THE BURDEN OF QUARANTINE ON MENTAL HEALTH AMIDST COVID-19 PANDEMIC: A CROSS SECTIONAL STUDY

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ABSTRACT

Objective: To gauge the frequency of post traumatic stress disorder, stress, anxiety and depression amongst the general population that has been quarantined in public quarantines.

Study Design: Cross sectional study.

Place and Duration of Study: Two months duration Mar to May 2020 at rural development authority building (Quarantine facility), Quetta.

Methodology: Total 377 individuals participated in the survey. Pre-validated 'Depression Anxiety Stress Scale' and 'The Impact of Event Scale-Revised'questionnaire were used to interview the individuals.

Results: The age ranged between 18 and 53 with a mean age of 30.9 years ± 4.9. Out of 377 participants 17 (4.5%) were seen to match a score on 'The Impact of Event Scale-Revised' that was positive for Post Traumatic Stress Disorder. On 'Depression Anxiety Stress Scale' scoring 25 (6.68%) showed symptoms indicative of depression, 19 (5%) for anxiety and 5 (1.3%) for stress.

Conclusion: Quarantine has significant psychological impact which includes Post-traumatic Stress Disorder, depression, anxiety and stress on the quarantined individuals in mass public quarantines.

Keywords: COVID-19 Pandemic, Isolation, Psychological impact, Quarantine.

INTRODUCTION

Corona virus disease 2019 (COVID-19), a novel corona virus, emerged as an epidemic in Wuhan (China) in December 2019 and was declared a Public Health Emergency by World Health Organization on 30th January 2020. Since then it has quickly transformed into a pandemic. An outbreak was first suspected when multiple unexplained cases of pneumonia were reported in Wuhan by the chinese health authorities. On 7th January 2020 the Chinese Centre for Disease Control and Prevention (CCDC) had isolated the causative agent which was subsequently named, COVID-19, by World Health Organization. The viral disease was mainly characterized by respiratory symptoms such as cough, dyspnea, sore throat accompanied with fever. However, a few individuals showed severe life threatening symptoms such as multi-organ failure, acute respiratory distress syndrome and septic shock etc[1]. It is a part of a series of coronavirus outbreaks since they were first isolated and identified in the 1960s. So far 7 coronaviruses have been identified to have caused disease in human beings with COVID-19 being the most recent of them[2].

As of today there is no specific cure or treatment for the disease. It has infected over seven million across the globe and well over 0.4 million people have lost their lives so far[3]. Researchers across the globe are involved in intensive research to find a cure or vaccine for this novel disease. However, until a cure or vaccine is discovered, quarantine has emerged as a frontline preventative measure. The concept of quarantine was formulated around 1127 C.E in Italy amidst the leprosy outbreak. Quarantine has been used as an effective measure in limiting the extensive damage and spread of the Black Death in the past

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and much recently for severe acute respiratory syndrome (SARS-CoV), middle east respiratory syndrome (MERS-CoV), Ebola Virus and COVID-19 outbreak. Quarantine is described as restricting the movement of healthy individuals who may have been exposed to a certain disease. The period of quarantine helps ascertain whether the individual will develop any symptoms characteristic of the disease, thus, helping to limit the spread to other healthy individuals[4].

The unprecedented mass public quarantines enforced by different countries in response to the COVID-19 outbreak has disrupted normal life. Thus, naturally, putting hundreds and thousands of individuals in great mental stress, anxiety and depression[5]. In multiple studies post traumatic stress disorder, exhaustion and depression has been shown in health care workers due to disease outbreaks that have overwhelmed health care systems. However, never before has quarantine been used on general population at such a mega scale with China forcibly quarantined a city of 11 million people[6]. Isolation, fear of unknown, economic burdens, and many other factors coupled together create an environment of stress. Thus, the psychological impact of such extreme, yet much needed, measures remains yet to be fully explored. China has used multiple self-administered verified and non-verified questionnaires to gauge the psychological impact of COVID-19 on general population. Egyptian study showed huge effect of COVID-19 on the mental health of adult population[7]. However, the psychological impact of quarantine on general population in third world countries who are more vulnerable to the effect of economic burdens and common life stressors still remains limited[8].

We conducted this study to gauge the frequency of post traumatic stress disorder, stress, anxiety and depression amongst the general population that has been quarantined in mass designated public quarantines on government directives. The purpose, thus, being to help stake holders formulate actionable policies to tackle the ever increasing mental stress due to COVID-19 and plan timely interventions.

METHODOLOGY

It was a cross-sectional questionnaire based observational study. We included all the individuals admitted in the quarantine during the a period of 2 months for our study. This study was conducted at Balochistan's Central Quarantine facility established in early March 2020 at Rural Development Authority Building, Quetta. A total of 730 individuals were enrolled in the quarantine facility over the period of two months i.e. 15th March to 15th May 2020 for completion of 14 days quarantine period each. The enrolled population included Zaireen (Pilgrims) returning from Iran (Qom/Tehran), their close handlers e.g. bus drivers, bus conductors, Levies force and Police personals. This mass quarantine facility had a capacity of holding 250 individuals at a time. A total of 377 individuals consented to participate in the study out of a total of 730 individuals who were enrolled in the mass quarantine facility. Universal sampling method and a non-probability convenient sampling technique was used. All healthy adults (age ≥18 years) enrolled in the quarantine facility for 14 days were included in the study. Individuals with previous history of chronic ailment like Diabetes Melitus, hypertension, ischemic hear disease, Chronic obstructive pulmonary disease, Asthma, Chronic liver disease or with history of any psychiatric illness/ substance abuse were excluded from the study. Individuals were asked for volunteer participation in the study using a detailed questionnaire including demographic details like age, sex, educational and socioeconomic status, marital status, number of children and number of earning hands in the family. Pre-validated Urdu translated Depression Anxiety Stress Scale' (DASS 21)[9] and 'The Impact of Event Scale-Revised' (IES-R)[10] questionnaire were used. Patients were classified on the basis of educational (Under matric, Intermediate, bachelors, masters, post graduation and Ph.D.) and socioeconomic status (lower class, lower middle class, upper middle class and upper class). Two nursing assistants with 16 years of education and strong grip on English, Urdu, Pashto, Balochi, Brewery and Parsi languages

were detailed to interview volunteer persons individually on the second last day of the enrollment. Written informed consent was taken from the individuals to publish the results of their answers maintaining confidentiality at each level. Ethical review committee of Combined Military Hospital Quetta reviewed and approved the study protocols (IRB no 029). Data were analysed by using IBM Statistical Package for the Social Sciences version 23 software and Microsoft Excel 360. Descriptive statistics were run for the quantitative variables and chi square test was applied to find out the association. The *p*-value ≤0.05 was considered statistically significant.

RESULTS

All 377 participants in the study were males with 77 (20.4%) single, 297 (78.7%) married and 3 (0.8%) divorced. The age ranged between 18 and 53 with a mean age of 30.9 years ± 4.9.

PTSD was seen to be strongly correlated with age (*p*-value 0.023). Age group 29-39 showed the maximum number of individuals with PTSD like symptoms in 11 out of which 6 showed Partial PTSD, 1 with a clinical cut off value for diagnosis of PTSD and 4 with severe PTSD as shown in table-I. IES-R was used to assess PTSD scores of individuals which showed increasing trends from 18 to 39 years and decreasing there on with minimal PTSD like symptoms >50 years.

Table-I: Post traumatic stress disorder score in different age groups.

Age Groups	Post Traumatic Stress Disorder Score				*p*-value
	No Post Traumatic Stress Disorder	Partial Post Traumatic Stress Disorder	Diagnosed Post Traumatic Stress Disorder	Severe Post Traumatic Stress Disorder	
18-28 years	140 (37.1%)	1 (0.2%)	3 (0.7%)	1 (0.2%)	0.023
29-39 years	180 (47.7%)	6 (1.3%)	1 (0.2%)	4 (1.1%)	
40-50 years	40 (10.6%)	1 (0.2%)	-	-	
51-60 years	1 (0.2%)	-	-	-	

Table-II: Depression score in different age groups.

Age Groups	Depression Score				*p*-value
	Normal	Mild Depression	Moderate Depression	Severe Depression	
18-28 years	134 (35.5%)	4 (1.1%)	7 (1.8%)	-	0.051
29-39 years	177 (46.9%)	4 (1.1%)	9 (2.3%)	1 (0.2%)	
40-50 years	40 (10.6%)	-	-	-	
51-60 years	1 (0.2%)	-	-	-	

Table-III: Anxiety score in different age groups.

Age Groups	Anxiety Score					*p*-value
	Normal	Mild Anxiety	Moderate Anxiety	Severe Anxiety	Extremely Severe Anxiety	
18-28 years	139 (36.8%)	5 (1.3%)	-	1 (0.2%)	-	0.065
29-39 years	181 (48%)	7 (1.8%)	2 (0.5%)	1 (0.2%)	-	
40-50 years	37 (9.8%)	2 (0.5%)	-	-	1 (0.2%)	
51-60 years	1 (0.2%)	-	-	-	-	

Table-IV: Stress score in different age groups.

Age Groups	Stress Score				*p*-value
	Normal	Mild Stress	Moderate Stress	Severe Stress	
18-28 years	144 (38.1%)	1 (0.2%)	-	-	0.032
29-39 years	187 (49.6%)	1 (0.2%)	1 (0.2%)	2 (0.5%)	
40-50 years	40 (10.6%)	-	-	-	
51-60 years	1 (0.2%)	-	-	-	

Increasing education level was inversely proportional IES-R scores. Those with an education up to Matric (10th Grade) showed a maximum number with PTSD like symptoms (n=14, Partial PTSD=6, PTSD Diagnosis=3, Severe PTSD=5).

A total of 17 individuals showed PTSD like symptoms on IES-R scoring out of which 12 (70.5%) were from the Lower Middle class earning around 30-50k/month. Number of earning hands in the household also showed an inverse relation with IES-R scores. Out of a total 17 individuals with positive IES-R scores for PTSD, 11 were from families where they themselves were the sole earning hands (Partial PTSD n=6, PTSD n=1, severe PTSD n=4).

Depression, anxiety and stress score as calculated by using DASS-21 score chart. Depression score on the depression subscale was seen to have an inverse relation with age. A total of 25 individuals showed depressive symptoms out of which 11 (44%) were aged 18-28, while 14 (56%) were aged between 29-39 (*p*-value -0.05). Anxiety subscale also had maximum scores for ages 29-39 (*p*-value 0.065) and so did the Stress sub-scale (*p*-value 0.03) as tabulated in table-II to IV.

Thus, a total of 17 (4.5%) individuals showed IES-R scores positive for PTSD on DASS scoring 25 (6.68%) showed symptoms indicative of depression, 19 (5%) for anxiety and 5 (1.3%) for stress.

DISCUSSION

Since outbreak of COVID-19, quarantine has emerged as one of the many measures being enforced to flatten the curve and stop local transmission of disease. Pakistan, a country with already meagre health resources, has undertaken unprecedented steps to prevent the spread of corona virus amongst its population. As a result, provinces established mass general quarantines for people travelling from endemic areas, having a history of positive contact or high susceptibility of carrying the disease. Such measures, though proven to be effective, also have a psychological impact on the quarantined individuals. This study has helped us better understand the psychological impact of quarantine on general population and the factors associated with it.

Our study enrolled a total of 377 individuals out of which 17 (4.5%) were seen to match a score on IES-R that was positive for PTSD. Prevalence of PTSD was seen to be lower than that found in a study conducted in Wuhan, where it was seen to be 7% in the hardest hit areas of China[11]. The lower prevalence can be attributed to the fact that at the time of conducting the study Pakistan had not yet reached it's peak in new number of cases arising per day, whereas, China has surpassed the peak and now is in the phase of rehabilitation. Thus, the prevalence of PTSD in general population is expected to grow as the number of cases of COVID-19 and deaths owing to the disease continue to grow[3].

The prevalence of PTSD, depression and anxiety in quarantined individuals has been seen to greatly vary from country to country. A study conducted in Spain recorded the prevalence of PTSD at 15.8%, Depressive symptoms at 18.7% and anxiety at 21.6%. In our study, psychological impact of quarantine has been seen to be strongly correlated with age (*p*-value 0.023). Increasing age was seen to be inversely associated with psychological impact as shown on IES-R scores with the middle aged group 29-39 years seen to be most vulnerable to develop psychological symptoms. A finding that was seen to be consistent with the study conducted on quarantined general population in Spain[12]. Prevalence of depressive symptoms were significantly lower at 6.6% and 5% for anxiety in our population.

Liu *et al*, reported clinically high levels of PTSD; 31.8%, depression; 43.3% and anxiety; 45.4% symptoms in one-third of the young adults study participants of United States. These figures are strikingly higher then our findings[13]. Wang *et al*, used the same DASS 21 score and IES-R score to find depression, anxiety, stress and PTSD in general population. In this Chinese study, they reported that 15.04%, 9.42% and 5.62% of respondents were found to have one, two or three somatic symptoms respectively. Despite the increase in

cases in China, they documented a stable levels of depression, anxiety and stress among general population[14].

Our study established a significant correlation between number of earning hands in the family and IES-R scores for PTSD. The population was divided into socioeconomic classes on the basis of income. Increasing family income was shown to be inversely related to PTSD. The finding was seen to be consistent with a study conducted in Toronto (Canada) during the SARS outbreak. Increasing family income of CAD <$40,000, CAD $40,000-75,000 and CAD >$75,000 was shown to be associated with decreasing mean IES-R scores and lower levels of depressive symptoms on CES-D score. The same study found no significant correlation between education status of an individual and subsequent psychological impact of quarantine. This was in contrast to our study where increasing education levels was seen to be inversely proportional to mean IES-R and DASS-21 scores[15]. The inverse relation may be explained by a better understanding by the educated individuals about the nature of disease and preventive measures. Similarly, inability to understand the rationale of quarantine as a preventive measure by the poorly educated may be the reason for positive correlation with PTSD, depression, anxiety and stress.Wang *et al*, using IES-R scores for the PTSD reported that one third of the participants reached the cut-of values for PTSD[14]. As the global pandemic continue to suffer thousands of lives daily, the long lasting effect of the disease on the mental health of general population and especially those effected by quarantine and isolations can not be fully anticipated. As all domains of life have changed in ways unprecedented in a lifetime, mental health care delivery systems are supposed to be changed as well. Face to face psychotherapies of the effected individuals are not possible at the moment due to lockdown and quarantine measures. Mental health are required to resort to tele-medicine. Cao *et al* suggested an evidence based treatment for patients suffering from PTSD. Trauma focused-cognitive behavioral therapy (TF-CBT) can be modified for COVID-19 effected mental health victims[16].

Last but not the least, it has been learnt from the previous experiences of pandemics that increased perceived stress levels further exacerbate the existing co-morbid conditions adding to the psychiatric morbidity of the pandemic[17]. Where punitive measures from the government to curb the increasing stress and post-traumatic stress disorders of the quarantined individuals, a few measures are required to be taken on individual levels including excessive exposure to news. Similarly, psychosocial and emotional support by the friends and family would help reduce the burden of mental health in the community[18].

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CONCLUSION

Our study concluded that while quarantine is being implemented as an effective and proven way to prevent spread of COVID-19, it does come with a psychological impact which includes PTSD, depression, anxiety and stress on the quarantined individuals. Thus, while quarantine is a necessary measure to control the outbreak, governments must also plan for adequate mental health of quarantined individuals.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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