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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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Introduction

Coronavirus disease 2019 (COVID-19), 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 (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 occurs 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, Malka 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 coronal virus anxiety scales.[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.

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	

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 ⩽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 fol1owers. 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 2. Behavioral and clinical characteristics 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).

Variables (N = 633)	Categories	Frequency	Percentage
Duration of follow-up (years)	0–5	385	60.8
	6–10	172	27.1
	>10	76	12.1
Types of chronic illness	Hypertension	123	19.43
	Diabetes mellitus	121	19.18
	Heart disease	40	6.34
	Asthmatic	30	4.75
	HIV/AIDS	236	37.4
	Tuberculosis	123	19.49
	Cancer	8	1.27
	Kidney disease	4	0.63
	Others	9	2.16
Types of comorbidities (n)	Hypertension and diabetes mellitus	31	4.91
	Hypertension and heart disease	4	0.63
	Diabetes mellitus and heart disease	2	0.32
	Diabetes mellitus and HIV/AIDS	5	0.79
	HIV/AIDS and tuberculosis	7	1.1
	Hypertension and kidney disease	4	0.63
	Diabetes mellitus and kidney disease	2	0.32
	Hypertension and tuberculosis	3	0.48
	Heart disease and cancer	1	0.16
Reason for current visit	Medication refill	420	66.4
	Complication	183	28.9
	Advise	25	3.9
	Others	5	0.79
Main sources of information on COVID-19	Health workers	133	26.65
	Radio	178 (33.71)	33.71
	TV	323	57.27
	Announcement	158	33.05
	Social media	141	30.92
	Others	181	28.59
Habit of substance	Yes	87	13.74
	No	546	86.26
Chewing chat	Yes	96	14.66
	No	537	84.91
Alcohol drinking	Yes	81	12.8
	No	552	87.2
Cigarette smoking	Yes	78	12.3
	No	555	87.7
Diagnosis of anxiety disorder before	Yes	47	7.42
	No	586	92.58

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

Table 3. COVID-19 preventive measures 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).

Variables	Response	Anxiety		X^2 P-value
		Yes	No	
	Yes	No		
	No			
Face mask	Yes	21	524	0.000001
	No	19	69	
Physical distancing	Yes	35	511	0.81
	No	5	82	
Hand washing/using hand sanitizer	Yes	35	501	0.61
	No	5	92	
Stay at home	Yes	18	335	0.16
	No	22	258	
Not touching face, eyes, and nose with unclean hands	Yes	31	395	0.16
	No	9	198	

cough, and myalgia. About 448 (70.77%) of respondents said that currently there is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection. Majority, 553(87.36%) and 507 (80.1%), of the respondents said that the COVID-19 virus spreads via droplets and is airborne, respectively. Majority, 570 (90.1%), of respondents reported that avoiding going to crowded places prevents the spread of COVID-19 infection. Most of the respondents (561(96.23%)) said that frequent proper handwashing with soap for 20 s was reported as one major means of protection of COVID-19 (Table 4).

In this study, about 570 (90.05%) reported that avoiding going to crowded places can prevent COVID-19, and about 339 (53.08%) reported that, unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.

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.[14] 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.[15] The findings of the present study were also lower compared to studies conducted in Turkish (45.1%)[16] and China (32.1%).[8] The result of this study was also lower compared to another study which was conducted in China.[17] 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%).[18] 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%).[19] 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.[20] This finding was higher than the study conducted at Jimma hospital, Ethiopia.[21] 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.[20] While that of the study by Bhagavathula et al. [22] was social media (60%). This difference 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

Table 4. Knowledge 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).

Variables	Yes		No		I do not know	
	No	%	No	%	No	%
Know main clinical symptom of COVID-19 (fever, fatigue, dry cough, and myalgia)	528	83.41	50	7. 50	55	8.69
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus	336	53.08	165	26.07	132	20.85
Currently, there is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection	448	70.77	84	13.27	101	15.96
Not all persons with COVID-19 will develop to severe cases	412	65.09	128	20.22	93	14.69
Those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases	476	75.20	53	8.37	104	16.43
Eating raw meat would result in infection by the COVID-19 virus	377	59.56	77	12.16	179	28.28
Persons with COVID-19 cannot spread the virus to others when a fever is not present	363	57.35	137	21.64	133	21.01
The COVID-19 virus spreads via droplets	553	87.36	47	7.42	33	5.21
The COVID-19 virus spreads via airborne	507	80.09	77	12.16	49	7.74
Ordinary residents should wear masks to prevent the infection by the COVID-19 virus	518	81.83	82	12.95	33	5.21
To prevent infection by COVID-19, individuals should avoid going to crowded places such as bus stations and avoid taking public transportations	570	90.05	38	6.00	25	3.95
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	573	90.52	26	4.11	34	5.37
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place for 14 days	553	87.36	32	5.06	48	7.58
COVID-19 can spread by touching coins and bank notes/ATM machine	523	82.62	43	6.79	67	10.58
COVID-19 can spread by touching contaminated surface	543	85.78	42	6.64	48	7.58
COVID-19 can be prevented by physical distance of 2 m	593	93.68	23	3.63	17	2.69
COVID-19 can be prevented by hand washing for 20 s with soap	561	96.23	7	1.20	15	2.57
Overall knowledge level COVID-19	Frequency		(%)			
Good knowledge	420		66.35			
Poor knowledge	213		33.65			

Table 5. Factors associated with anxiety among chronic patients both in bivariable and multiple logistic regressions 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).

Variables	Anxiety				
		Yes	No	95% CI COR	95% CI AOR
Use of facemask	Yes	21	524	0.15 (0.08–0.28)*	0.11 (0.05–0.26)*
	No	19	69	1	1
Sex	Male	33	354	3.18 (1.38–7.31)*	2.69 (1.11–6.53)*
	Female	7	239	1	1
Stay at home	Yes	18	335	0.63 (0.33–1.19)	1.65 (0.72–3.79)
	No	22	258	1	1
Substance use	Yes	14	73	3.84 (1.91–7.68)	1.59 (0.70–3.58)
	No	26	520	1	1
Residence	Rural	22	230	0.52 (0.27–0.99)	0.64 (0.29–1.36)
	Urban	18	363	1	1
Education	Educated	35	449	0.45 (0.17–0.16)*	0.26 (0.09–0.74)*
	Not educated	5	144	1	1

AOR: adjusted odds ratio; CI: confidence interval; COR: crude odds ratio.
*p value < 0.05.

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

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 that 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.

References

1. Fisher D and Wilder-Smith A. The global community needs to swiftly ramp up the response to contain COVID-19. *Lancet* 2020; 395(10230): 1109.
2. Ong SWX, Tan YK, Chia PY, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *JAMA* 2020; 323(16): 1610–1612.
3. Yang W, Cao Q, Qin L, et al. Clinical characteristics and imaging manifestations of the 2019 novel coronavirus disease (COVID-19): a multi-center study in Wenzhou city, Zhejiang, China. *J Infect* 2020; 80(4): 388–393.
4. Worldometer. COVID-19 Coronavirus pandemic, 2021, https://www.worldometers.Info/coronavirus/#countries (accessed 1 November, 2021).
5. Yimenu DK, Demeke CA, Kasahun AE, et al. Impact of COVID-19 on pharmaceutical care services and the role of community pharmacists: a multi-center cross-sectional study in Ethiopia. *SAGE Open Nurs* 2021; 7: 23779608211025804.
6. Arentz M, Yim E, Klaff L, et al. Characteristics and outcomes of 21 critically ill patients with COVID-19 in Washington State. *JAMA* 2020; 323(16): 1612–1614.
7. Holshue ML, DeBolt C, Lindquist S, et al. First case of 2019 novel coronavirus in the United States. *New Engl J Med* 2020; 382: 929–936.
8. Shi L, Lu Z-A, Que J-Y, et al. Prevalence of and risk factors associated with mental health symptoms among the general population in China during the coronavirus disease 2019 pandemic. *JAMA Network Open* 2020; 3(7): e2014053.
9. Santabárbara J, Lasheras I, Lipnicki DM, et al. Prevalence of anxiety in the COVID-19 pandemic: an updated meta-analysis of community-based studies. *Prog Neuro Psychopharm Biol Psych* 2021; 109: 110207.
10. Santabárbara J, Bueno-Notivol J, Lipnicki DM, et al. Prevalence of anxiety in health care professionals during the COVID-19 pandemic: a rapid systematic review (on published articles in Medline) with meta-analysis. *Prog Neuro Psychopharm Biol Psych* 2021; 107: 110244.
11. Ozamiz-Etxebarria N, Dosil-Santamaria M, Picaza-Gorrochategui M, et al. Idoiaga-Mondragon N. Stress, anxiety, and depression levels in the initial stage of the COVID-19

outbreak in a population sample in the northern Spain. *Cad Saude Publica* 2020; 36: e00054020.
12. Hajure M, Tariku M, Mohammedhussein M, et al. Depression, anxiety and associated factors among chronic medical patients amid COVID-19 pandemic in Mettu Karl Referral Hospital, Mettu, Ethiopia, 2020. *Neuropsychiatr Dis Treat* 2020; 16: 2511–2518.
13. Lee SA. Coronavirus anxiety scale: a brief mental health screener for COVID-19 related anxiety. *Death Stud* 2020; 44(7): 393–401.
14. Clarke DM and Currie KC. Depression, anxiety and their relationship with chronic diseases: a review of the epidemiology, risk and treatment evidence. *Med J Australia* 2009; 190: S54–S60.
15. Li H, Ge S, Greene B, et al. Depression in the context of chronic diseases in the United States and China. *Int J Nurs Sci* 2019; 6(1): 117–122.
16. Ã–zdin S and Bayrak Ã–zdin Åž. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: the importance of gender. *Int J Soc Psychiatry* 2020; 66(5): 504–511.
17. Qi T, Hu T, Ge Q-Q, et al. COVID-19 pandemic related long-term chronic stress on the prevalence of depression and anxiety in the general population. *BMC Psychiatry* 2021; 21(1): 1–10.
18. Kibret S, Teshome D, Fenta E, et al. Prevalence of anxiety towards COVID-19 and its associated factors among healthcare workers in a Hospital of Ethiopia. *PLoS ONE* 2020; 15(12): e0243022.
19. Birhanu A, Tiki T, Mekuria M, et al. COVID-19-induced anxiety and associated factors among urban residents in West Shewa Zone, Central Ethiopia, 2020. *Psychol Res Behav Manag* 2021; 14: 99–108.
20. Akalu Y, Ayelign B and Molla MD. Knowledge, attitude and practice towards COVID-19 among chronic disease patients at Addis Zemen Hospital, Northwest Ethiopia. *Infect Drug Resist* 2020; 13: 1949–1960.
21. Kebede Y, Yitayih Y, Birhanu Z, et al. Knowledge, perceptions and preventive practices towards COVID-19 early in the outbreak among Jimma university medical center visitors, Southwest Ethiopia. *PLoS ONE* 2020; 15(5): e0233744.
22. Bhagavathula AS, Aldhaleei WA, Rahmani J, et al. Novel coronavirus (COVID-19) knowledge and perceptions: a survey on healthcare workers. *Medrxiv*, 2020, https://www.medrxiv.org/content/10.1101/2020.03.09.20033381v1