

Psychosocial predictors of anxiety and depression in a sample of healthcare workers in Botswana during the COVID-19 pandemic: A multicenter cross-sectional study

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Abstract

Objectives: This study aimed to investigate the psychological impact of the COVID-19 outbreak on healthcare workers across multiple hospitals in different districts in Botswana.

Methods: We conducted a cross-sectional study in five public-funded hospitals from three districts in Botswana from 1 June 2020 to 30 October 2020. We used the neuroticism subscale of the 44-item Big Five Inventory, Patient Health Questionnaire, the Oslo 3-item Social Support Scale, the Anxiety Rating Scale, and the 14-item Resilience Scale to obtain data from 355 healthcare workers.

Results: The participants' mean age (standard deviation) was 33.77 (6.84) years. More females (207, 59%) responded than males (144, 41%). Anxiety and depression were experienced by 14% and 23% of the participants, respectively. After multiple regression analyses, neuroticism predicted depression ($B=0.22$; $p<0.01$) and anxiety disorder ($B=0.31$; $p<0.01$). Lower educational status ($B=-0.13$; $p=0.007$) predicted anxiety and younger age ($B=-0.10$; $p=0.038$) predicted depression, while resilience negatively correlated with both disorders.

Conclusion: There is a need to develop and implement interventions targeted at these identified risk and protective factors that can be easily delivered to healthcare workers during this pandemic.

Keywords

Psychological impact, anxiety, depression, healthcare professionals, resilience

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Introduction

Coronavirus disease (COVID-19), an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2),¹ was first reported in Wuhan, the capital of Hubei province in central China, in December 2019. The outbreak quickly spread worldwide and was declared a global pandemic by the World Health Organization on 11 March 2020.² The virus is now found virtually in every country in the world. Apart from physical consequences, previous epidemics of SARS illnesses have been accompanied by adverse psychological consequences affecting patients, the general population, and some segments of the population at high risk like healthcare workers (HCWs). Some of the psychological consequences have persisted;

for example, survivors of the SARS epidemic in 2003 still had psychological symptoms a year later.³ Although recent and still relatively poorly understood, COVID-19 has been

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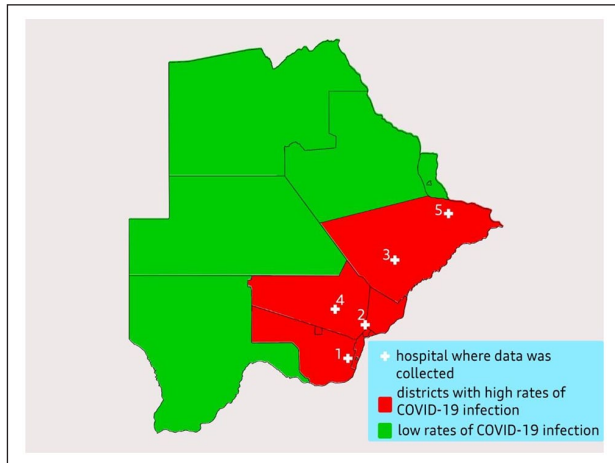


Figure 1. Showing the areas mostly affected by COVID-19 and the areas covered.

associated with adverse mental health effects in the general population early in the pandemic.^{4,5}

Depression, anxiety, insomnia, post-traumatic stress disorder (PTSD), and other stress-related symptoms have been among the most common psychological effects of COVID-19 reported across heterogeneous studies.^{6,7} The earliest reports of adverse psychological effects were from China, the epicenter of the initial outbreak;^{5,8} since then, reports of adverse psychological impact on various segments of the population have come in from all parts of the world in increasing numbers.^{9,10} Some studies have reported higher rates among HCWs than the general population.^{11,12}

Africa has reported relatively fewer studies on the psychological impact of COVID-19, and the need for these has been pointed out.^{13,14} For example, a recent study in Ghana among health workers in three hospitals found that 21.1% had depression, 27.8% had anxiety, and 8.2% had stress and recommended more studies.¹⁵

Botswana is an upper-middle-income country in Southern Africa with an estimated population of 2.3 million.¹⁶ Administratively, Botswana is divided into ten districts. The country's healthcare system is organized hierarchically, with 26 public hospitals organized in a three-tiered hierarchy with referral hospitals at the top, followed by district and primary hospitals. Further down the chain are clinics and health posts. The numbers and cadres of HCWs increase as one goes up the hierarchy. Although the country has relatively high number of HCWs per capita compared with others in the region, these are inadequate and unevenly distributed.^{17,18} The country recorded its first cases of COVID-19 in March 2020, and since then, the cases have been rising. At the time of writing, there were 46,934 cases reported, with 712 deaths (Coronavirus Resource Center, 2021). As the numbers keep rising, this is expected to put more stress on the HCWs at the forefront in fighting the disease and on whom the burden of interventions and reduction of transmission mostly falls. Those involved in the

direct care of patients with COVID-19 live with the fear of contracting the coronavirus infection and face vicarious trauma through dealing with very sick and dying patients. HCWs are thus a highly vulnerable group to adverse psychological consequences, and some studies have found particularly adverse impact among HCWs compared with the general population.^{12,19} A systematic review has found that the psychological impact was highest on patients, followed by HCWs and the general population.⁶

The need for COVID-19-related mental health research and interventions has been highlighted.²⁰ This need is even more acute among HCWs due to the rising COVID-19 numbers needing their care. In Botswana, although a raft of measures has been put in place to protect HCWs, including the provision of N95 masks and sanitizers in addition to other workplace adjustments,²¹ there are few interventions targeted at mental health challenges and no studies on the mental health and psychological effects of COVID-19. Therefore, this study aimed to investigate the psychological impact of the COVID-19 outbreak on HCWs across multiple hospitals in different districts in Botswana.

Materials and methods

Study design and setting

We conducted a cross-sectional study in five publicly funded hospitals from three different districts across Botswana; the selected hospitals are in districts with high rates of COVID-19 infection (Figure 1). These hospitals offer both outpatient and inpatient care facilities. The facilities available in these hospitals include general medical and surgical services, psychology, social welfare, physiotherapy, occupational therapy, pharmacy, laboratory, community, and emergency services.

Participants and sampling

This study involved all medical professionals such as doctors, nurses, laboratory staff, psychologists, social workers, and other auxiliary medical staff involved in patient care.

Inclusion. All hospital staff who can read and write in English and those whose duties involve contact with patients will be included in the study.

Exclusion. Support staff who have little or no contact with patients, those who decline to consent, and those who are on leave for the period of data collection will be excluded from the study.

The Cochran formula, $n = z^2 pq/d^2$, was used to calculate the minimum sample size of 315, using a recent study in which the rate of severe anxiety reported among health workers was 28.8%.⁵ We increased our sample by 20% to cater for nonresponse and set out to interview 378 participants. However, we attempted to survey all the staff of the selected hospitals regardless of the sample size estimation.

Proportional allocation was used to determine the number of participants across the five hospitals. A convenience sampling method was used for data collection.

Data collection procedures

The questionnaires were administered to every consenting HCW of the selected hospitals after obtaining approval from the Ethics and Research Committee of the University of Botswana, the Ministry of Health, and the management of the hospitals. The eligible participants were approached at their convenient times and informed of the purpose of the study. They were assured of confidentiality and anonymity and were advised not to share their information with anyone. All COVID-19 protocols specified by the ethics committee and the hospital management were strictly followed. Seven different questionnaires that are all self-administered were made into a booklet and given to every participant in private by the investigators. Once they were completed, they were asked to drop their responses into a pool of questionnaires that the investigators provided. Data obtained at the beginning of the exercise (during the pilot) using only the Anxiety Rating Scale in one of the hospitals were published and not part of the current article.²²

Measures

A *sociodemographic and clinical questionnaire* was specifically designed to inquire about the sociodemographic characteristics of the health professionals, including gender, age, marital status, location, and cadre. In addition, questions regarding the presence of any chronic medical condition were also added.

Items on recent life events were included to control for their influence on our outcome variables. This item was constructed as: “Do you have any history of a stressful or life-threatening event in the past 6 months?” The listed options include: (1) death of a spouse (or child), (2) divorce, (3) marital separation, (4) imprisonment of a close relative, (5) death of a close family member, and (6) others (specify).

The neuroticism (BFI-44). This self-report inventory was designed to measure personality traits. A subscale of the 44-item Big Five Inventory (BFI-44) was used for the present study.²³ Each item on the scale has five possible responses, which include “disagree strongly,” “disagree a little,” “neither agree nor disagree,” “agree a little,” and “agree strongly.” Higher scores are indicative of the higher levels of neuroticism reported by the respondents. The BFI-44 has a Cronbach’s alpha of 0.80 and a 3-month test–retest reliability of 0.84. The scale has been used in different cultures and countries and translated into more than ten languages. The five-factor model of personality has been reported to be reliable and used in Africans, including in Botswana samples by various researchers.^{24,25} A Cronbach’s alpha of 0.83 was obtained for the instrument during the pilot study.²²

Patient Health Questionnaire. Patient Health Questionnaire (PHQ-9) is a depression module, which is provisionally used to diagnose depression and grade severity of symptoms in general medical and mental health settings. It has nine items based on the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) criteria, and the scores range from “0” (not at all) to “3” (nearly every day). The PHQ-9 has been validated for use in Botswana. The cutoff of 9 or more was consistent with a diagnosis of a major depressive episode.²⁶

The Oslo 3-item Social Support Scale. The Oslo 3-item Social Support Scale (OSS-3) is a brief instrument that assesses social support. It consists of only three items that inquire about the number of close confidants the respondents have, their sense of concern from others, and how they relate. It also focuses on their ability to obtain practical help from friends, families, and others. Its structure and reliability (Cronbach’s alpha) have been documented in several European countries (0.60) and Africans (0.50) to be acceptably low.^{27,28} The OSS-3 scores range from 3 to 14 with a score of 3–8 = poor support; 9–11 = moderate support; and 12–14 = strong support.

The Anxiety Rating Scale. This is a self-administered questionnaire developed by the OCD Recovery Centers of America to assess anxiety in the adult population.²⁹ It has 10 items, some of which include: “I have difficulty eating too much, too little, or digesting my food,” and “I have difficulty falling asleep, staying asleep, or waking up early.” Each of these items has five possible responses, which are never (0), sometimes (1), half the time (3), frequently (4), and always (5). All the points from items 1 to 10 are added to form the total anxiety score. A total score of 25 points and above indicate high anxiety requiring clinical attention.

Resilience scale. This is a 14-item scale and a short version of the original 25-item Resilience Scale.³⁰ It has a Cronbach’s alpha coefficient of 0.82 (range, 0.76–0.91).³¹ It assesses individual competence and acceptance of self and life, for example, “I feel proud that I have accomplished things in life.” Respondents are expected to circle one of the seven numbers, ranging from “1” (strongly disagree) on the left to “7” (strongly agree) on the right. Scores from “5 to 7” indicate greater levels of resilience. This part of the tool takes about 3–5 min to complete and has been used in a previous study conducted among HCWs in Botswana.²²

The researchers developed a *perceived facility preparedness questionnaire* after reviewing similar research.^{32–34} It was designed to assess the HCW’s perception of the respective facility’s readiness in dealing with the COVID-19 pandemic. The questionnaire consists of five items assessing general facility preparedness, COVID-19 response team, timely communication, training, and self-efficacy. HCWs were requested to choose one of the options: “yes,” “to some

extent,” and “no.” Each question was scored 2 points for the “yes” answer, 1 point for the “to some extent” answer, and 0 for the “no” answer. The maximum total score for all questions is 10. Total scores are expressed as percentages. “Satisfactory perception” was considered present if a participant scored more than 60%. The instruments used are in the Supplemental material.

Data analysis

The data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics such as frequencies, median, and standard deviations (SDs) were used to describe sociodemographic variables such as gender, level of education, and clinical characteristics. Percentages were also used to present the prevalence rates of the outcome variables based on the instrument’s scoring. The scores of the outcome variables, namely, anxiety and depression, were used for further analysis. All the independent categorical variables used for further analysis were dichotomized. For example, marital status was regrouped into married and unmarried (divorced, separated, and widowed). Bivariate analyses such as the independent *t*-tests were used to test the difference in the outcome variables’ scores and the categorical variables such as gender, marital status, and religion. Pearson’s correlation was applied to explore the relationship of the outcome variables with age, resilience, neuroticism, which are continuous variables. All the significant variables on the bivariate analysis were entered into multiple regression models to explore the variables that could predict the outcomes. The significance level was set at a *p*-value of less than 0.05.

Results

Participants’ characteristics

Three hundred fifty-three questionnaires were returned, giving us a response rate of 95%. The participants’ mean age (SD) was 33.77 (6.84) years. More females (207, 59%) responded than males (144, 41%). Most of the participants were Christians (91.7%), single (62.7%), and were nurses (50%). Twenty-nine (8.2%) participants reported having hypertension, while 7 (2%) reported having diabetes, and 20 (5.7%) reported experiencing a recent life event such as divorce or separation, death of a close family member, and personal injury or illness.

Prevalence of psychological disorders

This study’s mean (SD) anxiety score was 8.77 (6.96). However, about 14% met the criteria for moderate-to-severe anxiety symptoms according to the scoring cutoff of the Anxiety Rating Scale used in this study. The present study’s mean (SD) score on the PHQ-9 was 5.29 (4.61). In the present study, a cutoff of 9 was used to diagnose depression

Table 1. Sociodemographic characteristics of participants.

Variables	Statistics	
	N	Percentage
Age median (IQR)	337	33 (29–37)
Gender ^a	351	100
Female	207	59
Male	144	41
Centers	353	100
Athlone Hospital	78	22.1
Princess Marina Hospital	126	35.7
SLH Molepolole	34	9.6
BLH Ramotswa	72	20.4
District Hospital Mahalapye	43	12.2
Marital status ^a	351	100
Single	220	62.7
Married	119	33.9
Separated	8	2.3
Divorced/widowed	4	1.2
Religion ^a	337	100
Christianity	309	91.7
Islam	5	1.5
Others ^b	23	6.7
Highest level of education ^a	347	100
Secondary	17	4.9
Diploma and degree	268	77.2
Postgraduate	62	17.9
Profession ^a	350	100
Doctor	44	12.6
Nurse	176	50.3
Pharmacist	35	10.0
Others ^c	95	27.1
Chronic medical condition	253	100
Hypertension	29	8.2
Diabetes	7	2.0
Asthma	8	2.3
Others ^d	17	4.8
None	292	82.7
Recent life event	353	100
Absent	333	94.3
Present	20	5.7

IQR: interquartile range.

^aN is not equal to 353.

^bAfrican traditional religion, Hindu.

^cPsychologists, social workers, laboratory scientists, and so on.

^dChronic rhinitis, HIV.

according to a previous study. According to this tool, 82 participants (23.2%) reported experiencing depressive symptoms (Table 1).

Factors associated with psychological disorders

On bivariate analyses, the *t*-tests revealed a moderately strong relationship between the anxiety score of the participants and educational status, with those who had secondary

Table 2. The relationship between participants' characteristics and outcomes.

Variables	Anxiety				Depression			
	N	Mean	t	p	N	Mean	t	p
Gender								
Male	144	8.28	-1.181	0.725	144	5.20	-0.383	0.195
Female	207	9.17			207	5.40		
Educational status								
Secondary and below	17	13.94	3.199	0.002	17	6.06	0.748	0.345
Tertiary and above	330	8.47			330	5.20		
Marital status								
Unmarried	232	8.95	0.523	0.601	220	5.55	1.471	0.142
Married	119	8.54			119	4.78		
Religion								
Christianity	309	8.68	-0.751	0.458	309	5.35	0.770	0.335
Islam and others	28	9.79			28	4.64		
Chronic medical condition								
Absent	292	8.34	-2.531	0.012	292	5.01	-2.321	0.023
Present	61	10.80			61	6.61		
Perceived preparedness								
Not satisfactory	319	8.69	-0.645	0.519	319	5.45	2.249	0.030
Satisfactory	34	9.50			34	3.71		
Recent life events								
Absent	333	8.64	-1.118	0.277	333	5.24	-0.616	0.545
Present	20	10.90			20	6.00		

Bold values indicate significant *p*-value.

Table 3. Spearman's intercorrelation of the continuous variables.

Measures	1	2	3	4	5	6
1 Depression	1	0.59**	-0.113*	0.290**	0.00	-0.392**
2 Anxiety		1	0.009	0.371**	0.026	-0.374**
3 Age			1	0.00	-0.048	0.054
4 Neuroticism				1	-0.096	-0.170**
5 Social support					1	0.085*
6 Resilience						1

*Correlation is significant at 0.05 level (two-tailed).

**Correlation is significant at 0.01 level (two-tailed).

education and below more likely to report anxiety symptoms ($t=3.199$; $p=0.002$). Those who had chronic medical conditions were also more likely to have anxiety symptoms ($t=-2.531$; $p=0.012$) and depressive symptoms ($t=-2.321$; $p=0.023$). Perceived unsatisfactory facility preparedness toward COVID-19 prevention was also associated with depression ($t=2.249$; $p=0.030$). There was no association between a recent life event and any psychological disorders (Table 2).

There was a positive correlation between neuroticism and anxiety, with high levels of neuroticism associated with high anxiety levels ($r=0.37$; $p<0.01$). Similar association was also observed between neuroticism and depression ($r=0.29$; $p<0.01$). There was a negative correlation

between resilience and anxiety, with high levels of resilience associated with low levels of anxiety ($r=0.37$; $p<0.001$). A negative correlation also exists between high levels of resilience and low levels of depression ($r=-0.39$; $p<0.01$). Age was negatively correlated with depression, while increased resilience was negatively correlated with low levels of neuroticism ($r=-0.170$; $p=0.001$) (Table 3).

Further analysis revealed that neuroticism remained a positive predictor of anxiety ($B=0.310$; $p<0.01$) and depression ($B=0.216$; $p<0.01$), while resilience was shown to be negatively associated with both psychological disorders: anxiety ($B=-0.305$; $p<0.01$) and depression ($B=0.349$; $p<0.01$). In addition, those with lower education

Table 4. Multiple regression analyses of variables associated with psychiatric disorders.

Variables	Anxiety			Depression		
	B	t	p-value	B	t	p-value
Neuroticism	0.310	6.504	<0.01	0.216	4.446	<0.01
Chronic medical condition	0.059	1.256	0.210	0.071	1.485	0.138
Resilience	-0.305	-6.400	<0.01	-0.349	-7.224	<0.01
Educational status	-0.129	-2.733	0.007			
Perceived preparedness				-0.087	-1.815	0.070
Age				-0.104	-2.082	0.038

Bold values indicate significant p-value.

status are more likely to develop anxiety symptoms ($B=-0.129$; $p=0.007$), while the older age groups are less likely to develop depression ($B=-0.104$; $p=0.038$; Table 4).

Discussion

Our population's prevalence of anxiety and depression during the COVID-19 pandemic was 14% and 23.2%, respectively. Our findings were compared with those of a study conducted by Ofori et al.¹⁵ in Ghana, where the prevalence of depression was 21.1%, and anxiety was experienced by 27.8% of the participants. The rates of depression and anxiety in our study are within the wide range of 8.9%–50.4% for depressive symptoms and 14.5%–44.6% for anxiety symptoms reported in a systematic review.³⁵ Compared with other countries in Africa, our rates are lower than those reported among nurses in Ethiopia.³⁶ This could be because the study conducted in Ethiopia was among nurses only, whereas ours was on different cadres of healthcare professionals. Also, nurses are in direct contact with patients for longer periods than other staff and are thus likely to experience high rates of negative psychological outcomes.³⁷

Globally, our rates are lower than the rate reported in China, where 46.04% of the participants had symptoms of depression.³⁸ The population of China was the first to grapple with the news of the pandemic; it thus makes sense that a large number would experience negative psychological outcomes. Our results also contrasted with findings from Singapore and Ireland, where 50.7% of participants reported depressive symptoms, 44.7% reported anxiety symptoms, and 42.58% and 45.13% scored positive for depression and anxiety, respectively.³⁹ Differences in assessment tools used and study settings may explain the variance. Furthermore, the studies from Asia and Europe were conducted at the pandemic's peak, whereas this was conducted when the psychological impact of the pandemic had been acknowledged with some interventions in place. These could have reduced the psychological impact on our population. Africa and specifically Botswana have experienced relatively lower numbers of infected cases and mortalities than Asia and Europe; therefore, the psychological impact of the pandemic is likely to be less severe.

The experience of anxiety in our sample was associated with having completed secondary education and below. This finding is comparable to studies from elsewhere.^{36,40,41} A study conducted in Iran revealed a strong association between low educational levels and anxiety.⁴² These findings suggest that the level of education plays a significant role in developing anxiety during stressful events. Wang et al. (2020)⁵ posited that up-to-date and accurate health information is key in reducing stress levels and anxiety during the pandemic. Thus, it is reasonable to assume that those with low education levels would have limited or inaccurate information regarding COVID-19 infectivity, which may be anxiety-provoking. Consequently, more attention needs to be paid to the populations with less education. This association remained even after controlling for other risk factors on multiple regression analysis. Hence, efforts should be made to provide them with the essential information in plain and comprehensible language, increase their knowledge about the pandemic, and reduce unnecessary fear.

Individuals with chronic conditions have been reported to be at a higher risk of developing complications and increased mortality if infected with COVID-19.⁴³ Therefore, it is not surprising that those who had a chronic disease in the current study reported higher anxiety levels. In addition, depression was likely to be experienced by those with chronic medical conditions, which compares with previous findings elsewhere.^{36,44,45} The relationship between chronic conditions and depression is well documented in the literature.^{46,47} Recently, research has focused on the influence imposed by psychological stress over depression;⁴⁸ the pandemic is an additional stressor to being diagnosed with a chronic illness and thus elevates the risk of developing depression. However, this association paled out when we controlled for other variables such as age.

Age was negatively associated with depression in our sample, which possibly suggests that the older participants were less likely to develop depression during a period like this. A cross-sectional study conducted in the general population involving different nations had suggested a link between younger age groups and increased vulnerability to depression during a pandemic.⁴⁹ One suggested factor is the increased resilience against stress in the older age group, as

these individuals are expected to have mastered a healthier way of coping during stressful periods such as this. This finding suggests a need for more age-specific health intervention strategies for each age group during crises.

The association of neuroticism, resilience, social support, and psychological disorders such as depression and anxiety disorder is a composite one and has been previously documented.^{50,51} In the present study, high levels of neuroticism correlated with high levels of anxiety in accord with the findings from Spain and Finland.^{52,53} Furthermore, individuals high in neuroticism have been reported to pay more attention to COVID-19-related information and are often preoccupied with the consequences of the pandemic resulting in negative affective reactivity.⁵⁴

Those with a high level of social support reported a low level of anxiety and depressive symptoms, albeit the association was not significant. Low social support levels have been shown to increase vulnerability to psychological distress, such as anxiety symptoms when exposed to stress.^{55,56} On the other hand, resilience was protective against depression and anxiety in our study, as documented previously.^{57,58} Although social support failed to correlate directly with psychological disorders in our sample, it is interesting to note that it correlated positively with resilience, while resilience negatively correlated with neuroticism. These findings further support the earlier statement, which proposed a complex interaction among these variables.

An earlier study had posited that social support protects against anxiety or other psychological disorders during stressful events by building resilience.⁵⁰ In accord with this, Raven et al.⁵⁹ underscore the role of peer and family support in building resilience against psychological distress during an epidemic in West Africa. Resilience occurs when psychological processes and behaviors are employed to enhance the mental assets needed to prevent the potentially unwanted outcomes of stressful events such as the COVID-19 pandemic.²² Based on our findings, it could be hypothesized that social support was used to build resilience against the psychological effect of COVID-19 or confer resilience to individuals with high neuroticism against a stressful event. Although our design lacks the power to establish this relationship, it suggests the need to further explore the complex relationship among these factors, their impacts on psychological disorders, and ways of addressing them in African settings. Furthermore, locally adapted interventions designed to address these risk factors should be implemented to prevent psychological disorders among the HCWs.

Limitations

There are several limitations to this survey. First, the self-report nature of our tools makes this current study vulnerable to underreporting or over-reporting; hence it should be interpreted with caution. Second, PTSD was not included in the

list of assessed disorders to minimize the already too many questionnaires. This may be a limitation. Third, the interpretation of the direction of causality is limited by the type of design used in our study.

Also, we could not say precisely if the levels of anxiety and depression in our study are majorly due to the pandemic because of our design. Nevertheless, we attempted to control for the influence of other everyday recent life events, such as divorce, marital separation, imprisonment of a close relative, and death of a close family member. Finally, our inability to sample all the health facilities in Botswana is a limitation to the generalizability of this study. However, an attempt was made to sample hospitals from varied regions in Botswana.

Conclusion

This study indicates that during the COVID-19 pandemic, HCWs experience a wide range of psychological stressors such as depression and anxiety, especially those suffering from chronic illnesses. Neuroticism, younger age, and low educational level correlated positively with psychological disorders, while resilience was protective. Therefore, there is a need to develop and implement interventions targeted at these identified risk and protective factors and can be easily delivered to HCWs during this pandemic.

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Authors' contributions

AO: conceptualization; proposal writing, data analysis; writing—original draft; review and editing. KM: conceptualization, proposal writing, original draft; review and editing. PO: writing—original draft; review and editing. KB: data collection, data entry, writing—review, and editing. OM, OI, OJMB, and ST: data collection, writing—review, and editing. All authors approved the final article.

Availability of data and material

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of conflicting interests

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Ethical approval

Ethical approval for this study was obtained from the Research and Ethics Committee of the Ministry of Health and Wellness IRB, Botswana (HPDME I3118/1).

Informed consent

A written informed consent was also obtained from everyone who participated in the study.

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Supplemental material

Supplemental material for this article is available online.

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