COVID-19-related anxiety and knowledge toward its preventive measures among patients with chronic medical illness on follow-up in public hospitals of Bale, East Bale, and West Arsi zones, Ethiopia

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Abstract

Background: Coronavirus disease 2019, also known as 2019-nCoV cluster of acute respiratory illness with unknown causes, which occurred in Wuhan, Hubei Province, in China, was first reported to World Health Organization country office as of December 30, 2019. People with medical illness are at a higher risk for coronavirus disease, and the pandemic influences mental health and causes psychological problems, particularly in those with chronic medical illness. Hence, this study aimed to assess coronavirus disease 2019-related anxiety and the knowledge on its preventive measures among patients with medical illness on follow-up in public hospitals of Bale, East Bale, and Arsi zones.

Objective: To assess coronavirus disease 2019-related anxiety and knowledge toward coronavirus disease 2019 preventive measures among patients with chronic medical illness on follow-up in public hospitals of Bale, East Bale, and West Arsi zones.

Methods: A hospital-based cross-sectional study was conducted in selected hospitals of Bale and West Arsi zones, Southeast Ethiopia. A total of 633 study participants were included in this study, and data were collected through an interviewer-administered questionnaire. A descriptive summary was computed. Bivariable and multivariable logistic regression analyses were carried out to identify the associated factors.

Results: Overall, the prevalence of anxiety among chronic patients in this study was 6.3% (95% confidence interval: 4.6%–8.5%) and 420 (66.35%) had good knowledge on the preventive measures of coronavirus disease 2019. Factors significantly associated with anxiety among chronic patients were being educated (95% confidence interval: adjusted odds ratio = 0.26 (0.09–0.74)), being male (95% confidence interval: 2.69 (1.11–6.53)), and use of mask (95% confidence interval: 0.11 (0.05–0.26)).

Conclusion: The prevalence of coronavirus disease 2019-related anxiety among chronic patients was high and being males, uneducated, and not using face mask was significantly associated with coronavirus disease 2019-related anxiety.

Keywords

Covid-19, anxiety, chronic patients

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Coronavirus disease 2019 (COVID-19), also known as 2019-nCoV, is an acute respiratory illness with unknown causes, which occurred in Wuhan, Hubei Province, in China, and was first reported to World Health Organization (WHO) country office as of December 30, 2019. On January 30, 2020, WHO declared the outbreak a public health emergency of international concern, and on March 11, WHO Secretary-General characterized COVID-19 as a pandemic.1

According to a report from WHO on March 27, 2020, the virus was transmitted through droplets that occur when a susceptible individual is in close contact with the infected one (within 1 m) and transmission may also occur through fomites in the immediate environment around the infected person.2 Fever, cough, and expectoration were the most common symptoms. In some patients, it also presents with decreased oxygen saturation, leucopenia, elevated C-reactive protein, and chest abnormality in peripheral parts of the lung with patchy form.3 As of November 1, 2021, the number of deaths and people with a serious illness of COVID-19 were 6459 and 432, respectively, in Ethiopia.4 Chronic patients have a follow-up at health facilities. However, this follow-up was interrupted due to the COVID-19 pandemic, which can result in anxiety. Another problem that occurred during the COVID-19 pandemic was shortage of drugs.5 This can also result in chronic patients developing anxiety.

The existence of chronic medical illness along with COVID-19 was commonly observed.6 Coronavirus attacks systems like respiratory and cardiovascular systems.7 People with medical illness are at higher risk for coronavirus disease, and the pandemic influences mental health and causes psychological problems, particularly in those with chronic medical illness.8 A systematic review and meta-analysis shows the prevalence of anxiety was 25% during the COVID-19 pandemic in the general population.9 Another systematic review and meta-analysis shows that the prevalence of anxiety was 25% among health professionals.10 Studies conducted in Spain and Mettu indicated that the prevalence of anxiety among chronic patients with medical illness was 25% and 61.8%, respectively.11,12 Factors associated with COVID-19-related anxiety among patients with medical illness were duration of the disease, having more than three comorbidities and smoking.12

WHO recommends practicing personal hygiene, maintaining social distancing, practicing respiratory hygiene, seeking medical care if have symptoms, and following the advice of health workers and others concerned as a method of prevention and control strategy of the virus. Therefore, knowledge of COVID-19 preventive measures is important, especially for those patients with chronic medical illness. However, in the study area, there was no research conducted on this topic. Hence, the study intended to assess COVID-19-related anxiety and its preventive measures knowledge among chronic patients with medical illness attending chronic follow-up at hospitals of three zones.

Methods

Study design, area, and period
A hospital-based cross-sectional study was conducted in public hospitals currently providing chronic follow-up for medical illnesses in three zones, that is, Bale, East Bale, and West Arsi zones in 2020. The West Arsi zone is found 250 km away from Addis Ababa, the Bale zone is found 450 km away from Addis Ababa, and East Bale is found at 600 km from Addis Ababa, the capital of Ethiopia in the southeast direction. It has all three climate zones: lowland (kola), midland (woina dega), and highland (dega). There are 10 hospitals in the three zones, namely Madda Walabu University Goba referral hospital, Ginir, Robe, Delo Mena, Bidre, Kokosa, Dodola, Maka Oda, Shashemene, and Negele Arsi hospitals. All these hospitals are providing care including chronic illness care and are working to improve the health of the community. The study was conducted from June 1, 2020, to June 20, 2020.

Source population, sample size, and sampling technique
All chronic adult patients who had follow-up for chronic medical illnesses in Public Hospitals of Bale, East Bale, and West Arsi zone were the source of population. However, all chronic patients who were presented during the study period participated in the study. Accordingly, 633 chronic patients participated in the study.

Inclusion and exclusion criteria
In this study, chronic patients whose age was 18 and above were included in the study. Patients who were critically ill and those with hearing impairment were excluded from the study.

Data collection and data quality assurance
Before the actual data collection, tools were pretested on 5% of the total study subjects who were not included in the study before actual data collection. A two-day training was given for data collectors and supervisors about the content of the questionnaire, the interview procedure, and the expected ethical approach. The tools were translated into local languages. The data were collected by trained nurses who work in each selected hospital through face-to-face interviews. Data regarding patients’ anxiety status were measured using a coronal virus anxiety scale.13 The sociodemographic data-related questionnaire was adopted from EDHs, and data were collected by interviewing the patient. Selected patients from chronic follow-up were screened for anxiety. Data were checked by data collectors for completeness every time before leaving the respondent and their card. During data collection, the data collector clarified the difficulty of understanding the question for every respondent.
Consistency and completeness of data were also checked by the principal investigator daily. After data collection, the filled questionnaire was kept carefully in a sealed envelope.

**Statistical analysis**

Data were checked for completeness and entered to EPI-data version 3.1 and exported to SPSS version 20 for analysis. Data cleaning was done using frequency distribution and descriptive statistics. Both bivariable and multiple logistic regression analyses were carried out, and variables with \( p \) value of less 0.25 were used as candidates for multiple logistic regression analysis. Finally, variables with \( p \) value with \( \leq 0.05 \) in multiple logistic regressions analysis were considered to declare statically significance. The findings were presented using frequency, percentage in tables, and texts.

**Results**

**Sociodemographic characteristics of the study participants**

Overall, 633 study participants were included in this study with a response rate of 100% (633/633). Out of the 633 study participants, majority, 387 (61.1%), were males. The mean age of the respondents was 41.8 SD ±15.4 years, and 278 (43.92%) were between the age of 26 and 44 years; majority, 428 (67.61%), of them were married and 381 (60.2%) were living in urban and 252 (39.8%) were living in rural. Three hundred twenty (50.63%) respondents were Muslims, and 236 (37.34%) were orthodox religion followers. And 73 (18.9%) of the respondents were unable to read and write or had no formal education and 193 (30.49%) were farmers as shown in (Table 1).

**Behavioral and clinical character of the respondents**

In this study, the patients had 123 (19.42%) hypertension, 121 (19.18%) diabetes mellitus, 40 (6.34%) heart disease, 30 (4.75%) asthmatics, 8 (1.27%) cancer, and 4 (0.63%) kidney diseases, while 236 (37.40%) and 123 (19.49%) respondents were HIV/AIDS and tuberculosis, respectively.

Among study participants, some patients had comorbid conditions (more than one chronic disease). Such comorbid conditions include 31 (4.91) hypertension and diabetes mellitus, 7 (1.1%) HIV/AIDS and tuberculosis, and 5 (0.79%) had diabetes mellitus and HIV/AIDS. The following are the main sources of information about the pandemic COVID-19: 323 (57.27%) study participants heard from television, 178 (33.71%) heard from the radio, health professionals 133 (26.65%), announcement 158 (33.05%), and social media 141 (30.92%). With regard to the reason for current visit: 548 (87.40%) chronic illness patients visited for medications refill, 183 (29.14%) of them visited for developing complications, and 25 (5.51%) for seeking medical advice. Among the study participants, 76 (12.01%) had a habit of substance

### Table 1. Sociodemographic of the study participants on COVID-19-related anxiety and its preventive measures knowledge among patients with chronic medical illness attending at hospitals of Bale, East Bale, and Arsi zones (N = 633).

| Characteristics (N = 633) | Categories | Frequency | Percentage | \( p \) value |
|---------------------------|------------|-----------|------------|---------------|
| Age, years                | <25        | 92        | 14.53      | 0.35          |
|                           | 26–44      | 278       | 43.92      |               |
|                           | 45–64      | 204       | 32.23      |               |
|                           | ⩾65        | 59        | 9.32       |               |
| Sex                       | Male       | 387       | 52.29      | 0.004         |
|                           | Female     | 246       | 47.71      |               |
| Marital status            | Single     | 105       | 16.59      | 0.89          |
|                           | Married    | 428       | 67.61      |               |
|                           | Divorced   | 60        | 9.48       |               |
|                           | Others     | 40        | 6.32       |               |
| Religion                  | Orthodox   | 236       | 37.34      | 0.39          |
|                           | Muslim     | 320       | 50.63      |               |
|                           | Protestant | 70        | 11.08      |               |
|                           | Others     | 6         | 0.95       |               |
| Educational status        | No formal education | 149 | 23.5 | 0.089 |
|                           | Formal education | 484 | 76.5 |       |
| Occupation                | Farmer     | 193       | 30.49      | 0.08          |
|                           | Merchant   | 109       | 17.22      |               |
|                           | Housewife  | 148       | 23.38      |               |
|                           | Governmental employee | 166 | 26.2 |       |
|                           | Others     | 17        | 2.6        |               |
| Residency                 | Urban      | 381       | 61.14      | 0.046         |
|                           | Rural      | 252       | 38.86      |               |
use and 557 (87.99%) did not have a habit of substance. Majority of participants, 398 (87.28%), did not drink alcohol, 394 (84.91%) did not chew chat, and 400 (87.72%) did not smoke cigarettes, as shown in (Table 2).

Preventive measures of COVID-19

In this study, 559 (88.31%) study participants use face mask and 364 (57.5%) have practiced the precaution stay at home. Among the study participants, those who wash their hands or use sanitizer were 536 (84.68%) (Table 3).

Prevalence of level of COVID-19-related anxiety and knowledge of the respondents

Overall, 40 (6.32%) of the study participants have anxiety related to COVID-19 diseases and 66.35% of participants had good knowledge.

Knowledge of respondents toward COVID-19

Out of the total respondents, majority, 528 (83.41%), knew the main clinical symptoms of COVID-19 like fever, fatigue, dry
Factors associated with anxiety among chronic patients

Both bivariable and multiple logistic regression analyses were carried out. Variables with $p$ value of $<0.25$ in bivariable logistic regression analysis were used as candidates for multiple logistic regressions. Accordingly, factors associated with anxiety among chronic patients in Bivariable logistic regression were sex, use of face mask, habit of substance, and residence. However, in multiple logistic regression analysis, factors associated with anxiety among chronic patients were education, being males, and use of face masks (Table 5).

Discussion

Chronic diseases and anxiety comorbidity in this study were 6.3%. This is newly screened during the study. However, there were also previously diagnosed anxiety patients among chronic patients. Anxiety in chronic patients might be due to the nature of the disease. As chronic disease patients worry about the disease, they can develop anxiety. And anxiety can in turn cause chronic diseases. Some stressful conditions can result in chronic diseases like diabetes mellitus and hypertension. During stressful conditions, proinflammatory cytokines will be increased and they are risk factors for different chronic diseases. A meta-analysis conducted regarding anxiety among chronic patients indicated that the prevalence of anxiety among heart disease, diabetes mellitus, and cancer was 10%–50%, 14%, and 15%–23%, respectively. The result of the present study is lower compared to this study. This might be due to the study design difference as compared with meta-analysis that could bring difference. Since meta-analysis showed the pooled prevalence, it might be higher compared to a single cross-sectional study.

Comparisons of the study conducted in China and the United States also showed that the prevalence of depression among chronic patients was higher. The common biological mechanism-associated depression with chronic diseases is inflammation. The findings of the present study were also lower compared to studies conducted in Turkish (45.1%) and China (32.1%). The result of this study was also lower compared to another study which was conducted in China. This difference might be due to the instrument difference that was used to assess anxiety. The prevalence of COVID-19-related anxiety among chronic patients in this study was also lower compared to a study conducted in Ethiopia among health workers (63%). The possible reason for this might be due to health professionals involved in the screening and treatment of the COVID-19 pandemic, which can increase the prevalence of COVID-19-related anxiety among them compared to others. The magnitude of COVID-19-related anxiety among urban residents conducted in West Shewa was also higher compared to this study (18.1%). This might be due to the pandemic that was started and expanded in the urban area for the first time.

This study revealed that the prevalence of poor knowledge among chronically ill patients on the COVID-19 pandemic was 33.65%. It is consistent with the study conducted in Addis Zemen hospital in North West, Ethiopia, of which 33.9% had poor knowledge. This finding was higher than the study conducted at Jimma hospital, Ethiopia. The discrepancy might be due to a tool used for knowledge assessment and duration of data collection.

In this study, the main source of information was TV and/or radio (57.27%). It is consistent with the study done in Addis Zemen hospital, Ethiopia. While that of the study by Bhagavathula et al. was social media (60%). The discrepancy might be due to differences in study populations’ socioeconomic and educational status.

In this study, factors associated with anxiety among chronic patients were the use of face mask (95% confidence interval (CI): adjusted odds ratio (AOR) = 0.11 (0.05–0.26)), being males (95% CI: AOR = 2.69 (1.11–6.53)), and being
The odds of developing anxiety among chronic patients who used face masks were 0.11 times less likely to develop anxiety compared to those who did not use face mask. This might be due to decrease in fear of infection with COVID-19 by the use of face mask. Chronic patients who were educated (95% CI: AOR = 0.26 (0.09–0.74)). Accordingly, the odds of developing anxiety among chronic patients who used face masks were 0.11 times less likely to develop anxiety compared to those who did not use face mask. This might be due to decrease in fear of infection with COVID-19 by the use of face mask. Chronic patients who were educated (95% CI: AOR = 0.26 (0.09–0.74)).
develop anxiety 0.26 less likely compared to their counterparts, and the odds of being anxious among males were 2.69 times compared to females. This might be due to males being exposed to different risk factors like substance use. However, a study conducted in Turkish indicated that being female was significantly associated with anxiety compared to males.12

This study was not without limitations. The limitations of this study were using a self-reported questionnaire to assess anxiety, and another limitation of this study was the sample size, which was not calculated. Instead, all the study subjects who were available during the study period were included. This was one of the limitations of the study. Using a self-reported questionnaire might under- or overestimate the prevalence of anxiety.

**Conclusion**

The prevalence of anxiety among chronic patients in this study is higher among males, patients who did not use face mask, and who had no education. Therefore, attention should be given to chronic patients during their follow-up.

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**Author contribution**

All authors made a significant contribution to the work reported, whether is 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.

**Availability of data**

The data are available from the corresponding author on reasonable request.

**Declaration of conflicting interests**

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**Ethical approval and consent to participate**

Written consent was obtained from all study participants, and it is accepted and approved by the Madda Walabu University, Goba Referral Hospital. This study was conducted in accordance with the Declaration of Helsinki. Ethical approval for this study was obtained from Madda Walabu University ethical committee prior to the study with Ref. No. MWU/GRHAcA.D. Ethical Com/203.

**Informed consent**

Written informed consent was obtained from all subjects before the study.

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**Supplemental material**

Supplemental material for this article is available online.

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