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PSYCHOLOGICAL IMPACT OF QUARANTINE DURING DISEASE OUTBREAKS

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Introduction

The world is now facing the largest global health emergency. The initial outbreak of novel corona virus (Covid -19) has emerged in Wuhan, China (1). WHO declared Covid-19 to be a Public Health Emergency of International Concern (PHEIC) on January 30, 2020. AFP reported 66 million infected population and 1.5 million deaths worldwide. (2) While the world is in need of the curative medicine and vaccines, many governments responded to this pandemic by implementing nationwide restricted movement of the public in the name of lockdown and quarantine as an intervention to stop the human to human transmission of Covid-19.

Quarantine refers to the segregation of people and restricted movement of those who have been actually or potentially into contact with the contagion but who may or may not become ill, reducing the risk of transmission. Whereas this definition differs from the isolation which is the separation of people who are known to be ill with the contagious disease from healthy people. (3)

Quarantine is considered as one of the oldest and most effective preventive strategies adopted by mankind in centuries with the continuous re-emergence of infectious diseases. Though it has a powerful impact on disease prevention, the weightage of benefits against the psychological and social wellbeing of individuals need to be considered.

Modern quarantine strategies include short term voluntary home confinement, State , local and territorial travel restriction, suspension of social

gatherings, restriction of people assembling at public places (shopping complex, theatres, schools etc) (4)

Why this review at this juncture?

Considering a significant gap in treatment protocol and primary prophylactic measures in this pandemic, quarantine is deemed necessary. Although quarantine is done for general public health, it has been widely reported as the state of an unpleasant experience. Humans are social beings; hence there are no surprises that a prolonged period of confinement is so difficult to undergo. The perspective view of 'stay home stay safe', failed to observe the dangerous impact it had on mental health and daily life.

Excessive psychological distress, separation from loved ones, frustration, loneliness, boredom, sadness, substantial anger and fear are commonly observed. Acute stress disorder, depression, suicidal thoughts, anxiety, post-traumatic stress disorder were also reported. (1)

Looking at the other end, if the quarantine is taken ease, and allowing the disease to spread in the community, it will also make the people feel stress. This review was planned to evaluate the psychological impact of quarantine and its consequences during disease outbreaks.

From Plague to corona virus: How quarantine as a public health strategy evolved over centuries

According to Oxford English dictionary, quarantine – a period during which persons who might serve to

spread contagious disease are kept isolated from the rest of the community; especially a period of detention imposed on travellers, also a period of seclusion or isolation after exposure to infection from a contagious disease.

The earlier documented reference suggests that quarantine is related to leprosy in the Old Testament. In the New Testament too, leprosy is considered as a disease of social discrimination and is cured employing divine miracle and isolation. The modern concept of quarantine began in the 14th century and it was first used in Venice, Italy. In 1377, authorities in the seaport of Ragusa (Currently Dubrovnik in Croatia) enacted the mandatory isolation of ships coming from plague affected places. It was called Trentina, Italian word No. 30. Latter these 30 days was extended to 40 days (Quaranta); thus originated the word quarantine, meaning “obligatory means of separating persons”. It is not known why 40 days was chosen as the length of isolation time needed to avoid contamination, but it may have derived from hippocrates theory regarding acute illness.

While this practice was effectively used to prevent the transmission of plague (droplets or flea bites), the absence of clear definition and discrepancy regarding the length of quarantine makes it less utilized in other diseases. In the beginning of 18th century, the emergence of terrible diseases such as yellow fever, small pox, cholera required quarantine as major method of disease prevention due to non discovery of diagnostic testing and treatment at initial point of outbreak .Furthermore, lack of knowledge about pathogens and disease spread quarantine was used as an effective method to tackle various contagious epidemics. In due course of time, it has been used as a managing tool for transmissible diseases such as Ebola, SARS, MERS and influenza till the development of a pharmaceutical defence.

The effectiveness of quarantine varies depending upon its initiation, implementation through time, duration of the quarantine period and disease severity. (5)

Adapting to the stress of quarantine and coping strategies

Two concepts are difficult for the physician to manage confinement distress.

1. Bio-psychosocial health - states health is a product of psychological wellbeing and balanced relationship between biological and social factor. (Fig:1)

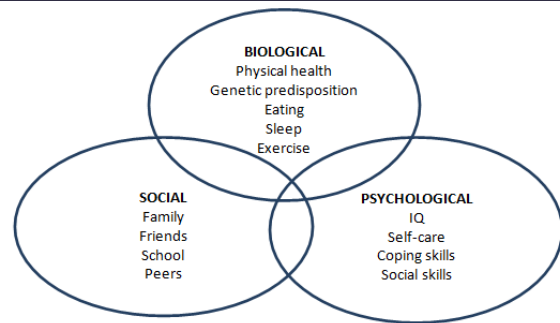


Fig1: Factors related to mental health

2. Cumulative nature of stress

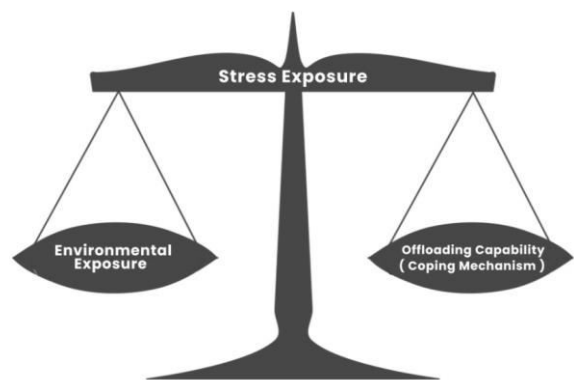


Fig 2: Stress balance

If this balance is disrupted then stress accumulation is countermanded by the environment, further negative imbalance increasing in stress can turn a human aggressive and make them indulge in anti-social activity. (Fig:2)

Big Five / Ocean Model Of Personality

explains how one’s personality influences coping mechanism in bitter circumstance. (6)

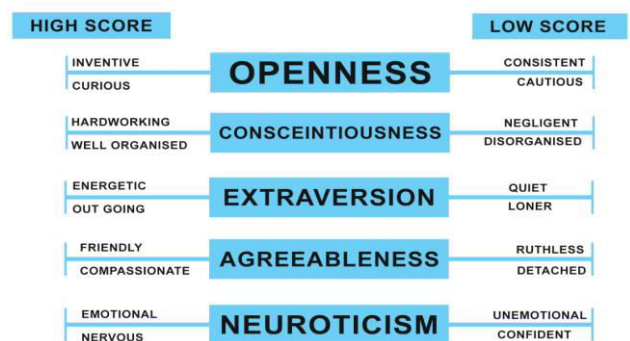


Fig 3: Ocean model of personality

Coping Strategies

Coping strategy can be appraisal focused, adaptive behavioural (problem-focused), emotional focused. However few adaptive methods of stress result in a higher risk of psychological problems.(6)

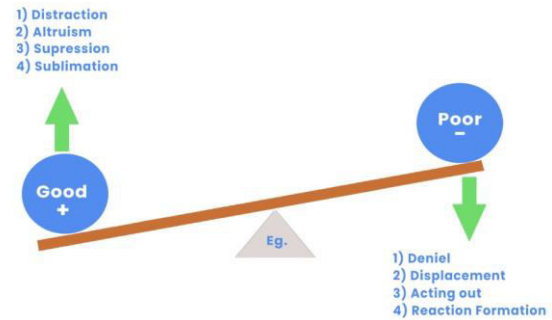


Fig 4: Response Strategies

Studies analysed in this review

Author	Country	Disease	Participants	Design	Assessment Methods
Chua SE et al (2004) (7)	Hong Kong	SARS	271 Health care workers 342 normal population	Cross Sectional	Self-administered Questionnaire method
Robertson E et al (2004) (8)	Toronto	SARS	10 Health care workers	Semi-structured quantitative	Telephone interviews
Hawryluck L et al (2004) (9)	Canada	SARS	129 respondents	Quantitative	Web based survey
Lee AM et al (2007) (10)	Hong Kong	SARS	SARS survivors	Cross Sectional	PSS – 10, GHQ
Brauback-Mayer et al (2013) ((3)	Australia	H1N1	56 school community members	Qualitative	Interviews
Abramowitz et al (2015) (2)	Liberia	EBOLA	386 community leaders	Qualitative	Focus groups and interviews
Jeong et al (2016) (3)	South korea	MERS	1656 residents	Cross Sectional	GAD-7 (anxiety) STAXI-2 (anger)
Giallonardo V et al (2020) (11)	Italy	COVID-19	Health care workers and COVID-19 (+) patients	Cross Sectional	DASS-21 OCI-R
Burke T et al (2020) (23)	Ireland	COVID-19	1620 participants	Cross Sectional	DASS-21 ECQ
Maria del Carmen et al (2020) (12)	Spanish	COVID-19	1043 participants	Cross Sectional (snowballing)	Affective Balance & Mood Evaluation Scale
Saurabh & Ranjan (2020) (1)	India	COVID-19	121 children and adolescents	Cross Sectional	Interviews

We made an analysis from the results of 11 studies from various population. Four studies were focused on SARS, one on MERS, one on Influenza, one on EBOLA and four on COVID-19. Details of the studies are tabulated as above. Majority of the participants were country residents and health care workers. Various tools have been used to assess the psychological stress during quarantine. Most importantly:

1. CES-D (Centre for Epidemiologic studies – Depression scale)
2. IES – R (Impact of Event Scale – Revised)
3. GHQ – 12 (General Health Questionnaire-12)
4. DASS – 21 (Depression, Anxiety & Stress scale - 21)
5. ESI (Insomnia Severity Index)
6. PTGI (Post Traumatic Growth Inventory) were used (1,9,11)

In the Toronto, Canada study, the individuals were mainly concerned about the uncertainty of their disease status and concept of isolation made them feel stressed and anxious. (8,9) Hong kong study flashes light on the psychological disturbances (fear of infection, self doubts) and stigmatization among health care workers. (7) The Spanish study has shown the effect of one's perception to the disease threat which influences negative mood and emotional irritation and agitation. (12) Research from India on the psychosocial impact of quarantine was limited.

Stressors (1)

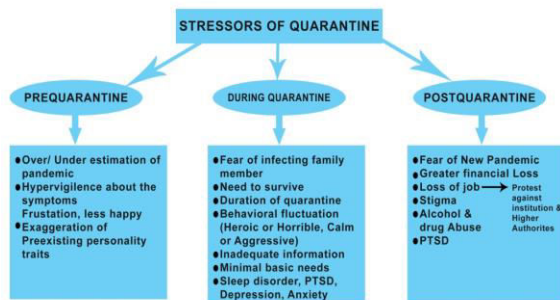


Fig 5: Stressors

Psychological impact among asymptomatic individuals

A large number of population who has been tested for covid-19 remains as asymptomatic. These people also undergo isolation in quarantine facilities provided by government or in-home isolation in recent days. They are unaware of their disease status prone to have a higher level of stress, anxiety and depression. Their mental stress is particularly due to worry for their family who has been in contact with them in the past days and uncertainty over their disease status. During the post lockdown period, of quarantined there would be a disrupted daily life, work-life, confusion which led to mental stress. Studies have shown that the individuals during quarantine have shown symptoms of acute stress disorder lately.(13)

Psychological impact among children

A child's normal psychological wellbeing depends mainly on their normal routine, interaction with their family and friends. Their day to day routine consists of schooling, much play and less screen time. Suddenly they have been deprived of all these and was put under social quarantine. Children and adolescent in quarantine locked up houses with their family / isolated in hospitals were known to develop certain psychological conditions like anxiety, restlessness, irritability, clinginess and behavioural problems. Specifically, older children have become angry, restless and withdrawn from family during these times. Most importantly children during quarantine have been noticed to develop *post-traumatic stress disorder* (PTSD). Especially the children who had been quarantined for more than 10 days have developed higher PTSD symptoms than other children. These conditions were also noted in previous disease outbreaks like EBOLA, MERS and SARS.

The negative effects of confinement have compromised the physical wellbeing as the children have become very much inactive without any physical activity. In addition to this, poor eating patterns, increased screen time have a considerable amount of weight gain in these age groups. Even though schools have taken measures to teach through online classes, it is not as engaging as normal schooling. Some children who don't have access to these online classes have also noted to undergo psychological stress.

An increased concern during this quarantine which

has to be addressed is the increasing rate of child abuse, child neglect and exploitation which also seen during previous EBOLA outbreak. The children are more prone to develop loneliness at times of social distancing which is mostly due to school closure and difficulty in seeing their friends. Parental stress has also seen to develop psychological stress in children since they always look up to their parents. Hence it is always seen that children are usually kept unaware of the unpleasant happening since they are very sensitive to these changes.

But the point to be noted is children worry more when they are kept in dark. Hence it is always good to explain to them about the prevailing condition and providing reassurance which helps to maintain their mental health. The news in social media should be explained to them for their better understanding. It is always important to acknowledge and validate their thoughts and feelings at times of quarantine.(14)

Another negative psychological impact reported was problematic gaming associated with increased mobile usage, poor concentration in studies, addiction behavior and inadequate sleep. Excessive engagement in online gaming has resulted in poor academic performance among school goers.(15)

Psychological impact among teenagers

These age group students are in high school and higher secondary who are actually aware of what is happening in the community. They are also facing the mental conditions which can be in many forms like anxiety, anger, stress, PTSD and depression. Still studies have shown that students in this age group adopt coping techniques and resilience. These 2 factors act as a protective mechanism for the above mental conditions. Even though students try to battle all these situations it is to be noted that higher secondary students are more susceptible to troublesome anxiety when compared to high school students because of extreme transition in social and academic conditions.

Thus they need the support from family and school at times like this. It has been found that children deprived of emotional support have higher chance of developing anxiety. In conclusion it is fit to say that positive coping and resilience have a protective mechanism and negative coping like withdrawal from family and friends act as a risk factor to mental health. (16)

Psychological impact among college students

Gaming has always been a part of students from their childhood period. The concept of gaming has become a matter of concern due to lockdown in many countries where the students are forced to stay indoors. Especially in India, when the lockdown was initiated it was at the time of semester examination for college students, the sudden use of the lockdown was like bolt from the blue to students who have been preparing for the exams.

The lockdown has caused uncertainty on their future academics and career prospects making them more vulnerable to stress during the pandemic. Many studies have been done and it was noted that college student has opted gaming as a coping mechanism during the quarantine. Majority of the students have reported a drastic increase in the gaming behaviour as it helps in coping with examination related stress and a strange belief that game helps to overcome stress as they can interact with friends through online gaming.

Excessive gaming can be harmful to their physical and mental wellbeing as they are immobile in the same place for hours together. Hence WHO has included gaming disorder as a “diagnosable mental disorder” in its recent revision of ICD 11. In contrary it is noted that majority of the people who involve in gaming do not fulfill the criteria for gaming disorder.

While many play games to combat stress, in case of adolescence it is used as a way to escape from the real world and is also considered as a new way of satisfying basic human needs within the existing restrictions. In India, public health experts have stated that lockdown is considered as ‘the worst public health disaster that mankind has experienced since the second world war’. In addition to all lockdown talks, uncertain academic and career options for the students who have been preparing for professional course exams faced another threat when the examinations got postponed indefinitely. This greatly added to the stress levels among college students.

It has also been understood that there were no published reports on the impact of the pandemic on gaming behavior as such. Another interesting plot is that students who have opted gaming as a coping method for exam related stress are less in number when compared to students who did not attribute to any change in gaming behavior as these students

did not perceive examination as an imminent stress factor. Other stressor among college student is the economic crisis which has indirect effect on student mental health. Further it has been noted that in various stressful condition, various coping methods have been independently used by the students which depends upon individual stress perception. Thus it can be said that exam related stress has been a controllable stress factor and covid related stress as an uncontrollable stress factor among students.

In a review given by the cognitive psychology of internet gaming disorder (IGD), the authors classified 'cognition behind pathological gaming in the categories of game reward value and tangibility, maladaptive and inflexible rules about gaming behavior; over reliance on gaming to meet self-esteem needs and gaming as a method of gaining social acceptance'. (18) Hence it is fit to say that majority of the students who overexpose themselves to gaming is merely to boost their self-esteem among their peer groups.

However, with all this over gaming, there is no significant association between increased gaming behaviour and moderate or severe depression during the quarantine. It can be due to the factor that high engagement with gaming had a protective effect against depression and anxiety during the lockdown. Also students with prior IGD have nothing to do with lockdown since there was no difference in their gaming attitude. Hence it can be appropriate to say that the newly increased rate in gaming is simply due to loss of leisure time and restrictions. Hence WHO advices to maintain a right balance of gaming with offline activities in daily routine in times of pandemic.(17,18)

Psychological impact among elderly people

Elderly people are considered to be as one of the most vulnerable group at times of disease outbreaks. This is because of associated comorbidities including hypertension diabetes, COPD and relatively low immune system make them easy targets of the infectious spread. People with already existing psychiatric conditions (like dementia and psychosis) face more difficulties than others.(19) All these factors increase the risk of anxiety, depression and adjustment disorders in this population.

Adding to them health ailments is the effect of social isolation or increasing self-isolation which adds on the effects of stress. In general elderly

people are the one who does not have much social interaction in their day to day life and people in the nursing home have it worse than former groups. This social isolation has caused increased loneliness and impaired mental health in elderly people to considerable health. People in nursing homes have increased risk of depression, adjustment disorder, insomnia, breakdown and self-destructive thoughts as they have not seen their family for a longer period than the usual. It has also been noted that isolation act as a trigger factor for pre-existing psychiatric conditions. The inability of this age group to have only a few social contacts with their grandchildren has also increased their social illness. In countries like India where there is insufficient telecommunication service available, made it worse and they have been pushed towards loneliness to a greater extent.(20,21)

Consequences of quarantine: (2,22,23)

Due to curfew and quarantine effect, the people has ended up in facing several consequence as explained in the figure below. (Fig:5)

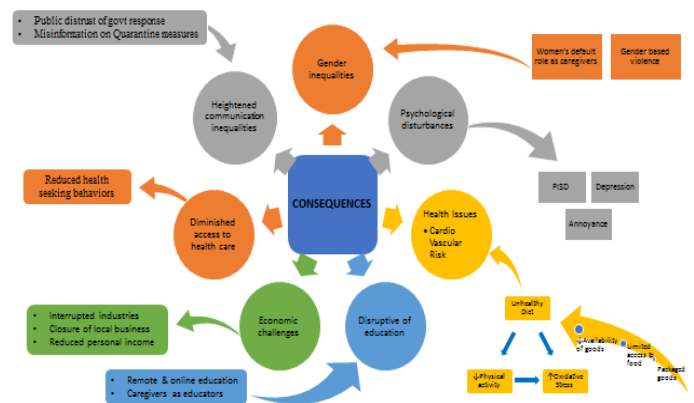


Fig 6: Consequences of quarantine

Conclusion

Overall this review enlightens about the psychological impact of quarantine in an elaborative manner. This is not a suggestion that quarantine is to be avoided; but the psychological effects of not following quarantine, which allows disease to widespread may be even worsen. In countries like India, there is diversity of communities and disparity in educational and socio economic status, finite nature of resources makes the implementation of preventive health measure like quarantine a challenging risk. Giving knowledge about disease transmission, nature of disease and effective preventive measures, absence of curative treatment, purpose of quarantine helps in reducing

unnecessary anxiety and stress.

This can be further reduced by regular telephonic counseling sessions, providing updated information, simple psychotherapy for coping strategies, promoting social engagement via phone, videochats and ensuring basic needs (food, water and medical supplies).

Further studies can be planned to address this issues, keeping in mind the socioeconomic and cultural diversities prevailing in the country.

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