

COVID-19 and serious mental illness: Experience from a psychiatric hospital in Cape Town, South Africa

A Research Report to Meet the Requirements of the Master of Medicine in Psychiatry at the University of Cape Town

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Declaration

I, Haseena Sablay, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Abbreviations

BMI	Body Mass Index
COVID-19	Coronavirus disease caused by SARS-CoV-2
DSM	Diagnostic and Statistical Manual of Mental Disorders
HIV	Human Immunodeficiency Virus
MHCA	Mental Health Care Act
PCR	Polymerase Chain Reaction
SARS-CoV	Severe Acute Respiratory Syndrome Coronavirus
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SIMD	Substance-induced mood disorder
SIPD	Substance-induced psychotic disorder
SMI	Severe Mental Illness
TB	Tuberculosis
UCT	University of Cape Town
VBH	Valkenberg Hospital

Abstract

Prepared for submission to the South African Journal of Psychiatry (SAJP)

Background:

Several factors make patients admitted to specialist psychiatric units more vulnerable and susceptible to infections like SARS-COV-2. This includes psychiatric hospital infrastructure and service design, patients' mental health profiles, and staff's medical skills.

Aim:

To describe the psychiatric and medical profile, and the risk factors associated with more severe disease and clinical outcomes of COVID-19 in patients with severe mental illness (SMI) admitted to a specialist psychiatric hospital in South Africa between 1 April 2020 and 30 September 2021.

Setting:

Valkenberg Hospital (VBH), a psychiatric hospital in Cape Town.

Method:

Demographic and clinical information were collected on all VBH in-patients who tested positive for SARS-COV-2 from 1 April 2020 to 30 September 2021.

Results:

Two hundred and fifty-four participants tested positive for SARS-COV-2. The sample included 75% (n=191) males with a mean age of 35,7 years. Most patients were diagnosed with schizophrenia 37% (n=94), bipolar disorder 21% (n=54) and schizoaffective disorder 19% (n=49). Comorbidities reported were nicotine use 71% (n=181), hypertension 11% (n=28), and HIV 7% (n=18). Most patients, 62% (n=156),

were symptomatic for COVID-19. 7% (n=17) required transfer to a medical ward. Almost all patients, 99% (n=252), recovered, and 1% (n=2) died.

Conclusion:

Despite the concerns that SMI and high substance use rates would worsen outcomes, most patients had mild illnesses and recovered. This contrasts with concerns raised early in the pandemic that institutionalised patients with SMI were at increased risk of mortality and an increased hospitalisation rate for COVID-19.

Contribution:

This descriptive study provided information on COVID-19 disease at a specialist psychiatric hospital during the pandemic.

COVID-19 and serious mental illness: Experience from a psychiatric hospital in Cape Town, South Africa

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Introduction

Infectious disease outbreaks in psychiatric units

Outbreaks of infectious diseases are common in psychiatric units, often caused by agents prevalent in the surrounding community.^{1,2} Respiratory infections such as respiratory syncytial virus, adenovirus, and influenza; gastrointestinal infections like norovirus and salmonella; and skin infections like scabies are among the most frequently encountered outbreaks in these facilities.¹ The consequences of these outbreaks can be severe for both patients and the facilities themselves, as documented in the literature.^{1,3} Unfortunately, psychiatric units are often ill-prepared to manage infectious outbreaks, and secondary spread is all too common, making containment challenging.^{1,4}

The Coronavirus disease (COVID-19) pandemic is the third Coronavirus outbreak within the last 20 years.⁵ It has highlighted the existing difficulties found in psychiatric hospital settings, especially in implementing infectious control measures.^{2,6,7} The pandemic has aided in unmasking the multifactorial challenges reported to increase psychiatric units' vulnerabilities to infectious disease outbreaks.^{6,8}

Psychiatric hospitals are designed differently from general hospitals. They focus on

therapeutic activities, have limited medical services, and infection control is not a priority.^{6-8, 9-11} High patient turnover and shared workspaces are common.^{10, 12} The wards have poor ventilation and may be over capacity, increasing the risk of infection.^{3, 13} In addition, patients may not be screened for COVID-19 before admission, and staff did not have extended screening criteria.²

Aside from this, patient factors also play a big role in the increased risk of contracting infectious diseases. Lifestyle choices, diet, lack of exercise, and smoking increase the risk of physical health issues in patients with mental illness.^{1, 6, 7, 9, 12, 14-16} Psychosocial factors like poor self-care, isolation, and frequent healthcare visits can also impact their health.⁹ Patients may struggle to express and monitor symptoms, leading to longer hospital stays and difficulty adhering to protective measures.¹⁴⁻¹⁶

Clinical staff in a psychiatric hospital may not adequately respond to an infectious outbreak due to a lack of necessary infrastructure, equipment, and training to manage infectious illnesses.^{6, 9, 17} Additionally, their focus on treating psychiatric illnesses may lead to medical symptoms being missed.^{3, 12} There were challenges with staff adhering to policies such as social distancing, particularly in recreational areas like tea rooms.¹⁸ Furthermore, staff often work when they are mildly unwell and possibly infectious, which increases the risk of outbreaks within the facility.¹²

The COVID-19 pandemic provides an opportunity to restructure health services by correcting the systemic and infrastructural challenges in inpatient psychiatric units caring for patients with Severe Mental Illness (SMI).^{2, 8}

[The Effects of the COVID-19 pandemic on the SMI population](#)

The COVID-19 pandemic placed the SMI population at high risk of relapse of their pre-existing psychiatric disorders due to the following: poor adherence to treatment and follow-ups due to service interruptions, less access to critical medication, and the increase in loneliness due to lockdowns and despair of the COVID-19 diagnosis itself.¹⁹⁻²¹

Evidence suggested increased cigarette and alcohol use in general during the COVID-19 pandemic.²² This, paired with the extraordinary stress of increased childcare burden, social isolation, loss of income, and the death of loved ones, has precipitated relapse and worsened the long-term prognosis of SMI.²³

South Africa, which already had limited mental health resources, faced even greater challenges during the COVID-19 pandemic.^{13, 24} Inadequate funding, staff shortages, and structural issues have long plagued the country's mental health services.²⁵ The pandemic has intensified these problems, particularly for those with SMI.²⁶

Inpatient specialised psychiatric hospitals are key in supporting the SMI population by relieving symptoms and enhancing functioning in a physically and psychologically safe space.²⁷ These hospitals have a structured approach to care, where patients interact with one another and staff through communal activities and group sessions. However, the COVID-19 pandemic has disrupted these activities, leading to a significant impact on the delivery of care and services.²⁰

[COVID-19 impact on psychiatric units.](#)

Throughout the COVID-19 pandemic, policymakers overlooked the SMI population while concentrating globally on the psychological impact on the general population.¹⁶ The psychiatry service had to adapt to accommodate the need for continued service provision.¹⁴ Since the Spanish flu, there have not been outbreaks with the same duration of lockdown, isolation, or impact as the COVID-19 pandemic.²⁸

During the pandemic's early stages, psychiatric hospitals in Wuhan experienced COVID-19 outbreaks, marking the first time such units faced a nosocomial virus outbreak.^{3, 6} Mental health practitioners, in Wuhan, encountered difficulties due to lacking guidelines, resources, and insufficient training to provide mental health services during the COVID-19 pandemic.²⁹

Inpatient psychiatric outbreaks were reported to be due to nosocomial or community-acquired transmission.¹² Forty-One Percent of COVID-19 infections were due to nosocomial spread.¹² Staff were carriers, so monitoring symptoms, hand hygiene, personal protective equipment, and training were important.^{2, 12} Psychiatric units managing patients with SMI have experienced higher COVID-19 doubling times than general hospitals.³⁰ As a result, tailored outbreak management policies were required, which included strategies for prevention, early detection, proactive testing, patient education, social distancing, and improving staff skills concerning infection prevention policies.^{2, 3, 12}

A review by Vai et al. investigated the correlation between mental disorders and the risk of COVID-19-related mortality, hospitalisation, and admission to the intensive care unit (ICU).³¹ They found that individuals with SMI, particularly those with psychotic disorders, were at an increased risk of COVID-19 mortality. Additionally, the SMI population had a higher likelihood of hospitalisation, but not ICU admission, compared to the general population.³¹ Social and lifestyle factors, along with medical comorbidities, could exacerbate COVID-19 outcomes in this group of patients.³¹ Furthermore, psychopharmacological interactions could make treatment more challenging, especially when using antipsychotics and benzodiazepines.^{5, 16}

This research project described the profile of patients with SMI and COVID-19 admitted to a specialist psychiatric hospital in South Africa from 1 April 2020 to 30 September 2021. The objectives were to describe the sample population's demographic and psychiatric clinical characteristics and their COVID-19 symptoms, severity, and need for transfer. This research is important as institutions caring for those with SMI required information regarding altered vulnerabilities and unique treatment needs of this population during the COVID-19 pandemic.

Research Methods and Design

Study Design

This was a retrospective, descriptive, cross-sectional study in the form of a folder review. The study cohort included all the patients admitted to Valkenberg Hospital (VBH) from the acute and forensic services who tested positive for SARS-CoV-2 from 1 April 2020 until 30 September 2021.

Study Setting

VBH is a government-funded specialist psychiatric hospital. The 370-bed institution in Cape Town dates from 1891 and is composed of 145 forensics service beds and 225 acute service beds. It provides inpatient and outpatient services.

The acute services primarily deal with patients with SMI admitted under the Mental Health Care Act (MHCA) (Act 17 of 2002), aged 18 to 60. The forensic service admits patients for forensic observation and state patients as mandated in the Criminal Procedure Act Sections 77 to 79 (Act 51 of 1977). This service caters for patients from the age of 14 years upwards.

VBH had to modify its services due to the COVID-19 pandemic, as most non-elective admissions could not be de-escalated. Infectious disease protocols and policies were implemented, and admission criteria were tightened. Before their psychiatric admission, patients were medically screened, including for symptoms of COVID-19. COVID-19 asymptomatic patients were admitted with a cohort of presumed COVID-19 negative patients. If patients were positive for SARS-CoV-2 and had mild symptoms of COVID-19, they would be accepted for admission directly into the VBH COVID-19 service.

All VBH inpatients were screened daily via daily review of vital signs and the VBH COVID-19 Patient screening tool form (Appendix I). Patients suspected of COVID-19 were

isolated as persons under investigation, and a polymerase chain reaction (PCR) test was done.

The consultant in charge of the VBH COVID-19 service developed a screening form for patients diagnosed with COVID-19 (Appendix II). The form was based on an existing screening tool reported in the literature.³² The process aimed to ensure the safe management of patients infected with COVID-19. Appendix II contained a section that assessed patients' vital signs and scored them. Patients with mild symptoms (score 0-4) were managed in the VBH Covid-19 service. Patients with severe COVID-19 symptoms (score >5 or 0-4 with comorbidities) were transferred to a medically equipped ward at Groote Schuur Hospital.

Study Population and Sampling Strategy

This is a non-probability convenience sample.

Inclusion criteria:

- The inpatients admitted to the acute and forensics services at VBH.
- Age 18 years and older.
- All genders.
- These patients must have had a positive SARS-CoV-2 PCR test requiring isolation.

Exclusion criteria:

- Those who had a COVID-19 diagnosis before VBH admission but were not treated by the VBH COVID-19 service as they have completed their isolation period.

Data Collection

The completed COVID-19 forms (Appendix II) and folders of the patients who required admission to VBH and tested positive for COVID-19 from 1 April 2020 to 30 September 2021 were reviewed.

The study focused on variables considered to affect the outcome of COVID-19 and result in more severe disease. Factors included:

- sociodemographic variables: age and sex.
- psychiatric variables: psychiatric diagnosis, current substance use: cigarettes, alcohol, cannabis, methamphetamine.
- medical variables: human deficiency virus (HIV) status, Body Mass Index (BMI), hypertension, diabetes mellitus, cardiovascular disease, chronic lung disease, previous tuberculosis (TB), COVID-19 symptoms during the quarantine period.
- outcomes: recovery from acute COVID-19 (during the quarantine period), transferred to a medical ward, or demised.

Data Analysis

The data was extracted, captured, and analysed using a statistical software package, Statistica 14.0. Descriptive statistics such as frequencies, median, and mean were used to examine the distribution of demographics, psychiatric diagnosis, current substance use, medical comorbidities, and COVID-19 symptoms.

Thereafter, associations between patient outcomes and several variables were calculated. The variables included:

- principle psychiatric diagnosis
- age and sex
- medical comorbidities
- substance use
- vital signs

Associations were run between the group transferred to the medical wards and the group not transferred and the following variables: sociodemographic variables, psychiatric variables, and medical variables.

For categorical variables, Chi-square and Fisher exact tests to determine significant associations. For continuous measurements, ANOVA and correlation analyses were conducted. The threshold for statistical significance was set at $p = 0.05$.

Ethical Considerations

This study was conducted in accordance with the Declaration of Helsinki (2013)³³, the South African Good Clinical Practice Guidelines (DoH 2006)³⁴, and The South African Department of Health Ethics in Health Research: Principles, Processes, and Structures (DoH 2015).³⁵

Ethics approval was obtained from the University of Cape Town Human Research Ethics Committee (HREC 771/2021) (Appendix III; IV). Approval was obtained from Valkenberg Hospital and the Provincial Government of the Western Cape (WC_202112_015) (Appendix V).

This was a low-risk study as it was a retrospective data set and folder review. It involved no patient contact. No informed consent was sought as the data collected was anonymised.

Results

Over the study period, two hundred and fifty-four participants tested positive for SARS-COV-2. Seventeen patients (7%) required transfer to the medical hospital. Two hundred and fifty-two (99%) patients recovered from acute COVID-19 isolation period, and 2 (1%) died.

The sample included 191 (75%) male and 63 (25%) female patients. The study population had a mean age of 35.7 (SD = 11.02), ranging from 15 to 65 years (Figure 1). The mean age of those transferred to the medical hospital was 42.06 (SD = 14.67) years, and those not transferred were 35.27 (SD = 10.61) years. Patients transferred to the medical hospital were significantly older ($p = 0.01$) (Table 1).

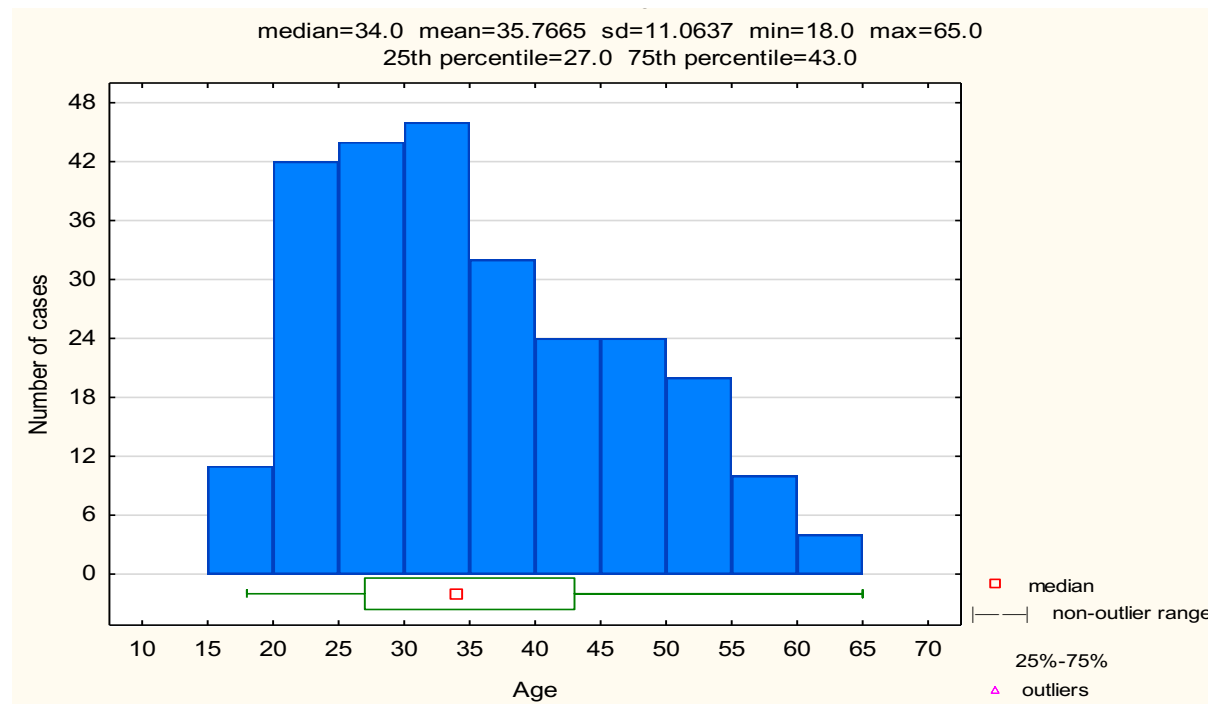


Figure 1: Age distribution of the study sample (n =254).

The study population consisted of 214 (84%) patients from the acute service and 41 (16%) patients from the forensic service at VBH. Of those patients that required transfer, 15 (88.2%) were from the acute service and 2 (11.8%) from the forensic service. There was no significant association between the type of service and transfer to a medical hospital (see Table 1; $p = 1.00$).

Ninety-four (37%) patients had a diagnosis of schizophrenia, 59 (23%) were grouped as other (which includes anxiety disorders, personality disorders, and psychosis secondary to another medical condition), 54 (21%) had bipolar disorder, and 49 (19%) had

schizoaffective disorder. Both, principle and secondary diagnosis were factored in. There was no statistically significant association between diagnosis and transfer to a medical hospital (Table 1).

The most common medical comorbidity was hypertension in 28 (11%) patients. The only comorbidity to have statistical significance associated with transfer to the medical hospital was 'other' ($p = 0.05$) (Table 1). The comorbidities grouped as 'other' included neurological conditions, thyroid disorders, autoimmune disorders, and dermatological disorders. At the time of the study, none of the comorbidities in the 'other' group were associated with COVID-19 severity. Previous TB ($n = 15$, 6%) showed a trend towards significance ($p = 0.07$). Therefore, those who were transferred were more likely to have had previous TB.

The most common substance used was nicotine by 181 (72%) patients, followed by cannabis in 151 (59%) and methamphetamine in 92 (36%). None of the substances were significantly associated with transfer to the medical hospital.

Table 1. Description of the demographic, psychiatric and medical profile of the sample (n=254)

	n	%	Not transferred (n, %)	Transferred (n, %)	P-value
Age, mean (SD)	35.72 (11.02)		35.27 (10.61)	42.06 (14.67)	0.01 (t)
Sex					
Male	191	75	180 (75.9%)	11 (64.7%)	0.38 (f)
Female	63	25	57 (24.1%)	6 (35.3%)	
Service					
Acute	214	84	198 (83.5%)	15 (88.2%)	1.00 (f)
Forensics	41	16	39 (16.5%)	2 (11.8%)	
Psychiatric Diagnosis					
Schizophrenia	94	37	88 (37.1%)	6 (35.3%)	0.88 (c)
Bipolar Disorder	54	21	48 (20.3%)	6 (35.3%)	0.21 (f)
SIPD/SIMD	41	16	39 (16.5%)	2 (11.8%)	1.00 (f)

Depression	7	3	7 (3%)	0	1.00 (f)
Schizoaffective Disorder	49	19	46 (19.4%)	3 (18.8%)	1.00 (f)
Other	59	23	56 (23.6%)	3 (17.6%)	0.77 (f)
Comorbid Substance use					
Nicotine	181	72	169 (71.6%)	12 (70.6%)	1.00 (f)
Cannabis	151	59	140 (59.3%)	10 (58.8%)	0.97 (c)
Methamphetamine	92	36	87 (36.9)	5 (29.4%)	0.54 (c)
Methaqualone	38	15	36 (15.3%)	2 (11.8%)	1.00 (f)
Alcohol	44	17	40 (16.9%)	4 (23.5%)	0.51 (f)
Other	26	10	26 (11.1%)	0	0.23 (f)
Comorbid Medical Disorders					
Diabetes Mellitus	10	4	10 (4.2%)	0	1.00 (f)
Hypertension	28	11	25 (10.6%)	3 (17.6%)	0.41 (f)
Cardiovascular Disease	4	2	3 (1.3%)	1 (5.9%)	0.24 (f)
Chronic Lung Disease	14	6	13 (5.5%)	1 (5.9%)	1.00 (f)
HIV	18	7	16 (6.8%)	2 (11.8%)	0.35 (f)
Previous PTB	15	6	12 (5.1%)	3 (17.6%)	0.07 (f)
BMI>30	10	4	9 (3.8%)	1 (5.9%)	0.51 (f)
Other	51	20	44 (18.6%)	7 (41.2%)	0.05 (f)

(t): Independent sample t-test. (f): Fisher's exact test. (c): Chi squared test.

One hundred and fifty-six (62%) patients were symptomatic for COVID-19 (Table 2). The most commonly reported symptoms were cough (n=74; 29%), sore throat (n= 69; 27%), and myalgia (n=65; 26%). None of these symptoms were significantly associated with transfer to a medical hospital. Of the symptoms reported, shortness of breath (n=22; 9%) was the only symptom significantly associated with transfer to the medical hospital (p = 0.01).

Table 2. Description of COVID-19 symptoms (n=252)

	n	%	Not transferred (n, %)	Transferred (n, %)	P-value
Asymptomatic	96	38	94 (40%)	2 (11.8%)	0.02 (c)
Symptomatic	156	62	141 (60%)	15 (88.2%)	
Cough	74	29	68 (28.9%)	6 (35.3%)	0.59 (f)
Sore throat	69	27	64 (27.2%)	5 (29.4%)	0.79 (f)
Myalgia	65	26	58 (24.7%)	7 (41.2%)	0.15 (f)
Fever	51	20	46 (19.7%)	5 (29.4%)	0.35 (f)
Shortness of breath	22	9	17 (7.3%)	5 (29.4%)	0.01 (f)
Diarrhea	17	7	16 (6.8%)	1 (5.9%)	1.00 (f)
Anosmia	10	4	10 (4.3%)	0	1.00 (f)
Other	72	29	66 (28.1%)	6 (35.3%)	0.58 (f)

Table 3 displays a description of the patients' vital signs. The majority of patients were alert (n= 241; 96%). Patients who were not transferred were significantly more likely to be alert ($p = 0.002$). Most patients had a normal respiratory rate between 12 and 20 breaths per minute (n=229; 92%). Patients who were not transferred were significantly more likely to have a normal respiratory rate ($p < 0.001$). On the other hand, patients who were transferred were significantly more likely to have a respiratory rate above 20 ($p < 0.001$).

Eleven (4%) patients had low oxygen saturation below 94%, and 10 (4%) required supplemental oxygen. Low oxygen and requiring supplemental oxygen were significantly associated with transfer to the medical hospital ($p < 0.001$) (Table 3).

Most patients had temperatures in the normal range of 36 to 37.5 degrees Celsius (n=193; 76%). There was no significant association between temperature and transfer to a medical hospital.

The majority of the patients had normal heart rates between 60 and 100 beats per minute (n=191; 76%). Patients transferred to a medical hospital were significantly more likely to have a heart rate of 60 to 100 compared to patients not transferred (p = 0.001). However, only 57 (23%) patients had increased heart rates above 100 beats per minute. Patients who were transferred were more likely to have an increased heart rate (p < 0.001) (Table 3).

Two hundred and twenty-three (89%) patients had systolic blood pressures within the normal range of 100-139 millimetres of mercury, and only 12 patients (5%) had a high systolic blood pressure above 140 millimetres of mercury. There was no association between blood pressure and transfer to a medical hospital (p = 0.18). From the vital signs described in Table 3, the following significant associations are reported: Patients who were not transferred (remained at VBH) were significantly more likely to (a) be alert (p = 0.002), (b) have a normal respiratory rate (p < 0.001), (c) not need oxygen (p < 0.001), and (d) have a normal heart rate (p = 0.001).

Table 3. Description of the vital signs (n=253)

	n	%	Not transferred (n, %)	Transferred yes (n, %)	P-value (Fishers test)
Alert					0.002
Yes	241	96	228 (97.9%)	13 (76.5%)	
No	9	4	5 (2.1%)	4 (23.5%)	
Respiratory rate					<0.01
<12	0	0	0	0	-
12-20	229	92	221 (94.8%)	8 (47.1%)	<0.001
20-24	18	7	12 (5.2%)	6 (35.3%)	<0.001
>25	3	1	0	3 (17.6%)	<0.001

Oxygen saturation						<0.001
<94%	11	4	5 (2.1%)	6 (35.3%)		
>94%	237	95	226 (97%)	11 (64.7%)		
Oxygen needed						<0.001
Yes	10	4	2 (0.9%)	8 (47.1%)		
No	240	96	231 (99.1%)	9 (52.9%)		
Systolic Blood pressure						
<100	14	6	12 (5.2%)	2 (11.8%)	0.25	
100-140	223	89	210 (90.1%)	13 (76.5%)	0.18	
>140	12	5	10 (4.3%)	2 (11.8%)	0.19	
Heart Rate						
<60	0	0	1 (0.4%)	0	1.00	
60-100	191	76	184 (79%)	7 (41.2%)	0.001	
>101	57	23	47 (20.2%)	10 (58.8%)	<0.001	
Temperature						
<35.9	17	7	16 (6.9%)	1 (5.9%)	1.00	
36-37.4	190	76	179 (76.8%)	11 (64.7%)	0.25	
>37.5	43	17	38 (16.3%)	5 (29.4%)	0.18	

Discussion

In this study, we described the psychiatric, medical profile and clinical outcomes of patients with SMI and COVID-19 admitted to a specialist psychiatric hospital in South Africa. Most patients were male and, in their thirties, receiving care in the acute service. Schizophrenia and bipolar disorder were the prevailing diagnoses, and nicotine was the most frequently used substance. Despite this population's heightened risk of COVID-19 complications, only a few were transferred to other facilities, and only two individuals succumbed to the illness. These findings are remarkable, particularly in light of prior reports indicating worse outcomes for those with SMI and COVID-19.^{6, 36, 37}

Throughout the study period, it was observed that an elevated number of male patients received a COVID-19 diagnosis in comparison to female patients. This variance in figures could be attributed to the fact that Valkenberg Hospital allocates more beds to male patients in the acute service. More patients were from the acute service. The acute service had more COVID-19 cases due to the higher frequency of patient admissions, resulting in increased vulnerability to infections and more difficulty in controlling outbreaks.¹⁰ This finding also could suggest that the hospital's forensic unit policy of limiting admissions during the pandemic, was effective. Furthermore, the absence of female forensic state patients at the hospital contributed to more male patients. The prevalence of male patients is consistent with the patient profiles of other specialised psychiatric hospitals in South Africa.^{38, 39} Research has suggested that being male may be a risk factor for susceptibility to infection and severe illness resulting from COVID-19.^{40, 41} Notably, only a small percentage of the total cohort was transferred to a medical hospital, and there was no significant difference in transfer rates between males and females.

The cohort had an average age of 35.7 years and a median age of 34. This finding is not surprising given that it is common for acute psychiatric services to admit younger patients and that the hospital forensic unit adopted a policy of limiting admissions during the pandemic.^{38, 39}

Our study revealed that patients transferred to a medical hospital were significantly older than those that recovered at VBH. This aligns with previous research indicating that older individuals experience more severe illness and worse outcomes.⁴²⁻⁴⁴

In this study, schizophrenia, bipolar disorder, and schizoaffective disorder were the most common psychiatric diagnoses. This is similar to other SMI cohorts admitted to psychiatric hospitals in South Africa.³⁹ Evidence suggests that those with SMI have a higher mortality rate and reduced life expectancy than the general population.^{15, 45, 46} South Africa's general population experienced high fatality due to COVID-19.³¹ Thus, we expected this population to be more vulnerable to COVID-19 and have poorer outcomes.^{10, 36, 45, 46} The

study found no significant link between psychiatric diagnoses and transfer to a medical hospital for COVID-19. However, it is possible that the results were influenced by the young age of the study group and the low occurrence of medical comorbidities. A few studies outside South Africa have raised concerns about the severity of COVID-19 in the SMI population, but this study showed that most infected patients were able to be treated at VBH and did not need to be transferred to a medical hospital.^{6, 15, 36} The majority of the population had mild COVID-19 and experienced positive medical outcomes, with few fatalities. Similar findings have been reported in other psychiatric inpatient settings.^{11, 47,}

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Our sample revealed that a significant number of individuals presented with symptoms that are commonly associated with COVID-19.⁴⁹ Interestingly, only a small subset of patients displayed anosmia, initially believed to be a hallmark symptom of SARS-COV-2.⁵⁰ It is worth noting that most symptomatic patients reported experiencing a range of symptoms that were classified as "other." These findings highlight the difficulties the SMI population may encounter in comprehending and articulating physical symptoms.^{10, 12, 15} Most symptoms were elicited through history taking and assessment of basic vital signs. This emphasises the importance of medical history taking and physical examination as a continuous process throughout the contact with psychiatric services.⁵¹ The only COVID-19 symptom that had statistical significance with needing to be transferred to a medical facility was shortness of breath. This is in keeping with respiratory distress and indicates a more severe COVID-19.⁴³

The vital signs significantly associated with being transferred to a medical facility were heart rate, low oxygen saturation, needing oxygen, respiratory rate, and alertness. These findings are associated with more severe COVID-19 and a greater need for management at a medically equipped facility.^{32,43} The group that required transfer was more likely to have abnormal vital signs, which is expected. However, most of the study population had vitals within normal limits. This suggests that most participants had a mild form of COVID-19, and the COVID-19 screening form (Appendix II) appropriately identified those who

needed to be transferred to a medical hospital early and those who could be treated at VBH.

Our study population reported nicotine as the most common substance used. High rates of nicotine use are prevalent in psychiatry inpatient settings in South Africa.^{52, 53} This is especially seen in the male population.⁵⁴ Smoking is a leading cause of preventable death, with a higher prevalence of conditions such as malignancy, cardiovascular disease, and chronic obstructive pulmonary disease, increasing morbidity and mortality.⁵³ During the COVID-19 pandemic, smoking cigarettes was initially considered a significant risk factor, prompting the South African government to ban cigarette sales early in the pandemic.^{55, 56} This was implemented with concerns of significant respiratory compromise in nicotine smokers infected with COVID-19 and increasing risk of virus transmission. Shortness of breath, low oxygen saturation, and oxygen requirement were significantly associated with transfer, indicating more severe disease requiring medical care. Smoking was associated, in theory, with severe disease.⁵⁵ However, in our sample we did not find that association as only a few patients required transfer to a medical hospital.

A significant prevalence of cannabis and methamphetamine consumption was exhibited in the study cohort. It has been observed that individuals who have severe mental illness tend to use multiple substances.^{38, 57} It should be noted that substance use can have detrimental effects on the respiratory, cardiovascular, and immune systems and can heighten the likelihood of severe COVID-19 and unfavourable outcomes.^{58, 59} Nonetheless, only a minority of the participants experienced severe COVID-19, and thus, just a few needed to be relocated to an alternative facility.

The SMI population is at high risk for medical comorbidities due to their poor lifestyle factors and the side effects of psychopharmacological agents.^{6, 45} It is worth noting that, apart from the category "other," the study population had a low prevalence of medical comorbidities. Our sample's lower rates of medical comorbidities may be attributed to the younger age group, which could also explain the lack of severe COVID-19 cases and the positive outcomes observed in our study. The category "other" showed statistical

association with the need to be transferred to a medical hospital, and previous PTB showed a trend towards significance, suggesting that those who were transferred were more likely to have had previous TB. The literature has suggested a correlation between multimorbidity and severe COVID-19, as well as a poorer prognosis.^{42, 43, 46, 60}

In our study, most of our patients fared well, except for two individuals who passed away. These two patients were from the long stay ward, over 40 years old and with multiple underlying medical conditions. This is consistent with findings that older age and multiple medical comorbidities are associated with severe COVID-19.^{42, 46}

When analysing the results of this cross-sectional study, it is essential to consider certain limitations. Specifically, the study examined the link between COVID-19 exposure and outcome simultaneously, making interpreting the associations challenging. Additionally, the accuracy of the data collected relied on the form completed by the treating clinician at the time of admission to the VBH COVID-19 service. Other limitations include the study being conducted at a single site with a relatively small population size. Only medically screened patients who were physically stable were accepted for transfer into VBH, which could introduce bias. Finally, the study was conducted in a specific population within an urban hospital with specific geographic drainage, so the findings may not represent the larger population.

Our study highlighted the importance of comprehensive history-taking, physical examination, and the use of screening tools in managing COVID-19 patients at VBH during the pandemic.

Conclusion

This descriptive study provided information on the demographic, clinical profiles, and outcomes of SMI patients with COVID-19 at a specialist psychiatric hospital. Despite the concerns that poor social and lifestyle factors and high comorbidity of substance use would worsen outcomes, most of the patients had mild illnesses and recovered. This

contrasts with concerns raised early in the pandemic that institutionalised patients with severe mental illness were at increased risk of mortality and an increased hospitalisation rate due to COVID-19. Further research is necessary to understand the vulnerabilities of special psychiatric units to infectious disease outbreaks. This will help to decrease risk and minimize nosocomial spread.

Acknowledgements

The authors would like to thank Dr Roos and Dr Parker for their critique and recommendations to the research protocol.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Author Contributions

All authors conceptualized this study. HS collected the data and wrote the final draft. QC and DP supervised the study and edited the article.

Funding

The authors have nothing to disclose.

Data Availability

Data sharing and availability does not apply to this article as no new data was created or analysed in this study.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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Supervisor declaration

The journal publishing the paper is accredited by the Department of Higher Education and Training or it has been approved by the UCT Health Sciences Specialist Training Committee and:

- The candidate is the first author of the paper.
- The candidate contributed the most to the paper.
- The candidate developed the protocol and wrote the paper under supervision.
- The candidate was involved in the analysis, presentation and interpretation of results.
- The other authors and their contributions to the paper are stated.

Signed:

Dr. Qhama Cossie

Appendices

Appendix I: VBH COVID-19 Patient screening tool form

Välkenberg hospital

Covid-19: Patient screening control tool (Use when patient is for admission)

DEPT:

DATE:

Patient sticker

	Questions	Yes	No
1.	Did you travel out of the country in the past 14 days?		
2.	Were you in close contact with someone confirmed to have the coronavirus?		
	If Yes... Name of contact person:		
3.	Do you feel ill and have flu like symptoms?		
A.	Vital signs: Temp (Above 38° call DR): BP:mmhg Pulse:b/pm Sats:% Resp (Above 20p/min call DR):		
B.	Cough (Dry/Productive)		
C.	Difficulty breathing		
D.	History of respiratory illness e.g. Asthma, COPD		
E.	Medical Conditions e.g. History of cardiac problems, chronic kidney diseases, CCF, CVA		
4.	Screened by: Rank: Signature: Date: Comments:		
5.	Doctors Plan:		

Appendix II: VBH COVID-19 tracker form

Valkenberg Hospital COVID19 TRACKER 2020			
Patient sticker if available			
Demographics	Name:		
	Folder Number:		
	MaleFemale [M / F]		
	DateOfBirth: [DDMMYYYY]		
MHCA	Referral Hospital:		
	DateForm06: [DDMMYYYY]		
	Admission date to VBH: [DDMMYYYY]		
	Date of referral to general hospital [DDMMYYYY]		
Psychiatric diagnoses			
Comorbid substance use disorders			
COVID19	DateOfSymptomOnset: [DDMMYYYY]		
		Yes	No
	Asymptomatic		
Symptoms	PresentingSymptomType1: Cough		
	PresentingSymptomType2: Sore Throat		
	PresentingSymptomType3: Shortness of breath		
	PresentingSymptomType4: Anosmia		
	PresentingSymptomType5: Fever		
	PresentingSymptomType6: Myalgia		
	PresentingSymptomType7: Diarrhoea		
	PresentingSymptomType8: Other		
	Quarantined ward		
	DateOfTestTaken: [DDMMYYYY]		
	DateTestResultPositive: [DDMMYYYY]		

		Yes	No
Comorbidity	Diabetes Mellitus		
	Hypertension		
	Cardiovascular disease		
	Chronic lung disease: specify		
	HIV		
	Smoker		
	Previous TB (specify year if known)		
	BMI		
Other comorbidity			

Transfer to general hospital								
Physical symptoms		3	2	1	0	1	2	3
	Age				<65			>65
	Respiratory rate (/min)	<9		9-11	12-20		20-24	>25
	Oxygen sats on room air (%)	<92	92-93	94-95	>95			
	Oxygen supply necessary		yes		no			
	Systolic blood pressure mmHg	<91	91-100	101-110	111-219			>219
	Pulse (/min)		91-100	101-110	111-219			>219
	Level of awareness				alert			altered
	Temperature (°C)	<35		35-36	36-38	38-39	>39	
	Total							
	0-4 Remain at VBH with bi-daily vitals and saturation monitoring							
	0-4 with co-morbidities: Discuss with consultant							
	5 or more: Transfer to designated medical facility							
								Yes
Psychiatri	Responding to psychotic symptoms							

Symptoms	Disinhibited		
	Aggression-verbal		
	Aggression-physical		
	Disorganised		
	Ongoing self-harm		
	Suicidal intent		
	Ongoing suicidal ideation		
	Agitated/restless		
Medication	Requires regular sedation		
	Special motivation (e.g. Consta)		
	Recent accuphase [DDMMYYYY]		
	Last depot [DDMMYYYY]		
Name, dose and frequency			

Appendix III: UCT Human Research Ethics approval



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room 45, E-52- Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6492
Email: hrec-enquiries@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

19 November 2021

HREC REF: 771/2021

Dr Q Cossie
Department of Psychiatry & Mental Health
Neurosciences Institute-GSH
Email: qhama.cossie@uct.ac.za
Student: SBI.HAS001@myuct.ac.za

Dear Dr Cossie

PROJECT TITLE: COVID-19 AND SERIOUS MENTAL ILLNESS: EXPERIENCE FROM A PSYCHIATRIC HOSPITAL IN CAPE TOWN, SOUTH AFRICA-MASTERS CANDIDATE-DR HASEENA SABLAY

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee (HREC) for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Please be aware of all sensitivities in any publication.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, dated 17 March 2020: 06 July 2020 & 01 July 2021.

Approval is granted for one year until the 30 November 2022.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: Dr Haseena Sablay will also be involved in this study.

Please quote the HREC REF 771/2021 in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

HREC/REF 771/2021sa

Appendix IV: UCT Human Research Ethics approval renewal



FACULTY OF HEALTH SCIENCES
Human Research Ethics Committee



FHS017: Annual Progress Report / Renewal

Record Reviews/Audits/Collection of Biological Specimens/Repositories/Databases/Registries

HREC office use only (FWA00001637; IRB00001938)			
This serves as notification of annual approval, including any documentation described below.			
☒ Approved	Annual progress report	Approved until/next renewal date	30/11/2023
☐ Not approved	See attached comments		
Signature Chairperson of the HREC/ Designee		Signed by candidate	Date Signed 17/11/22

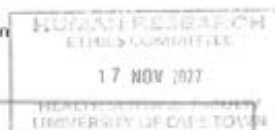
Note: Please note that incomplete submissions will not be reviewed.
Please email this form and supporting documents (if applicable) in a combined pdf-file to
hrec-enquiries@uct.ac.za.

Please clarify your plan for research-related activities during COVID-19 lockdown

Principal Investigator to complete the following:

1. Protocol information

Date (when submitting this form)	15 November 2022		
HREC REF Number	771/2021	Current Ethics Approval was granted until	30/11/2022
Protocol title	COVID-19 and serious mental illness: Experience from a psychiatric hospital in Cape Town, South Africa.		
Principal Investigator	Dr. Qhama Zamani Cossie		
Department / Office Internal Mail Address	UCT Department of Psychiatry and Mental Health Anzio Road Observatory, Cape Town 7925		
1.1 Does this protocol receive US Federal funding?		☐ Yes	☒ No



2. Protocol status (tick ✓)

☐	Research-related activities are ongoing
☒	Data collection is complete, data analysis only
Please indicate (in the block below) the titles and HREC reference numbers of any projects currently making use of the Database/registry/repository.	

3. Protocol summary

Total number of records or specimens collected, reviewed or stored since the original approval	257
Total number of records or specimens collected, reviewed or stored since last progress report	
Have any research-related outputs (e.g. publications, abstracts, conference presentations) resulted from this research? If yes, please list and attach with this report.	☒ Yes ☐ No

4. Signature

Signature of PI	Signed by candidate	Date	11/11/22
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16 February 2022

Page 1 of 2

FHS017

(Note: Please complete the Closure form (FHS019) if the study is completed within the approval period)

Appendix V: Western Cape health research and VBH approval



STRATEGY & HEALTH SUPPORT

Health.Research@westerncape.gov.za
tel: +27 21 483 0866; fax: +27 21 483 6058
5th Floor, Norton Rose House,, 8 Riebeeck Street, Cape Town, 8001
www.capegateway.gov.za

REFERENCE: WC_202112_015
ENQUIRIES: Dr Sabela Petros

University of Cape Town
Anzio Road
Observatory
Cape Town
7925

For attention: Dr Qhama Cossie, Haseena Sablay

Re: COVID-19 and serious mental illness: Experience from a psychiatric hospital in Cape Town, South Africa

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research. Please contact the following people to assist you with any further enquiries in accessing the following sites:

Valkenberg Hospital

Ms Estelle Malgas

021 826 5805

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted and the constraints caused by the Covid-19 epidemic above are respected and adhered to.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**Annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY
DIRECTOR: HEALTH INTELLIGENCE
DATE: 18/01/2022
CC

Appendix VI: Submission guidelines for the South African Journal of Psychiatry

Original Research Article

An original article provides an overview of innovative research in a particular field within or related to the focus and scope of the journal, presented according to a clear and well-structured format. Systematic reviews should follow the same basic structure as other original research articles. The aim and objectives should focus on a clinical question that will be addressed in the review. The methods section should describe in detail the search strategy, criteria used to select or reject articles, attempts made to obtain all important and relevant studies and deal with publication bias (including grey and unpublished literature), and how the quality of included studies was appraised, the methodology used to extract and/or analyse data. Results should describe the homogeneity of the different findings, and clearly present the overall results and any meta-analysis.

Submission status	open
Word limit	3000-4000 words (<u>excluding</u> the abstract, tables, figures, graphs, and references)
Abstract	maximum: 250 words requires structural headings: Background, Aim, Setting, Methods, Results, Conclusion and Contribution
Main text	requires structural headings, refer to the full structure 'Ethical considerations' is a sub-section in the manuscript and must include: • Name of the ethical review committee • Study approval number • Manner of consent (written, oral) for human participants • Description of measures taken to maintain the confidentiality of data • If the study was not human or animal research or the study was determined to be non-human subjects research or exempt, the authors must provide a statement with those details in this section.
References	60 or less, adhere to the Vancouver referencing style
Tables, figures and graphs	7 or less, adhere to the Illustrations requirements found in the AOSIS House style guide
Formatting requirements	apply the guidelines located on the Formatting requirements page and the AOSIS house style guide
Compulsory supplementary file(s)	the Authorship, disclosure statements, copyright, and license agreement form , Ethical Clearance/Waiver Documentation and any other relevant form applicable to your submission

Ethical clearance/waiver documentation	evidence of ethical clearance for the study, such as the study approval letter or certificate from the Institutional Review Board (IRB), a waiver from the IRB et cetera
Formatting requirements	apply the guidelines located on the Formatting requirements page and the AOSIS house style guide
Compulsory supplementary file(s)	the Authorship, disclosure statements, copyright, and license agreement form , Ethical Clearance/Waiver Documentation and any other relevant form applicable to your submission
Ethical clearance/waiver documentation	evidence of ethical clearance for the study, such as the study approval letter or certificate from the Institutional Review Board (IRB), a waiver from the IRB et cetera

Original Research Article full structure

Title: The article's full title should contain a maximum of 95 characters (including spaces).

Abstract: The abstract, written in English, should be no longer than 250 words and must be written in the past tense. The abstract should give a succinct account of the objectives, methods, results and significance of the matter. The structured abstract for an Original Research article should consist of seven paragraphs labelled Background, Aim, Setting, Methods, Results, Conclusion and Contribution.

- **Background:** Summarise the social value (importance, relevance) and scientific value (knowledge gap) that your study addresses.
- **Aim:** State the overall aim of the study.
- **Setting:** State the setting for the study.
- **Methods:** Clearly express the basic design of the study, and name or briefly describe the methods used without going into excessive detail.
- **Results:** State the main findings.
- **Conclusion:** State your conclusion and any key implications or recommendations.
- **Contribution:** What key insights into the research results and its future function are revealed? How do these insights link to the focus and scope of the journal? It should be a concise statement of the primary contribution of the manuscript; and how it fits within the scope of the journal.

Do not cite references and do not use abbreviations excessively in the abstract.

Introduction: The introduction must contain your argument for the social and scientific value of the study, as well as the aim and objectives:

- **Social value:** The first part of the introduction should make a clear and logical argument for the importance or relevance of the study. Your argument should be supported by the use of evidence from the literature.
- **Scientific value:** The second part of the introduction should make a clear and logical argument for the originality of the study. This should include a summary of

what is already known about the research question or specific topic and should clarify the knowledge gap that this study will address. Your argument should be supported by the use of evidence from the literature.

- Conceptual framework: In some research articles it will also be important to describe the underlying theoretical basis for the research and how these theories are linked together in a conceptual framework. The theoretical evidence used to construct the conceptual framework should be referenced from the literature.
- Aim and objectives: The introduction should conclude with a clear summary of the aim and objectives of this study.

Research methods and design: This must address the following:

- Study design: An outline of the type of study design.
- Setting: A description of the setting for the study; for example, the type of community from which the participants came or the nature of the health system and services in which the study is conducted.
- Study population and sampling strategy: Describe the study population and any inclusion or exclusion criteria. Describe the intended sample size and your sample size calculation or justification. Describe the sampling strategy used. Describe in practical terms how this was implemented.
- Intervention (if appropriate): If there were intervention and comparison groups, describe the intervention in detail and what happened to the comparison groups.
- Data collection: Define the data collection tools that were used and their validity. Describe in practical terms how data were collected and any key issues involved, e.g. language barriers.
- Data analysis: Describe how data were captured, checked and cleaned. Describe the analysis process, for example, the statistical tests used or steps followed in qualitative data analysis.
- Ethical considerations: Approval must have been obtained for all studies from the author's institution or other relevant ethics committee and the institution's name and permit numbers should be stated here.

Results: Present the results of your study in a logical sequence that addresses the aim and objectives of your study. Use tables and figures as required to present your findings. Use quotations as required to establish your interpretation of qualitative data. All units should conform to the [SI convention](#) and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Discussion: The discussion section should address the following four elements:

- Key findings: Summarise the key findings without reiterating details of the results.
- Discussion of key findings: Explain how the key findings relate to previous research or to existing knowledge, practice or policy.
- Strengths and limitations: Describe the strengths and limitations of your methods and what the reader should take into account when interpreting your results.
- Implications or recommendations: State the implications of your study or recommendations for future research (questions that remain unanswered), policy or practice. Make sure that the recommendations flow directly from your findings.

Conclusion: Provide a brief conclusion that summarises the results and their meaning or significance in relation to each objective of the study.

Acknowledgements: Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution. Authors are responsible for ensuring that anyone named in the Acknowledgments agrees to be named. Refer to the acknowledgement structure guide on our *Formatting Requirements* page.

Also provide the following, each under their own heading:

- **Competing interests:** This section should list specific competing interests associated with any of the authors. If authors declare that no competing interests exist, the article will include a statement to this effect: *The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.* Read our [policy on competing interests](#).
- **Author contributions:** All authors must meet the criteria for authorship as outlined in the [authorship](#) policy and [author contribution](#) statement policies.
- **Funding:** Provide information on funding if relevant
- **Data availability:** All research articles are encouraged to have a data availability statement.
- **Disclaimer:** A statement that the views expressed in the submitted article are his or her own and not an official position of the institution or funder.

References: Authors should provide direct references to original research sources whenever possible. References should not be used by authors, editors, or peer reviewers to promote self-interests. Refer to the journal referencing style downloadable on our *Formatting Requirements* page.