

Psychological Status and Behavior Changes Among Addis Ababa People during the COVID-19 Epidemic.

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Abstract

Background: The outbreak of coronavirus disease-19 (COVID-19) is a public health emergency of international concern. The epidemic has brought not only the risk of being infected and death but also unbearable psychological impact like anxiety and depression. The aim of this study was investigating the psychological status and behavior changes of the public during COVID-19 epidemic.

Methods: None randomly selected 300 respondents were recruited voluntarily and completed questionnaire. We used the State-Trait Anxiety Inventory, Self-rating Depression Scale, and Symptom Checklist-90 to evaluate psychological status. We also investigated respondents' behavior changes. Quantitative data were analyzed by t-tests or analysis of variance, and classified data were analyzed with chi-square tests. We just simply describe the qualitative data we got by interviewing medical doctors who are working at referral and designated COVID-19 treatment hospital in Addis Ababa.

Result: More respondents had state anxiety than trait anxiety (46.7% vs. 30.0%). Respectively, mild, moderate and severe depression was found among 28.1%, 7.2% and 1.4% of respondents and 27.4% had psychological abnormalities. Our analysis of the relationship between subgroup characteristics and psychological status showed that age, occupation, income level, knowledge about COVID-19, Place where the participants' lives and confidence about overcoming the outbreak significantly influenced psychological status. Around 84.1% of respondents were avoided and significantly reduce going to public places than in previous years and 91.8 % of respondents reduced visiting families, relatives and friends and holiday-related activities during Eastern and Arafa.

Conclusion: COVID-19 not only causes physical health concerns but also results in a number of psychological problems. We need to pay more attention to public psychological stress, especially among young people, as they are likely to experience anxiety, depression, and psychological abnormalities.

Background

Anxiety is a subjective feeling of apprehension, nervousness, tension, and worry related to the arousal of automatic nervous system. Anxiety can gravely have a negative influence and can inhibit the ability of attentiveness and daily activities (1). Anxiety can manifest itself in two recognizable ways, state or trait. State anxiety is a short-term condition. Patients suffering from trait anxiety usually experience it as a permanent psychological trait (2).

Depression is a mood disorder characterized by a sense of inadequacy, despondency, decreased activity, pessimism, and sadness where these symptoms severely disrupt and adversely affect the person's life, sometimes to such an extent that suicide is attempted or results (3). At its worst, depression can lead to suicide. According to World Health Organization (WHO), depression is a common illness worldwide, with more than 264 million people affected (4).

Severe acute respiratory infection remains one of the leading causes of mortality around the world. The recent pandemic caused by an RNA virus that belongs to the family of CORONA (Latin Crown, from the structure of the virus under electron microscope) virus is a challenge for both developed and underdeveloped nations.

The coronavirus outbreak is a global concern. With each passing day the situation seems to change for the worst. The COVID 19 pandemic is causing huge stress on the health care system of all countries in the world. The impact of the pandemic is both social and economic. It is observed that early interventions with optimal Political commitment and community mobilization help to flatten the curve averting occurrence of many cases and deaths.

In addition to endangering human health and consequently their deaths, COVID-19 imposes irreversible psychological impacts on human societies. For example, complete quarantine and commuting restrictions that prevent people from going out, fear of suffering from the disease, anxiety about losing loved ones, and more importantly, depression following losing friends and family are some of the issues people should deal with (5).

In the absence of appropriate pharmacological interventions, like vaccines or curative drugs, the main method of controlling epidemics like COVID-19 is to change public behavior. An individual's behavior can affect their family, social networks, organizations in which they participate, communities to which they belong, information they obtain, and the impact on their society (6).

Previous experience suggests that the public is likely to experience anxiety, depression, and panic attacks when faced with highly contagious diseases. A study focused on the avian influenza in France (n =600) reported that 39.0% of participants expressed anxiety about the disease, and 20.0% that had knowledge about avian influenza had changed their behaviors during the epidemic (7). During the SARS epidemic, a study from Toronto found a high incidence of psychological distress among 129 quarantined individuals. Symptoms of post-traumatic stress disorder and depression were found in 28.9 and 31.2% of respondents, respectively (8).

During the initial stage of the COVID-19 outbreak, 53.8% of Chinese respondents rated the psychological impact of the outbreak as moderate or severe, 16.5% reported moderate to severe depressive symptoms, 28.8% reported moderate to severe anxiety symptoms, and 8.1% reported moderate to severe stress levels (9). Similarly, Cuiyan Wang et al. explored the immediate psychological responses and associated factors during the Initial Stage of COVID-19 epidemic among the general population in China and found that 53.8% of respondents rated the psychological impact of the outbreak as moderate or severe; 16.5% reported moderate to severe depressive symptoms; 28.8% reported moderate to severe anxiety symptoms; and 8.1% reported moderate to severe stress levels (9).

In a study that examined the mental health status and its influencing factors among college students during the epidemic of COVID-19 conducted on 3881 college students in Guangdong Province, China Chang Jinghui, Yuan Yuxin, Wang Dong indicated that the overall incidence of anxiety was 26.60% , and the incidences of mild, moderate and severe anxiety were 23.19% , 2.71% , and 0.70% , respectively. Depressive emotions were detected in 21.16% of the students,

and the incidences of mild, moderate, and moderate-to-severe depression were 16.98%, 3.17%, and 1.01%, respectively (10). Thus, the aim of this review was to assess the psychological status and behavior changes among Addis Ababa people during the COVID-19 epidemic.

Methods

Research design

To conduct this research a cross sectional study design was applied to reach at desired objectives. This is because it is designed to study some phenomenon by taking a cross section of it at one time so we will conduct our research through a cross sectional or one shot study.

Source of Data

The study was carried out based on both primary and secondary data sources. The primary data was collected from people who live in Addis Ababa by using closed ended self-administered questionnaires. We also collect data from 10 medical doctors who are working on COVID-19 response and also we interviewed those medical doctors who provide the routine health service using checklist (Annex 3). The secondary data was collected from different books, journal articles, website, published dissertation papers of the graduates etc.

Data collection technique and instruments

The study subjects were invited to the study voluntarily by explaining the rationality of the study at the time of data collection. Then standardized self-administered questionnaire was administered to respondent by trained data collector. Anonymity of the participant was kept by informing them not to write their name and contact.

The questionnaire has four parts. The first part of the questionnaire covered general demographic information, including gender, age, and religion. The second part included questions developed by the present researchers, such as respondents' epidemiological history, their understanding of COVID-19, and the impact of the epidemic outbreak. The third part of the questionnaire comprised the State-Trait Anxiety Inventory (STAI, score range 20–80) designed by Spielberger (11) and the Self-rating Depression Scale (SDS) developed by Zung (12), which were used to evaluate respondents' anxiety and depression, respectively. The final part included the Symptom Checklist-90 (SCL-90) designed by Derogatis (13) which is used to screen for psychological problems other than anxiety and depression. In addition to the above data collection instruments, we used check list to interview the medical doctors who are working in Addis Ababa at different referral and COVID-19 designated hospitals.

Study area

Ethiopia is divided administratively into nine regional states and two chartered cities, which are further sub-divided in to zones, sub-cities, Woredas (districts) and Kebeles (wards/villages). **Addis Ababa** is the capital of Ethiopia. It is likewise the biggest city in the nation in terms of population. It is a chartered city and accordingly, is viewed as both a city and a state (14). According to the 2007 census, the city has a population of 2.7 million inhabitants (15). It is located at an altitude of 2000 to 2500m above mean sea level. It is where the African Union is headquartered. It also hosts the headquarters of the United Nations Economic Commission for Africa (ECA), as well as various other continental and international organizations. Addis Ababa is therefore often referred to as "the political capital of Africa" for its historical, diplomatic and political significance for the continent (16). The city is divided into 10 boroughs, called sub-cities, namely Addis Ketema, Akaky kaliti, Arada, Bole, Gillele, Kirkos, Kolfe Keranio, Lideta, Nifas Silk Lafto, and Yeka sub-cities.

Data preparation, presentation and analysis techniques

Editing and sorting of the questionnaires was done to determine the completeness manually every day. Data entry and analysis was performed by using SPSS for windows version 25. The responses in the completed questionnaire will be coded and entered into a data entry template. Summary tables, figures, and charts were used for describing or presenting analyzed data. The collected data were analyzed using SPSS version 25.0 (IBM SPSS Statistics, New York, United States). Quantitative data were analyzed by t-tests or analysis of variance, and classified data were analyzed by chi-square tests. $P < 0.05$ was considered statistically significant. We just simply describe the qualitative data we got by interviewing medical doctors who are working at referral and designated COVID-19 treatment hospital in Addis Ababa.

Ethical Consideration

Considering ethical aspect of the research enough time is given to the respondent of the study so that they can depict their true view on research questions. Primary and secondary data was used in this study. The study participants was informed about the benefit of the study as well as there is no risk, Consent from the respondents was taken and appropriate permission was ensure privacy of thier data. Beyond that fact, usage of any secondary data from any source was acknowledged with appropriate reference.

Result

Respondents' demographic characteristics

The study period was from July 22, 2020 to August 22, 2020. In total 300 questionnaires were revived; 10 questionnaires were excluded because of a previously diagnosed psychological illness. Among the 290 valid questionnaires included in our study, 13 questionnaires were incomplete. Respondents were from 10 Sub cities around Addis Ababa and were distributed across different ages, occupations, and education levels; therefore, we believe that these respondents could represent the Addis Ababa dwellers. Of all the study participants, 27(9.7%) were from Nifas Silk Lafto, 26(9.4%) from Akaki Kaliti,

29(10.5%) Addis Ketema, 27(9.7%) Gulelle, 24(8.7%) Bole, 30(10.8) Yeka, 30(10.8%) Arada, 30(10.8%) Kolife Keraniyo, 26(9.4%) Kirkos, and 28(10.1%) were from Lideta sub cities.

Majority of the study participants were male (54.5%); nearly half of the study participants were belong to the age group 19-39 years (46.2%) and the rest 27.8%, 14.8%, 4.3% and 4.0% were belong to the age group 40-49, 50-59, ≤ 18 and ≥ 70 years respectively. When we come to the occupation status of the participant, 98(35.4%) were working in government institutes, 71(25.6%) were private companies, 55(19.9%) were self-employed, 27(9.7%) were students and the rest 24(8.7%) and 2(1.1%) were currently unemployed and others like being housewife respectively. With nearly similar proportion 23.1% were complete secondary school (9-12 grades) and TVET educational level. Participants with college degree and Masters or PhD were 28.9% and 15.2% respectively. While, only 4.0% of the study participants were uneducated. 58.1% of them were single in their marital status. Majority of the study participants 41.7% were Orthodox in religion. Relatively, most of the study participants were belongs to the income level 4000 to 6000 birr per month.

Approximately 50% of the respondents knew much about COVID-19 the current epidemic situation, pathogenesis, transmission routes and preventive measures. 28.9% of them had some knowledge the transmission route and preventive measures of COVID-19. Similarly, respondent with very much knowledge about pathogen situation, epidemic characteristics, clinical performance, prevention and control measures and epidemic situation were 16.6%. While the rest 5.1% of the study participants know only about contagious nature of the virus.

Respectively 18.8% and 23.5% of the study participants had family members, relatives, friends, colleagues and neighbors who have been diagnosed with COVID-19 or suspected patients and family, relatives, friends, colleagues, neighbors, etc. who are medical staff withstanding COVID-19.

The COVID-19 pandemic is far more than a health crisis: it is affecting societies and economies at their core (18). The study result indicated that, nearly 80.0% (of which 28.5% very much) of the participants agreed that the pandemic affect their life and work much. 16.2% of the participants' life somehow affected by the pandemic. While, 4.0% of the participants agreed that, the pandemic didn't affect their life. (Figure 5)

Regarding to the confidence that we can overcome the outbreak, 40.8% of the respondents' had little, 40.8% had much and 29.6 had very much confidence to overcome the pandemic. While the rest 4.7% of the participants had no confidence at all regarding to overcoming the outbreak.

Table 1: The demographic characteristics of the respondents

| | Variable | Number (%) (Total, n = 277) |
|-----------------------|-------------------------------|-----------------------------|
| Gender | Male | 151(54.5) |
| | Female | 126(45.5) |
| Age group (years) | Below 18 (including 18) | 12(4.3) |
| | 19-39 | 128(46.2) |
| | 40-49 | 77(27.8) |
| | 50-59 | 41(14.8) |
| | 60-69 | 11(4.0) |
| | Above 70 (including 70) | 8(2.9) |
| Occupation | Students | 27(9.7) |
| | Self employed | 55(19.9) |
| | Government employed | 98(35.4) |
| | Working In private company | 71(25.6) |
| | Unemployed | 24(8.7) |
| | Others | 2(1.1.) |
| Education level | Uneducated | 11(4.0) |
| | Primary school (1-8 grade) | 15(5.4) |
| | Secondary school (9-12 grade) | 64(23.1) |
| | TVET | 65(23.5) |
| | College degree | 80(28.9) |
| | Master's or PhD | 42(15.2) |
| Marital status | Single | 161(58.1) |
| | Married | 103(37.2) |
| | Divorced | 6(2.2) |
| | Widowed | 7(2.5) |
| Religion | Orthodox | 115(41.7) |
| | Muslim | 78(28.3) |
| | Protestant | 73(26.4) |
| | Others | 10(3.6) |
| Income level (Birr) | <2000 | 46(18.6) |
| | 2000-4000 | 44(17.8) |
| | 4001-6000 | 48(19.4) |
| | 6001-8000 | 37(15.0) |
| | 8001-10000 | 32(13.0) |
| | >10000 | 40(16.2) |
| Sub city | Nifas Silk Lafto | 27(9.7) |
| | Akaki | 26(9.4) |
| | Addis Ketema | 29(10.5) |
| | Gulelle | 27(9.7) |
| | Bole | 24(8.7) |
| | Yeka | 30(10.8) |
| | Arada | 30(10.8) |
| | Kolife Kraniyo | 30(10.8) |
| | Kirkos | 26(9.4) |
| | Lideta | 28(10.1) |
| Mental Health Problem | Yes | 10(3.6) |
| | No | 267(96.4) |

Note: TVET= Technical and Vocational Education and Training

Public psychological status

The healthy norm results of the three scales were used as the criteria to assess psychological status. The age range of STAI norm results was 19–69 years; therefore, we excluded 20 questionnaires for respondents aged < 18 or > 70 years. According to the healthy norm results of the SDS and SCL-90, depression was classified by an SDS index score ≥ 50 (< 50= normal, 50-59=Mild, 60-69=Moderate and ≥ 70 =sever), and the psychological abnormality was classified by a SCL-90 total score ≥ 160 . Respondents' psychological status (state anxiety, trait anxiety, depression, and psychological abnormalities) is shown in Table 2.

Table 2: The proportion of respondents with anxiety, depression and psychological Abnormalities

| Variables | n(%) | | |
|-------------------------------------|------|-----------|----------|
| State anxiety (n=257) ^a | Yes | 120(46.7) | |
| | No | 137(53.3) | |
| Trait anxiety (n= 257) ^a | Yes | 77(30.0) | |
| | No | 180(70.0) | |
| Depression (n =277) | Yes | Mild | 79(28.5) |
| | | Moderate | 20(7.2) |
| | | Severe | 4(1.4) |
| | No | 174(62.8) | |
| Psychology abnormal (n =277) | Yes | 76(27.4) | |
| | No | 201(72.6) | |

^a The age range of ST-AI norm result was from 19 to 69, 20 questionnaires under 18 or above 70 years of age were excluded, 257 cases were enrolled in the analysis

Note: State and trait anxiety cut-off point is ≥ 40 ; Depression (No= < 50 , mild = 50-59, moderate = 60-69 and sever = ≥ 70); cut-off point for psychological abnormality is the total score ≥ 160 .

Proportion of respondents by psychological status

State anxiety describes the experience of unpleasant feelings when confronted with specific situations, demands or a particular object or event. Trait anxiety describes a personality characteristic rather than a temporary feeling (19). So, the study finding indicated that, More respondents had state anxiety (46.7%, 120/257) than trait anxiety (30.0%, 77/257) ($P < 0.001$; Table 3). The average score for state anxiety was also higher than that for trait anxiety (Annex Table 1), which remained consistent.

Psychological status by sex and age group

State anxiety (55.0%) and trait anxiety (49.4%) was more common in females than in males. In addition, depression was more common in female [21.0% (54/257)], of which 32.5 % (41/126) participants had mild, 9.5 % (12/126) moderate and 0.79% (1/126) severe depression. Relatively more severe depression male participants were observed than female. Respondents' psychological status also differed across age groups. Respondents aged 19–39 years appeared to be more prone to state anxiety (46.7%), trait anxiety (39.0%), depression (50.8%) and psychological abnormalities (31.6%) than other respondents. Those aged 60–69 years had the lowest rates of state anxiety (7.5%) and trait anxiety (7.8%). The proportion of state anxiety and trait anxiety among respondents aged 50–69 years was 14.2%, and 23.4% respectively.

Table 3: The chi-square test result between state anxiety and trait anxiety

| Variables | Trait anxiety | | Total n (%) | χ^2 | P value |
|--------------|---------------|----------|----------------|-----------|---------|
| | Yes | No | | | |
| Sate anxiety | Yes | 48(40.0) | 72(60.0) | 120(46.7) | 10.81 |
| | No | 29(21.2) | 108(78.8) | | |
| | Total | 77(30.0) | 180(70.0) | 257 | <0.001 |

Table 4: Psychological status of the public under the epidemic of COVID-19 in Addis Ababa

| Variables | State anxiety (n=257) ^a | | | | Trait anxiety (n=257) ^a | | | | Depression (n=277) | | | | Psychology abnormalities (n=277) | | | | | | |
|-----------------|------------------------------------|-----------|-----------|-----------|------------------------------------|-----------|-----------|----------|--------------------|-----------|-----------|---------------|----------------------------------|----------|-------------|-----------|-----------|----------|-------|
| | Total (257) | No (137) | Yes (120) | P-value | Total (257) | No (180) | Yes (77) | P-value | Total (277) | No (174) | Mild (79) | Moderate (20) | Severe(4) | P-value | Total (277) | No (201) | Yes(76) | P-value | |
| Gender | Male | 144(56.0) | 90(65.7) | 54(45.0) | 0.001 | 144(56.0) | 105(58.3) | 39(5.6) | 0.256 | 151(54.5) | 102(58.6) | 38(48.1) | 8(40.0) | 3(75.0) | 0.182 | 151(54.5) | 113(56.2) | 38(50.0) | 0.354 |
| | Female | 113(44.0) | 47(34.3) | 66(55.0) | | 113(44.0) | 75(41.7) | 38(49.4) | | 126(45.5) | 72(41.4) | 41(51.9) | 12(60.0) | 1(25.0) | | 126(45.5) | 88(43.8) | 38(50.0) | |
| | <=18 years | - | - | - | 0.087 | - | - | - | 0.023 | 12(4.3) | 7(4.0) | 5(6.3) | 0(0.0) | 0(0.0) | 0.022 | 12(4.3) | 10(5.0) | 2(2.6) | 0.004 |
| | 19 to 39 | 128(49.8) | 72(52.6) | 56(46.7) | | 128(49.8) | 98(54.4) | 30(39.0) | | 128(46.2) | 63(36.2) | 50(63.3) | 12(60.0) | 3(75.0) | | 128(46.2) | 104(51.7) | 24(31.6) | |
| | 40 to 49 | 77(30.0) | 39(28.5) | 38(31.7) | | 77(30.0) | 54(30.0) | 23(29.9) | | 77(27.8) | 60(34.5) | 12(15.2) | 4(20.0) | 1(25.0) | | 77(27.8) | 54(26.9) | 23(30.3) | |
| | 50 to 59 | 41(16.0) | 24(17.5) | 17(14.2) | | 41(16.0) | 23(12.8) | 18(23.4) | | 41(14.8) | 31(17.8) | 7(8.9) | 3(15.0) | 0(0.0) | | 41(14.8) | 25(12.4) | 16(21.1) | |
| | 60 to 69 | 11(4.3) | 2(1.5) | 9(7.5) | | 11(4.3) | 5(2.8) | 6(7.8) | | 11(4.0) | 9(5.2) | 1(1.3) | 1(5.0) | 0(0.0) | | 11(4.0) | 5(2.5) | 6(7.9) | |
| =70 | - | - | - | | - | - | - | | 8(2.9) | 4(2.3) | 4(5.1) | 0(0.0) | 0(0.0) | | 8(2.9) | 3(1.5) | 5(6.6) | | |
| Employment | Student | 16(6.2) | 13(9.5) | 3(2.5) | 0.208 | 16(6.2) | 9(5.0) | 7(9.1) | 0.406 | 27(9.7) | 18(10.3) | 7(8.9) | 1(5.0) | 1(25.0) | 0.829 | 27(9.7) | 23(11.4) | 4(5.3) | 0.011 |
| | Self employed | 51(19.8) | 29(21.2) | 22(18.3) | | 51(19.8) | 39(21.7) | 12(15.6) | | 55(19.9) | 35(20.1) | 17(21.5) | 2(10.0) | 1(25.0) | | 55(19.9) | 43(21.4) | 12(15.8) | |
| | Government employed | 98(38.1) | 50(36.5) | 48(40.0) | | 98(38.1) | 70(38.9) | 28(36.4) | | 98(35.4) | 63(36.2) | 28(35.4) | 6(30.0) | 1(25.0) | | 98(35.4) | 77(38.3) | 21(27.6) | |
| | Private company | 71(27.6) | 35(25.5) | 36(30.0) | | 71(27.6) | 48(26.7) | 23(29.9) | | 71(25.6) | 41(23.6) | 21(26.6) | 9(45.0) | 0(0.0) | | 71(25.6) | 43(21.4) | 28(36.8) | |
| | Unemployed | 20(7.8) | 10(7.3) | 10(8.3) | | 20(7.8) | 14(7.8) | 6(7.8) | | 24(8.7) | 15(8.6) | 6(7.6) | 2(10.0) | 1(25.0) | | 24(8.7) | 13(6.5) | 11(14.5) | |
| | Others | 1(0.4) | 0(0.0) | 1(0.8) | | 0(0.0) | 0(0.0) | 0(0.0) | | 2(1.1) | 0(0.0) | 0(0.0) | 0(0.0) | 0(0.0) | | 2(1.1) | 2(1.0) | 0(0.0) | |
| Education | Uneducated | 8(3.1) | 2(1.5) | 6(5.0) | 0.498 | 8(3.1) | 5(2.8) | 3(3.9) | 0.583 | 11(4.0) | 5(2.9) | 4(5.1) | 2(10.0) | 0(0.0) | 0.599 | 11(4.0) | 6(3.0) | 5(6.6) | 0.052 |
| | Primary school | 13(5.1) | 6(4.4) | 7(5.8) | | 13(5.1) | 10(5.6) | 3(3.9) | | 15(5.4) | 10(5.7) | 4(5.1) | 0(0.0) | 1(25.0) | | 15(5.4) | 11(5.5) | 4(5.3) | |
| | Secondary school | 52(20.2) | 26(19.0) | 26(21.7) | | 52(20.2) | 32(17.8) | 20(26.0) | | 64(23.1) | 42(24.1) | 18(22.8) | 3(15.0) | 1(25.0) | | 64(23.1) | 41(20.4) | 23(30.3) | |
| | TVET | 64(24.9) | 33(24.1) | 31(25.8) | | 64(24.9) | 44(24.4) | 20(26.0) | | 65(23.5) | 42(42.1) | 18(22.8) | 5(25.0) | 0(0.0) | | 65(23.5) | 44(21.9) | 21(27.6) | |
| | College degree | 79(30.7) | 46(33.6) | 33(27.5) | | 79(30.7) | 57(31.7) | 22(28.6) | | 80(28.9) | 51(29.3) | 19(24.1) | 8(40.0) | 2(50.0) | | 80(28.9) | 62(30.8) | 18(23.7) | |
| | Masters or PhD | 41(16.0) | 24(17.5) | 17(14.2) | | 41(16.0) | 32(17.8) | 9(11.7) | | 42(15.2) | 24(13.8) | 16(20.3) | 2(10.0) | 0(0.0) | | 42(15.2) | 37(18.4) | 5(6.6) | |
| Marital Status | Single | 149(58.0) | 82(59.9) | 67(55.8) | 0.488 | 149(58.0) | 105(58.3) | 44(57.1) | 0.409 | 161(58.1) | 94(54.0) | 54(68.4) | 10(50.0) | 3(74.0) | 0.334 | 161(58.1) | 125(62.2) | 36(47.4) | 0.164 |
| | Married | 98(38.1) | 52(38.0) | 46(38.3) | | 98(38.1) | 68(37.8) | 30(39.0) | | 103(37.2) | 73(42.0) | 20(25.3) | 9(45.0) | 1(25.0) | | 103(37.2) | 67(33.3) | 36(47.4) | |
| | Divorced | 4(1.6) | 1(0.7) | 3(2.5) | | 4(1.6) | 4(2.2) | 0(0.0) | | 6(2.2) | 2(1.1) | 3(3.8) | 1(5.0) | 0(0.0) | | 6(2.2) | 4(2.0) | 2(2.6) | |
| | Widowed | 6(2.3) | 2(1.5) | 4(3.3) | | 6(2.3) | 3(1.7) | 3(3.9) | | 7(2.5) | 5(2.9) | 2(2.5) | 0(0.0) | 0(0.0) | | 7(2.5) | 5(2.5) | 2(2.6) | |
| | Orthodox | 111(43.2) | 64(46.7) | 47(39.2) | 0.307 | 111(43.2) | 84(46.7) | 27(35.1) | 0.251 | 115(41.7) | 62(35.8) | 43(54.5) | 9(45.0) | 1(25.0) | 0.303 | 115(41.7) | 91(45.5) | 24(31.6) | 0.188 |
| | Muslim | 72(28.0) | 37(27.0) | 35(29.2) | | 72(28.0) | 47(26.1) | 25(32.5) | | 78(28.3) | 57(32.9) | 15(19.0) | 4(20.0) | 2(50.0) | | 78(28.3) | 54(27.0) | 24(31.6) | |
| Protestant | 66(25.7) | 34(24.8) | 32(26.7) | | 66(25.7) | 45(25.0) | 21(27.3) | | 73(26.4) | 47(27.2) | 19(24.1) | 6(30.0) | 1(25.0) | | 73(26.4) | 49(24.5) | 24(31.6) | | |
| Others | 8(3.1) | 2(1.5) | 6(5.0) | | 8(3.1) | 4(2.2) | 4(5.2) | | 10(3.6) | 7(4.0) | 2(2.5) | 1(5.0) | 0(0.0) | | 10(3.6) | 6(3.0) | 4(5.3) | | |
| Income | < 2000 | 45(19.0) | 19(15.2) | 26(23.2) | 0.116 | 45(19.0) | 30(18.0) | 15(21.4) | 0.213 | 46(18.6) | 28(18.1) | 14(19.4) | 3(17.6) | 1(33.3) | 0.571 | 46(18.6) | 26(14.4) | 20(29.9) | 0.014 |
| | 2000-4000 | 42(17.7) | 23(18.4) | 19(17.0) | | 42(17.7) | 27(16.2) | 15(21.4) | | 44(17.8) | 28(18.1) | 14(18.4) | 2(11.8) | 0(0.0) | | 44(17.8) | 29(16.1) | 15(22.4) | |
| | 4001-6000 | 48(20.3) | 32(25.6) | 16(14.3) | | 48(20.3) | 34(20.4) | 14(20.0) | | 48(19.4) | 33(21.3) | 8(11.1) | 5(29.4) | 2(66.7) | | 48(19.4) | 37(20.6) | 11(16.4) | |
| | 6001-8000 | 35(14.8) | 14(11.2) | 21(18.8) | | 35(14.8) | 22(13.2) | 13(18.6) | | 37(15.0) | 25(16.1) | 10(13.9) | 2(11.8) | 0(0.0) | | 37(15.0) | 26(14.4) | 11(16.4) | |
| | 8001-10000 | 28(11.8) | 17(13.6) | 11(9.8) | | 28(11.8) | 25(15.0) | 3(4.3) | | 32(13.0) | 18(11.6) | 13(18.1) | 1(5.9) | 0(0.0) | | 32(13.0) | 27(15.0) | 5(7.5) | |
| | >10,000 | 39(16.5) | 20(16.0) | 19(17.0) | | 39(16.5) | 29(17.4) | 10(14.3) | | 40(16.2) | 23(14.8) | 13(18.1) | 4(23.5) | 0(0.0) | | 40(16.2) | 35(19.4) | 5(7.5) | |
| | Nifas Silk lafo | 27(10.5) | 21(15.3) | 6(5.0) | 0.185 | 27(10.5) | 24(13.3) | 3(3.9) | 0.051 | 27(9.7) | 13(7.5) | 9(11.4) | 3(15.0) | 2(50.0) | 0.145 | 27(9.7) | 25(12.4) | 2(2.6) | 0.036 |
| Akakai KAliti | 25(9.7) | 13(9.5) | 12(10.0) | | 25(9.7) | 18(10.0) | 7(9.1) | | 26(9.4) | 17(9.8) | 6(7.6) | 3(15.0) | 0(0.0) | | 26(9.4) | 14(7.0) | 12(15.8) | | |
| Addis Ketema | 28(10.9) | 12(8.8) | 16(13.3) | | 28(10.9) | 13(7.2) | 15(19.5) | | 29(10.5) | 24(13.8) | 2(2.5) | 3(15.0) | 0(0.0) | | 29(10.5) | 17(8.5) | 12(15.8) | | |
| Gulelle | 24(9.3) | 11(8.0) | 13(10.8) | | 24(9.3) | 19(10.6) | 5(6.5) | | 27(9.7) | 16(9.2) | 10(12.7) | 1(5.0) | 0(0.0) | | 27(9.7) | 18(9.0) | 9(11.8) | | |
| Bole | 19(7.4) | 12(8.8) | 7(5.8) | | 19(7.4) | 14(7.8) | 5(6.5) | | 24(8.7) | 12(6.9) | 11(13.9) | 1(5.0) | 0(0.0) | | 24(8.7) | 21(10.4) | 3(3.9) | | |
| Yeka | 27(10.5) | 15(10.9) | 12(10.0) | | 27(10.5) | 20(11.1) | 7(9.1) | | 30(10.8) | 20(11.5) | 8(10.1) | 2(10.0) | 0(0.0) | | 30(10.8) | 21(10.4) | 9(11.8) | | |
| Arada | 30(11.7) | 18(13.1) | 12(10.0) | | 30(11.7) | 22(12.2) | 8(10.4) | | 30(10.8) | 17(9.8) | 7(8.9) | 5(25.0) | 1(25.0) | | 30(10.8) | 21(10.4) | 9(11.8) | | |
| Kolefe Keraniyo | 29(11.3) | 12(8.8) | 17(14.2) | | 29(11.3) | 18(10.0) | 11(14.3) | | 30(10.8) | 19(10.9) | 11(13.9) | 0(0.0) | 0(0.0) | | 30(10.8) | 23(11.4) | 7(10.5) | | |
| Kirkose | 20(7.8) | 11(8.0) | 9(7.5) | | 20(7.8) | 11(6.1) | 9(11.7) | | 26(9.4) | 18(10.3) | 8(10.1) | 0(0.0) | 0(0.0) | | 26(9.4) | 18(9.0) | 8(10.5) | | |
| Lideta | 28(10.9) | 12(8.8) | 16(13.3) | | 28(10.9) | 21(11.7) | 7(9.1) | | 28(10.1) | 18(10.3) | 7(8.9) | 2(10.0) | 1(25.0) | | 28(10.1) | 23(11.4) | 5(6.6) | | |
| Religion | Yes | 44(17.1) | 26(19.0) | 18(15.0) | 0.398 | 44(17.1) | 29(16.1) | 15(19.5) | 0.511 | 52(18.8) | 32(18.4) | 15(19.0) | 5(25.0) | 0(0.0) | 0.693 | 52(18.8) | 30(14.9) | 22(28.9) | 0.008 |
| | No | 213(82.9) | 111(81.0) | 102(85.0) | | 213(82.9) | 151(83.9) | 62(80.5) | | 225(81.2) | 142(81.6) | 64(81.0) | 15(75.0) | 4(100.0) | | 225(81.2) | 171(85.1) | 54(71.1) | |
| Housing | Yes | 59(23.0) | 33(24.1) | 26(21.7) | 0.645 | 59(23.0) | 43(23.9) | 16(20.8) | 0.587 | 65(23.5) | 44(25.3) | 17(21.5) | 4(20.0) | 0(0.0) | 0.604 | 65(23.5) | 43(21.4) | 22(28.9) | 0.186 |
| | No | 198(77.0) | 104(75.9) | 94(78.3) | | 198(77.0) | 137(76.1) | 61(79.2) | | 212(76.5) | 130(74.7) | 62(78.5) | 16(80.0) | 4(100.0) | | 212(76.5) | 158(78.6) | 54(71.1) | |
| Effort | Nothing | 0(0.0) | 0(0.0) | 0(0.0) | 0.127 | 0(0.0) | 0(0.0) | 0(0.0) | 0.220 | 0(0.0) | 0(0.0) | 0(0.0) | 0(0.0) | 0(0.0) | 0.572 | 0(0.0) | 0(0.0) | 0(0.0) | 0.001 |
| | A little | 11(4.3) | 6(4.4) | 5(4.2) | | 11(4.3) | 6(3.3) | 5(6.5) | | 14(5.1) | 8(4.6) | 6(7.6) | 0(0.0) | 0(0.0) | | 14(5.1) | 11(5.5) | 3(3.9) | |
| | Some | 72(28.0) | 30(21.9) | 42(35.0) | | 72(28.0) | 47(26.1) | 25(32.5) | | 80(28.9) | 55(31.6) | 20(25.3) | 5(25.0) | 0(0.0) | | 80(28.9) | 55(27.4) | 25(32.9) | |
| | Much | 128(49.8) | 73(53.3) | 55(45.8) | | 128(49.8) | 90(50.0) | 38(49.4) | | 137(49.5) | 83(47.7) | 41(51.9) | 11(55.0) | 2(50.0) | | 137(49.5) | 91(45.3) | 46(60.5) | |
| | Very much | 46(17.9) | 28(20.4) | 18(15.0) | | 46(17.9) | 37(20.6) | 9(11.7) | | 46(16.6) | 28(16.1) | 12(15.2) | 4(20.0) | 2(50.0) | | 46(16.6) | 44(21.9) | 2(2.6) | |
| of 19 | Almost nothing | 8(3.1) | 5(3.6) | 3(2.5) | 0.316 | 8(3.1) | 5(2.8) | 3(3.9) | 0.655 | 11(4.0) | 6(3.4) | 5(6.3) | 0(0.0) | 0(0.0) | 0.906 | 11(4.0) | 11(5.5) | 0(0.0) | 0.097 |

| | | | | | | | | | | | | | | | | | | |
|------|-----------|-----------|----------|----------|-------|-----------|----------|----------|-------|-----------|----------|----------|----------|---------|-------|-----------|----------|----------|
| r | Some | 40(15.6) | 16(11.7) | 24(20.0) | | 40(15.6) | 28(15.6) | 12(15.6) | | 45(16.2) | 30(17.2) | 11(13.9) | 3(15.0) | 1(25.0) | | 45(16.2) | 36(17.9) | 9(11.8) |
| | Much | 134(52.1) | 74(54.0) | 60(50.0) | | 134(52.1) | 98(54.4) | 36(46.8) | | 142(51.3) | 90(51.7) | 40(50.6) | 11(55.0) | 1(25.0) | | 142(51.3) | 99(49.3) | 43(56.6) |
| | Very much | 75(29.2) | 42(30.7) | 33(27.5) | | 75(29.2) | 49(27.2) | 26(33.8) | | 79(28.5) | 48(27.6) | 23(29.1) | 6(30.0) | 2(50.0) | | 79(28.5) | 55(27.4) | 24(31.6) |
| ical | Almost | 16(6.2) | 10(7.3) | 6(5.0) | 0.158 | 16(6.2) | 8(4.4) | 8(10.4) | 0.187 | 18(6.5) | 13(7.5) | 5(6.3) | 0(0.0) | 0(0.0) | 0.446 | 18(6.5) | 15(7.5) | 3(3.9) |
| | nothing | | | | | | | | | | | | | | | | | |
| | Some | 89(34.6) | 51(37.2) | 38(31.7) | | 89(34.6) | 66(36.7) | 23(29.9) | | 98(35.4) | 57(32.8) | 32(40.5) | 6(30.0) | 3(75.0) | | 98(35.4) | 79(39.3) | 19(25.0) |
| e | Much | 95(37.0) | 53(38.7) | 42(35.0) | | 95(37.0) | 69(38.3) | 26(33.8) | | 104(37.5) | 69(39.7) | 28(35.4) | 7(35.0) | 0(0.0) | | 104(37.5) | 68(33.8) | 36(47.4) |
| | Very much | 57(22.2) | 23(16.8) | 34(28.3) | | 57(22.2) | 37(20.6) | 20(26.0) | | 57(20.6) | 35(20.1) | 14(17.7) | 7(35.0) | 1(25.0) | | 57(20.6) | 39(19.4) | 18(23.3) |
| | Almost | 12(4.7) | 8(5.8) | 4(3.3) | 0.319 | 12(4.7) | 8(4.4) | 4(5.2) | 0.441 | 13(4.7) | 6(3.4) | 5(6.3) | 2(10.0) | 0(0.0) | 0.793 | 13(4.7) | 8(4.0) | 5(6.6) |
| g | nothing | | | | | | | | | | | | | | | | | |
| | Some | 110(42.8) | 64(46.7) | 46(38.3) | | 110(42.8) | 83(46.1) | 27(35.1) | | 113(40.8) | 73(42.0) | 29(36.7) | 8(40.0) | 3(75.0) | | 113(40.8) | 93(46.3) | 20(26.3) |
| | Much | 62(24.1) | 31(22.6) | 31(25.8) | | 62(24.1) | 41(22.8) | 21(27.3) | | 69(24.9) | 43(24.7) | 22(27.8) | 4(20.0) | 0(0.0) | | 69(24.9) | 43(21.4) | 26(34.2) |
| ak | Very much | 73(28.4) | 34(24.8) | 39(32.5) | | 73(28.4) | 48(26.7) | 25(32.5) | | 82(29.6) | 52(29.9) | 23(29.1) | 6(30.0) | 1(25.0) | | 82(29.6) | 57(28.4) | 25(32.9) |

^a The age range of ST-AI norm result was from 19 to 69, 20 questionnaires under 18 or above 70 years of age were excluded, 257 cases were enrolled in the analysis.

Note: The table shows the raw and percentage frequencies of the study participants' psychological status by sex, age group, education level, occupation, marital status, monthly income level, sub-cities and other additional factors. Cut-off values for State and Trait anxiety is ≥ 40 ; depression (No depression < 50; Mild = 50-59; Moderate = 60-69; Severe = ≥ 70); psychological abnormality cut-off score is ≥ 160 .

Table 5: Chi-square analysis results between behavior changes and different psychological status under the epidemic of COVID-10 in Addis Ababa

| ables | State anxiety | | | | Trait anxiety | | | | Depression | | | | Psychology abnormalities | | | | | |
|---------------------------|---------------|-----------|-----------|---------|---------------|-----------|----------|---------|------------|-----------|----------|--------------|--------------------------|---------|-----------|-----------|----------|---------|
| | Total(257) | No(137) | Yes(120) | P-value | Total(257) | No(180) | Yes(77) | P-value | Total(277) | No(174) | Mild(79) | Moderate(20) | Sever(4) | P-value | Total | No | Yes | P-value |
| Never | 58(22.6) | 30(21.9) | 28(23.3) | 0.465 | 58(22.6) | 45(25.0) | 13(16.9) | 0.120 | 65(23.5) | 42(24.1) | 16(20.3) | 5(25.0) | 2(50.0) | 0.903 | 65(23.5) | 55(27.4) | 10(13.2) | 0.006 |
| Sometimes | 158(61.5) | 81(59.1) | 77(64.2) | | 158(61.5) | 111(61.7) | 47(61.0) | | 166(59.9) | 106(60.9) | 46(58.2) | 12(60.0) | 2(50.0) | | 166(59.9) | 121(60.2) | 45(59.2) | |
| Same as usual | 40(15.6) | 25(18.2) | 15(12.5) | | 40(15.6) | 24(13.3) | 16(20.8) | | 44(15.9) | 25(14.4) | 16(20.3) | 3(15.0) | 0(0.0) | | 44(15.9) | 24(11.9) | 20(26.3) | |
| More than usual | 1(0.4) | 1(0.7) | 0(0.0) | | 1(0.4) | 0(0.0) | 1(1.3) | | 2(0.7) | 1(0.6) | 1(1.3) | 0(0.0) | 0(0.0) | | 2(0.7) | 1(0.5) | 1(1.3) | |
| Never | 119(46.3) | 69(50.4) | 50(41.7) | 0.345 | 119(46.3) | 84(46.7) | 35(45.5) | 0.093 | 127(45.8) | 79(45.4) | 40(50.6) | 7(35.0) | 1(25.0) | 0.510 | 127(45.8) | 97(48.3) | 30(39.5) | 0.125 |
| Sometimes | 117(45.5) | 60(43.8) | 57(47.5) | | 117(45.5) | 85(47.2) | 32(41.6) | | 123(44.4) | 82(47.1) | 28(35.4) | 10(50.0) | 3(75.0) | | 123(44.4) | 89(44.3) | 34(44.7) | |
| Same as usual | 19(7.4) | 7(5.1) | 12(10.0) | | 19(7.4) | 11(6.1) | 8(10.4) | | 23(8.3) | 11(6.3) | 9(11.4) | 3(15.0) | 0(0.0) | | 23(8.3) | 12(6.0) | 11(14.5) | |
| More than usual | 2(0.8) | 1(0.7) | 1(0.8) | | 2(0.8) | 0(0.0) | 2(2.6) | | 2(1.4) | 2(1.1) | 2(2.5) | 0(0.0) | 0(0.0) | | 4(1.4) | 3(1.5) | 1(1.3) | |
| Stay home | 161(62.6) | 86(62.7) | 75(62.5) | | 161(62.6) | 117(65.0) | 44(57.1) | | 171(61.7) | 113(64.9) | 41(51.9) | 16(80.0) | 1(25.0) | | 171(61.7) | 123(61.2) | 48(63.2) | |
| Wearing face mask | 224(87.2) | 121(88.3) | 103(85.8) | | 224(87.2) | 158(87.7) | 66(85.7) | | 236(85.2) | 151(86.8) | 64(81.0) | 17(85.0) | 4(100.0) | | 236(85.2) | 177(88.1) | 59(77.6) | |
| Hand hygiene | 204(79.4) | 106(77.4) | 98(81.6) | | 204(79.4) | 140(77.7) | 64(83.1) | | 214(77.3) | 136(78.2) | 58(73.4) | 18(90.0) | 2(50.0) | | 214(77.3) | 154(76.6) | 60(78.9) | |
| Take traditional medicine | 66(25.7) | 37(27.0) | 29(24.2) | | 66(25.7) | 42(23.3) | 24(31.2) | | 70(25.3) | 48(27.6) | 15(25.9) | 6(30.0) | 1(25.0) | | 70(25.3) | 47(23.4) | 23(30.3) | |
| Others | 20(7.8) | 12(8.7) | 8(6.6) | | 20(7.8) | 10(5.5) | 10(12.9) | | 22(7.9) | 18(10.3) | 2(2.5) | 2(10.0) | 0(0.0) | | 22(7.9) | 13(6.5) | 9(11.8) | |

^a The age range of ST-AI norm result was from 19 to 69, 20 questionnaires under 18 or above 70 years of age were excluded, 257 cases were enrolled in the analysis.

Note: Cut-off values for State and Trait anxiety is ≥ 40 ; depression (No depression < 50; Mild = 50-59; Moderate = 60-69; Severe = ≥ 70); psychological abnormality cut-off score is ≥ 160 .

Behavioral change

From the result, 45.8% and 44.4% of participants were never visits and visit their relatives during the holydays significantly less than in previous years respectively. Similarly, 60% of the study participants, even if they often went to some public places such as supermarkets, church, mosques, parks, sport places and hotels, but less than before outbreak. And also 23.5% of the study participants didn't go to some public places after the outbreak. But, surprisingly, those who didn't visit their relatives during holydays and went to public places exhibited state and trait anxiety, depression and some other psychological abnormalities (See table 5).

Participants who went to some public places significantly less than to that of the previous years appeared to be more prone to state anxiety (66.4%), trait anxiety (61.0%) and mild (58.2%), moderate (60.0%), and severe (50.0%) depression. Similarly, 50.2% of them prone to some psychological abnormalities. Respectively, 41.7%, 45.5% and 50.6% of the participants who didn't visit their relatives during the holydays had more state anxiety, trait anxiety and mild depression. But those who visited their relatives during the holydays but significantly less than the previous years had relatively high level of moderate (50.0%) and severe (75.0%) depression as well as psychological abnormalities (44.7%).

Influence of other factors on psychological status

The proportions of respondents with state and trait anxiety, depression and psychological abnormalities differed by their occupation, education level, marital status, and sub-city where the study participants lives. Participants who are working at government institutes had high level state anxiety (40.0%), trait anxiety (36.4%), and mild (35.4%), moderate (30.0%) and severe (25.0%) depression. Psychological abnormality was more common among participants who were working at private company (36.8%).

Participants with college degree has highest rate of state anxiety (27.5%), trait anxiety (28.6%) and mild (24.1%), moderate (40.0%) and severe (50%) depression than others, where as participants with secondary school education level more prone to psychological abnormalities. Single participants in their marital status had more state anxiety (55.8%), trait anxiety (57.1%) and mild (68.4%), moderate (50.0%) and 74.0% depression. Respondents' psychological status also differed across the sub-city, location where the participants lives, state anxiety was more common at Kolife Keraniyo sub city [17(14.2%)] and Lideta sub-city [(16(13.3%)] and trait anxiety at Addis Ketema sub-city [15(19.5%)]. Relatively more participants from Bole (13.9%) and Arada (13.9) sub-city had mild depression. But, relatively large participants from Yeka sub-city exhibited moderate (25.0%) and severe (25.0%) depression. Neither the presence of family members, relatives, friends, colleagues and neighbors who have been diagnosed with COVID-19 or suspected patients nor the presence of a medical worker withstanding COVID-19 around respondents increased levels of anxiety, depression and psychological abnormalities.

Moreover, participants whose life or work was affected by COVID-19 outbreak also experience high level of state and trait anxiety, depression and psychological abnormalities. Similarly, those who were more worried about being infected with COVID-19 had a higher proportion of state anxiety, trait anxiety, depression and psychological abnormalities. Of the respondents with state anxiety, trait anxiety, and psychological abnormalities, 35.0%, 33.8%, and 47.4% were "much worried" about being infected with COVID-19 respectively. Only 5.0%, 10.4% and 3.9% were "not worried at all." Those that were much confident about overcoming the epidemic outbreak appeared to have lower rates of state and trait anxiety and depression compared with other respondents (Table 3).

Other psychological abnormalities

The SCL-90 is a 90-item self-report symptom inventory designed primarily to reflect the psychological symptom patterns of psychiatric and medical patients. It is a measure of current, point-in-time psychological symptom status, not a measure of personality (20). The SCL-90 covers 10 different psychological abnormality factors. According to the results of the normal model of the scale, we defined a score of ≥ 2 for each factors as corresponding to abnormal symptoms (6). Based on the study results, which are shown in table 6, majority of the study participants exhibited normal psychological symptoms. But the scores for the Obsessive-compulsive and Interpersonal sensitivity factors were relatively highest with an average score of 1.84 ± 1.04 and 1.86 ± 1.01 respectively.

Table 6: The results of 277 respondents' SCL-90 factors scores compared with norm result of Chinese healthy (mean \pm std. deviation)

| Variables | Respondents in this study |
|----------------------------------|---------------------------|
| Somatization factor | 1.49 \pm 0.81 |
| Obsession-Compulsive factor | 1.84 \pm 1.04 |
| Interpersonal sensitivity factor | 1.86 \pm 1.01 |
| Depression factor | 1.62 \pm 0.93 |
| Anxiety factor | 1.61 \pm 0.92 |
| Hostile factor | 1.57 \pm 0.96 |
| Phobia factor | 1.68 \pm 0.98 |
| Paranoid factor | 1.64 \pm 0.94 |
| Psychotic factor | 1.52 \pm 0.91 |
| Other factors | 1.63 \pm 0.97 |

Discussion

The emergence of COVID-19, with its rapid spread, has exacerbated anxiety in populations globally, leading to mental health disorders in individuals. This has even caused cases of stereotyping and discrimination (21). Most of the studies which is done previously in this area predominantly focused on the psychological status of patients (22) or medical staffs (21-23) during the epidemic, and little attention has been directed to the psychological status and behavior changes of the general public. Therefore, it is necessary to examine and recognize people's mental states in this challenging, destructive and unprecedented time. Recent studies have similarly shown that COVID-19 affects mental health outcomes such as anxiety, depression, and post-traumatic stress symptoms (8, 24,25). COVID-19 is novel and unexplored, and its rapid transmission, its high mortality rate, and concerns about the future can be the causes of anxiety, depression and other psychological abnormalities (26). Anxiety, when above normal, weakens body's immune system and consequently increases the risk of contracting the virus (27).

Our study found that ratio of overall state anxiety among respondents was 46.7%, which was greater than that of trait anxiety, suggesting that the epidemic had caused some anxiety. Similarly, significant number of participants were prone to depression (37.2%) and psychological abnormalities (27.4%). This result is consistent with the study done in China (6). In our study, females appeared to be more prone to anxiety, depression and other psychological abnormalities than male. This may be due to their sensitivity to psychological stress and post-traumatic stress disorder than men (6). This result also consistent with other studies done in China (19,26,27), Iran (28).

Aging increases the risk of COVID-19 infection and mortality, however, the results of existing studies show that during the pandemic, the levels of anxiety, depression and psychological abnormalities are significantly higher in the age group of 19–39 years. The main reason for this seems to be that this age group, as they are key active working forces in a society, have the main responsibility for social productivity and their family, so they concerned over the future consequences and economic challenges caused by the pandemic, therefore, mostly affected by redundancies and business closures (19,25,28,29). Some researchers have argued that a greater anxiety among young people may be due to their greater access to information through social media, which can also cause stress (19,28).

Our study result indicated that, people with higher level of education had greater level of anxiety, depression and psychological abnormalities. Consistently, the recent studies done in Iran (28) and China (30) indicated that there is an association between education level and anxiety and depression. This may be due to, even if the public had equal chance to be infected by COVID-19, this group's high self-awareness in relation to their own health (31).

Those study participants who were single in their marital status had high level state anxiety, trait anxiety, depression and psychological abnormalities. This may be due to lack of close interpersonal relationship with others. There were no significant difference in state anxiety, trait anxiety, depression and psychological abnormalities in the place where the participants lives (sub-city).

Participants who are working at government institutes had high level state anxiety, trait anxiety, and depression. This may be due to living expense and market inflation caused by COVID-19. Similarly, significant number of the study participants who are working at private company had state anxiety, trait anxiety, depression and psychological abnormalities. This may be due to job security, if the epidemic continues with this pace for unlimited time, their job become under question.

We found participants with better knowledge about COVID-19 had more state and trait anxiety, depression and other psychological abnormalities. The reason for this may the public psychological status is more likely worsen, as the knowledge about epidemic situation and number of confirmed cases and deaths from COVID-19 increased. Most of the news published on COVID-19 are distressing, and sometimes news are associated with rumors, which is why anxiety levels rise when a person is constantly exposed to COVID-19 news. Misinformation and fabricated reports about COVID-19 can exacerbate anxiety and depressive symptoms in the general population (32).

Participants who worried much about infected with COVID-19 had high level of state anxiety, trait anxiety, depression and psychological abnormalities. The main reason for this seems to be time to time and day to day increasing number of patients, suspected cases and death, as well as the increased number of countries affected by the outbreak (33).

About 80% of the study participants life or/and work were affected by the epidemic. And those participants were also prone to high level of state anxiety, trait anxiety, depression and psychological abnormalities. Consistent with our study result, the study done on Chinese college students during epidemic indicated that COVID-19 related stressors, which includes economic stressors, effects on daily-life, and academic delays, were positively associated with anxiety and depression (33). In addition to the national health situation, the epidemic will also have a significant impact on the economy of the country and individuals. Because of the outbreak, some families will lose their source of income, which inevitably disrupted routine life of the study participants and resulted anxiety and depression.

From the perspective of the severity of psychological symptoms, factors that scored 2 or higher in the SCL-90 were Obsession-Compulsive (OC) factor and Interpersonal sensitivity factor relatively presenting with more severe symptoms. Obsession is a mental illness that causes repeated unwanted thoughts or sensations (obsessions) or the urge to do something over and over again (compulsions) (34). Obsessions are characterized as persistent, unintentional, and unwanted thoughts and urges that are highly intrusive, unpleasant, and distressing (35). Therefore, due to the COVID epidemic, relatively significant number of the study participants experience recurrent, persistent thoughts, impulses, and urges that lead them to depression or anxiety.

Limitations

Some methodological limitations should be considered when interpreting the result of this study. First, we used cross sectional study design, which could reflect the psychological status of the population at a single time point, which might not reflect long-term exposure to the dimensions related to participants' psychological health when facing the COVID-19 epidemic. Second, the study population is based on voluntary selection, which might introduce a self-selection bias. The third limitation was that we used self-reporting data collection materials; there is no guarantee that the questionnaire responses were not distorted. Notwithstanding the above limitations, this study provides valuable information on the psychological status of the population.

Conclusion And Recommendation

In less than few months, the COVID-19 pandemic has created an emergency state globally. This contagious virus has not only raised concerns over general public health, but has also caused a number of psychological disorders like anxiety, depression and other psychological abnormalities. According to our study analysis, it can be conclude that Addis Ababa dwellers are experiencing anxiety, depression and other psychological abnormalities due to COVID-19 pandemic. The government, health officials and other stakeholders needs to pay more attentions to the psychological status of the public, especially those

aged 19-39 years. This age group appears likely to experience psychological stress when faced with an infectious disease epidemic like COVID-19. Even if there is inconsistency and improper implementation of prevention measures, majority of the participants follow specific behaviors required to prevent and control the epidemic, but it will take time to observe the effect of these behaviors on the epidemic. We hope that this preliminary survey can provide some guidance for psychological interventions for the Addis Ababa dwellers and for Ethiopian population in general and it can serve as a base line for further researches.

Based on the public psychological status during the COVID-19 epidemic, we suggest that government and health officials must provide the latest and more accurate information on the state of the pandemic, refute rumors in a timely manner, and reduce the impact of misinformation on the general public's emotional state can reduce anxiety, depression and psychological abnormalities levels. Optimistic and positive thoughts and attitude toward the COVID-19 spread are also protective factors against depression and anxiety (32). In this regards, mental health professionals recommended promoting healthy behaviors, avoiding exposure to negative news, and using alternatives communication methods such as social networks and digital communication platform to prevent social isolation.

Doing broad based researches with the aim of monitor and report rates of anxiety, depression, and psychological abnormalities both to understand mechanisms and crucially to inform interventions is so important. This should be adopted across the general population and vulnerable groups, including front-line workers. The surveyed medical doctors also recommend that, government should provide necessary personal prevention equipment (PPE) like N95 or surgical mask, surgical gloves and other materials which help the health personnel to protect them from being infected by COVID-19. Individuals also, instead of being afraid and panic about the current situation, it is better to be more conscious and implement specific instructions given from government and other responsible bodies.

Abbreviations

COVID-19: The outbreak of coronavirus disease-19; SCL-90: Symptom Checklist-90; STAI: State-Trait Anxiety Inventory; SDS: Self-rating Depression Scale; ECA: Africa Economic Commission; OC: Obsessive-compulsive; WHO: World Health Organization

Declarations

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Authors' contributions

FT, RW, YC and MD: study concept and design, acquisition of the data, analysis and interpretation of the data, and drafting of the manuscript, acquisition of the data, critical revision of the manuscript for important intellectual content, analysis and interpretation of the data, drafting of the manuscript, and statistical analysis, study supervision. The author(s) read and approved the final manuscript.

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Availability of data and materials

Datasets are available through the corresponding author upon request.

Ethics approval and consent to participate

This study was approved by the ethics committee of Kotebe Metropolitan University. The informed written consent was obtained from all participants.

Consent for publication

All authors have read through the final version of the manuscript and given consent for publication in BMC Psychology

Competing interests

All authors of this manuscript have no financial or non-financial conflicts of interest to declare

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Figures

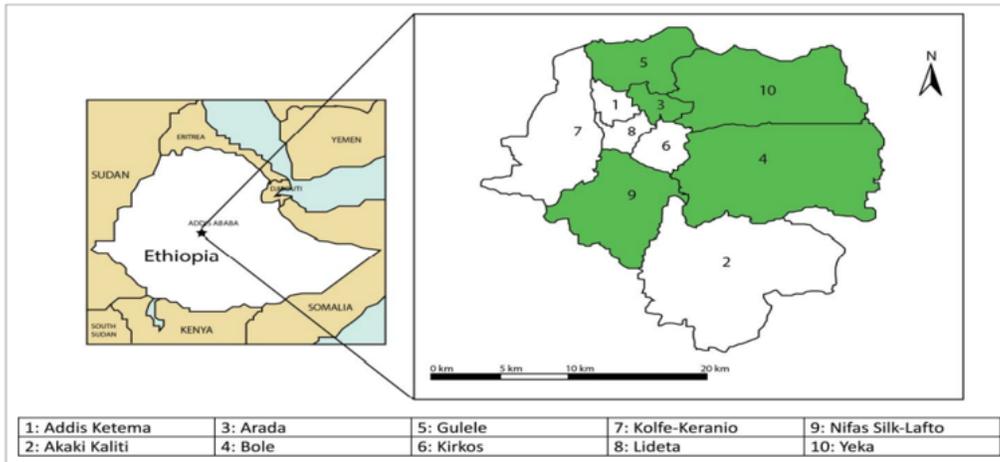


Figure 1

Map of Addis Ababa with administrative sub-city designations. Modified from (17). Note: Highlighted sub-cities (Arada, Gulele, Yeka, Bole, and Nifas Silk) were selected randomly as clusters for analysis