

# Prevalence and Correlates of Depression and Anxiety in Quarantined Population During the COVID-19 Outbreak in Central Ethiopia

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## Research

**Keywords:** Anxiety, Depression, psychological problems, COVID-19, Ethiopia

**Posted Date:** February 25th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-248456/v1>

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# Abstract

**Background:** Since the declaration of coronavirus disease 2019 (COVID-19) outbreak as a pandemic, different countries across the globe have been using quarantine to decrease the transmission of the disease and subsequently to minimize morbidity and associated mortality. Evidence suggests that quarantine might have a wide-ranging, substantial, and long-lasting negative psychological impact especially when the necessary preventive measures are not taken. However, to the best of our knowledge, there are no prior studies that determined the prevalence and correlate of depression and anxiety in quarantined populations during the COVID-19 outbreak in Sub-Saharan Africa including Ethiopia.

**Methods:** A community-based cross-section study was conducted among individuals under quarantine from June 5 to July 5, 2020. After obtaining verbal consent, data was collected face to face using the structured and self-administered hospital anxiety and depression scale instrument. Hospital Anxiety and Depression Scale (HADS) was used to assess depression and anxiety. Binary logistic regression analysis (multivariate analysis) was used to identify the potential determinants of depression and anxiety.

**Result:** A total of 297 participants were included in the study which makes the response rate 90.8%. The prevalence of anxiety, depression, and co-morbid anxiety and depression were 21.5%, 70.7%, and 15.8% respectively. In our multivariable analyses, stressful life events (AOR 2.61, 95%CI (1.46, 4.67)), spent time on sleeping (AOR 1.97, 95% CI (1.08, 3.62)), and believing that COVID-19 could be prevented by wearing a glove (AOR 0.30, 95% CI (0.11, 0.81)) showed a statistically significant association with anxiety, whereas being married (AOR 2.67, 95% CI (1.37, 5.22)), had stressful life event in the last six months (AOR 1.44, 95% CI (1.44, 5.25)) and spending of time by sleeping during the quarantine (AOR 1.97, 95% CI (1.42, 6.19)) predicted depression.

**Conclusion:** The current study result indicated that a considerable proportion of individuals who were under quarantine during the COVID-19 pandemic have experienced psychological disturbances, such as anxiety and depression. The presence of stressful life events, time spent on sleeping, and believing that COVID-19 could be prevented by wearing masks were found to be significant predictors of depression or anxiety among the participants. The results suggest that attention needs to be given to mitigate mental health problems in the quarantined population during the COVID-19 outbreak.

## Introduction

Corona Virus Disease 2019 (COVID-19) is an infectious disease caused by a novel coronavirus (2019-nCoV) which was identified as a cause of a group of pneumonia cases in Wuhan, Hubei Province, China in December 2019 (1). It is highly infectious during the incubation period, and asymptomatic infection might exist. It has been affecting more than 92, 767,845 people resulting in more than 1 986,696 mortalities worldwide (2) and it declared a Global Public Health Emergency (1). Also, in Africa, the virus has spread to dozens of countries within weeks, although governments and health authorities across the continent are striving to limit widespread infections more than one million COVID-19 cases reported (3).

After the first case has been reported on March 13th of 2020 on Japanese citizens in Ethiopia (4), a total of 123,145 detected cases and 1912 deaths has reported (5). Due to the rapid and continuous spread of the infection, strong contagion, lethality in severe cases, and no specific medicine, it poses a huge threat to human life and health, and also has a huge impact on the mental health of the general public, causing people to a different degree of psychological problems (6, 7). In Ethiopia, as of January 14th, 2021, a total of 129,455 confirmed cases and 2,006 deaths have been reported (2).

For that matter, initially at the onset of the infection different countries of the world have been using quarantine to decrease the transmission of COVID-19 outbreak. This outbreak had seen entire cities in China effectively placed under mass quarantine, while many thousands of foreign nationals returned home from the COVID-19 outbreak area have been asked to self-isolate at home or in state-run facilities (8). Also, many countries of the world were declared quarantine. Quarantine is the separation and restriction of movement of people who have potentially been exposed to a contagious disease to ascertain if they become infected, so reducing the risk of them infecting others (9). It is differing from the word isolation, which is the separation of people who have been diagnosed with a contagious disease from people who are not sick (10). The word quarantine was first used in Venice, Italy in 1127 with regards to leprosy and was widely used in response to the Black Death (11).

Quarantine might have a wide-ranging, substantial, and long-lasting negative psychological impact on individuals as well as their family members (12, 13). The prevalence of psychiatric problems, including anxiety and depression, are high both during and after any infectious outbreaks (14, 15). During the initial phase of the COVID-19 outbreak, one-third of the individuals have moderate-to-severe anxiety and more than half of them rated the psychological impact as moderate-to-severe (16). These mental health problems could have a long-lasting effect on the mental health of the individual as well as the society, which hinders the urgent response to the current COVID-19 pandemic (14). Also, individuals with severe depressive symptoms are more susceptible to the severity of the pandemic (17). In addition, determinants such as female gender, student status, having specific physical symptoms, and poor self-rated health status are significantly associated with a greater psychological impact of the outbreak as well as higher levels of anxiety and depression (16). Further, factors such as longer quarantine duration, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma are also other sources of stressors (12). Whereas, factors like having specific up-to-date and accurate health information about the outbreak situation and particular precautionary measures like wearing personal protective equipment's (PPE) in the reverse has a significance association with a lower psychological impact of the outbreak and lower levels of anxiety, and depression (16).

Factors like a lower level of psychological impact and better mental health status can be used to formulate psychological interventions to improve the mental health of vulnerable groups during the COVID-19 epidemic (16). Taking appropriate psychological measurements on an individual under quarantine could reduce the negative mental impact (12). Because the psychological impact of stressful events related to an infectious disease outbreak may be mediated by enhancing peoples' perceptions of those events (18). Therefore, raising public awareness of the disease and providing positive

psychological programs in the media aimed at controlling stress can reduce anxiety in society (7). Governments and healthcare authorities should take urgent actions to protect the mental health of their community (14) and should focus more on providing economic and medical support to improve the general population's mental state (15).

However, this is not to suggest that quarantine should not be used because the psychological effects of not using quarantine and allowing the disease to spread might be worse (19). Whereas, whenever quarantine is needed, depriving people of their liberty for the wider public good is often contentious and needs to be handled carefully and officials should take every measure to ensure that this experience is as tolerable as possible for people (12). Further, the provision of mental health first aid training and services during the quarantine period has paramount significance and benefit to individuals expected to be under quarantine (13). So, responsible health officials charged with implementing quarantine, are in employment and usually with reasonable job security, should also remember that not everyone is in the same situation (12).

In general, even if the government of Ethiopia in collaboration with other stakeholders has been trying to control and handle the COVID-19 outbreak, there is a gap in information that to what extent does those individuals experiencing psychological problems. So, the current study proposed with the aim to fill the gap by providing information about the magnitude of depression and anxiety among individuals under quarantine. Then the finding of the current study may also serve as a scientific reference to the health institutions and Ethiopian FMOH to offer comprehensive psychological support to individuals as well as their general population to minimize the psychological impact of every epidemic event and the mental problems. It may also serve as a reference for future studies and to develop appropriate policies and plans by the responsible health and other sectors.

## **Methods And Materials**

### **Study area, period, and design**

A community-based cross-sectional study was conducted from June 05 to July 05, 2020, at selected quarantine centers in Addis Ababa, Ethiopia. Addis Ababa is the capital city of Ethiopia, occupying a total area of 540 km<sup>2</sup>. The city is divided into ten sub-cities and 116 suburbs (Woredas). Initially, during the onset of COVID-19, the Ethiopian government shut down all Universities. And, all campuses of the Addis Ababa University, Addis Ababa Science and Technology University, governmental health colleges, and some selected hotels were assigned as quarantine centers. The number of individuals under quarantine varied from time to time, because it depends on the number of graduated individuals from the quarantine centers, travels to other regions, and a number of travels to Ethiopia from abroad. There were around 800 individuals under quarantine in Addis Ababa during the data collection period.

### **Study population, sample size determination, sampling technique, and inclusion criteria**

All individuals who were under quarantine and available during the study period at the selected quarantine centers in Addis Ababa were the study population. The sample size was determined by using a single population proportion formula considering and assuming the proportion of depression and anxiety among individuals under quarantine to be 50%, a 95% confidence level, and 5% degree of precision, the required sample size was estimated to be 384.

After adding a non-response rate of 10%; the final sample size was 422. Around 1000 individual were expected to be under quarantine every month, so by considering this one we used the correction formula that is implemented when the source/study population are less than 10000, and the final sample size becomes 297 (adding 10% =327). Regarding the sampling technique, first, we purposively selected the quarantine centers which were proposed by the government found in Addis Ababa. A simple random sampling technique was employed in order to select a representative sample of participants. The sampling frame was taken from the responsible office (EPHI & Ethiopia FMOH) that control the overall situation of the quarantine centers. Then, individuals were selected by the lottery method.

## **Data collection tools, procedure, management, and analysis**

A structured self-administered written questionnaire which had six sections was used to collect the data on socio-demographic characteristics (age, sex, and marital status), quarantine and clinical factors, psycho-social and substance-related factors.

Depression and anxiety were assessed by using the Hospital Anxiety and Depression Scale (HADS) (20). HADS is a 14 item questionnaire, extensively used to use to screen for depression and anxiety in Ethiopia (21–23). The 14 items can be separated into two 7 item subscales for anxiety and depression. It is validated in Ethiopia and internal consistency is 0.78 for anxiety, 0.76 for depression, and 0.87 for full scale. The scale uses a cut-off score for depression and anxiety of greater than or equal to 8 (20).

The researchers recruited eight data collectors, and three supervisors (psychiatry/BSC nurses). The principal investigator supervised the whole activities of the data collection process. The training was delivered to data collectors and supervisors on how to use the questionnaire, the ethical principles of confidentiality, and data management before their involvement with data collection.

All questionnaires were checked for completeness and consistency of responses manually by the supervisors and researchers. After cleaning, data was entered into EPI-Data version 3.4 and was exported to SPSS version 25 for analysis. Descriptive statistics (frequencies and percentages) were used to explain the study participant in relation to study variables. Bivariate and multivariate analysis was used to determine the presence of statistically significant associations between the independent and dependent variables. All variables having a p-value < 0.05 in the bivariate analysis were selected for the multivariable logistic regression to control for possible confounders. The strength of the association was presented in the odds ratio and 95% confidence interval. A p-value of < 0.05 on multivariate analyses was considered statistically significant.

## **Ethical considerations**

Ethical approval and clearance were obtained from Saint Paul's Hospital Millennium Medical College (SPHMMC) ethical review board. In addition, verbal consent of the respondents was obtained after giving information and thoroughly explaining the aim of the study to each respondent. The respondents were told that participation is voluntary, could withdraw at any time, or refuse to answer any question if they want to. The subjects were self-administrated questionnaires to maintain privacy. No information concerning the individual was passed to a third party.

## Results

### **Socio-demographic characteristics of the respondents**

A total of 297 participants were included in the study which makes the response rate 90.8%. The mean age of the respondents was 28.33(SD = 6.22) years. Among the respondents, the majority 114(38.6%) were 25 years and below, 217(73.1%) were female, 169(56.9%) were unmarried, 153 (51.5%) were Muslim religion members, 119 (40.1%) had primary educational status, 241 (81.1%) were Maid at abroad, 158 (53.2%) were living at rural area of the country, 172 (57.9%) had no child, 291 (98%) were living with their family and 100% of them were living abroad before they joined the quarantine centers. Also, 209 (70.4%) had 8000 Ethiopian birrs and below as a monthly income with a mean of 8783.74. (Table 1)

Table 1

Descriptions of socio-demographic factors among individuals under quarantine during the Covid-19 pandemic, in Addis Ababa, Ethiopia, 2020.

<b>Variables</b>		<b>Frequency</b>	<b>Percent (%)</b>
Age	25 and below	114	38.6
	26–30	96	32.5
	31 and above	85	28.8
Sex	MALE	79	26.6
	Female	217	73.1
Marital status	Married	105	35.4
	Single	169	56.9
	Divorced	23	7.7
Religion	Orthodox	89	30.0
	Muslim	153	51.5
	Protestant	53	17.8
	Catholic	2	.7
Educational status	Unable to read and write	22	7.4
	Able to read and write	31	10.4
	Primary school	119	40.1
	Secondary school	105	35.4
	Certificate and above	20	6.7
Job	Government employed	1	.3
	Student	2	.7
	Merchant	19	6.4
	Unemployed	33	11.1
	Other specify (maid)	241	81.1
Residence	Urban	139	46.8
	Rural	158	53.2
Have a child	Yes	125	42.1
	No	172	57.9

Variables		Frequency	Percent (%)
Living with family	Yes	6	2.0
	No	291	98.0
Were living abroad	Yes	295	99.3
	No	2	.7
Income	8000 and below	209	70.4
	> 8000	88	29.6

## Clinical and psychosocial characteristics

Regarding clinical and psychosocial characteristics of the respondents, the majority (270, 90.9 %) had no confirmed diagnosed chronic illness, and 159 (53.5%) spent their time on Social Media including Facebook and YouTube during their stay at the quarantine center. About 148 (49.8%) of them had intermediate social support and 173 (58.2%) had no stressful life events in the last 6 months. Regarding substance use history, 234 (78.8%) and 262 (88.2%) had no ever used and within a month history of tobacco products consumption, 243 (81.8 %) and 283 (95.3 %) had no ever use and history of alcohol use within a month as well as 215 (72.4 %) and 293 (98.7 %) of the respondents had no ever use and history of amphetamine-related substance use within a month respectively. Further, all of them joined the center because of having a travel history to COVID-19 outbreak areas. (Table 2)

Table 2

Description of clinical, psychosocial & substance use factors among individuals under Quarantine for the case Covid-19 Pandemic, at Addis Ababa, Ethiopia, 2020.

Variables		Frequency	Percent (%)
Reason for quarantine	History of traveling to the COVID-19 outbreak area	297	100.0
Diagnosed chronic illness	Yes	27	9.1
	No	270	90.9
Type of co-morbid	Diabetes	2	.7
	Renal disease	7	2.4
	Hypertension	11	3.7
	other specify	6	.7
Method of refreshment at the quarantine center	Watching TV	6	2.0
	Listening to a radio	7	2.4
	Using social media like Facebook, YouTube etc..	159	53.5
	Reading a book or other published documents	26	8.8
social support	by sleeping	99	33.3
	poor social support	114	38.4
	intermediate support	148	49.8
Stressful life events	good social support	35	11.8
	No	173	58.2
	Yes	124	41.8
Ever use of tobacco products	Yes	63	21.2
	No	234	78.8
Ever use of alcohol	Yes	54	18.2
	No	243	81.8
Ever use of Amphetamine	Yes	82	27.6
	No	215	72.4
Tobacco within a month	Yes	35	11.8

Variables		Frequency	Percent (%)
	No	262	88.2
Alcohol use within a month	Yes	14	4.7
	No	283	95.3
Amphetamine use within a month	Yes	4	1.3
	No	293	98.7

## Awareness of COVID-19 pandemic and PPE utilization

The current study also showed that the vast majority of the respondents (282, 94.9%) had heard about the COVID-19 pandemic which roughly three fourth reported their source was from mass media (74.1%). Two hundred six (69.4%) and 183 (61.6%) considered that COVID-19 is a disease of the respiratory tract and caused by a virus respectively. In addition, almost all agreed that COVID-19 can be prevented by using a facemask (98.3%), wearing gloves (81.8%), using a sanitizer (88.2%), and keeping a physical distance (98.3%). Concerning COVID-19 disease prevention methods utilization, 286 (96.3%) reported that they were using a facemask, 281 (94.6%) keep their physical distance, 253 (85.2%) wash their hands, 151 (50.8%) use a sanitizer whereas, only a small proportion (37.4%) have used gloves. (Table 3).

Table 3

COVID-19 related awareness and PPE utilization behavior of the study participants in at quarantine centers, in Addis Ababa, Ethiopia, 2020.

Variables		Frequency	Percent (%)
Hear about the COVID-19 pandemic	Yes	282	94.9
	No	15	5.1
Source of information	Mass media	220	74.1
	Health professional	7	2.4
	From my family	14	4.7
	from my friends	24	8.1
	Other	17	5.7
	Hypertension	11	3.7
	other specify	6	.7
COVID-19 is caused by	Bacteria	17	5.7
	Virus	183	61.6
	Fungus	5	1.7
	Parasite	3	1.0
	I don't know	88	29.6
	Other	1	.3
COVID-19 is	Disease of the heart	25	8.4
	Disease of the respiratory system	206	69.4
	I don't know	66	22.2
Which one of the following will help us to prevent COVID-19			
handwashing	Yes	284	95.6
	No	13	4.4
Face mask	Yes	292	98.3
	No	5	1.7
By wearing gloves	Yes	243	81.8
	No	54	18.2

Variables		Frequency	Percent (%)
By using sanitizer	Yes	262	88.2
	No	35	11.8
By keeping physical distance	Yes	292	98.3
	No	5	1.7
Did you use the following to prevent COVID-19			
Face mask	Yes	286	96.3
	No	11	3.7
Glove	Yes	111	37.4
	No	186	62.6
Sanitizer	Yes	146	49.2
	No	151	50.8
Hand washing	Yes	253	85.2
	No	44	14.8
Keep physical distance	Yes	281	94.6
	No	16	5.4
COVID-19 affect all age groups	Yes	239	80.5
	No	58	19.5

## The prevalence of anxiety, depression, and comorbid

This study revealed that the prevalence of anxiety, depression, and co-morbid anxiety and depression was 21.5% (CI 16.8, 26.6), 70.7% (CI 65.7, 76.1), and 15.8% (95% C.I: 11.8, 20.2) respectively

## Factors associated with anxiety and depression

### Bivariate Analysis

For each explanatory variable, bivariate analysis was done and socio-demographic factors such as having a child, stressful life event, spending the quarantine time by sleeping, and perceiving transmission of COVID-19 can be prevented by wearing of glove for anxiety and factors such as marital status, stressful life event, method of refreshment, source of information about COVID-19, perception on the cause of COVID-19, knowledge on method of prevention and utilization of COVID-19 prevention methods

for depression were variables that fulfilled the minimum requirement of p-value < 0.05 significance level for further multivariate logistic analysis.

## Multivariate Logistic Analysis

In our multivariate analysis; factors such as those who had stressful life event in the last six months (AOR 2.61, 95%CI (1.46, 4.67)), who spent their time sleeping during the quarantine (AOR 1.97, 95% CI (1.08, 3.62)), and those who considered COVID-19 could not be prevented by wearing gloves AOR 0.30, 95% CI (0.11, 0.81)) were statistically significant association with anxiety (Table 4).

Table 4

Factors associated with anxiety among individuals under Quarantine for the case Covid-19 Pandemic, at Addis Ababa, Ethiopia, 2020

Explanatory Variables	Anxiety		COR,95%(CI)	AOR,95%(CI)	p-value
	No	Yes			
Have a child					
No	128	44	1	1	
Yes	105	20	1.81, (1.00, 3.25)*	1.53, (0.82, 2.84)	0.181
Stressful life event					
Yes	85	39	2.72, (1.20, 8.25)*	2.61, (1.46, 4.67)**	0.001
No	148	25	1	1	
Methods refreshment					
By sleeping	70	29	4.97, (1.10, 3.40)*	1.97, (1.08, 3.62)**	0.028
Other <sup>1*</sup>	163	35	1	1	
COVID-19 can be prevented by wearing gloves					
Yes	184	59	1	1	
No	49	5	3.14, (1.20, 8.25)*	0.30, (0.11, 0.81)**	0.018
* Significant association (p-value < 0.05 in bivariate)					
**-significant association (p-value < 0.05 in multivariate analysis) Hosmer and Lemeshow test = 0.027					
<sup>1*</sup> other methods of refreshment = Using social medias (like Facebook, YouTube etc.), Watching TV, listening a radio and Reading a book or other published documents					

Whereas, being married (AOR 2.67, 95% CI (1.37, 5.22)), had stressful life event in the last six months (AOR 1.44, 95% CI (1.44, 5.25)), and spending of time sleeping during the quarantine (AOR 1.97, 95% CI (1.42, 6.19)) were significantly associated with depression. (Table 5).

Table 5

Factors associated with depression among individuals under quarantine during the COVID-19 pandemic, in Addis Ababa, Ethiopia, 2020

Explanatory Variables	Depression		COR,95%(CI)	AOR,95%(CI)	p-value
	No	Yes			
<b>Marital status</b>					
Single	63	106	1	1	
Married	18	87	2.87, (1.58, 5.21)*	2.67, (1.37, 5.22)**	0.004
Divorced	6	17	1.68, (0.63, 4.49)	1.44, (0.50, 4.16)	0.503
<b>Stressful life event</b>					
Yes	23	101	2.58, (1.49, 4.46)*	1.44, (1.44, 5.25)**	0.002
No	64	109	1	1	
<b>Methods of refreshment</b>					
By sleeping	14	85	3.55, (1.88, 6.69)*	1.97, (1.42, 6.19)**	0.004
Other <sup>1*</sup>	73	125	1	1	
<b>Source of information</b>					
From health professional	4	3	1	1	
Mass media	61	159	3.48, (0.76, 15.98)	2.46, (0.43, 13.92)	0.310
From family	1	13	17.33, (1.39, 216.60)*	8.68, (0.60, 126.16)	0.114
from friend	12	12	1.33, (0.24, 7.28)	0.52, (0.71, 3.84)	0.524
Other	3	14	6.22, (0.89, 43.66)	1.58, (0.16, 15.58)	0.693
<b>Cause of COVID-19</b>					

\* Significant association (p-value < 0.05 in bivariate)

\*\*-significant association (p-value < 0.05 in multivariate analysis) Hosmer and Lemeshow test = 0.022

<sup>1\*</sup> other methods of refreshment = Using social media (like Facebook, YouTube, etc.), Watching TV, listening to a radio and Reading a book or other published documents

Explanatory Variables	Depression		COR,95%(CI)	AOR,95%(CI)	p-value
	No	Yes			
Virus	66	117	1	1	
I don't know	16	72	2.54, (1.37, 4.72)*	1.64, (0.68, 3.95)	0.274
Other	5	21	2.37, (0.85, 6.58)	2.68, (0.89, 8.06)	0.080
<b>COVID-19 can be prevented by wearing gloves</b>					
Yes	78	165	1	1	
No	9	45	2.36, (1.00, 5.08)*	1.80, (0.63, 5.13)	0.271
<b>COVID-19 can be prevented by using sanitizer</b>					
Yes	82	180	1	1	
No	5	30	2.73, (1.02,7.30)*	2.07, (0.43, 9.93)	0.362
<b>Did you use sanitizer</b>					
Yes	52	94	1	1	
No	35	116	1.83, (1.04, 3.05)*	1.57, (0.83, 2.99)	0.169
* Significant association (p-value < 0.05 in bivariate)					
**-significant association (p-value < 0.05in multivariate analysis) Hosmer and Lemeshow test = 0.022					
<sup>1</sup> * other methods of refreshment = Using social media (like Facebook, YouTube, etc..), Watching TV, listening to a radio and Reading a book or other published documents					

## Discussion

To the best of our knowledge, this is the first study to explore the prevalence and factors associated with anxiety and depression among in quarantined population during the COVID-19 outbreak in Sub-Saharan Africa including Ethiopia. Our final analysis revealed a high prevalence of anxiety, depression, as well as comorbid anxiety and depression among the participants. The prevalence of anxiety in this study (21.5%) was higher than the previous study finding conducted in southwestern China (8.3%)(24) and lower than other studies conducted in different countries including China (28.8–58%) (16, 17), Huwan (70.78%) (25), Sierra Leone (48 %) (26), Australian (34%) (27) and the global prevalence based on finding from a recent meta-analysis (45%)(14). The discrepancy in the finding of the current study and the previous studies

could be the difference in factors influencing the prevalence of anxiety such as sample size and instrument used (14, 16, 17, 24, 26, 27) and differences in characteristics of the study participant across the studies (14, 26, 27).

Regarding associated factors of anxiety, in the current study, those who had stressful life events in the last six months were 2.61 times more likely to have anxiety symptoms as compared to those who hadn't. The psychological impact of stressful events could have related to an infectious disease outbreak (18). Further, factor such as frustration, inadequate supplies, and financial loss are among the different stressful life events which could provoke individuals to experience anxiety (12).

Individuals who spent their time sleeping during the quarantine period were 1.97 times more likely to experience anxiety symptoms based on the hospital anxiety and depression scale as compared to those who spent their time using different social media and mass media. This might be because receiving different refreshing information and games through these social media's as well as mass media's could help the individuals to experience more relaxation and exposure with others. Lack of social support or rejection of oneself from social aspects could exposed peoples to develop more psychological impacts like anxiety(14).

Moreover, those who considered COVID-19 infection couldn't have prevented by wearing the glove were more likely to have anxiety as compared to those who considered it could prevent. This could be associated with the type of information they received and their way of interpretation. But the current study finding is in contrast with others that inadequate information (26) with a high level of stress, whereas having specific up-to-date and accurate health information and particular precautionary measures like gloves are associated with a lower psychological impact of the outbreak (27).

Regarding the prevalence and factors associated with depression among individuals under Quarantine for the case Covid-19 Pandemic, the current study result determined that the prevalence of depression was 70.7% which is high. The high prevalence might be related to being separated from close families and friends because social isolation and lockdown can lead to psychological disturbance (28). Quarantine may have a detrimental impact on mental health which can increase psychiatric symptoms and mental health problems in the general population (29). Thus, even if quarantine has a wide-ranging, substantial, and long-lasting psychological impact, it is not to suggest that quarantine should not be used; because of the psychological effects of not using quarantine and allowing the disease to spread might be worse(30). But, it is better to recognize its psychological impact as well as the rapid spread of the COVID-19 pandemic as a public health priority for both authorities and policymakers who should rapidly adopt clear behavioral strategies to reduce the burden of disease and the dramatic mental health consequences of this quarantine related to the current pandemic (31). Our finding is higher than the reported results from studies which were conducted in China (14.6–27.9%) (16, 24, 32), Hong Kong (19%) (33), Huwan (26.47%) (25), and the global prevalence on finding from a meta-analysis (28%)(34). Further, it was also quite higher than study results of different countries like Sierra Leone that any anxiety-depression symptom was reported among 48% of the general population (26), around 15% of the

university students living in Bangladesh (35), 6.21 % in Shenzhen (36), in Albania 6.22% and 6.28% of bachelor and master university students (nurses/midwives) and their family members' respectively reported symptoms of depression (13) and as per the systematic rapid review and meta-analysis study result, 38% of the healthcare workers' (HCWs) were reported depression symptoms (14). The differences in the methodologies used and the characteristics of the participants might be the possible reasons for the observed variations.

Concerning the associated factors of depression those who were married are 2.67 times more likely to have depression symptoms based on HAD data collection tool that we used as compared to those who were single. This could be due to separation from their sexual partner and more worry about their family. Quarantine experience has a positive correlation with depressive symptoms, while home quarantine is positively correlated with happiness (17).

In addition, those who had experienced stressful life events in the last six months had 1.44 times more likely to have depression as compared to those who hadn't. Stressful life events by itself it has its own contribution in the development or exposing individuals to experience more depression symptoms. Being more worried about being infected, having no psychological support, greater property damage, and lower self-perceived health condition has a significant association with higher scores of self-rating depression scale (24). Also, having specific physical symptoms, principal financial problems or loss (27), infection fears, frustration, inadequate information, and stigma has a great risk of developing psychological problems like depression (12).

With respect to methods of refreshment or way spending time during the quarantine period, the current study found that those who were spending their time by sleeping were 1.97 times more likely to have a high score of depression symptoms as compared to those who were spent their time by using social media (like Facebook, YouTube, etc..), watching TV, listening radio and reading a book or other published documents. But this was in contrast with the previous study report because it was mentioned frequent exposure to social media as a risk factor for depression (37).

## **Conclusion**

In summary, in this study, more than one fifth and about three fourth of the participants had anxiety and depression respectively, suggesting anxiety and depression requires attention in quarantined population during the COVID-19 outbreak. Moreover, roughly one-sixth of the participant had comorbid anxiety and depression. The presence of stressful life events, time spent on sleeping, and believing that COVID-19 could be prevented by wearing masks were found to be significant predictors of depression or anxiety among the participants. The results suggest that attention needs to be given to mitigate mental health problems in the quarantined population during the COVID-19 outbreak,

## **Abbreviations**

**AOR;** Adjusted Odd Ratio

**COVID-19;** Coronavirus disease

**CI;** Confidence Interval

**COR;** Crude Odd Ratio

**FMOH;** Federal Ministry of Health

**SARS;** Severe acute respiratory syndrome

**SPHMMC;** Saint Paul's Hospital Millennium Medical College

**SPSS;** Statistical Package for Social Sciences

**WHO;** World Health Organization

## **Declarations**

### **Ethics approval and consent to participate**

The current manuscript had got ethical approval from Saint Paul's Hospital Millennium Medical College (SPHMMC) IRB. In addition, informed consent was obtained from all study participants before they enrolled in the study. They were told that their participation is voluntary, could withdraw at any time, or refuse to answer any question if they want to. We were used a self-administrated written questionnaire to maintain privacy. No information concerning the individual was passed to a third party. So, in general, we carried out the current research by fulfilling all the requirements of the institutional (SPHMMC) IRB guidelines and regulations and also it fulfilled the [Declaration of Helsinki](#) guidelines and regulations.

### **Availability of data and materials**

The datasets used and analyzed during the current study are available from the corresponding Author on reasonable request.

### **Consent for publication**

Further, informed consent for publication was also obtained from each study participant under the consent form by mentioned for all of them that the data will be published in international journals. So, this is to confirm that informed consent for publication was obtained from all the study participants. The collected data is kept confidentially under the primary investigator and co-investigators.

### **Acknowledgments**

The authors acknowledge saint Paul Hospital Millennium Medical College IRB of the institution for their ethical evaluation and approval. Also, for the institution Academic and Research Vice provost and research directorate office for sponsoring the research proposal. The authors appreciate the respective study institution and the study participants for their cooperation in providing the necessary information.

### **Authors' contributions**

MA was involved starting from conceiving the idea, developing the proposal, the study design, reviewed the article, analyzing, report writing, and drafted and write up the manuscript; GA was involved in reviewing and developing the proposal, report, and manuscript; DB, AG, MB, MG, MS, AM, SD, GT & TS were involved in reviewing the proposal and manuscript, but MS was also involved in the data collection process.

### **Funding**

There is no source of funding for the current manuscript

### **Competing interest**

All authors read and approved the final manuscript. The authors declare that they have no competing interests.

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