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Depression, Anxiety and Associated factors among COVID-19 Patients at Armed Force Comprehensive COVID-19 Center Hospital in Ethiopia

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ABSTRACT: The coronavirus disease 2019 (COVID-19) pandemic has a significant impact on the public mental problem. The anxiety and depression symptoms are a common emotional reaction to the COVID-19 pandemic. The objective of the study was to assess the level of depression and anxiety reactions and associated factors among COVID-19 patients at the COVID-19 center of the Armed Force Comprehensive Hospital in Ethiopia. Across-sectional study was conducted among 150 COVID-19 patients who were interviewed for the survey in the Afaan Oromo language. The Beck's Depression Inventory and Beck's Anxiety Inventory measuring scale questionnaires were adapted and used to measure depression and anxiety of COVID-19 patients. Data were analyzed by logistic regression using SPSS computer software version 23. Mean age of the COVID-19 patients was 29 with a standard deviation of ± 7.6 years. Among the total respondents, 92 (61.3%) were males. The overall prevalence of depression from borderline clinical to severe was 84% and anxiety from moderate to severe was 86.7%. The multivariate regression analysis showed that being married, divorced, fear of death, poor sleep quality, fear of re-infection, less family support, loneliness, and lower oxygen saturation were positively associated with depression and anxiety reactions. From study participants, the majority of them were presented with features of depression and anxiety. Being married, divorced, fear of death, poor sleep quality, fear of re-infection, less family support, loneliness, and lower oxygen saturation were the associated factors with depression and anxiety reaction for COVID-19 patients.

Keywords: Anxiety, COVID-19 center, COVID-19 patients, Depression, Ethiopia

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is first recognized in Wuhan, Hubei Province of China since December 2019, which is a worldwide pandemic of public health emergency and has features spreading rapidly around the globe (Chinazzi *et al*., 2020; Nishiura *et al*., 2020; Zhou *et al*., 2020). By August 31, 2020, the World Health Organization (WHO) reported that more than 41 million were infected 1,130,220 deathsglobally, 1,675,580 infections and 40,309 deaths in African, and 90,490 cases and 1,371 deaths in Ethiopia which is increasing from day to day (WHO, 2020). Anxiety and depression are common mental illnesses in the world and the most impact causing mental problems. During this outbreak, the mental health issue is not an ignored problem since there is the influence of the outbreak on the mental health problem. As different studies revealed that depression and anxiety are commonly persistent among chronic diseases. Symptoms of depression and anxiety are common psychological reactions to COVID-19 (Dai *et al*., 2020; Hopwood & Stephens, 2000; Natale *et al*., 2019; Pathan & Thakur, 2020; Polikandrioti *et al*., 2015; WHO, 2017).

As different studies indicated that among COVID-19 patients surveyed, a significant proportion was experiencing mental illnesses; mainly depression and anxiety that cause trouble of symptom regulator and have decreased quality of life. Though recently published researches on the psychological impact of COVID-19 are mainly focused on the healthcare workers despite, the general public who were worried about the risks of infection and protective measures, resulting in psychological distress (Dai, Hu, Xiong, Qiu, & Yuan, 2020; Wang *et al*., 2020; Zhu *et al*., 2020).

Even though COVID-19 is a new strain of coronaviruses, it is known by causing diseases ranging from cold to more severe illnesses like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Severe cases of this disease can lead to cardiac problems like heart failure, and respiratory syndrome, and

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renal failure as well as death. Anxiety is one of the common psychosocial problems that affect the majority of populations. Many of the current research evidence suggests that isolated and quarantined people were experiencing a significant level of anxiety, stress, and confusion (Ashour, Elkhatib, Rahman, & Elshabrawy, 2020; Brooks *et al.*, 2020; Holshue *et al.*, 2020).

As different strategies were implemented by different countries in the world to minimize the risk of the COVID-19 transmission in the community. Ethiopia also declared an emergency state to minimize the risk of COVID-19 transmission by applying travel restrictions, physical distancing, quarantine, frequent handwashing, reducing the capacity of public transportation, and stay-at-home preventive and control strategies. Despite many efforts to reduce the risk of COVID-19 transmission, mental health problems and psychological impact among COVID-19 patients have remained high. Therefore, this study aimed to assess the level of depression, anxiety, and associated factors among COVID-19 patients in the COVID-19 center of an Armed Force Comprehensive Hospital in Ethiopia.

METHODS AND MATERIALS

Study Design, Setting, and Population

The institution-based cross-sectional study was conducted from 15 July to 30 August 2020 at COVID-19 Center of Armed Force Comprehensive Hospital in Ethiopia. The COVID-19 center of Armed Force Comprehensive Hospital is found in Oromia regional state in Bishoftu town which is about 40 kilometers far from Addis Ababa (the capital city of Ethiopia) to the Northeast. The hospital gives service for 600 SARS Cov-2 positive patients. All SARS Cov-2 positive (18 years or older) and admitted patients were included, except those who were critically ill and unable to talk at the time of data collection. Samples of 150 COVID-19 patients were selected by simple random sampling techniques.

The data were collected by three nurses holding a Bachelor of Science degree under the supervision of a senior psychiatry professional. The data collectors were provided one day of concentrated training on the content of the measuring tool and how to select a participant for the interview. The principal investigators also made a continuous follow-up to ensure the quality of the data collected. The Institutional Review Board of the College of Health Sciences at Defense University had reviewed and approved the research project and a letter of cooperation was written to COVID-19 Center of Armed Force Comprehensive Hospital. After permission was obtained from the authorities of the study setting, the written informed consents were secured from each participant and the study was conducted as per the Declaration of Helsinki.

Measurements

The socio-demographic characteristics and other factors for COVID-19 patients were recorded using 14-items. These include sex, age, religion, educational status, occupation, marital status, fear of death, stigma, absence of sleep, fear of re-infection, less social support, loneliness, economic impact, and lower oxygen saturation. The measurements for depression and anxiety concerning COVID-19 positive patients were recorded using 21-items Beck Depression Inventory and 21-items Beck Anxiety Inventory.

Both the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) were used to measure depression and anxiety reactions of the COVID-19 patients, respectively. Both tools contain 21 items with a Likert scale ranging from 0 (not at all) to 3 (severely). The total score (0-63) was obtained by summing up the scores of all items. The cut-off point for levels of depression interpretation was $\geq$17 score points without focusing on normal mood (1-10) and mild mood disturbance (11-16) scores. Borderline clinical depression (17-20), moderate depression (21-30), severe depression (31-40), and extreme depression (>40) scores were considered for the level of depression assessment. Again, for the level of anxiety interpretation, the cut-off point for individuals with anxiety problems was $\geq$ 22-point scores without emphasizing a mild form of anxiety reaction because it is the usual problem without causing significant clinical distress, occupational, and functional impairment. The moderate form of

anxiety with a grand sum between 22-35 score and the severe form of anxiety with a grand sum of ≥ 36 scores was considered potentially concerning levels of anxiety for assessment (Beck, Epstein, Brown, Steer, & psychology, 1988; Sprinkle *et al*., 2002).

Data was collected in the Afaan Oromo language using a face-to-face interviewer. In this regard, the questionnaire was translated from English to the Afaan Oromo language by a fluent translator and then back-translated to English by another fluent translator. Before data collection, we assessed the Afaan Oromo language version of the BDI and BAI to ensure meaning equivalence with the original English.

Data Processing and Analysis

Data were coded, entered, and cleaned using Epi-data version 3.1 and then transferred to SPSS version 23.0 for analysis. Frequency distributions were computed for sociodemographic variables and the patient's reactions. The independent variables in this study were sociodemographic factors and the dependent variables were depression and anxiety. The independent variables associations with depression and anxiety reactions were analyzed first by using bivariate analysis. Then, only those variables with p-values ≤ 0.25 were taken as a candidate for multivariate logistic analysis. In the multivariate logistic analysis p-value <0.05 was considered to be statistically significant.

RESULTS

Sociodemographic Characteristics of the Participants

All of the study participants (150) were interviewed with a 100% response rate. The age of respondents ranges from 18 to 60 years with the mean age of 29 ± 7.6 years. Among the total respondents, 92 (61.3%) were males, 77 (51.3%) were married and 71 (47.3%) were Christian by religion. Half (50%) of them have attended College/University education and 76 (50.6%) were military members(Table 1).

Table 1. Distribution of participants by socio-demographic characteristics of COVID-19 patients at Armed Force Comprehensive Hospital in Oromia, Ethiopia (n=150).

Characteristics	Category	Frequency (n)	Percentage (%)
Sex	Male	92	61.3
	Female	58	38.7
Age	18-22	11	7.3
	23-27	40	26.7
	28-32	53	35.3
	≥33	16	10.7
Religion	Orthodox	71	47.3
	Muslim	29	19.3
	Protestant	42	28
	Others	8	5.3
Educational status	Primary school	35	23.3
	High school	40	26.7
	College/University	75	50
Occupation	Jobless	5	3.3
	Civilian workers	69	46
	Military	76	50.7
Marital status	Single	53	35.3
	Married	77	71.3
	Divorce	20	13.3

Factors that contribute to the presence of anxiety and depression among COVID-19 patients at the Armed Force Comprehensive COVID-19 center Hospital.

Among the factors that contribute to depression and anxiety for COVID-19 patients, fear of death (96.7%), lower oxygen saturation (93.3%), loneliness (91.3%), fear of re-infection (85.3%), economical problem (80 %), and stigma (66.7%) (Table 2).

Table 2. Factors that contribute to the presence of anxiety and depression among COVID-19 patients at Armed Force Comprehensive Hospital in Oromia, Ethiopia (n=150).

Factors	Yes/No	Frequency (n)	Percentage (%)
Fear of death	Yes	145	96.7
	No	5	3.3
Stigma	Yes	100	66.7
	No	50	33.3
Poor sleep quality	Yes	126	84
	No	24	16
Fear of re-infection	Yes	128	85.3
	No	22	14.7
Less family support	Yes	104	71.3
	No	46	30.7
Loneliness	Yes	137	91.3
	No	13	8.7
Economic problem	Yes	120	80
	No	30	20
Lower oxygen saturation	Yes	140	93.3
	No	10	6.7

The Prevalence of Depression and Anxiety among COVID-19 patients

According to the multidimensional scoring system of Beck's depression and anxiety Inventory measuring scales, the proportion of mild, borderline clinical, moderate, and severe depression was 7.3%, 18.7%, 56%, and 9.3%, respectively. Similarly, mild, moderate, and severe anxiety was 6%, 10%, and 76.7%, respectively. The overall prevalence of depression from borderline clinical to severe was 84% while that of anxiety from moderate to severe was 86.7%.

Factors Associated with Depression and Anxiety of the COVID-19 patients

In the bivariate analyses, sociodemographic factors (age, sex, and marital status), and factors for depression and anxiety level concerning COVID-19 patients (fear of death, stigma, fear of re-infection, loneliness, less family support, poor sleep quality, low oxygen saturation, and economic problem) had a statistically significant association with depression and anxiety level, while religion, educational status, and occupation did not have an association with depression and anxiety. However, in the multivariate logistic regression analysis, age, marital status, fear of death, fear of re-infection, loneliness, less family support, poor sleep quality, low oxygen saturation, and an economic problem had a statistically significant association with both depression and anxiety.

Those who were married and divorced were more likely develop depression and anxiety than others (AOR=3.61; CI: 3.12, 3.74), AOR=2.60; CI: 1.56, 4.36), (AOR =3.12; CI: 0.54, 3.34), and (AOR =1.60; CI: 1.64, 3.68), respectively. Fear of death among depressed and anxious patients was (AOR =2.26; CI: 1.30, 4.67) and (AOR =4.18; CI: 1.32, 5.33). Poor sleep quality was more likely affects depressed and anxious COVID-19 patients were (AOR =3.56; CI: 1.50, 5.44) and (AOR =2.12; CI: 1.42, 3.59). Fear of re-infection, less family support, loneliness and lower oxygen saturation among depressed and anxious patients were (AOR =3.61; CI: 2.21,5.87), (AOR =2.17; CI: 1.42, 3.38), (AOR =2.43; CI: 1.34,5.91), (AOR =3.11; CI: 1.32, 3.35), (AOR =4.01; CI: 2.33,8.77), (AOR =3.18; CI: 1.42, 3.39), (AOR =2.22; CI: 1.43,4.54), (AOR =4.10; CI: 1.42, 5.35), respectively positively associated (Table 3).

Table 3. Factors Associated with Depression and Anxiety among COVID-19 patients at COVID-19 center of Armed Force Comprehensive Hospital Oromia, Ethiopia (n=150).

Explanatory Variables		Depression		Anxiety	
		COR, 95%CI	AOR,95%CI	COR,95%CI	AOR,95%CI
Age	18-22	1.00	1.00	1.00	1.00
	23-27	2.26(1.30,4.67)	2.19(1.42,3.39)	3.15(0.55,5.11)	2.11(.76,3.66)
	28-32	2.85(0.69,4.23)	3.14(0.54,3.34)	2.26(1.30,4.67)	1.19(1.12,3.30) *
	≥ 33	3.43(0.54,4.33)	4.72(0.34,5.76)	2.61(2.13,3.14)	2.11(1.35,3.77) *
Sex	Male	1.00	1.00	1.00	1.00
	Female	8.11(1.94,13.93)	2.84(1.12,6.78)	2.24(1.42,4.52)	2.35(1.14,4.51) *
Marital status	Single	1.00	1.00	1.00	1.00
	Married	0.43(0.41,0.87)	3.61(3.12,3.74)	0.76(0.56,1.92)	2.60(1.56,4.36) *
	Divorce	2.85(0.69,4.25)	3.12(0.54,3.34)	1.67(1.32,2.52)	1.60(1.64,3.68) *
Fear of death	Yes	5.26(1.50,9.76)	2.26(1.30,4.67)	2.08(1.02,4.24)	4.18(1.32,5.33) *
	No	1.00	1.00	1.00	1.00
Poor sleep quality	Yes	0.66(0.01,5.67)	3.56(1.50,5.44)	1.15(1.12,2.69)	2.12(1.42,3.59) *
	No	1.00	1.00	1.00	1.00
Fear of re-infected	Yes	1.43(1.22,7.23)	3.61(2.21,5.87)	1.43(0.62,3.13)	2.17(1.42,3.38) *
	No	1.00	1.00	1.00	1.00
Less family support	Yes	1.11(1.01,3.54)	2.43(1.34,5.91)	1.23(0.76,3.25)	3.11(1.32,3.35) *
	No	1.00	1.00	1.00	1.00
Loneliness	Yes	4.17(0.26,8.12)	4.01(2.33,8.77)	2.21(0.41,4.46)	3.18(1.42,3.39) *
	No	1.00	1.00	1.00	1.00
Economic problem	Yes	2.22(1.82,3.28)	1.92(1.68,3.78)	1.52(0.53,2.44)	2.13(1.43,3.38) *
	No	1.00	1.00	1.00	1.00
Lower oxygen saturation	Yes	6.31(3.33,12.32)	2.22(1.43,4.54)	1.57(0.89,4.13)	4.10(1.42,5.35) *
	No	1.00	1.00	1.00	1.00

Refers to a significant association (p-value < 0.05)
1.00 = reference
AOR: Adjusted odds ratio
COR: Crudes odds ratio
CI: confidence interval

DISCUSSION

In this study, we assessed the prevalence of depression and anxiety and their associated factors among COVID-19 patients at the Armed Force Comprehensive COVID-19 center Hospital in Oromia, Ethiopia. The age of respondents ranges from 18 to 60 years with the mean age of 29 ± 7.6 years. Of the total participants, 84% had depression and 86.7% had anxiety. This high prevalence of depression and anxiety at the COVID-19 center can exert an impact on the patient's life or prognosis. Due attention is necessary because global health threats with devastating consequences of COVID-19 and the burden of depression and anxiety can potentially impact the outcome of this pandemic disease (Chinazzi *et al*., 2020; Nishiura *et al*., 2020; Zhou *et al*., 2020).

The prevalence of depression and anxiety were higher (84% depression and 86.7% anxiety) than the findings of the studies done in Huoshenshan Hospital, Wuhan China, (28.47% and 34.72%) and Jianghan Fangcang Shelter Hospital in Wuhan China 13.4% and 8.6 %, respectively (Dai *et al*., 2020; Kong *et al*., 2020; Tariku, 2020). This might be because that study had been conducted in a different community with different socio-economic factors.

Another finding of our present study identified that older age, being female, married, and divorced have a positive association with depression and anxiety which was similar to the study conducted in China, Italy, and Spain (Barzilay *et al*., 2020; Dai *et al*., 2020; González-Sanguino *et al*., 2020; Kong *et al*., 2020; Rossi *et al*., 2020; Sher, 2020; Wang *et al*., 2020).

The result found in this study indicated that those respondents who had been fear of death were 2 times more likely to have depression and 4 times more likely to have anxiety compared to those who had not been with fear of death. This finding was similar to the result of other studies (Barzilay *et al*., 2020; González-Sanguino *et al*., 2020). This might be partly explained by the fact that fear of death causes a multidimensional effect on the psychology of respondents while they think more about the quarantine, loss of social support, and decreased family relationships.

Those who had been known to be less family support were 2 times more likely to have depression and 3 times more likely to have anxiety compared to those who have good family support. On the other hand, even if it was not associated with both depression and anxiety, stigma might have a psychological scar that might be painful. Those who had poor sleep quality and fear of re-infection had more likely 3 times depression and 2 times anxiety compared to those who had no sleep problem and fear of re-infection. This study substantiates with the previous study conducted in other settings (Chang *et al*.; Dai *et al*., 2020; Sher, 2020). The economic problem of the respondents, in general, had the possibility of altering the presence of depression and anxiety which corroborates with a previous study (Barzilay *et al*., 2020; Brooks *et al*., 2020; Sher, 2020). Another finding from the present study was loneliness and low oxygen saturation of COVID-19 patients who were more likely to have depression and anxiety symptoms. COVID-19 had a significant impact on people's health, economy, sleep, fear, and relationship (Barzilay *et al*., 2020; Brooks *et al*., 2020; Dai *et al*., 2020; Endomba, Wouna, & Danwang, 2020; González-Sanguino *et al*., 2020; Guo *et al*., 2020; Hirvonen, Abate, & de Brauw, 2020; Huang & Zhao, 2020; Ma *et al*., 2020) our study of why the prevalence of depression and anxiety is high among COVID-19 patients. This is the first study conducted in Ethiopia to assess depression and anxiety at the COVID-19 center of Armed Force Comprehensive Hospital in Ethiopia. However, the study design itself has limitations since it is not identifying the causal factor relationship.

CONCLUSIONS

There is a high reaction feeling of depression and anxiety among COVID-19 patients. Factors associated with depression and anxiety among COVID-19 patients were fear of death, loneliness, lower oxygen saturation, and lack of social support. Efforts need to be focused to raise awareness of how depression and anxiety exert an impact on the COVID-19 patients.

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