Prevalence of Psychological Distress Among Quarantined People in the Trivandrum District During the COVID-19 Pandemic: A Cross-sectional Study

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Abstract

Background: Quarantine is considered the most effective way to reduce the transmission of an infectious disease. The outbreak of coronavirus disease-19 (COVID-19) in 2020 led to many people being quarantined at various locations. The literature shows that people who undergo quarantine face psychological problems, such as depression, anxiety and stress. The aim of this study was to estimate the prevalence of psychological issues among quarantined people during the COVID-19 pandemic. **Methods:** This cross-sectional study was conducted in Trivandrum, Kerala, India. Adults aged 18 years and above who underwent quarantine in the area of the Pangappara Medical Health Centre were included. A semi-structured questionnaire and the Depression Anxiety Stress Scale-21 were administered to those who had given their informed consent. Quantitative variables were summarized using mean, standard deviation, and categorical variables with proportions. Significance of association was tested using the chi-square tests. **Results:** There were 143 participants included in the study. It was found that 23.8% had depressive symptoms, 14% had anxiety symptoms and 16.8% had significant stress. People from the age group of 26-40 years (p = 0.017), people from the higher educated group (p = 0.010) and non-resident Keralites (Keralites who were residing elsewhere and returned to Kerala during the pandemic) (p = 0.041) had the highest prevalence of depressive symptoms. **Conclusion:** People who undergo quarantine face many psychological issues. The health care system should provide adequate psychosocial support to quarantined people who undergo quarantine face many psychological issues should undergo appropriate training to provide these supports.

Key Words: Coronavirus Disease; COVID-19; Quarantine; Depression; Anxiety; Stress (Source: MeSH-NLM).

Introduction

The coronavirus disease (COVID-19) pandemic that started in China was declared a public health emergency of international concern by the World Health Organization (WHO) on 30 January 2020.¹ On 11 March 2020, it was subsequently declared a pandemic.² The first case of COVID-19 in India was reported in the southern state of Kerala on 30th January 2020.³ The number of cases has been increasing ever since. Transmission of infectious diseases is often controlled by quarantine and isolation of the population at risk.⁴

Quarantine is the separation and restriction of people who have potentially been exposed to a contagious disease to ascertain if they become unwell so as to reduce the risk of them infecting others.⁵ The term 'quarantine' was first used in Venice, Italy, in 1127 with regard to the spread of leprosy and was widely used during the period of the Black Death in England.⁶ In the case of the COVID-19 pandemic, the WHO issued quarantine guidelines on 29 February 2020.7 Previous studies have shown that implementing strict quarantine measures can precipitate various psychological problems, such as panic disorder, anxiety disorder and depression.⁸ Other negative psychological issues that may be triggered by quarantines include post-traumatic stress symptoms, confusion and anger.9 A study conducted among Chinese university students during the COVID-19 outbreak also reports that mandatory quarantine is significantly associated with emotional distress.¹⁰ According to Hawryluck et.al, symptoms of post-traumatic stress disorder and depression were observed in 28.9% and 31.2% of

people quarantined during the Severe Acute Respiratory Syndrome (SARS) epidemic. $^{\mbox{\tiny 11}}$

Several studies have investigated the psychological impact of pandemics and the lockdown that follows on the general population, as well as among healthcare workers.¹²⁻²¹ The quarantined population differs from the general population in that they had to follow a strict protocol and stay in isolation due to the risk of probable exposure to the disease. According to the guidelines issued by the Ministry of Health and Family Welfare, Government of Kerala, the people coming from outside countries, from states outside Kerala, and those who had primary contact with people who tested positive for COVID-19 were required to spend 14 days at home or an institutional quarantine facility.22 There are only limited studies, especially in an Indian setting, investigating the extent and prevalence of psychological issues among those who were quarantined. These psychological issues include depression, anxiety and stress. Thus, this study aims to better understand these psychological issues and their relationship with factors such as age and educational status to help formulate better policies to improve population mental health during this period.

The primary objective of this study is to estimate the prevalence of psychological issues such as symptoms of depression, anxiety and stress among quarantined people in the Trivandrum district during the COVID-19 pandemic. The secondary objective is to assess associations of psychological issues during a quarantine with socio-demographic factors.

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Prakash SS, et al.

Methods

A cross-sectional study was done in the area of Pangappara Medical Health Centre Unit, in the Trivandrum district, India. Trivandrum district is the capital city of Kerala, India with a mostly urban population.

The study population included all adults who had undergone quarantine in the Trivandrum district during the COVID-19 pandemic, were classified under the Pangappara Medical Health Centre Unit, could be contacted over the phone and consented to participate in the study. The data was collected between July 2020 and September 2020 through telephone interviews. The data was collected from individuals who had completed their quarantine in the past 7 days and had consented to participate in the study. The study was started only after obtaining permission and ethical approval from the health authorities and clearance from the Institutional Ethics Committee (HEC No. 03/51/2020/MCT). The list containing the details of the people under quarantine in the district, under the Pangappara Medical Health Centre Unit, was obtained from the Administrative Medical Officer. Those quarantined individuals in the list who were aged 18 years and above and had given their informed consent constituted the study participants. These study participants were contacted over the phone and invited to participate in the study. The participants gave their informed consent after learning about the procedure and objectives of the study. They were assured that they would not have any financial burden due to participating in the study, that they could withdraw from it at any time they wanted and that none of their personal details would be published or misused in any way.

Inclusion criteria included all persons aged 18 years and above who had undergone quarantine in Trivandrum district during the COVID-19 pandemic.

illness, The study tools used to measure psychological sociodemographic factors and medical comorbidities included the Depression and Anxiety Stress Scale (DASS-21)23 as well as a semistructured questionnaire. The semi-structured questionnaire was used to collect relevant information regarding the socio-demographic factors as well as comorbidities. The socio-demographic factors investigated included variables such as age, sex, educational status, occupational status and resident status. Non-resident Keralites include Non-Resident Indians (NRIs) as well as Keralites who had been residing in other states and returned to Kerala during the time of the pandemic. Resident Keralites denote the native residents of Kerala and non-Keralites residing in Kerala refer to the natives of other states who were residing in Kerala during the pandemic period. The DASS-21 is a symptomanalysis scale and contains 21 questions, seven questions each for Depression, Anxiety and Stress.²³ Each question is graded on a 4-point Likert scale and the scores range from 0 to 3. To calculate the total score for each condition, the scores of relevant questions were added together and the value obtained was multiplied by 2 as per the description in the tool manual. The scores obtained for each question in the DASS-21 questionnaire were added as per the guidelines given in the DASS score sheet to obtain the total scores for depression, anxiety and stress.23 The cut-off scores given in the tool manual to categorize as Depression, Anxiety and Stress were at 9, 7 and 14, respectively. This tool has been validated in the regional setting and used for other Indian studies.18

Statistical Analysis and Sample Size Calculation:

According to *Hawryluck et al.* the prevalence of post-traumatic stress disorder among quarantined people is 28.9%.¹¹ Using this value in the equation 3.84 * pq/d2, the sample size is calculated as (as suggested by a statistician): p = 29, q = 71, Absolute precision d = 25% of p = 8. Sample size = 3.84 * pq/d2 = 124. Therefore, the target sample size was set at 130 to be conservative.

The sociodemographic data and the DASS-21 scores collected were entered in a Microsoft Excel spreadsheet and analyzed using Statistical Package for Social Sciences (SPSS) Version 25.0 for Windows. Quantitative variables were summarized in means and standard deviations while categorical variables were summarized as proportions. Significance of association was tested using Chi-square tests (p<0.05).

Results

There were approximately 250 people in the list and 204 were over the age of 18. Seventeen calls could not be connected because either the phones were switched off or they were out of network coverage area and 18 persons did not attend the call. Out of the remaining 169, 143 individuals gave consent to participate in the study.

The study population was composed of 143 adults, of which 96 (67.1%) were males, and 47 (32.9%) were females, with ages ranging from 18 to 72, the mean age being 36.28. The socio-demographic characteristics of the study population are shown in **Table 1**. The main socio-demographic characteristics that were assessed included gender, age, educational status, occupation and place of residence. All of the 143 adults included in the study were quarantined at their respective homes except one person, who was under institutional quarantine.

Nearly about one-fourth of the study population, 34 out of 143 (23.8%), were found to have depressive symptoms; 20 out of 143 (14%) were found to have symptoms of anxiety; and 24 out of 143 (16.8%) were found to have symptoms of stress as per DASS-21. Associations of socio-demographic factors with depression, anxiety, and stress are shown in **Table 2**. Among these factors, age group (in years) (p=0.017), education status (p=0.010) and place of residence (i.e., Resident Status) (p=0.041) showed statistically significant associations with depressive symptoms. None of the studied variables were significantly associated with anxiety symptoms. Only education status (p=0.005) was significantly associated with stress (**Table 2**)

Table 1. Socio-demographic characteristics of the study population (n = 143).

Socio-demographic Variables	Frequency n (%)		
Gender			
Male	96 (67.1)		
Female	47 (32.9)		
Age Groups (in years)			
18-25	24 (16.8)		
26-40	75 (52.4)		
41-65	42 (29.4)		
>65	2 (1.4)		
Education			
Pre-degree and below	31 (21.7)		
Degree and above	112 (78.3)		
Occupation			
Professionals and skilled workers	103 (72.0)		
Unskilled workers	11 (7.7)		
Students	12 (8.4)		
None	17 (11.9)		
Place of Residence (Resident Status)			
Non-Resident Keralites	83 (58.0)		
Resident Keralites	49 (34.3)		
Non-Keralites residing in Kerala	11 (7.7)		

Legend: Non-resident Keralites include non-resident Indians (NRIs) as well as Keralites who had been residing in other states and returned to Kerala during the time of the pandemic, resident Keralites denote the native residents of Kerala and non-Keralites residing in Kerala refer to the natives of other states who were residing in Kerala during the pandemic period. The category 'Pre-degree and below' in education includes people who have received formal education only up to Grade 12 or below. The category 'degree and above' includes people who have completed formal school education and are either pursuing or have received a college degree.

Prakash SS, et al.

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Discussion

Among the study population, it was found that 23.8% had depressive symptoms, 14% had anxiety symptoms and 16.8% symptoms of significant stress as per DASS-21. People aged 26 to 40 years had the highest prevalence of depressive symptoms, followed by the 18 to 25 years' age group. Regarding educational status, a higher proportion of people from the higher educated group were found to have depressive symptoms when compared with the group that had a lower educational status. Stress followed the same pattern of association and was significantly associated with higher educational status. Regarding resident status, a higher prevalence of depressive symptoms was found among Non-Resident Keralites.

In a study conducted in West Bengal, *Chakraborthy et al.* found that the prevalence of depression among the general population due to lockdown was 24.7%.¹² Another study conducted in India found the prevalence of depression to be 25%, anxiety 28% and stress 11.6% among the general population during the COVID-19 pandemic.¹⁸ Our study differs from those studies since they were conducted among the general public, while our study was specifically conducted among a group of people under quarantine. The quarantined population differs from the general population in that the quarantined population was more likely to be exposed to infection (in order to be forced to quarantine) and thus had to observe strict social distancing norms and other practices like handwashing and the use of face masks.

The findings obtained in our study correlate with many other studies which had revealed that pandemics put great pressure on the mental health of the general population. Many of these studies have used the same scale as we used (DASS-21).¹⁸ As stated earlier, *Hawryluck et al.* found similar findings among quarantined persons during the SARS epidemic.¹¹ Another study conducted in Hong Kong among survivors of SARS found that 10% to 18% reported symptoms related to PTSD, anxiety

and depression.²⁴ In a study among the Ebola survivors and healthcare workers during the 2014-15 Ebola outbreak in Sierra Leone, the survivors had a higher prevalence of depression, anxiety and several other psychological disorders.²⁵

The results obtained in the present study can be attributed to the quick spread of the pandemic across the world, which resulted in many people returning to their homes and native lands. Then, they found that they had to spend a certain number of days in guarantine and had to stay in their homes even after their quarantine periods were over. Moreover, most recreational activities such as traveling, meeting people and social gatherings were not possible. The importance of social groups in providing support has been studied in detail by groups such as Felton et.al.26 Moreover, while still in quarantine, people had to adjust to their 'new normal' way of life that included more video calls, online meetings, online classes and work-from-home. Above all, the fear of an unknown disease that was quickly spreading everywhere, the day by day increase in the number of cases and misinformation regarding various aspects of the disease could have contributed to the general increase in the prevalence of depression, anxiety, and stress among the quarantined population. Chakraborthy et al., in their study, had found that a significant proportion of the population was preoccupied with the idea of getting infected.¹² Some of the participants in our study also reported that they felt uncomfortable due to the social stigma attached to being in quarantine and that they had to face negative comments from their neighbors concerning this stigma.

The higher prevalence of depressive symptoms among the younger age groups in the present study may be because of the restrictions that the quarantine had imposed upon them, right in their prime productive age. This included restrictions on social mobility and their usual pursuits of recreation like meeting with their social circle and traveling.

Table 2. Associations of Socio-Demographic Factors with Depression, Anxiety, and Stress (n = 143).

Socio-demographic Variables	Depression Present n (%)	p-value	Anxiety Present n (%)	p-value	Stress Present n (%)	p-value
Gender						
Males	22 (22.9)	0.73	12 (12.5)	0.464	16 (16.7)	0.957
Females	12 (25.5)		8 (17.0)		8 (17.0)	
Age Groups (in years)						
18-25	7 (29.2)	0.017	5 (20.8)	0.369	6 (25.0)	0.071
26-40	24 (32.0)		12 (16.0)		16 (21.3)	
41-65	3 (7.1)		3 (7.1)		2 (4.8)	
>65	0 (0)		0 (0)		0 (0)	
Education						
Predegree and below	2 (6.5)	0.01	2 (6.5)	0.172	0 (0.0)	0.005
Degree and above	32 (28.6)		18 (16.1)		24 (21.4)	
Occupation						
Professionals and skilled workers	25 (24.3)	0.051	14 (13.6)	0.18	17 (16.5)	0.205
Unskilled workers	2 (18.2)		1 (9.1)		0 (0.0)	
Students	6 (50.0)		4 (33.3)		4 (33.3)	
None (Unemployed)	1 (5.9)		1 (5.9)		3 (17.6)	
Place of residence (Resident Status)						
Non-resident Keralites	26 (31.3)	0.041	14 (16.9)	0.503	19 (22.9)	0.051
Resident Keralites	6 (12.2)		5 (10.2)		5 (10.2)	
Non-Keralites residing in Kerala	2 (18.2)		1 (9.1)		0 (0.0)	

Legend: Non-resident Keralites include non-resident Indians (NRIs) as well as Keralites who had been residing in other states and returned to Kerala during the time of the pandemic. Resident Keralites denote the native residents of Kerala and non-Keralites residing in Kerala refer to the natives of other states who were residing in Kerala during the pandemic period.

The category Predegree and below in education includes people who have received formal education only up to Class 12 of school or below. The category Degree and above includes people who have completed formal school education and are either pursuing or have received a college degree.

Original Article

Prakash SS, et al.

Another study also reported that younger age groups, especially the 18-24 years' age group and the 25-35 years' age group, had a more negative psychological impact when compared with the rest of the population. In comparison, the ones above 65 years of age had the least psychological impact.¹⁴ Moreover, most of these participants were home-quarantined and had a fear of infecting family members who might be more vulnerable. Many people, especially those belonging to the 26 to 40 years' age group, had worries regarding the safety of their families, especially their elderly parents and young children. In support of this finding, a study conducted in Wuhan by *Zhu et al.* reported that living with family and worries about family members getting infected were risk factors for psychological problems among healthcare workers during the beginning of the COVID-19 pandemic.²⁰

This study also found that a higher proportion of people among the group with higher education had depressive symptoms and stress. This could be because they were more aware of the risks and chances of contracting the infection. They were possibly also more aware of the ongoing research on the long-term complications that might arise due to COVID-19; hence, they had more worry than their counterparts from the group that had less education. On the other hand, the participants were not being diagnosed by a healthcare provider but were answering questions over the phone. Therefore, perhaps, people with lower education status were more prone to reporting bias or there may have been a knowledge gap, which led to this finding.

The higher prevalence of depressive symptoms among Non-Resident Keralites could be attributed to their worries regarding the loss of their jobs and livelihood, fear of infecting their family members, the difficulties of getting accustomed to work-from-home, and other such concepts. Some of the study participants also reported that they were sad that they could not see their family and friends from their

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hometowns. However, they understood the reason and necessity of the quarantine process. This could also have contributed to a higher prevalence of depressive symptoms among this group.

A limitation of this study was that it was conducted by interviewing the study participants over the phone, which might not yield results with the same accuracy as self-reporting or a face-to-face interview. Other limitations such as selection bias, interviewer bias and report bias may also have affected the outcome of the study. In addition, as this was a cross-sectional study, we can only infer correlation and not causation from these results, and a clear conclusion cannot be clearly stated because of the possibility of confounders altering the levels of psychological distress in the study population.

Conclusion

The present study has concluded that a considerable group of people who had undergone quarantine faced psychological problems like depressive symptoms, anxiety symptoms and stress. This issue needs to be addressed since it demonstrates that the mental health of quarantined individuals can differ from the general population based on unique challenges and may need to be approached from a different perspective. This can be done by reaching out to these individuals and providing adequate psychological support and counseling services. Moreover, primary healthcare workers should be trained to identify and address the mental health issues of quarantined people and offer necessary support and services. The services that have already been launched by the Government of Kerala to provide mental health support such as telecounselling services namely, "Ottakkalla Oppamund" (translated as "You're not alone, we are with you"), need to be strengthened. As the authors, we feel that family members and the general public should be made aware of the psychological impacts of quarantine and they could benefit from their constant love and support.

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Prakash SS, et al.

Prevalence of Psychological Distress Among Quarantined People in Trivandrum District During the COVID-19 Pandemic: A Cross-sectional Study

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Author Contributions

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