant positive linear relationship between somatization and GHQ. This demonstrates that HCWs may suffer somatization related to mental distress.

There haven't been many studies comparing the somatization rates of healthcare professionals and non-healthcare professionals during COVID-19. For instance, Tian et al. discovered that the

somatization score between healthcare professionals and the general population was significantly different (Tian *et al*., 2020). On the other hand, according to Chew et al., The risk of somatization and psychological distress among healthcare workers during the COVID-19 outbreak were significantly correlated. According to Song et al., (2021) Health care workers had higher prevalence rate of somatization ($p < 0.001$) than non-health care workers.

The high prevalence of mental distress in HCWs is cause for concern as patient care may be affected. Productivity at work was affected for example 12.5 million working days (or 49% of all days) were lost in 2016–2017 in the USA as a result of the 526 000 employees who reported experiencing stress, despair, or anxiety connected to their jobs. (American Psychological Association, 2022). Some productivity loss may come from sick leave for somatization where mental health is not prioritized in the workplace.

A number of HCWs may suffer from somatization that is associated with acute and chronic diseases. There is a high possibility that some participants had chronic diseases, so that's why it's coming as severe. According to Herman et al. (2009), over half of South Africans (47.5%) are at risk of acquiring a psychiatric condition later in life, and one in three (30.3%) will receive a mental illness diagnosis. Of those cases, 25% are deemed severe.

Strengths and limitations of the study

Strengths

The strengths for this study is that it has acceptable sample size The study is adequately powered the statistical analysis is adequate. Another strength is that detailed validated tools for distress and somatization was used namely PHQ-15 and GHQ-12 questionnaires.

Limitations

No comparable data prior to covid-19

Secondary analysis is another limitation that was noted in this study. Secondary data doesn't provide all the answers to the current study simply because the objectives and the aim of the original study and for the current study are different. The primary study was designed to find answers to a different problem than for the current study therefore it creates gaps in data analysis.

5. Conclusion

Health Care Workers in South Africa suffering psychological distress whether work or home related may be at risk of somatization. This study found a significant association between psychological distress and somatization as well as sex and somatization. Somatization could affect the work performance and increase the health care utilization (use of health care services) of HCWs. Somatization could also result in increased use of sick leave, which can in turn have a negative impact on patient care. Globally, stress has a significant impact on workers. Stressed employees tend to be less engaged in their work. Reduction of work stress and access to mental health support is important in the health care sector for staff as much as patients.

6. Recommendations: outbreaks, policy, awareness, access to services

Companies, Employers and all the managers should start looking at providing support for their employees when it comes to mental health. When employees know that they have somewhere to turn to, that can in turn improve them reporting if they are under pressure at work or experiencing difficulties that can impact service delivery negatively. One of the ways to offer support to employees can be through awareness about mental distress at a workplace. There should also be policies that will reinforce that employees have access to support at a workplace, that will also be beneficial to the employees that are not taken seriously by the employers. According to the National Mental Health Framework and strategic plan 2013-2020, mental health training programme for general health staff will be conducted at PHC level and district and regional hospitals in order to strengthen the mental health system at a district level.

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APPENDIX 1

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I NTSAKO RAMUEDI (Student number: 2485660) am a student registered for the degree of MSc in Epidemiology in the academic year 2023.

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 Witwatersrand may take 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: _____ Date: 28 March 2023

APPENDIX 2

UNIVERSITY OF THE WITWATERSRAND, V JOHANNESBURG	HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research and Innovation)

TO: Ms N Ramuedi
School of Public Health
Division of Epidemiology and Biostatistics
Medical School
University

E-mail: 2485660@students.wits.ac.za

cc: Supervisor: Dr K Wilson <KerryW@nioh.ac.za>
and <HREC-Medical Research Office@wits.ac.za>

FROM: Mr lain Burns
Human Research Ethics Committee (Medical)
Tel: 01 1 717 1252

E-mail: lain.Burns@wits.ac.za

DATE: 2022/06/29

REF: R14/49

PROTOCOL NO: M220373 (This is your ethics application reference number. Please quote it in all enquiries, oral or written, relating to this study.)

PROJECT TITLE: The relationship between mental distress and somatization in hospital-based healthcare workers in Gauteng during the COVID-19 pandemic in 2020

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to Government funding of the University.

MS SWorks2000orks2000/lain0007/Clearscan.wps

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R49 Ms N Ramuedi

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL) CLEARANCE CERTIFICATE NO. M220373

NAME: (Principal Investigator)	Ms N Ramuedi
DEPARTMENT:	School of Public Health Division of Epidemiology and Biostatistics Medical School University
PROJECT TITLE:	The relationship between mental distress and somatization in hospital-based healthcare workers in Gauteng during the COVID-19 pandemic in 2020
DATE CONSIDERED:	2022/03/25
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 K Wilson

Dr CB Penny, Chairperson, HREC (Medical)

APPROVED BY:

DATE OF APPROVAL: 2022/06/29

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.

l/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and l/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, l/we undertake to submit details to the Committee. I aqree to submit a yearly proqress 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 March and therefore reports and re-certification will be due in the month of March each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

_____ _____

Signature of Principal Investigator Date

APPENDIX 3

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