ORIGINAL RESEARCH

Prevalence of Depression and Associated Factors Among Quarantined Individuals During the COVID-19 Pandemic in Tigrai Treatment and Quarantine Centers, Tigrai, Ethiopia, 2020: A Cross-Sectional Study

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Aim: The global impact of COVID-19 on mental health increases from time to time. Several studies show that depression is highly prevalent among quarantined individuals. COVID-19 is a pandemic with a rapidly increasing incidence of infections and deaths. People are depressed and psychologically overwhelmed by the illness and possible loss of their friends and loved ones.

Objective: To assess the prevalence and associated factors of depression symptoms among quarantined individuals in Tigrai treatment center, Tigrai, Ethiopia, 2020.

Methods: A multicenter Institution-based cross-sectional study was employed among individuals in the Tigrai quarantine centers. A simple random sampling technique was used between April and October 2020 until an adequate sample size was reached. Depression was assessed by using the depression, anxiety, and stress scale (DASS). Epi data manager version 4.4 was used to enter data and data was analyzed using SPSS version 20. Logistic regression was carried out and an odds ratio with 95% confidence intervals (CI) was computed to identify factors associated with depression. A P-value of less than 0.05 was considered as statistically significant and the strength of the association was presented by an odds ratio of 95% CI.

Results: The finding of the present study on the prevalence of depression among quarantined individuals was 18.1 with 95% CI (14.8–22.9). Bivariate and multivariable logistic regression analysis was performed and factors such as being female, duration of quarantine, unemployment, and having perceived stigma were significantly associated with depression.

Recommendation and Conclusion: The prevalence of depression symptoms among quarantined individuals during the COVID-19 pandemic was 18.1%. In multivariable logistic regression analysis, being female, duration of quarantine, unemployment, and having perceived stigma were significantly associated with depression. So, clinicians, mental health professionals, and policymakers should work together to address the problem.

Keywords: Ethiopia, depression, COVID-19

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Introduction

The World Health Organization (WHO) declared the outbreak of coronavirus (COVID-19) to be a public health emergency of international concern and the crisis is generating economic and health problem throughout the population.[1] Coronavirus disease 2019 (COVID-19) initially broke out in Wuhan, China, in December 2019

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and promptly became a worldwide pandemic and global heath threat within few months.[2]

COVID-19 is the largest outbreak of atypical pneumonia since the severe acute respiratory syndrome (SARS) outbreak in 2003.[3] Within a short period of time after the initial outbreak the total number of cases and deaths increased.[4]

Studies reported that impact of COVID-19 on mental health was higher due to many aspects such as the loss of employment, loss of finances, fear of contamination and death. This increases the prevalence of mental health problems, specially depression and anxiety in quarantined individuals.[5]

According to the WHO report the pandemic has its own consequences on mental health and psycho-social behavior.[1] It reported that that new measures such as self-isolation and quarantine have affected usual activities that may lead to an increase in loneliness, anxiety, depression, drug use, and self-harm or suicidal behavior.[1,6] The recent survey done by the Indian Psychiatric Society shows a 20% increase in mental illnesses since the outbreak in India.[7]

The public health emergencies resulting from COVID-19 are negatively impacting the mental health of the population and increasing the incidence of psychological crises and challenge to psychological resilience.[8,9] Recent studies reported that during the COVID-19 outbreak, the depression rate in the general population ranges from 3.7%~48.3%.[10–12] In Korea, the first COVID-19 outbreak occurred at a local psychiatric ward. Out of 103 patients held in the psychiatric ward, 102 tested positive for the virus; this shows that mental health problems make it difficult to manage the spread of the virus.[13] COVID-19 is more serious and fatal for the elderly and those with underlying health conditions and serious mental illness.[14] A study carried out in Colombia reported that there were no differences in anxiety between people who were under full versus and not confirmed quarantined individuals but higher than that of general population.[15]

Psychologists and mental health professionals reported that the pandemic will impact the mental health of the global population with an increase in cases of depression, suicide, and self-harm, as well as other symptoms reported globally.[16–18] Studies carried out in China, Italy, and the USA reported that the prevalence of depression has increased rapidly during the COVID-19 pandemic.[19]

Mental health and psychosocial consequences of the COVID-19 pandemic may be particularly serious for at least four groups of people: 1) those who have been directly or indirectly in contact with the virus; 2) those who are already ready vulnerable to biological or psycho-social stressors, because of higher level of exposure, and 3) people who are following the news through numerous media channels.[20] Studies show that the major adverse consequence of the COVID-19 pandemic are likely to be increased social isolation and loneliness, both of which are strongly associated with anxiety, depression, self-harm, and suicide attempts.[21,22] Chronic depression may lead to severe cognitive impairment,[23] severe social dysfunction,[24] poor quality of life,[25,26] and may lead to serious suicidal behavior.[27,28] The prevalence of depression in Ethiopia was 6.5% before the pandemic.[29]

Early identification of the population's mental health problems allows for the efficient implementation of interventional strategies, according to the findings.

To the best of our knowledge, there have been no previous studies carried out on depression among quarantined individual in Ethiopia.

Methods and Materials

A multi-institution-based cross-sectional study design was conducted from June to October 2020 at Study Tigray emergency and treatment center. Tigrai regional state is in northern Ethiopia, 783 Kilometers north of Addis Ababa, the capital city of Ethiopia. Tigrai regional state has five emergency treatment centers and currently it is also used as quarantine center and three centers was selected randomly using a lottery method. The study was conducted at the selected three treatment centers. The estimated number of quarantined individuals was 3500. All were adult quarantined individuals age ≥ 18 at the selected Tigrai emergency and treatment centers during data collection period.

Sample Size Determination

The sample was calculated by using single population formula, using the following assumptions.

$$n = \frac{\left(Z\frac{\alpha}{2}\right)^2 p(1-p)}{d^2}$$

Where;

   n = sample size

   $Z\frac{\alpha}{2}$ = significance level at $\alpha = 0.05$

   P = the prevalence of psychological distress among quarantined individual is unknown in our country; hence, P = 50% (0.5) was used.

d = Absolute precision or tolerable margin of error = 0.05

Therefore:

$$n = \frac{(1.96)^2 0.5(1 - 0.5)}{0.05^2} = 384$$

Since the population was less 10.000 a correction formula was used = N*n/n+N+1 = 346

N = Total population = 3500

n = sample size

Considering the sample size was 10% of the none respondent rate, the size yields 346+35 = 381.

Sampling Techniques and Compositions

A simple random sampling technique was used to select study population at Tigrai emergency operation and treatment centers during study period. Sampling frame was obtained from each emergency operation and treatment center and Computer generation was used to select the study participants. Sample was proportionally allocated the three treatment and quarantine centers.

Tools and Data Collection Procedure

Socio-demographic characteristics were collected by structured socio-demographic questionnaires and clinical factors such as duration of quarantine and substance use were also collected by semi-structured questionnaires. Social support was collected by Oslo-3 item social support scale, it is a three item questionnaire, commonly used to assess social support and has been used in several studies. The sum score scale ranges from 3–14, which has three categories: poor support 3–8, moderate support 9–11, and strong support 12–14. Stigma was assessed by the Jacoby three-item Perceived Stigma Scale and those who score 1 and above are considered as having perceived stigma; depression was assessed by depression, anxiety, and stress scale (DASS). Data was collected by face-to-face interviews using the Tigrigna version of the pre-tested questionnaire, adhering to social distancing during the interviews and using personal protective equipment to reduce the transmission of the disease. Training was given to data collectors and supervisors.

Operational Definitions

Depression

A score of 10 and above in DASS-D indicates the presence of depression.[30]

Social Support

Using OSLo-3 scale categorized in to poor "3–8" moderate "9–11" and strong "12–14."[31]

Substance Ever Use

Use of specific substance once in their life time (for non-medical purpose).[32]

Substance Current Use

Using of specific substance in the last three months (for non-medical purposes).[32]

Perceived Stigma

Based on the Jacoby Perceived Stigma Scale: a score of 1 and above indicates the patient is stigmatized.[33]

Data Quality Assurance and Analysis

The data was check, coded, and entered to Epi-data manager version 4.4.1 and was exported to SPSS version 20. The descriptive statistics (frequency, percentage, mean) and charts were done to describe data. Multicollinearity was checked using variance inflation factor (VIF) and tolerance. Binary logistic regression analysis was used. All variables with a p-value of, less than 0.2 at bivariate logistic regression analysis were entered into the multivariable logistic regression model. Multivariable logistic regression analysis was conducted to determine the presence of a statistically significant association between explanatory variables and outcome variables. Hosmer-lemeshow goodness and model fitness was checked and P values less than 0.05 were considered statistically significant and strength of the association was present by odds ratio with 95% C.I.

To control quality of data the questionnaire was translated to Tigrigna and back to English to check consistency. Data collectors were supervised daily and the filled questionnaires were checked daily by the supervisors and principal investigator.

Results
Socio-Demographic Characteristics

In this study initially we hoped to have 381 quarantined participants, but only 371 individuals participated, with a response rate of 97%. AOf the participants 269 (72.5%) were male and 102 (27.5%) were female. The majority of the participants (92.7%) were orthodox Christians. The mean age of the study participants was 27.8, with an SD of 10.4 (See Table 1).

Table 1 Socio-Demographic Characteristics of Quarantined Individuals Due to COVID–19 in Tigrai Quarantine and Treatment Centers Tigrai, Ethiopia, 2020 (n = 371)

Variables	Frequency	Percentage
Sex		
Male	269	72.7
Female	102	27.5
Marital status		
Married	138	37.2
Single	217	58.5
Divorced	11	3
Widowed	5	1.3
Religion		
Orthodox	344	92.7
Muslim	22	5.9
Protestant/Catholic	5	1.3
Occupation		
Unemployed	191	51.8
Employed	180	48.5
Educational status		
Unable to read and write	19	5.1
Able to read and write	18	4.9
Primary school	126	34
2° school	143	38.5
College and above	65	17.5

Table 2 Frequency Distribution of Substance Related Factors of Quarantined Individuals at Tigrai Quarantined and Treatment Centers, Tigrai, Ethiopia, 2020 (n = 371)

Variables	Frequency	Percent (%)
Ever drunk alcohol		
Yes	289	77.9
No	82	22.1
Ever use Kate chawing		
Yes	50	13.3
No	321	86.5
Ever smoked cigarettes		
Yes	15	4
No	356	96
Current use of alcohol		
Yes	249	86.2
No	40	13.8
Current use of Kate chawing		
Yes	35	70
No	15	30
Current use of cigarettes		
Yes	11	73.3
No	4	26.7

Clinical and Psychosocial Factors of the Study Participants

The mean duration of quarantined individuals was 11.6 with an SD of 1.5. Of the total participants 28.3% (105) had perceived stigma and around 19.4% and 37% of quarantined individuals had poor and moderate social support, respectively (see Table 2).

Factors Associated with Depression Among Quarantined Individuals

A binary logistic regression model was used to analyze the data. Bivariate and multivariable logistic regression analysis was carried out and variables with p-value>0.2 in bivariate analysis were exported to multivariable logistic regression analysis to see a further association. In bivariate logistic regression analysis sex, marital status, job, social support, and perceived stigma were with a p-value of >0.2 and exported to multivariable logistic regression analysis. Multivariable logistic regression analysis was performed and factors such as being female, duration of quarantine, unemployment, and

having perceived stigma were significantly associated with depression with a p-value less than 0.05.

The odds of depression among quarantined individuals due to COVID-19 was about 2.5 (AOR 2.5, 95% CI [1.2–5.4]) times higher among female quarantined individuals than male quarantined individuals. As the duration of quarantine increased by one unit depression among quarantined individuals increased by 1.3. Quarantined Individuals with perceived stigma were about 12 (AOR, 12.9, 95% CI [6.0–27.9]) times more likely to have depression than those who had no perceived stigma. In this study, 54% (AOR 0.46, 95% CI, [0.22–0.96]) of unemployed quarantined individuals were less likely to develop depression than those employed individuals (Table 3).

Discussion

The prevalence of depression among quarantined individuals was 18.1% with 95% CI (13.7–22).

In this study, depression among quarantined individuals was lower than studies conducted in affected areas of China, which was 35.9% and 26.5% in two different studies.[34,35] This discrepancy might be due to higher

Table 3 Bivariate and Multivariable Logistic Regression Analysis Showing Factors Associated with Depression Among Quarantined Individuals Due to COVID-19 in Tigray Quarantine and Treatment Centers Tigrai, Ethiopia, 2020 (n = 371)

Variables	Depression		COR (95%, CI)	AOR (95%, CI)
	Yes (%)	No (%)		
Duration of quarantine	Mean	SD	1.2(0.96–1.23)	**1.3(1.1–1.53)***
	11.6	1.5		
Sex				
Male	41	228	1	1
Female	26	76	1.9(1.09–332)	**2.5(1.2–5.4)***
Marital status				
Married	27	111	1	1
Single	33	184	0.74(0.42–1.3)	0.82(0.39–1.7)
Divorced	4	7	2.35(0.64–8.6)	2.0(0.32–13.8)
Widowed	3	2	6.2(0.98–38.8)	1.93(0.24–17.4)
Job				
Unemployed	19	172	0.30(0.17–0.54)	**0.46(0.22–0.96)***
Employed	48	132	1	1
Social support				
Poor	24	48	4.24(2.1–8.55)	1.5(0.6–3.8)
Moderate	26	112	1.97(1.02–3.8)	1.6(0.7–3.8)
Strong	17	144	1	1
Perceived stigma				
Yes	50	55	13.3(7.1–24.8)	**12.9(6.0–27.9)****
No	17	249	1	1

Notes: 1, reference **Variables with p-value less than 0.01, *Variables with p-value less than 0.05 in multivariable logistic regression analysis and Bold variables that show significant association in multivariable logistic regression analysis.
Abbreviations: AOR, adjusted odd ratio; OR, crude odd ratio; CI, confidence interval.

numbers of cases in China during the study period and low numbers of cases and deaths.

A study carried out in southwestern China in early February 2020 was lower than this study.[36] Another study carried out in Italy showed that the prevalence of depression was lower than this current study. This difference might be the study period time and that the study carried out in Italy was on population, whereas this study was on quarantined individuals.[37]

In this study factors associated with depression among quarantined individuals were: being female, duration of quarantine, unemployment, and perceived stigma. This was supported by studies carried out in China, Italy, Spain, and Japan.[36,38–41] In the current study, as the duration of quarantine increased by one unit, depression among quarantined individuals increases by 1.3. This might be due to individuals being unable to adapt to a new environment and prolonged periods of loneliness.

The odd of depression among quarantined individuals due to COVID-19 was about 2.5 times higher among female quarantined individuals than male quarantined individuals. This might be because females are less likely to express their feelings than men due to sociocultural influences. Quarantined Individuals with perceived stigma were about 12 times more likely to have depression than those who had no perceived stigma. The possible explanation for this finding might be that COVID-19 is a highly contagious disease and is easily spread across the world.[1] So quarantined individuals might perceive fear of stigma and avoidance which may lead them to depression.

Conclusion and Recommendation

The prevalence of depression among quarantined individuals during the COVID 19 pandemic was higher than the general population. In multivariable logistic regression analysis being female, duration of quarantine, unemployment, and having perceived stigma were significantly

associated with depression. So clinicians, mental health professionals, and policymakers should work together to address the problem.

Limitations of the Study

The study design was cross-sectional which does not provide a cause-and-effect relationship between variables. Whether participants may or may not have been previously diagnosed with depression is not known.

Abbreviations

AOR, Adjusted Odds Ratio; CI, Confidence Interval; COR, Crude Odds Ratio; SPSS, Statistical Package for Social Sciences; WHO, World Health Organization.

Data Sharing Statement

The data sets used and analyzed during this study are available from the corresponding author if needed.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the ethical review committee Adigrat University and formal letter of permission was obtained from Adigrat University. This research was conducted by the declaration of Helsinki. The data collectors clearly explained the aims of the study for study participants. The right was given to the study participants to refuse or discontinue participation at any time they want and the chance to ask anything about the study and data collection was started right after obtained consent from participants. All personnel information was kept entirely anonymous and confidential.

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Author Contributions

All authors made a significant contribution to the work reported: whether in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

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