

Mental Health Status among the Quarantined Population during COVID-19 Pandemic: A Cross-sectional Study from Western Rajasthan, India

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ABSTRACT

Introduction: Although, isolation and quarantine are important measures to curb the exponential growth of the prevailing Coronavirus Disease-2019 (COVID-19) pandemic, but at same time this can impose psychological issues among the affected population and also to their family members.

Aim: To evaluate the mental health problems, their severity and associated factors in quarantined population during the COVID-19 pandemic.

Materials and Methods: This cross-sectional study was conducted among 207 quarantined subjects at different quarantine centres of Ajmer, associated with JLN Medical College, Ajmer, India, from August to October 2020, after getting approval from Ethics Committee of the centre. All the consenting quarantined subjects who were of age 18 years and above, irrespective of their gender were enrolled in the study. For the assessment of psychiatric morbidity, participants were screened using Mini-International Neuropsychiatric Interview (MINI) 6.0.0. Finally, the relevant

psychiatric assessment tools like Hamilton Rating Scale for Depression (HAM-D), Hamilton Anxiety Rating Scale (HAM-A) and Yale-Brown Obsessive Compulsive Scale were applied to assess the severity of the disorders. Pearson correlation analysis was used to evaluate the relationship among various clinical variables. The level of significance was considered at p-value <0.05.

Results: Majority 85 (41.1%) subjects belonged to the age group 31-40 years of age. Around 160 (77.3%) participants were male. Around 51 (24.6%) presented moderate depression and 25 (12%) presented with severe depression. Also 182 (87.9%) presented with moderate anxiety. The study showed a statistically significant association between depression/anxiety and substance abuse, insomnia, co-morbidities, suicidal ideation/attempts.

Conclusion: The findings of the present study concluded that a significant proportion of the quarantined population suffered from psychological issues. So, the psychological impact of a mandatory quarantine should be weighed more thoughtful and in an evidence based manner.

Keywords: Anxiety, Coronavirus disease-2019, Depression, Isolation, Psychological issues

INTRODUCTION

The word ‘quarantine’ was first used in Venice, Italy in the year 1127 with regard to leprosy. Although, it was not until 300 years later that the UK began to impose quarantine in response to the plague [1]. Quarantine is the separation and restriction of movement of people who have potentially been exposed to a contagious disease to ascertain if they become unwell, thus reducing the risk of them infecting others [2]. This differs from isolation, which is the separation of people who have been diagnosed with a contagious disease from people who are not sick [3].

One of the extreme challenges for the survival of mankind is facing a pandemic of an infectious disease of the COVID-19 type since the last one year [4]. The World Health Organisation (WHO) declared COVID-19 as a pandemic on March 11, 2020 [5]. A wide range of interventions regarding public health like restricted travelling, physical distancing, home confinement and centralised quarantine and easy access to medical supplies have enormously contributed to the quick containment of the epidemic in China and set an encouraging example for other countries being affected [6]. However, the preventive measures like quarantine and isolation, urgently adopted to manage pandemic might potentially have adverse psychological and social effects especially on those at risk, such as frontline workers, children and older adults [7-9]. Most of the anticipated direct consequences of quarantine and associated social and physical distancing, including financial insecurity, boredom, frustration, feeling a burden, loneliness, inadequate supplies, inadequate information and stigma and fear of getting an

infection are risk factors for mental health issues including anxiety, depression, suicide and self-harm [7].

It is well known that quarantine for any cause and in the context of a pandemic (Severe Acute Respiratory distress Syndrome, 2003) has been associated with significant mental health problems such as anxiety, fear of infection or death, low mood, sense of loneliness, sleep disturbances, agitation, anger outburst, etc., just after few days of quarantine and followed by symptoms of post-traumatic stress disorder and depression after discharge from the hospital [10]. Keeping all these facts in mind, this study aimed to evaluate the mental health problems, their severity, and association with clinical variables in quarantined population during the COVID-19 pandemic.

MATERIALS AND METHODS

This cross-sectional study was conducted among quarantined subjects at different quarantine centres of Ajmer, associated with Jawaharlal Nehru Medical College, Ajmer, India, from August to October 2020. The ethical clearance from Institutional Ethical Committee was sought (1533Acad-III/MCA/2020 dated on 30th July 2020).

Inclusion criteria: Subjects who consented to participate in the study, of age 18 years and above, and of either gender were included in the study.

Exclusion criteria: Subjects unwilling to give consent or suffering from severe medical illness or already a diagnosed and documented case of psychiatric disorder were excluded.

Study Procedure

The format of the study and the method adopted were explained to participants. Written informed consent of participants was taken prior to the recruitment in the study. After getting consent, a socio-demographic profile was noted down using a pretested semi-structured proforma. For the assessment of psychiatric morbidity participants (N=207) were screened by using MINI version 6 [11]. Finally, the relevant psychiatric assessment tools like HAM-D, HAM-A, Y-BOCS were applied to assess the severity of the disorder [12-14].

There were six different quarantine centers. All the quarantine centers were taken for the study. Permission from the concerned authorities were sought minimum two and maximum five participants were interviewed at bedside from 9:00 am to 5:00 pm, each day. It was an interviewer administered proforma filled at bedside ensuring privacy. Every participant was quarantined for 14 days and he/she was interviewed once on day 14 of his quarantine.

Psychiatric assessment tools:

- Semi-structured proforma:** It included the socio-demographic profile sheet and clinical profile sheet.
- MINI 6.0.0:** It was designed as a brief structured interview for the major Axis I psychiatric disorders mentioned in Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) and International Classification of Diseases (ICD-10) [11]. Reliability and validity studies, done by comparing MINI to the Structured Clinical Interview for DSM Disorders-Patient Edition (SCID-P) for DSM-III-R and Composite International Diagnostic Interview (CIDI) (developed by WHO for interviewers for ICD-10). For this study following modules were used- major depressive disorder, Obsessive Compulsive Disorder (OCD), suicidality, generalised anxiety disorder [11].
- Hamilton Rating Scale for Depression (HAM-D):** It is available in two versions with either 17 or 21 items. It is scored on 5 point scale between 0 to 4 points. Severity of depression was measured by first 17 items whereas the remaining 4 items on the 21 item version measure the factors related to depression. Scores of 0-7 are supposed as normal, 8-16 mild depression, 17-23 moderate depression, and scores more than 24 indicates severe depression. The maximum score being 52 on the 17-point scale [12].
- Hamilton Anxiety Rating Scale (HAM-A):** It measures the severity of both psychic anxiety and somatic anxiety symptoms. It consists of 14 items. Each item is scored on a four point scale, where <17 indicates mild severity, 18-24 mild to moderate severity, and 25-30 moderate to severe, with a score range of 0-56 [13].
- Y-BOCS:** It is a standardised rating scale. Two versions viz., clinician-administered and self-report versions are available. It measures 10 items of obsessions and compulsions on a five point Likert scale. A total score can range from 0-40 and is calculated by summing items 1 to 10 [14].

STATISTICAL ANALYSIS

Statistical analysis was done by using Statistical Package for the Social Sciences (SPSS) version 23.0 and results were tabulated. Descriptive statistics were used to report frequencies. Pearson correlation analysis was used to evaluate the relationship among various clinical variables. Statistically significant difference was considered at p-value <0.05.

RESULTS

In total, 248 people were quarantined during this period at six different quarantine centers of the city. Seven of them had advanced illness, so the total eligible participants were 241. Out of them 34 refused to give consent. The final sample size was 207. The socio-demographic profile of the participants is shown in [Table/Fig-1].

Majority of them belonged to the age group 31-40 years 85 (41.1%) followed by the age group 41-50 years 66 (31.1%). Most of the participants were male 160 (77.3%), married 158 (76.3%), hindu 158 (76.3%), educated up to secondary/senior level 98 (47.3%), belonged to nuclear family 119 (57.5%).

Socio-demographic variables		Frequency, N (%)
Age group (In years)	18-30	33 (15.9)
	31-40	85 (41.1)
	41-50	66 (31.8)
	51-60	15 (7.2)
	>60	8 (3.9)
Gender	Male	160 (77.3)
	Female	47 (22.7)
Marital status	Married	158 (76.3)
	Unmarried	23 (11.1)
	Widow/Divorcee/Separated	26 (12.6)
Religion	Hindu	158 (76.3)
	Islam	47 (22.7)
	Others	2 (0.9)
Education	Upto middle school	78 (37.7)
	Secondary to senior	98 (47.3)
	Undergraduate and postgraduate	31 (14.9)
Family income (rupees per month)	0-1600	7 (3.4)
	1600-4800	21 (10.1)
	4800-8000	86 (41.5)
	8000-12000	46 (22.2)
	12000-16000	32 (15.5)
	16000-32000	14 (6.8)
	>32000	1 (0.5)
Family type	Nuclear	119 (57.5)
	Extended nuclear	70 (33.8)
	Joint	18 (8.7)

[Table/Fig-1]: Socio-demographic profile of participants.
N=207

The severity of depression over the HAM-D rating scale is shown in [Table/Fig-2]. About 60% of the participants reported depression of different severity. Around 8 (3.8%) of the participants reported very severe depression, whereas 25 (12.1%) of them reported severe depression and 51 (24.6%) showed moderate depression.

Severity	N (%)
Normal (0-7)	84 (40.6)
Mild (8-13)	39 (18.8)
Moderate (14-18)	51 (24.6)
Severe (19-22)	25 (12.1)
Very severe (>23)	8 (3.8)

[Table/Fig-2]: Scores on HAM-D.

The severity of anxiety over the HAM-A is shown in [Table/Fig-3]. Only 2 (0.9%) percent of the participants were severely anxious, whereas 23 (11.1%) of them were moderately anxious and 182 (87.9%) of them reported mild anxiety symptoms.

Severity	N (%)
Mild (<17)	182 (87.9)
Moderate (18-24)	23 (11.1)
Severe (25-30)	2 (1)

[Table/Fig-3]: Scores on HAM-A.

The clinical variables of the participants is shown in [Table/Fig-4]. Around 6 (2.9%) of the participants had suicidal ideation whereas

1 (0.5%) attempted suicide. The OC symptoms were present in 3 (1.4%) participants. Insomnia was present in 54 (26.1%) of participants. Around 28 (13.5%) of the participants watched news continuously/updated themselves continuously about pandemic. Around 40% of the participants consumed different substances namely alcohol 65 (31.4%), tobacco 14 (6.7%), whereas 12 (5.7%) of them concomitantly took both alcohol and tobacco.

Clinical variables		N (%)
Insomnia		
Present		54 (26.1)
Absent		153 (73.9%)
Suicide Ideation/attempts		
No ideation/Attempts		200 (96.6)
Only ideation		6 (2.9)
Attempts		1 (0.5%)
Substance abuse		
No substance abuse		117 (57.5%)
Only alcohol		65 (31.4%)
Only tobacco		14 (6.7%)
Both (Alcohol+Tobacco)		12 (5.7%)
Others		4 (1.9%)
OCD/OC symptoms		
Present		3 (1.4%)
Absent		204 (98.6%)
Watching news about the pandemic		
Yes		28 (13.5%)
No		179 (86.5%)

[Table/Fig-4]: Clinical variables.

OC: Obsessive compulsive

The association of depression and anxiety with other co-variates of the participants is shown in [Table/Fig-5]. It shows the statistically significant association between the HAM-A and different variables such as substance abuse, OC symptoms, watching the news, suicide, insomnia and other co-morbidities such as Diabetes Mellitus (DM), hypertension and cardiac problems. It also showed a statistically significant association between the HAM-D and variables such as substance abuse, watching news, suicide ideas, insomnia and other co-morbidities such as diabetes mellitus, hypertension, and cardiac problems.

Variable	Number	HAM-D		HAM-A	
		Mean (SD)	p-value	Mean (SD)	p-value
Substance abuse	Yes	90	14.08 (5.79)	11.45 (5.87) 7.34 (4.78)	<0.05* <0.05*
	No	117	7.47 (3.50)		
Insomnia	Present	54	18.40 (3.71)	11.79 (5.44) 7.95 (5.31)	<0.05* <0.05*
	Absent	153	7.12 (6.3)		
Suicide ideation/attempt	Present	7	20.40 (4.03)	18 (4.74) 8.73 (5.43)	<0.05* <0.05*
	Absent	200	9.80 (7.48)		
News	Watched	28	14.75 (7.46)	12.14 (6.02) 9.4 (5.37)	<0.05* <0.05*
	Didn't watch	179	9.33 (7.37)		
OC symptoms/Complaints	Present	3	16 (4.35)	21.33 (6.40) 8.33 (5.06)	0.120 <0.05*
	Absent	204	9.28 (7.40)		
DM/HTN/Cardiac problems	Present	13	22 (2.85)	15.15 (4.30) 8.50 (5.43)	<0.05* <0.05*
	Absent	194	9.26 (5.12)		

[Table/Fig-5]: Association of depression and anxiety with co-variates.

*Association is significant at the 0.05 level (2-tailed)

*Association is significant at the 0.01 level (2-tailed)

DISCUSSION

Review of literature revealed that any epidemic or pandemic may give rise to new psychiatric symptoms/disorders or causes relapse/recurrence of previous psychiatric disorder. Across the globe, various measures have been taken to halt the progression of pandemics. It has been observed that implementing early quarantine was taken as a prime measure of control [15]. Those who are quarantined have their freedom restricted, to prevent spread of transmissible diseases. It can have various consequences at personal and population level both on mental health and wellbeing apart from physical sufferings. All these facts develop immense interest to work on the hot topic of the current scenario. This study is most likely the first, in the specific geographical area, to explore the likely impacts of quarantine measures on the mental health of the quarantined population.

It was noticed that there is around 20-fold rise in the prevalence of depression (60%) and around thirtyfold rise in the prevalence of anxiety (90%) in quarantined participants as compared to baseline statistics in the Indian population as per global burden of disease study 1990-2017 (3.1-3.6% for depressive disorders and 3.0-3.5% for anxiety disorders) [16]. This study was conducted when the pandemic was at its peak which may be a reason for such a sharp rise in the prevalence of depression and anxiety. The stressors such as uncertainty of disease progression, an insufficient supply of essentials, financial losses, perceived higher risk of getting infected, vague information, and improper communications through media related to the quarantine may be contributing to the much hike in the prevalence of depression and anxiety [7,17,18]. Rumours about the pandemic and continue being active in different social media platforms might also be imposing a psychological burden on participants. It was also noticed that 26.1% subjects reported insomnia, around 2.9% reported suicidal ideation with suicidal attempts in less than 1% of the participants. Around 2% of the participants complained of OC symptoms with 1 participant fulfilling the diagnostic criteria of OCD as per ICD-10. More than 40% had a history of substance abuse namely alcohol, tobacco, or both concomitantly along with other drugs. Several other studies that only investigated those who were quarantined, reported a high prevalence of depression (31.2%), insomnia (34.2%) [18,19].

It is evident from previous outbreaks that there is various psychological impact of quarantine. It can vary from immediate effects, like irritability, fear of infection to family members, anger, confusion, frustration, loneliness, denial, anxiety, depression, insomnia, despair and to extremes of consequences, including suicide [7,20-23]. Other adverse outcomes included avoidance behaviours (avoiding crowded or public places), detachment from others, symptoms of alcohol use disorder and post-traumatic stress disorder, excessive preoccupation with distressing somatic symptoms and stigma, as well as domestic violence and suicidal ideation and behaviour [7,24]. Statistically significant association was found in a positive direction between different clinical variables in the present study. It showed that both anxiety and depression were more in those who were having a history of substance abuse, co-morbidities namely hypertension, diabetes and other cardiac complications. Suicidal ideation, OC symptoms and insomnia were also associated positively with anxiety and depression. It was seen that those who were having co-morbidities are more prone to death [25], so the increased anxiety and depression might be all because of that. Abrupt deterioration in health parameters, sudden death, and uncertain progression of the disease might cause the rise of psychological burden. Scarcity of resources, poor medical facility, stigmatisation, fear of death might prone for a candidate for suicidal ideation, OC symptoms.

Limitation(s)

Sample size was not pre-estimated, all the eligible and consenting participants were recruited in the study. It was a cross-sectional

study so association does not imply causation. The confounders such as baseline insomnia, anxiety, depression, suicidal tendency, OC symptoms were not studied.

CONCLUSION(S)

Psychological impact of quarantine is varied, substantial and can be long lasting. A significant proportion of the quarantined population suffered from psychological issues. Though, it helps in controlling the prevailing pandemic at one hand, on the other hand it looks like the beginning of another pandemic of depression, anxiety and other psychiatric disorders. So, the psychological impact of a mandatory quarantine should be weighed more thoughtful and in an evidence based manner.

REFERENCES

- [1] Newman KL. Shut up: Bubonic plague and quarantine in early modern England. *Journal of Social History*. 2012;45(3):809-34.
- [2] Centers for Disease Control and Prevention. (2017). Quarantine and isolation. <https://www.cdc.gov/quarantine/index.htm>. (Accessed Jan 30, 2020).
- [3] Manuell ME, Cukor J. Mother Nature versus human nature: Public compliance with evacuation and quarantine. *Disasters*. 2011;35(2):417-42.
- [4] Coronavirus. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. [Last accessed on 2020 Mar 21].
- [5] Coronavirus. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. [Last accessed on 2020 Mar 22].
- [6] Pan A, Liu L, Wang C, Guo H, Hao X, Wang Q, et al. Association of public health interventions with the epidemiology of the COVID-19 outbreak in Wuhan, China. *JAMA*. 2020;323(19):1915-23.
- [7] Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*. 2020;395(10227):912-20.
- [8] Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*. 2020;7(6):547-60.
- [9] Liu JJ, Bao Y, Huang X, Shi J, Lu L. Mental health considerations for children quarantined because of COVID-19. *The Lancet Child & Adolescent Health*. 2020;4(5):347-49.
- [10] Reynolds DL, Garay JR, Deamond SL, Moran MK, Gold W, Styra R. Understanding, compliance and psychological impact of the SARS quarantine experience. *Epidemiology & Infection*. 2008;136(7):997-1007.
- [11] Sheehan DV, Leclerc Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*. 1998;59(20):22-33.
- [12] Hamilton M. A rating scale for depression. *Journal of Neurology, Neurosurgery, and Psychiatry*. 1960;23(1):56.
- [13] Thompson E. Hamilton rating scale for anxiety (HAM-A). *Occupational Medicine*. 2015;65(7):601.
- [14] Goodman WK, Price LH, Rasmussen SA, Mazure C, Fleischmann RL, Hill CL, et al. The Yale-Brown obsessive compulsive scale: I. Development, use, and reliability. *Archives of General Psychiatry*. 1989;46(11):1006-11.
- [15] Rubin GJ, Wessely S. The psychological effects of quarantining a city. *BMJ*. 2020;368:m313.
- [16] Sagar R, Dandona R, Gururaj G, Dhaliwal RS, Singh A, Ferrari A, et al. The burden of mental disorders across the states of India: The Global Burden of Disease Study 1990–2017. *The Lancet Psychiatry*. 2020;7(2):148-61.
- [17] Maunder R, Hunter J, Vincent L, Bennett J, Peladeau N, Leszcz M, et al. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ*. 2003;168(10):1245-51.
- [18] Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styra R. SARS control and psychological effects of quarantine, Toronto, Canada. *Emerging Infectious Diseases*. 2004;10(7):1206.
- [19] Lee S, Chan LY, Chau AM, Kwok KP, Kleinman A. The experience of SARS-related stigma at Amoy Gardens. *Social Science & Medicine*. 2005;61(9):2038-46.
- [20] Robertson E, Hershenfield K, Grace SL, Stewart DE. The psychosocial effects of being quarantined following exposure to SARS: A qualitative study of Toronto health care workers. *The Canadian Journal of Psychiatry*. 2004;49(6):403-07.
- [21] Barbisch D, Koenig KL, Shih FY. Is there a case for quarantine? Perspectives from SARS to Ebola. *Disaster Medicine and Public Health Preparedness*. 2015;9(6):547-53.
- [22] Jeong H, Yim HW, Song YJ, Ki M, Min JA, Cho J, et al. Mental health status of people isolated due to Middle East Respiratory Syndrome. *Epidemiol Health*. 2016;38:e2016048.
- [23] Liu X, Kakade M, Fuller CJ, Fan B, Fang Y, Kong J, et al. Depression after exposure to stressful events: Lessons learned from the severe acute respiratory syndrome epidemic. *Comprehensive Psychiatry*. 2012;53(1):15-23.
- [24] Pfefferbaum B, North CS. Mental health and the Covid-19 pandemic. *New England Journal of Medicine*. 2020;383(6):510-12.
- [25] Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P, et al. Comorbidity and its impact on participants with COVID-19. *SN Comprehensive Clinical Medicine*. 2020;2(8):1069-76.

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AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. No

PLAGIARISM CHECKING METHODS:

- Plagiarism X-checker: Aug 13, 2021
- Manual Googling: Feb 07, 2022
- iThenticate Software: Mar 09, 2022 (17%)

ETYMOLOGY:

Author Origin

Date of Submission: **Aug 12, 2021**
 Date of Peer Review: **Sep 29, 2021**
 Date of Acceptance: **Feb 09, 2022**
 Date of Publishing: **May 01, 2022**