

Psychological Impact Among Residents of Southwest Ethiopia During the Second Wave of COVID-19 Pandemic: A Community-Based Cross-Sectional Study

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Abstract

Background: The psychological impacts of the corona virus-19(COVID-19) pandemic in East Africa, particularly in countries like Ethiopia still devastated by the social and political instability, the inadequacy of vaccines for the larger segment of the population accompanied by uprising death rate. Therefore, our study aimed to investigate the psychological impact of the COVID-19 pandemic and its correlate among residents of the Ilu Abba Bor and Buno Bedelle zones, Southwest Ethiopia during the second wave of the pandemic.

Methods: A community-based cross-sectional study design was employed to collect data by interviewer-administered pre-tested semi-structured questionnaire from 663 households. Data entry was done by Epi-data version 3.1 and analyzed by SPSS version 24.0 statistical software applications. The strength of association between variables was assessed using crude and adjusted odds ratio by running logistic regression and P-value <0.05 or 95% confidence interval for declaring the cutoff point or statistical significance.

Result: The response rate of the study was 97.5%. About one-fourth of the respondents reported moderate-to-severe psychological impact. Self-employment and use of Khat (amphetamine-like stimulants) in the past three months was associated with the psychological impacts of the respondents.

Conclusion and recommendation: The current psychological impacts of the residents were compared with the preliminary wave of the pandemic suggests a decreased level of the effects. However, a substantial proportion of psychological impact was reported among residents during the second wave of the pandemic.

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Moreover, during this pandemic wave, psychosocial factors still affect people's mental health. Therefore, psychological interventions identifying and targeting substance users and high-risk populations are still needed given priority. Government and different stakeholders better support residents affected by psychological impacts. Once again appropriate precautions and mitigation strategies must be implemented and sustained across all public health sectors to prevent potentially devastating outcomes.

Keywords: *COVID-19; Psychological impact; Second wave; Ethiopia*

1. Introduction

According As the first country to experience the outbreak of the coronavirus disease 2019 (COVID-19), China urgently implemented a psychological assistance measures in response to the panic caused by the epidemic [1]. According to one study in seven countries, COVID-19 has a very strong psychological impact on the global population [2]. A study shows pervasive anxiety, frustration, and boredom, disabling loneliness were the most frequent psychological effects of the pandemic [3].

In the context of COVID-19 pandemic, the finding of study conducted in Saudi Arabia regarding COVID-19 mental health status reported 23.6% moderate or severe psychological impact and 28.3%, 24%, and 22.3% of the accused stated moderate to severe depressive, worry, and stress sign of illness or problem, respectively [4]. A study conducted in Poland during the second wave of the pandemic shows that about 20% and 19% of respondents had anxiety and depression symptom respectively [5].

Studies show the psychological impact of fear and anxiety caused by the rapid spread of pandemic has to be obviously acknowledged as priority public health again for different stakeholders to design strategies to reduce the impacts and intense mental health penalties of the pandemic [6].

A multilevel systematic review report among the general population during the COVID-19 pandemic in China, Spain, Italy, Iran, the US, Turkey, Nepal, and Denmark showed upper rates of symptoms of uneasiness (6.33% to 50.9%), depression (14.6% to 48.3%), posttraumatic stress disorder (7% to 53.8%), psychological distress (34.43% to 38%), and stress (8.1% to 81.9%) [7].

The potential vulnerability of COVID-19 increased among children, older people, and those with underlying health conditions as it was extremely frightening and very fear-inducing. Also, medical staff and frontier healthcare workers were increasingly pressured both physically and psychologically [8].

In Ethiopia, report from January 2020 to February 2022, shows about 468,495 confirmed cases of COVID-19 with 7,446 deaths, reported to WHO. As of 20 February 2022, a total of 17,634,380 vaccine doses have been administered [9]. Until this article was submitted, vaccine coverage was restricted to special populations like healthcare professionals and older greatly impacting the psychological well-being of the largest segment of the population.

A study in Bahrain, in April 2020, showed about 30% prevalence rate of symptoms resulting from depressive disorder [10], a 5-fold increase compared with national estimates before the epidemic [11]. Research on past epidemics has highlighted the negative impact of outbreaks of infectious diseases on people's mental health [12].

The rapid transmission of the COVID-19 will increase the possibility of psychological stress in the populations, not simply attributed to persistent quarantine and massive negative news portrayal, but moreover influenced by the rising number of confirmed and suspected cases in Ethiopia and the globe on a daily basis.

The COVID-19 status in Ethiopia has evolved rapidly in the past two year. Even though the initial wave of the pandemic in the first half of 2020 progressed more gradually within Africa compared to other continent, the second wave has hit Africa much harder, and presently shows no sign of decelerating, particularly given the appearance of the highly transmissible Delta and Omicron variant. Ethiopia is now officially in the third wave of the pandemic and the negative impacts of the pandemic is being further exacerbated by associating catastrophes, including the political conflict in different parts of Ethiopia (being nastiest in the Northern parts of the country), the outbreak of the locust and flooding, with substantial concern for the psychological crisis, poverty and socioeconomic crisis [13].

To date, research on the psychological impact of COVID-19 is still not adequate coupled with increasing impacts of the pandemic from inadequate vaccine coverage and existing social, political and economic crisis in the country. Moreover, the extent of the pandemic's impact on the residents living in the study area during the second wave of the pandemic is still unknown. Therefore, this study aims to assess the prevalence of psychological impact of covid-19 and its associated factors during the second wave of the pandemic in Ilu Abba zone and Buno Bedelle residents, Oromia regional state, southwestern Ethiopia.

2. Methods and Materials

2.1 Study design and setting

The study was conducted at Buno Bedelle and Ilu Aba Bor zones of the Oromia region, in Ethiopia. The centers of these zones are located at 480 km and 600 km distance from Addis Ababa, the capital city of Ethiopia, to the southwest of Ethiopia respectively. Buno Bedelle zone has 9 districts and 1 town. Ilu Aba Bor zone has 13 districts. The two zones have a total population of 2,101,272. A community-based cross-sectional study was conducted in Ilu Aba Bor and Buno Bedelle zone from August to October, 2021, G.C.

2.2 Population

All residents of Ilu Aba Bor and Buno Bedelle zone were considered as source population while the study populations were all residents in Ilu Aba Bor and Buno Bedelle zone who were included in the sampling frame to get an equal chance to be selected during the data collection period.

2.3 Inclusion and exclusion criteria

Residents of households whose age is 18 years or older and available during the time of data collection were included and residents of households who are deaf and who are unable to give information due to acute exacerbation of illness were excluded from the study.

2.4 Sample size determination

The sample size is determined by the single population proportion formula, by considering the following assumptions; $P=50\%$, with a precision of 95%, including a 15% loss to follow-up, design effect of 1.5, and tolerable margin of error of 5%. The final sample size was 442 (a total 663 of households were included in the study).

2.5 Sampling technique

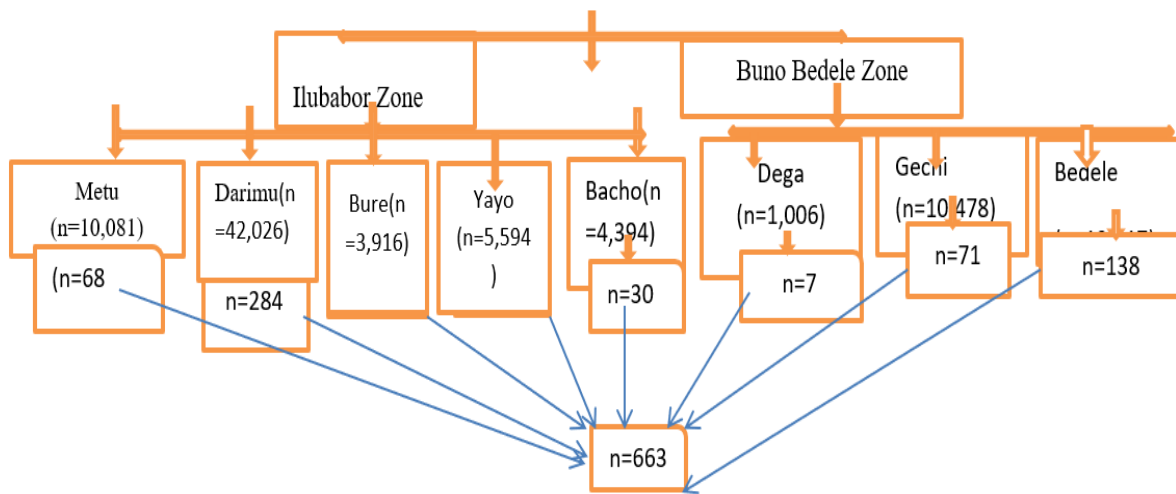
The multistage sampling technique was used to obtain a representative sample of the communities in both zones (Ilu Aba Bor and Buno Bedelle) as follows. Stratification was first done on the districts level, then kebele by households. We assumed that 35% of the total districts found in both zones were enough for the study due to lack of resources, 8 districts (5 from Ilu Aba Bor and 3 from Buno Bedelle zone) and the districts were selected randomly by simple random sampling. The general technique looks as follows:

Stage 1: A sampling frame of all the districts in the Ilu Aba Bor and Buno Bedelle zone was drawn and stratified into zones. Three districts and five districts were obtained from Buno Bedelle and Ilu Aba Bor zone respectively by simple random sampling. According to this, Mettu town, Bacho, Bure, Yayo, and Darimu districts from Ilu Aba Bor zone and Dega, Gechi and Bedelle town from Buno Bedelle zone will be selected.

Stage 2: A sampling frame of all the kebeles in the selected districts was drawn. The kebeles where the study was carried out were randomly selected by simple random sampling. The selected kebeles from each district was as follows: (kebele 1, 2, 3 from Mettu), (kebele 1, 2, 3 from Yayo), (kebele 1, 2 from Bure), (kebele 1, 2, 3, 4, 5 from Darimu), (kebele 1 and 2 from Bacho), (kebele 1, 2, 3 from Gechi) and (kebele 1 from Dega) and (kebele 1, 2, 3, 4, from Bedelle town).

Stage 3: The total number of households in each kebele was obtained. Based on the proportionate allocation to size, the numbers of households selected in each kebele were determined.

Stage 4: A systematic sampling technique was employed to select the houses that were visited in the chosen communities. Household in the first household was selected by lottery method and house representative (father) was interviewed in the selected households. A total of 663 Households were recruited into the study. The total sample size was proportionally allocated between the two zones based on the proportion of districts. Consequently, proportionally allocated sample size to the two zones was proportionally allocated to the selected districts, based on the number of households in each selected district. The sampling procedure in general was distributed as follows (FIG. 1).



Key: Mettu=(kebele 1=20, kebele 2=15, kebele 3=33), Darimu=(kebele 1=68, kebele 2=55, kebele 3=46, kebele 4=43, kebele 5=72), Bure=(kebele 1=12, kebele 2=15), Yayo=(kebele 1=17, kebele 2=12, kebele 3 =9), Bacho=(kebele 1=14, kebele 2=16), Dega=(kebele 1=7), Gechi=(kebele 1=31, kebele 2=16, kebele 3=24), Bedelle=(kebele 1=35, kebele 2=38, kebele 3=30, kebele 4=35).

FIG. 1. Sampling procedure and sample size allocation between Ilu aba bor Zone and Buno bedele Zone, 2021.

2.6 Data collection procedure and tools

Data were collected using an interviewer-administered pre-tested semi-structured questionnaire by face-to-face interview technique. Initially tools and developed a structured questionnaire in the English language was translated Afan Oromo and back to English by an independent person to check for consistency and understandability of the tool. Questionnaires about socio-demographic were developed after an extensive review of the literature and similar studies. All the precautionary measures while the data collection methods.

The psychological impact of COVID-19 was measured using the Impact of Event Scale-Revised (IES-R)(14). The IES-R is a self-administered questionnaire that has been well-validated in the Chinese population for determining the extent of psychological impact after exposure to a public health crisis within one week of exposure. This 22-item questionnaire is composed of three subscales and aims to measure the mean avoidance, intrusion, and hyper-arousal. The total IES-R score was divided into 0-23 (normal), 24-32 (mild psychological impact), 33-36 (moderate psychological impact), and >37 (severe psychological impact).

A pre-test was done on a population with similar characteristics compared to the actual population in Agaro town, Jimma zone, Oromia regional state, south-western Ethiopia, and the scale had good reliability with Cronbach’s alpha of 0.969 for Impact Of Events Scale-Revised (IES-R).

Social support: Oslo-3 social support scale ranges from 3-14 total score, respondents scored 3-8 was considered as having poor social support, score 9-11 was considered as having moderate social support and score of 12-14 considered as having strong social support(15).

2.7 Operational definitions

Corona virus - are a group of viruses belonging to the family of Coronaviridae, which infect both animals and humans.

Psychological Impact - The total IES-R score was divided into 0-23 (normal), 24-32 (mild psychological impact), 33-36 (moderate psychological impact), and >37 (severe psychological impact). A binary score of IES-R 33 and above reveals psychological impact, while a score of 33 and below shows no psychological impact.

Current substance use - use of at least one of the specified substances in the past 3 months [16].

Oslo 3- items social support scale:- Score of 3-8 poor support, a score of 9-12 is moderate support, and score of 12-14 is strong support [17].

2.8 Data processing, analysis, interpretation and presentation

Once all necessary data were obtained, data was checked for completeness. Data were coded, entered to Epi Data version 3.1, edited, and exported to SPSS. The collected data were analyzed using SPSS version 20.0. The data were presented by frequencies, percentages, cross-tabulation, odds ratios for different variables. Multiple regressions and Chi-square analyses were used to examine relationships between the dependent and exploratory variables. All explanatory variables with P-value ≤ 0.20 in the bivariate logistic analysis were fitted into a multivariate logistic regression to identify independently associated factors in the final model. We defined the psychological stress on the binary category with an IES-R score of greater than 33 points. Statistical significance was declared at P-value less than 0.05.

2.9 Ethical consideration

Ethical clearance was obtained from the ethical review board of the Mettu University College of health sciences with a letter written with (Ref.No: **MP 177/1313**) on date July 26, 2021. Written informed consent was obtained from the study participants following the ethical review board approval. The confidentiality of information obtained from respondents was ensured.

3. Result and Discussion

3.1 Socio-demographic characteristics of the participants

A total of 663 participants were recruited, of which 647 responded, giving a response rate of 97.5%. Three hundred sixty-five (56.4%) were females. The median age of the study participants was 32.89 (IQR=16) years (TABLE 1).

TABLE 1. Socio-demographic, clinical and psychosocial characteristics of study population (N=647).

Variables	Category	Frequency (N)	Percent (%)
Sex	Male	282	43.6
	Female	365	56.4
Educational status	No formal education	107	16.5

	Primary school	145	22.4
	Secondary school and above	395	61.1
Occupation	Self-employed	519	80.2
	Government employed	128	19.8
Marital status	Single	134	20.7
	Divorced	45	7.0
	Widowed	25	3.9
	Married	443	68.5
Residence in the past 14days	Urban	492	76.0
	Rural	155	24.0
Family size	Alone	18	2.8
	Two	135	20.9
	Three	302	46.7
	4 and above	192	29.7
Social support	Poor	305	47.1
	Moderate	274	42,3
	Strong	68	10.5
Current alcohol use	No	550	85.0
	Yes	97	15.0
Current tobacco use	No	563	87.0
	Yes	84	13.0
Current Khat use	No	310	47.9
	Yes	337	52.1

3.2 Prevalence and associated factors of psychological impacts

The prevalence of psychological impacts among residents of the Ilu Abba Bor and Buno Bedelle zone was 28.3% (95% CI 24.9, 31.8). Of all participants, 391 (60.4%) reported subclinical psychological impact, 73 (11.3 %) rated mild psychological distress, while 183 (28.3%) of them reported moderate to severe psychological distress.

Chi-square analysis revealed that no formal education and government-employed, urban residency during the past 2 weeks, khat use in the past three months, divorced marital status, family size of four and above were found to associate with the psychological impact among respondents (TABLE 2).

TABLE 2. Comparing associations of different predictors and psychological impacts among residents of Ilu Abba Bor and Buno Bedelle zones, Southwestern Ethiopia, 2020 (n=647).

Variables	Category	Psychological impact		Chi-square	P-value*
		No	Yes		
Current Khat use	No	266 (85.8%)	44 (14.2%)	0.300	<0.001
	Yes	198 (58.8%)	139 (41.2%)		
Current alcohol use	No	391 (71.1%)	159 (28.9%)	0.033	0.401
	Yes	73 (75.3%)	24 (24.7%)		
Current tobacco use	No	405 (71.9%)	158 (28.1%)	0.013	0.747
	Yes	59 (70.2%)	25 (29.8%)		
Occupation	Self	358 (69.0%)	161 (31.0%)	0.122	0.002
	Government	106 (82.8%)	22 (17.2%)		
Educational status	No formal education	84 (78.5%)	23 (21.5%)	0.102	0.035
	Primary school	93 (64.1%)	52 (35.9%)		
	Secondary school and above	287 (72.7%)	108 (27.3%)		
Marital status	single	114 (85.1%)	20 (14.9%)	0.166	<0.001
	Divorced	28 (62.2%)	17 (37.8%)		
	Widowed	14 (56.0%)	11 (44.0%)		
	Married	308 (69.5%)	135 (30.5%)		
Sex	Female	257(70.4%)	108 (29.6%)	0.033	0.402
	Male	207 (73.4%)	75 (26.6%)		
Residence in the past 2weeks	Urban	358 (72.8%)	134 (27.2%)	0.041	0.291
	Rural	106 (68.4%)	49 (31.6%)		
Social support	Poor	220 (72.1%)	85 (27.9%)	0.042	0.563
	Moderate	192 (70.1%)	82 (29.9%)		
	Strong	52 (76.5%)	16 (23.5%)		
Family size	Alone	18 (100.0%)	-	0.121	0.024
	Two	91 (67.4%)	44 (32.6%)		
	Three	212 (70.2%)	90 (29.8%)		
	4 and above	143 (74.5%)	49 (25.5%)		

AOR= Adjusted Odds Ratio; reference category = 1.00: P-value significant <0.05= *, P-value <0.001= **: current use=past three months

In the multivariate regression analysis, after controlling the potential confounder', Khat chewing in the past three months and self-employed respondents were found to be independent predictors of psychological impact among respondents. Accordingly, the odds of psychological impact among self-employed individuals were 2 times more likely to have psychological impacts (AOR: 1.92, 95%CI (1.05, 3.48) compared to government-employed individuals. Concerning the substance use, odds of

psychological impacts among respondents who used Khat in the past three months was 5 times (AOR: 4.49, 95% CI (2.86, 7.07) more compared to those who didn't have used (TABLE 3).

TABLE 3. Multivariable regression examining the associations of different predictors with psychological impacts among residents of Ilu Abba Bor and Buno Bedelle zone, southwestern Ethiopia, 2020 (n=647).

Variables	Psychological impacts		AOR (95%CI)	P-value
	No n [%]	Yes n [%]		
Current Khat use				
No	266 (85.8%)	44 (14.2%)	1.00	0.033
Yes	198 (58.8%)	139 (41.2%)	4.49 (2.86, 7.07)**	
Occupation				
Self-employment	358 (69.0%)	161 (31.0%)	1.92 (1.05, 3.48)**	0.000**
Gov't employed	106 (82.8%)	22 (17.2%)	1.00	

AOR=Adjusted Odds Ratio; reference category=1.00: p-value significant<0.05 = *, p-value<0.001=**: current use=past three months

4. Discussion

It is familiar that the impacts of the pandemic in East Africa, particularly in countries like Ethiopia still devastated by the social and political instability, the inadequacy of vaccines for the larger segment of the population accompanied by uprising death rate. Consequently, the current psychological impacts of the residents were compared with the preliminary wave of the pandemic suggesting the decreased effects. The overall status of psychological impact and early behavioral response during the initial wave of the COVID-19 pandemic in Ethiopia were 51.4% [18]. However, the figure is decreased to 28.3% during the second wave of the pandemic. The finding of the current study was higher than the finding of the study from Saudi Arabia (23.6%) [19]. The possible reason might be related to the adaptability of the condition within the trends of time presented with higher psychological impacts during early stage of the pandemic which reduced overtime and difference in the socio-economic status of the respondents. Also, the finding from this study was lower than the study conducted in Spain which was 36% [20]. As of other measures, lockdown is one measure to prevent COVID-19. Such measures have a great effect on both food access and utilization. In the current study self-employed participants showed significantly higher psychological impact than government-employed respondents. This could be related to the effect of lockdown as a self-employed individual like daily laborers depends on routine activity to lead their life. This was supported by the finding of the study which shows more than 73.8% of the respondents had suffered significant changes in their work or study routines or had to cancel substantial activities [21]. Those who reported significant modifications or, cancelation of relevant activities showed a significant psychological impact than those who did not since the COVID-19 crisis [22]. This was again supported by the fact that psychological impact was more likely to occur among individuals who have less flexibility and secure jobs, and other basic needs insecurities.

A study shows that the emergence of the COVID 19 pandemic had a significant impact on substance use. Accordingly, past three months use of Khat (amphetamine-like stimulant substance) was significantly associated with psychological impact. This was in line with finding of the study reported earlier [9,23].

5. Limitation of the Study

Although our study has a sufficient response rate and uses sound and cross-culturally valid data collection tools and incorporate several factors to reflect an actual representation of the psychological impacts during the COVID-19 pandemic in that area it has certain limitations; our study was a cross-sectional survey that covers only short follow-up duration; therefore, long term mental health implications were not seen.

6. Conclusion

Generally, the study revealed that about one-fourth of the respondents reported moderate-to-severe psychological impact evidencing for a substantial proportion of psychological impact among residents in the study area. Self-employment and khat use in the past three months were associated with the psychological impacts of the respondents. Generally, Moreover, during this pandemic wave, psychosocial factors still affect people's mental health. Therefore, psychological interventions identifying and targeting high-risk populations with heavy psychological distress are needed urgently even during the second wave of the pandemic.

7. List of Abbreviations

COVID-19: Corona Virus; CI: Confidence Interval; IES-R: Impact of Event Scale-Revised; SARS: Severe Acute Respiratory Syndrome

8. Declarations

8.1 Consent for publication

“Not applicable”

8.2 Availability of data and materials

The data sets analyzed for this study is available from the corresponding author on reasonable request.

8.3 Competing interests

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

8.4 Funding

The study was funded by Mettu University. The university had no role in the design of the study, in the collection, analysis, and interpretation of the data; or in writing the manuscript.

8.5 Authors' contribution

DD, DN and **AM** wrote the protocol, design the study, organized data collection process, analyzed the data and wrote the manuscript. **MM, KJ, AD, and MAH** wrote the protocol, design the study, organized data collection process, reviewing and editing the manuscript. All authors read, critically reviewed and approved the final version of the manuscript for publication and agreed to be accountable for all aspects of the work.

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