Assessment of Post-traumatic Stress Disorder and Associated Factors Among Survivors of Covid 19 in Addis Ababa, Ethiopia

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Abstract

Background

The COVID-19 pandemic has negatively impacted the psychological well-being of individuals and society. Previous studies conducted on coronavirus outbreaks including severe acute respiratory syndrome and Middle East Respiratory Syndrome pandemic found that posttraumatic stress disorder (PTSD), depression, and anxiety were the most common mental health problems and long-term consequences of these outbreaks. Coronavirus disease 19 (COVID-19) hospitalization is a potentially traumatic experience, especially in severe cases. Two studies reported significant post-traumatic stress symptoms in 42.1% and 96.2% of hospitalized COVID-19 patients which is quite high. Importantly, PTSD can be effectively treated with pharmacological or psychological interventions. PTSD if untreated can cause hypertension, cardiac disease and the risk of suicidal attempt is high as well.

Objectives

the aim of the study is to know the prevalence of PTSD and associated factors among survivors of COVID 19 in Addis Ababa, Ethiopia.

Methods

A hospital based cross-sectional study design was used among 387 randomly selected patients who were admitted in COVID 19 treatment center and discharged who full fill inclusion criteria between April 1, 2021 to 30, 2022, at three selected public hospitals in Addis ababa Ethiopia(St Peter's Specialized Hospital, Eka Kotebe Hospital, and St Paul's Millennium Medical Colleg). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) was used to assess post-traumatic stress disorder (PTSD) symptoms. Logistic regression analyses with 95% CI were used to examine the relationship between independent and outcome variables.

Result

A total of 329 respondents participated in the study. the results demonstrated 13.7% of COVID 19 survivors had PTSD and the identified associated factors are duration of COVID 19 admission (AOR: 5.17, 95% CI:1.51,17.65). and severity of illness (AOR: 10.52, 95% CI:3.13,35.32)

Conclusion

Post-traumatic stress disorder (PTSD) is a significant mental health problem among survivors of COVID-19 in Addis Ababa, Ethiopia, with a prevalence of 13.7%. Longer duration of hospitalization and severity

of illness were independently associated with PTSD. These findings highlight the need to integrate mental health screening and psychosocial support into post-COVID-19 care services, particularly for individuals with severe disease and prolonged hospital stay. Strengthening mental health services and implementing routine psychological assessment for COVID-19 survivors should be prioritized to reduce the long-term psychological impact of the pandemic.

Background

Post-Traumatic Stress Disorder (PTSD) is a serious public health issue that can arise in the aftermath of pandemics. The consequences of large-scale pandemics can be devastating, leading to increased rates of illness and death, and causing significant disruption to society. Additionally, the mental health of individuals may be severely impacted by a major infectious disease outbreak, resulting in widespread negative effects (1, 2).

The COVID-19 outbreak was declared a pandemic by the World Health Organization. As of February 4, 2023, WHO has received reports of 676,101,245 confirmed cases, with 648,428,772 recoveries and 6,770,476 deaths, from 220 countries and territories (2).

Previous studies conducted on coronavirus outbreaks including severe acute respiratory syndrome and Middle East Respiratory Syndrome pandemic found that posttraumatic stress disorder (PTSD), depression, and anxiety were the most common mental health problems and long-term consequences of these outbreaks (3).

Quarantine and lockdown restrictions have been placed on populations worldwide to stop the spread of COVID-19 (4). However, these social interaction restrictions, along with the high numbers of infection and deaths have negatively impacted the psychological well-being of individual and society (5). Experiencing or witnessing the suffering related to COVID-19 may result in high prevalence of posttraumatic disorder (PTSD), a mental disorder leading to serious distress and disability among survivors, family members, people who provide first aids and care (medical and public health professionals, police officers, etc.), and even among the general public (1, 4).

Based on previous epidemics experiences, including SARS and Middle East respiratory syndrome (MERS) it is recognized that COVID-19 infection may pose a significant threat to the mental health of affected individuals (6)

The pandemic itself is a significant psychological stressor in addition to its enormous impact on social and economic sectors worldwide. Isolation and small social networks during quarantine period limit access to external supports (4)

Infectious disease outbreaks have not only affected the physical health but also mental health of those infected and even those not infected. Post-traumatic stress disorder (PTSD) and post-traumatic stress

disorder related symptoms are prevalent and disabling conditions occur as a consequence of traumatic events (7)

People infected by COVID-19 may experience feelings of trauma due to the hospitalization and the disease itself and also stigmatization from family and friends after recovery or release from quarantine due to the viral nature of the outbreak. (2)

Due to the disease, social stigma, prolonged hospital stays, economic loss, etc., some COVID-19 patients developed severe infections and required ICU admission during the treatment. These ICU admissions can be traumatic experiences for the patients. As a result, some might also develop the condition Post Traumatic Stress Disorder (PTSD) (1)

However, an early assessment of post-traumatic stress symptoms during hospitalization may reflect temporary acute stress disorder rather than PTSD (8).

Materials and Methods

Study area, design, and period.

The study was conducted in COVID-19 treatment centers in Addis Ababa, Ethiopia. The selected hospitals were St Peter's Specialized Hospital, Eka Kotebe Hospital, and St Paul's Millennium Medical College. These hospitals were chosen because they served more than 90% of COVID-19 patients in the city during the pandemic. The study period was from April 1, 2022-April 30, 2022. Institution-based cross-sectional study using quantitative method were used.

Population

All patients who were treated for COVID-19 in treatment centres in Addis Ababa, Ethiopia Eka Kotebe Hospital, St Peter's Specialized Hospital, and St Paul's Millennium Medical College and were discharged from these hospitals. the study population consisted of randomly selected patients who were treated and discharged from the COVID-19 treatment centres (Eka Kotebe Hospital, St Peter's Specialized Hospital, and St Paul's Millennium Medical College) in Addis Ababa and who fulfilled the inclusion criteria.

Inclusion and exclusion criteria

COVID-19 survivors aged 18 years and above, Patients discharged from a treatment center at least three months before the time of data collection, Patients who are available during data collection and willing to participate in the study from April 1 to April 30, 2022, were included in the study. However, COVID-19 survivors who are not available during data collection, Patients who are critically ill and unable to provide reliable information, Patients with mental illness that prevents them from providing accurate information were excluded.

Sample size determination and sampling procedure.

The required sample size was calculated using tow population proportion formula utilizing Epi Info version 7.2, taking ICU admission as the main exposure factor. The calculation was based on the following assumptions: 95% confidence level (CL), 80% power, an odds ratio (OR) of 2.5 for ICU admission based on previous studies, and a 1:1 ratio of exposed to unexposed participants. After adding 10% for non-response, the final sample size of 368 participants was taken for the study.

A multi-stage sampling approach was employed to select a representative sample of COVID-19 admitted patients. The study included Eka Kotebe Hospital, St Peter's Specialized Hospital, and St Paul's Millennium Medical College, with total patient populations of 3,000, 2,500, and 3,000, respectively, totaling 8,500 patients. Patient lists obtained from the HMIS registration system served as the sampling frame for each facility. Samples were allocated proportionally to each hospital based on the number of admitted patients. Within each facility, the first patient was chosen using a lottery method, and subsequent patients were selected using systematic random sampling with an interval of 23 until the allocated sample size was achieved.

Dependent variable

The study's dependent variable was PTSD among survivors of COVID 19 infection.

Independent variables.

The independent variables included in this study were socio-demographic factors, such as age, sex, marital status, occupation, and religion; COVID-19 illness and treatment factors, including severity of illness, duration of hospital admission, ICU admission and duration of ICU stay, and intubation and duration of intubation, comorbidities and lifestyle factors, including the presence and type of chronic illness and anthropometric factors, such as body mass index (BMI) and obesity..

Measurement

PTSD

in this study is defined as a score of 33 and higher on PCL-5 (9, 10).

COVID 19 survivors

anyone Hospitalized for COVID 19 infection and discharged and spent 90 days after discharge.

Data collection tools, procedures, and quality control

Data were collected using the PCL-5 questionnaire, a standardized self-report tool for assessing PTSD based on DSM-5 criteria. Both English and Amharic versions were used. The questionnaire was translated and backtranslated to ensure consistency, with review by a bilingual psychiatrist. A pretest on 5% of the population identified challenges in reaching participants by phone and classifying illness severity. To address this, multiple call attempts were made, and severity of illness was obtained from patient charts or, if missing, assessed during the interview.

A total of six trained psychiatric nurses conducted phone interviews using participant contacts obtained from hospital registration databases. they received two days of training on data quality, ethical considerations, and supervision procedures, out of 368 contacts, 39 did not respond due to refusal, non-functional numbers, or unanswered calls. The questionnaire also collected data on demographic and clinical characteristics, including age, sex, religion, salary, occupation, comorbidities, ICU admission, and BMI. Daily supervision by the supervisor and primary investigator ensured completeness, accuracy, and consistency of the data. The PCL-5, with multiple-choice items, is a validated, standard tool widely accepted for PTSD assessment.

Method of Data Processing and Analysis

After data collection, questionnaires were checked for completeness, entered into Epi Info version 7, and imported into SPSS version 25 for analysis. Data cleaning and consistency checks were performed using frequencies and cross-tabulations to identify missing values and outliers, with outliers assessed via standard scores. Bivariate analysis was conducted to identify variables associated with PTSD, and variables with $p \leq 0.25$ were included in the multivariable analysis. Multicollinearity was assessed using the variance inflation factor (VIF), excluding variables with VIF > 10. In the multivariable model, variables with $p < 0.05$ and 95% confidence intervals (CIs) were considered statistically significant. Associations were expressed using odds ratios (ORs) with 95% CIs.

Results

Socio-Demographic Characteristics

The study involved 329 respondents in total, with an 89.4% response rate. The mean (± SD) age of the respondents was 41.86 (± 11.12) years.

Regarding sex distribution the majority of participants were men, accounting for 211(64.1%) of respondents. The majority of responders could read and write, and the majority were married. 247 (75.1%) of them identified as Ethiopian Orthodox Church adherents. Most of the respondents were male, accounting for 211 (64.1%). The majority were married, 246 (74.8%), and had completed Grade 1–10 education, 133 (37.4%).

In terms of religion, 247 (75.1%) of the respondents were followers of the Ethiopian Orthodox Church. Known chronic medical illness was reported among 79 (24.0%) of participants, with hypertension being

the most commonly identified condition. The median monthly income of respondents was 7,000 ETB (IQR: 5,000–9,000).

Table 1
Sociodemographic characteristics of patients who were admitted and treated in COVID-19 treatment centers, Addis Ababa, Ethiopia

Variable	Category	Frequency (n)	Percentage (%)
Age group	25–34 years	108	32.8
	35–44 years	103	31.3
	45–54 years	63	19.1
	55–64 years	41	12.5
	≥ 65 years	14	4.2
Sex	Male	211	64.1
	Female	118	35.9
Marital status	Married	246	74.8
	Single	56	17.0
	Widowed	8	2.4
	Divorced	19	5.8
Educational status	Grade 1–10	133	37.4
	Grade 11–12	51	15.5
	TVET/College Diploma	74	22.5
	Undergraduate Degree	59	17.9
	Postgraduate Degree	12	3.6
Religion	Orthodox	247	75.1
	Muslim	62	18.8
	Protestant	20	6.1
Known chronic illness	Yes	79	24.0
	No	250	76.0
Type of chronic illness*	Diabetes Mellitus	28	35.4
	Hypertension	46	58.2
	COPD	7	8.9
	Asthma	7	8.9

Insert Table 1 here.

Anthropometric, life-style factors and COVID-19 illness characteristics

Weight, height, and BMI were approximately normally distributed, with most respondents clustered in the middle categories, particularly 60.0-69.9 kg for weight 141 (42.9%) and 170-174.9 cm for height 111 (33.7%). The majority of participants had a normal BMI 18.0-24.9 kg/m² accounting for 264 (80.2%) of the study population.

The mean (± SD) weight and height of the respondents were 65.59 (± 9.77) kg and 169.31 (± 5.41) cm, respectively. The mean BMI of the respondents was 22.81 (± 2.77) kg/m². Only 22 (6.0%) of the respondents were smokers. The median duration of smoking was 240.0 months (IQR: 180.0-372.0), equivalent to 21.9 years (IQR: 15–31). On average, smokers reported consuming 23.19 (± 7.16) cigarettes per day. The median smoking exposure was 25 pack-years (IQR: 22.5–28). The majority of smokers had moderate smoking exposure (20.1–40 pack-years).

The median duration of ICU admission was 6 days (IQR: 3.0-7.75), while the median duration of intubation was 10 days (IQR: 8.5–12.5). The mean (± SD) duration of admission to the COVID-19 treatment center was 16.1 (± 7.05) days.

Table 2
Anthropometric, life-style factors and COVID-19 illness characteristics of patients admitted and treated at COVID-19 treatment centers in Addis Ababa, Ethiopia

Variable	Category	n	%
Weight (kg)	50.0-59.9	74	22.5
	60.0-69.9	141	42.9
	70.0-79.9	89	27.1
	80.0-89.9	11	3.3
	≥ 90.0	14	4.3
Height (cm)	160.0-164.9	75	22.8
	165.0-169.9	79	24.0
	170.0-174.9	111	33.7
	175.0-179.9	57	17.3
	≥ 180.0	7	2.1
BMI (kg/m²)	< 18.5	14	4.3
	18.5–24.9	264	80.2
	25.0-29.9	37	11.2
	≥ 30.0	14	4.3
Ever smoked	Yes	21	6.4
	No	308	93.6
Severity of COVID-19 illness	Moderate	126	38.3
	Severe	172	52.3
	Critical	31	9.4
Duration of admission	≤ 14 days	197	59.9
	> 14 days	132	40.1
ICU admission	Yes	26	7.9
	No	303	92.1

Insert Table 2 here.

Prevalenc of PTSD

The prevalence of PTSD symptoms was found to be 14% (Fig. 1).

Table 3
PCL-5 score of patients admitted to COVID-19 treatment centers in Addis Ababa, Ethiopia

PTSD symptom	Not at all, n (%)	A little bit, n (%)	Moderately, n (%)	Quite a bit, n (%)	Extremely, n (%)
Repeated disturbing memories	184 (50.0)	85 (23.1)	72 (19.6)	27 (7.3)	0 (0.0)
Disturbing dreams	334 (90.8)	23 (6.3)	11 (3.0)	0 (0.0)	0 (0.0)
Flashbacks (reliving experience)	341 (92.7)	16 (4.3)	11 (3.0)	0 (0.0)	0 (0.0)
Emotional distress when reminded	307 (83.4)	51 (13.9)	10 (2.7)	0 (0.0)	0 (0.0)
Physiological reaction to reminders	308 (83.7)	47 (12.8)	13 (3.5)	0 (0.0)	0 (0.0)
Avoidance of thoughts/feelings	306 (93.0)	14 (4.3)	9 (2.7)	0 (0.0)	0 (0.0)
Negative beliefs about self/others	287 (87.2)	42 (12.8)	0 (0.0)	0 (0.0)	0 (0.0)
Self-blame or blaming others	285 (86.0)	41 (12.5)	5 (1.5)	0 (0.0)	0 (0.0)
Persistent negative feelings	273 (83.0)	56 (17.0)	0 (0.0)	0 (0.0)	0 (0.0)
Loss of interest	298 (90.6)	27 (8.2)	4 (1.2)	0 (0.0)	0 (0.0)
Feeling detached from others	301 (91.5)	28 (8.5)	0 (0.0)	0 (0.0)	0 (0.0)
Difficulty experiencing positive feelings	268 (81.5)	61 (18.5)	0 (0.0)	0 (0.0)	0 (0.0)
Irritable behaviour or anger	271 (82.4)	58 (17.6)	0 (0.0)	0 (0.0	
Risky behaviour	319 (97.0)	5 (1.5)	5 (1.5)	0 (0.0)	0 (0.0)
Hypervigilance	147 (44.7)	48 (14.6)	77 (23.4)	48 (14.6)	9 (2.7)
Startle response	263 (79.9)	57 (17.3)	9 (2.7)	0 (0.0)	0 (0.0)
Difficulty concentrating	264 (80.2)	56 (17.0)	9 (2.7)	0 (0.0)	0 (0.0)

PTSD symptom	Not at all, n (%)	A little bit, n (%)	Moderately, n (%)	Quite a bit, n (%)	Extremely, n (%)
Sleep disturbance	265 (80.5)	39 (11.9)	25 (7.6)	0 (0.0)	0 (0.0)

Insert Table 3 here.

Figure 1: Prevalence of PTSD among COVID-19 patients admitted and treated in COVID-19 treatment centers in Addis Ababa, Ethiopia

Insert Fig. 1 here.

Factors associated with PTSD.

On bivariable logistic regression analysis, BMI, smoking status, exposure to smoke, duration of admission to the COVID-19 treatment center, severity of illness, and ICU admission were found to have a statistically significant association with PTSD. Variables with a p-value < 0.2 at the bivariable stage were considered for inclusion in the multivariable logistic regression model.

A final multivariable model was then developed using the principle of parsimony, guided by theoretical considerations, evidence from previous studies, and after checking for multicollinearity. The final model included BMI, smoking status, smoke exposure, duration of admission to the COVID-19 treatment center, severity of illness, and ICU admission.

In the multivariable analysis, only duration of admission and severity of COVID-19 illness remained statistically significant predictors of PTSD. Each additional day of hospitalization was associated with a 20% increase in the odds of developing PTSD (AOR = 1.20; 95% CI: 1.10–1.30; p < 0.001). Participants who stayed in the treatment center for more than 14 days were about five times more likely to develop PTSD compared with those who stayed 14 days or less (AOR = 5.17; 95% CI: 1.51–17.65; p = 0.009). In addition, patients with critical COVID-19 illness had more than ten times higher odds of PTSD compared to those with moderate illness severity (AOR = 10.52; 95% CI: 3.13–35.32; p < 0.001).

Table 4
Multivariable logistic regression of factors associated with PTSD among COVID-19 patients who were admitted and treated in COVID-19 centers in Addis Ababa, Ethiopia

Variable	Category	PTSD Yes, n (%)	PTSD No, n (%)	COR (95% CI)	P-value	AOR (95% CI)	P-value
BMI	Underweight	5 (35.7)	9 (64.3)	1.80 (0.50–6.43)	0.362	0.62 (0.08–4.38)	0.637
BMI	Healthy weight	28 (10.6)	236 (89.4)	0.38 (0.18–0.82)	0.014	0.37 (0.06–2.05)	0.259
BMI	Overweight	7 (18.9)	30 (81.1)	0.61 (0.15–2.53)	0.320	0.61 (0.08–4.41)	0.632
BMI	Obese (Reference)	5 (35.7)	9 (64.3)	1.00	-	1.00	-
Smoking status	No (Reference)	35 (11.4)	273 (88.6)	1.00	-	1.00	-
Smoking status	Yes	10 (47.6)	11 (52.4)	7.09(2.80-17.89)	< 0.001	2.01 (0.55–7.27)	0.286
Duration of admission	≤ 14 days (Reference)	15 (7.6)	182 (92.4)	1.00	-	1.00	-
Duration of admission	> 14 days	30 (22.7)	102 (77.3)	3.56 (1.83–6.94)	< 0.001	5.17 (1.51–17.65)	0.003
Severity of COVID-19 illness	Moderate (Reference)	8 (6.3)	118 (93.7)	1.00	–	1.00	-
Severity of COVID-19 illness	Severe	22 (12.8)	150 (87.2)	2.16 (0.93–5.03)	0.073	2.22 (0.93–5.33)	0.072
Severity of COVID-19 illness	Critical	15 (48.4)	16 (51.6)	13.82 (5.06–37.75)	< 0.001	10.52 (3.13–35.32)	< 0.001
ICU admission	No (Reference)	35 (11.6)	268(88.4)	1.00	-	1.00	-
ICU admission	Yes	10 (38.5)	16 (61.5)	4.78 (2.01–11.36)	< 0.001	1.176 (0.27-5.00)	0.826

Insert Table 4 here.

Discussion

The COVID-19 pandemic has had a profound impact globally, resulting in millions of deaths and placing a significant burden on health systems worldwide (10). In addition to its physical health effects, COVID-19 has also been associated with considerable psychological consequences among survivors, particularly those who experienced hospitalization and severe illness (12).

Patients admitted to treatment cenetrs were exposed to stressful experiences such as isolation, fear of death, invasive procedures, and prolonged hospital stays, which may increase the risk of developing post-traumatic stress disorder (PTSD) (12). Therefore, this study aimed to assess the prevalence and associated factors of PTSD among COVID-19 survivors in selected treatment cenetrs in Addis Ababa, Ethiopia. This study also contributes to the limited evidence available on the psychological impact of COVID-19 among survivors in Ethiopia.

This study assessed the prevalence of post-traumatic stress disorder (PTSD) among COVID-19 survivors who were discharged from three COVID-19 treatment cenetrs in Addis Ababa, Ethiopia, and had completed at least three months after discharge. The study found that 13.7% of respondents had PTSD symptoms. This finding is consistent with evidence from previous coronavirus outbreaks, including SARS and MERS, which reported increased psychological distress and PTSD symptoms among survivors. These findings suggest that the psychological impact of COVID-19 may persist even after recovery from the acute illness.

The prevalence identified in this study was slightly higher than findings reported from Norway, where PTSD prevalence was 9.5% among hospitalized patients and 7.0% among non-hospitalized patients. The difference may be explained by variations in healthcare systems, psychosocial support services, socioeconomic conditions, and coping mechanisms between the two settings. In addition, differences in study population, assessment tools, and timing of evaluation after discharge may also contribute to the variation in prevalence. (13)

However, the finding of this study is comparable with results from a systematic review and meta-analysis that reported a pooled PTSD prevalence of 16% among survivors of severe COVID-19 infection worldwide. This consistency may indicate that PTSD is a common mental health consequence among COVID-19 survivors, particularly among patients who experienced severe illness and hospitalization. (12)

In this study, ICU admission was significantly associated with PTSD symptoms. Similar findings have been reported in studies conducted in Italy and the United States among COVID-19 and acute respiratory distress syndrome survivors. This association may be related to the traumatic experiences commonly encountered during ICU admission, including severe disease condition, fear of death, prolonged isolation, invasive procedures such as intubation, and limited communication with family members. These experiences can have long-term psychological effects even after physical recovery. (7, 9)

The findings of this study highlight the importance of integrating mental health assessment and psychosocial support into post-COVID follow-up care, particularly for patients with severe illness and ICU admission history. Early screening and appropriate mental health interventions may help reduce the long-term psychological impact among COVID-19 survivors.

Conclusion

Post-traumatic stress disorder (PTSD) is a significant mental health problem among survivors of COVID-19 in Addis Ababa, Ethiopia, with a prevalence of 13.7%. Longer duration of hospitalization and severity of illness were independently associated with PTSD. These findings highlight the need to integrate mental health screening and psychosocial support into post-COVID-19 care services, particularly for individuals with severe disease and prolonged hospital stay. Strengthening mental health services and implementing routine psychological assessment for COVID-19 survivors should be prioritized to reduce the long-term psychological impact of the pandemic.

Limitations of the Study

This study has several limitations. First, it was conducted in selected COVID-19 treatment centers in Addis Ababa; therefore, the findings may not be fully generalizable to other regions of Ethiopia or to different healthcare settings. In addition, the study included only patients who were hospitalized for COVID-19, which limits the applicability of the results to non-hospitalized COVID-19 survivors.

Second, although a validated PCL-5 instrument was used for assessing PTSD symptoms, the use of a self-administered questionnaire may introduce information bias, including social desirability and recall bias. Participants may have overestimated or underestimated their symptoms due to personal, psychological, or cultural factors.

Finally, the cross-sectional study design limits the ability to establish temporal or causal relationships between PTSD and its associated factors. The findings therefore reflect associations at a single point in time rather than causal effects.

Abbreviations

AIDS
Acquired Immune Deficiency Syndrome
BMI
Body Mass Index
COPD
Chronic Obstructive Pulmonary Disease
CAPS
Clinical Administrative Post Traumatic Stress Disorder Scale
COVID 19

Corona Virus
DM
Diabetes Mellitus
DSM
Diagnostic and Statistical Manual for Mental Disorder
HIV
Human Immune Deficiency Virus
MERS
Middle East Respiratory Syndrome
OR
Odds Ratio
PCL
Post-Traumatic Stress Disorder Checklist
PTSD
Post-traumatic stress disorder
SARS
Severe Acute Respiratory Syndrome
SPHMMC
St Paul Hospital Millennium Medical College
SPSS
Statistical Package for the Social Sciences
WHO
World Health Organization

Declarations

Ethical approval

Before data collection, the research proposal was reviewed and approved by St. Paul's Millennium Medical College Institutional Review Board (IRB) which followed institutional ethics guidelines based on the Nuremberg Code, Helsinki Declaration, Belmont Report, and WHO affiliated center of international organization for medical sciences (CIONS), and official ethical clearance was obtained. an official permission letter was also secured from the research directorate of the institution prior to data collection.

All study participants were informed about the objective of the study, which was to assess the magnitude of PTSD and its associated factors among COVID-19 survivors. Participation was voluntary, and informed consent was obtained from each respondent before enrolment. Participants were assured that refusal to participate would not affect their clinical care or services in any way.

Confidentiality and anonymity were strictly maintained throughout the study. No personal identifiers were collected, and all data were used solely for research purposes. The information obtained was not shared with any third party.

The study posed no physical risk to participants. In addition, since data were collected through telephone interviews, there was no risk of COVID-19 transmission during the study process.

Consent for publication

Not applicable.

Competing interests

The authors state that they do not have any competing interests.

Funding

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Author Contribution

Amdetsion abate and Belay Bekretsion developed the research topic, prepared the proposal, and participated in data collection, analysis, and manuscript writing. Dr Ewenat Geberehana (PHD) and Mrs Fatimetu Mohamed also played key roles by guiding data collection, analysis, writing, and revision. All the authors have read and approved the final version of the manuscript for submission.

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Data Availability

The dataset used in this study is available from the corresponding author, Amdetsion abate/Belay Bekretsion, upon reasonable request (email: amdetsionabate@gmail.com/belayoas24@gmail.com).

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Figures

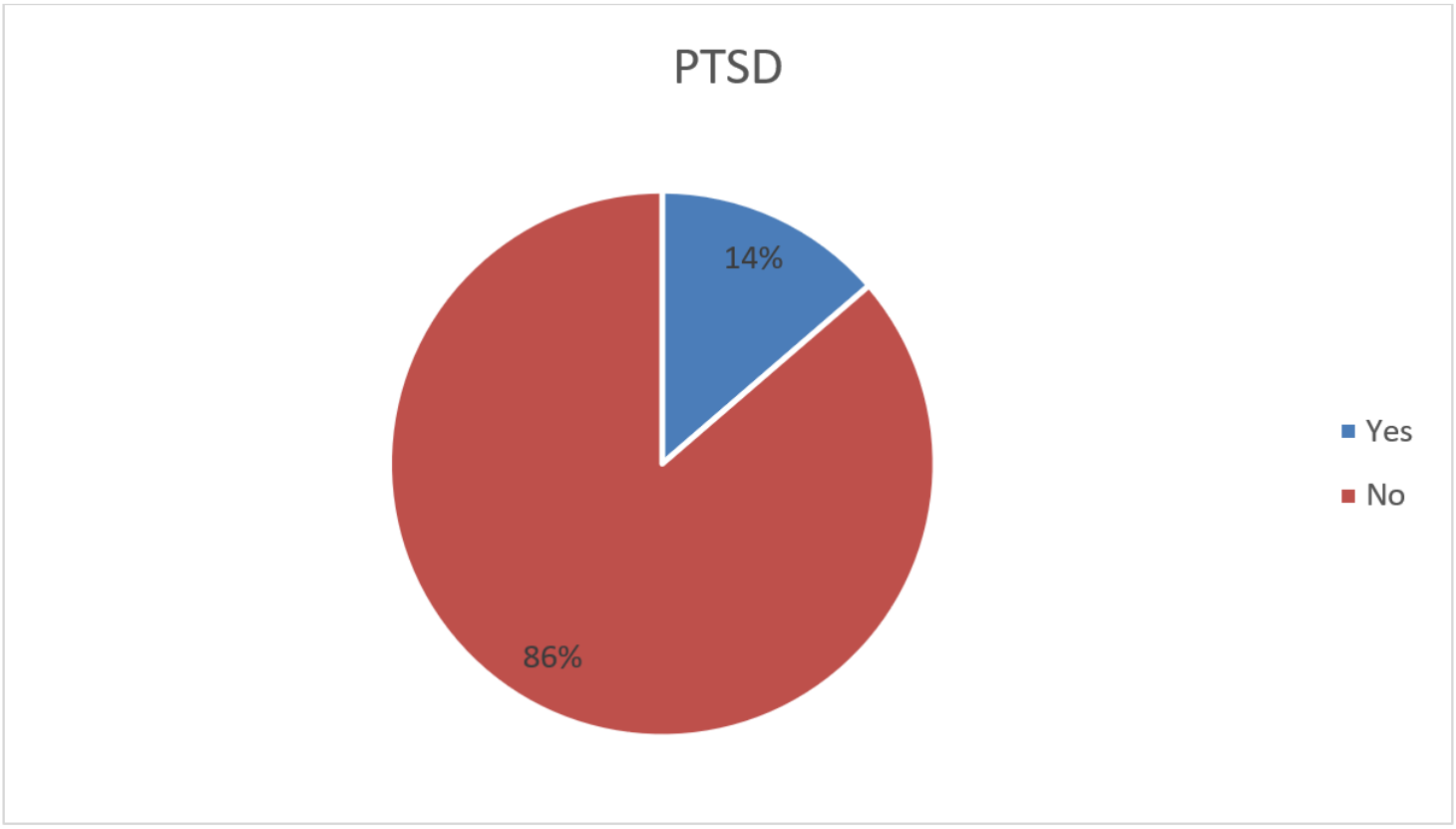

Figure 1

Prevalence of PTSD among COVID-19 patients admitted and treated in COVID-19 treatment centers in Addis Ababa, Ethiopia