



## Original Article

# Psychological Response & Perceived Risk Associated with Coronavirus Disease

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## Abstract

**Background:** The Coronavirus Disease 2019 (COVID-19) was declared a pandemic by WHO as it is found to be excessively transmissible & to spread throughout the world. The disease has caused a worldwide impact because of the need to establish worldwide activity by extensive social distancing and quarantine due to the daily rising death toll. Through this study, we examined intend to examine the psychological effects, perceptual vulnerability, and perceived stress developed among the general population.

**Methodology:** The study was conducted from 2nd March to 26th May 2020. A total of 2188 of subjects replied to our informal online survey internationally. The respondent's demographic details and data regarding precautionary measures, perceptual vulnerability, perceived stress, and level of susceptibility of COVID-19 was collected. The perceived stress scale (PSS-10) was used for assessment of perceived anxiety, stigmatization, and fear of developing COVID-19.

**Results:** As per the study findings, moderate perceived stress was observed among 66.6% of the respondents. Among the protective measures, washing hands was most frequent 56.2%, but the use of face mask wasn't widespread, i.e. 48.9% rarely or never used face masks. 37.1% felt anxious around sick people, 58.5% were usually bothered by the people sneezing without covering their mouths. 32.3% occasionally felt agitated because of no control over the current situation & 18.6% frequently felt stressed and/or nervous. The contact history revealed that 11.2% had close contact, 20.9% had a non-close contact, and 12.9% were those who had suspected connection with a confirmed case.

**Conclusion:** Evidently, COVID-19 has numerous psychological impacts, and the responses vary due to perceived vulnerability & stress. The social distancing, disease fear, and quarantine may have some negative effects which may have some lasting consequences on general population.

## Keywords

COVID-19, Perceived Vulnerability, Psychological Impacts, Perceived Stress, Disease Susceptibility.



## Introduction

The novel outbreak of COVID-19 emerged from China by the end of 2019, followed by a continuous spread globally<sup>1</sup>. Although it is not new for the medical community, the current pandemic is the 5th type of coronavirus infection, i.e. severe acute respiratory syndrome, SARS-CoV21 spread in 2002-2003 8,098 cases and a 10% death rate. However, the associated contingency of COVID-19 is reported to be more lethal with a higher rate of symptomatic and asymptomatic fatalities that directed immediate emergency to be led by the scientific and medical community<sup>2</sup>. The virus has been known to cause a range of illnesses from a minor cold to severe complications like acute respiratory distress syndrome (ARDS), that were also observed in 2012 through Middle East Respiratory Syndrome (MERS-CoV) and the SARS-CoV in 2003. Still, this strain of COVID-19 is somewhat different from the ones previously identified among humans<sup>1,3</sup>.

COVID-19 was declared a Pandemic by WHO due to its transmission mode and reported means of infection spread<sup>4</sup>. An emergency has been announced to control global health, and severe preventive measures are being taken to prevent the disease from spreading globally<sup>2</sup>. According to the World Health Organization (WHO), there were almost 1,133,681 confirmed cases of COVID-19 globally by April 5, 2020, and 62,784 confirmed deaths from 209 affected countries, areas, or territories with confirmed cases<sup>4</sup>. Moreover, specific guidelines for both biomedical and psychological management of this pandemic have been issued by WHO<sup>5</sup>. They are recommending that preventive measures are as necessary as medical aid during this physiological health crisis<sup>5</sup>. The global scenario that is considered a threat to any healthy individual's well-being has created much psychological stress globally and already generated fear among individuals. This might be due to the daily news depiction indicating rising figures of

suspected and confirmed COVID-19 cases and pertinacious quarantine<sup>2</sup>.

Apart from physical suffering, it is not uncommon for confirmed or suspected patients of COVID-19 to deal with psychological pressure and other health-related problems<sup>5</sup>. The mental health of the affectees has not been adequately assessed. Many of the academic institutes are now providing counselling services for such psychologically affected individuals<sup>6</sup>. The negative psychological impact of the epidemic and social distancing includes Post-Traumatic Stress (PTS) symptoms, depression, anxiety, and anger confirmed amongst individuals<sup>6</sup>.

Moreover, numerous studies have presented that front-line healthcare workers and patients are more susceptible to the emotional influences of COVID-19<sup>7</sup>. Additionally, rejection, loneliness, depression, insomnia, anxiety, and hopelessness were also experienced. Increased risk of aggression and suicide were also reported but rarely<sup>8</sup>. It is noteworthy that this disease is not only disrupting the physical state of humans but also demolishing our psychological well-being.

Furthermore, mass quarantine is expected to elevate anxiety significantly for several reasons. This raised anxiety might also have follow-on consequences for further health dealings<sup>9</sup>, as the general population is encountering disappointment, boredom, and irritability under the isolation measures<sup>7</sup>. Moreover, strict social distancing and compulsory contact tracing policies by health specialists could cause discrimination, societal rejection, financial loss, inability to perform routine work, and stigmatization<sup>6</sup>. A recent study, including 4,607 individuals of Chinese descent, disclosed that these individuals' cognitive evaluations, particularly their perceived severity of COVID-19, are associated with increased negative emotions and behavioural reactions<sup>10</sup>.



Furthermore, the health experts are of no exception during the crucial time as they are on the forefront, in direct and close contact with the infected patients, suspected cases, families and are also answerable to the public inquiries<sup>7</sup>.

Competent efforts are required concerning all disciplines to combat COVID-19, both medically and psychologically. There is little to no known evidence on mental health and psychological influences due to the COVID-19 pandemic within the general population<sup>11</sup>. Most of the COVID-19 related research emphasizes epidemiology and the clinical features of the diseased persons<sup>12</sup>, the genomic description<sup>13</sup> and the challenges faced by the global health authorities<sup>9</sup>. There is no ongoing research investigating the psychological influence of COVID-19 on the general population to the best of our knowledge. Hence, the current study aimed to stimulate research on the psychological impacts of the COVID-19 pandemic. It is intended to explore the incidences of psychological distress and identify the perceived risks and protectiveness among general the population. This might support the healthcare authorities in preserving the mental health of the community during this pandemic.

## Methodology

The survey was created and distributed using online survey administration app (Google Forms). Data was collected from March 2 to May 26, 2020. A total of 2188 subjects replied to our informal online survey globally. Participants were notified that they would not be compensated for their participation in the study and could stop taking the study at any time. They were also informed that the purpose of the study was to investigate their attitudes about COVID-19. The institutional ethics committee approved survey procedures. Subjects completed the online survey by using their phone or computer. The survey was advertised through social media (e.g., Facebook, Twitter). The respondent's demographic details were

inquired, and the data regarding precautionary measures, perceptual vulnerability, perceived stress, and level of susceptibility of COVID-19 were collected. The Perceived Stress Scale (PSS-10) was used to assess perceived anxiety, stigmatization, and fear of developing COVID-19.

The collected data were analyzed using SPSS version 22.0, and all qualitative variables like gender, regional distribution, protective measures, personal habits, perceptual vulnerability, and perceived stress subscale scoring, etc. were given as frequency and percentages. All quantitative variables like age and perceived stress scores were presented using mean and standard deviation (SD).

## Result

### Respondents' characteristics

Overall, 2188 responders from 21 different countries globally took part in the electronic survey. Of the total, 68.1% were females, and 31.9% were males with a mean age of  $28.22 \pm 9.42$  years. Most of the respondents included post-graduate students (40.3%), followed by under-graduates (24.3%) and graduates (21.5%). The majority of responses were obtained from the Eastern Mediterranean Region (27.90%), i.e. Pakistan, Saudi Arabia, Tunisia, and The United Arab Emirates, followed by countries from The European Region (27.51%), namely Belgium, Finland, France, Germany, Greece, Poland, Portugal and The United Kingdom (Table 1). The demographic characteristics of the study participants are displayed in table 1.

### Predictors for implementation of precautionary measures

Regarding the protective measures taken by the responders and personal habits developed after the declaration of the COVID-19 pandemic, the most reported action and the most frequently established practice was washing hands with soap, i.e. 56.2% of respondents washed their hands very often. Moreover, 54% cover their mouth habitually while coughing or sneezing, and



28.2% would immediately wash their hands after while 32.7% of respondents would sometimes wash their hands after sneezing, coughing, or rubbing their nose. The essential protective measure of wearing face masks

wasn't ubiquitous, as only 22.9% of respondents were using face masks frequently, while 26.9% of the respondents never used face masks.

**Table 1: Demographic characteristics & Regional distribution of the study participants along with Protective measures, personal habits and various aspects of perceptual vulnerability.**

Variables		n=2188				
<b>Gender</b>	Female	1491(68.1)				
	Male	697(31.9)				
<b>Age (Years) Mean ± Standard deviation</b>		28.22±9.42				
<b>Education</b>	Graduate	470(21.5)				
	Post-Graduate	882(40.3)				
	Under-Graduate	532(24.3)				
	Others	304(13.8)				
<b>Countries</b>	Western Pacific Region	Australia	86(3.9)			
	East African Region	Tanzania	69(3.2)			
	East Asian Region	Taiwan	86(3.9)			
	South Asian Region	Bangladesh	82(3.7)			
	South-East Asia Region	India	151(6.9)			
	Eastern Mediterranean Region	Pakistan	342(15.6)			
		Saudi Arabia	71(3.2)			
		Tunisia	108(4.9)			
		United Arab Emirates	90(4.1)			
	European Region	Belgium	63(2.9)			
		Finland	66(3)			
		France	60(2.7)			
		Germany	106(4.8)			
		Greece	62(2.8)			
		Poland	103(4.7)			
		Portugal	56(2.6)			
		United Kingdom	86(3.9)			
		Region of the Americas	Canada	108(4.9)		
		United States of America	167(7.6)			
	Western Pacific Region	Malaysia	95(4.3)			
New Zealand		73(3.3)				
Philippines		58(2.7)				
<b>Habits</b>	<b>Fairly Often</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometime</b>	<b>Very Often</b>	
	Wearing face masks	291(13.3)	588(26.9)	480(22)	617(28.2)	212(9.7)
	Washing hands with soaps	606(27.7)	-	81(3.7)	271(12.4)	1230(56.2)
	Covering mouth while coughing or sneezing	445(20.3)	59(2.7)	96(4.4)	406(18.6)	1182(54)





Washing hands after touching possible contaminated objects	558(25.5)	51(2.3)	221(10.1)	361(16.5)	997(45.4)
Washing hands immediately after sneezing, coughing or rubbing the nose	495(22.6)	85(3.9)	276(12.6)	715(32.7)	617(28.2)
<b>Perceptions</b>					
Based on my past experiences, I am not likely to get sick	252(11.5)	632(28.9)	498(22.8)	600(27.4)	206(9.4)
I have a history of susceptibility to infectious diseases	239(10.9)	873(39.9)	606(27.7)	344(15.7)	126(5.8)
I am more likely to catch an infectious disease than the people around me	190(8.7)	523(23.9)	689(31.5)	617(28.2)	169(7.7)
It does not make me anxious to be around sick people	284(12.9)	424(19.3)	441(20.2)	812(37.2)	227(10.4)
My immune system protects me from most illnesses that other people get	538(24.6)	151(6.9)	359(16.4)	818(37.4)	322(14.7)

\*Values are given as n(%)

### The perceptual vulnerability of respondents

The respondents' perceived vulnerability was assessed. It was found that 14.7% of the respondents reported that their immune system protects them from most illnesses that often affect others. Moreover, 10.3% of the respondents were not very anxious around the sick people, while 37.1% sometimes felt anxious. Around 7.7% of the respondents thought they were more likely to catch infectious diseases, 5.8% were sure of disease susceptibility, and 9.4% believed that they were less likely to get sick (Table 1).

### Perceived Stress among the respondents

The respondents' level of perceived stress due to the COVID-19 outbreak was assessed through the Perceived Stress Scale (PSS-10). Both negative and positive subscales were used except for items 4 & 5. As per the analysis, the mean PSS score was  $19.98 \pm 6.08$ , indicating that most of the respondents had moderate perceived stress (66.6%). Moreover, 17.9% were those displaying high perceived stress and 15.4% with low perceived pressure. The descriptive summary shows that 58.5% of the respondents reported that people who sneeze without covering their mouths make them anxious. While 32.3% sometimes felt agitated because the things happened were outside their control, and 29.4% reported that they sometimes felt difficulties piling up so high that they could not recover. 18.6% frequently felt stressed and nervous and fearful, and 17.6% believed they were unable to control the essential things in their life. Moreover, 25% very often felt upset because of the unexpected happenings of COVID-19, followed by 23.4% reporting it fairly often and 27% sometimes (Table 2).

**Table 2: Shows the Perceived Stress among the respondents**

<b>PSS-10 score (Mean <math>\pm</math> SD)</b>	19.98 $\pm$ 6.08				
<b>Subscale Scoring</b>	<b>n(%)</b>				
Low Perceived Stress ( $\leq 13$ )	338(15.4)				
Moderate Perceived Stress (14-26)	1458(66.6)				
High Perceived Stress ( $\geq 27$ )	392(17.9)				
<b>Descriptive Results</b>	<b>Fairly Often</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Very Often</b>
In the last month, how often have you been upset because of	512(23.4)	204(9.3)	334(15.3)	590(27)	548(25)



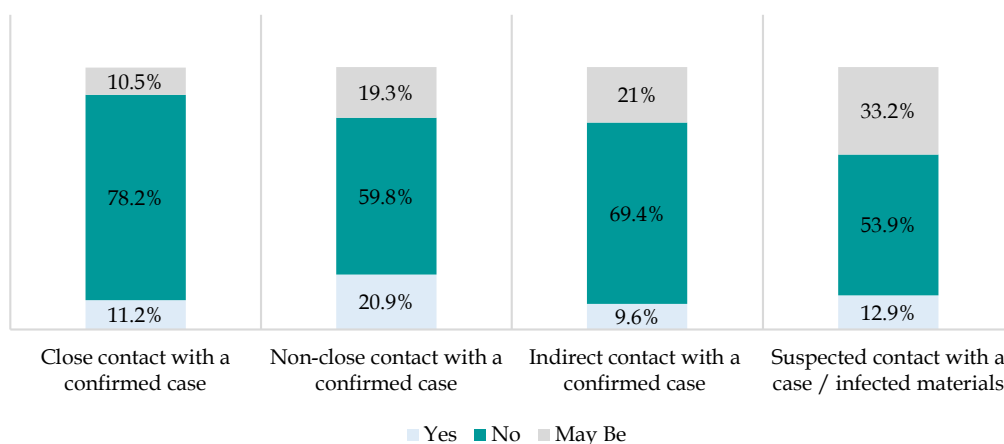
something that happened unexpectedly?

In the last month, how often have you felt that you could not control the essential things in your life?	456(20.8)	188(8.6)	474(21.7)	680(31.1)	384(17.6)
In the last month, how often have you felt nervous and stressed?	454(20.7)	160(7.3)	452(20.7)	712(32.5)	406(18.6)
In the last month, how often have you found that you could not cope with all the things you had to do?	456(20.8)	270(12.3)	498(22.8)	624(28.5)	320(14.6)
In the last month, how often have you been able to control irritations in your life?	554(25.3)	136(6.2)	334(15.3)	896(41)	246(11.2)
In the last month, how often have you felt that you were on top of things?	424(19.4)	286(13.1)	562(25.7)	750(34.3)	150(6.9)
In the last month, how often have you been angered because of things that happened that were outside of your control?	400(18.3)	208(9.5)	488(22.3)	706(32.3)	386(17.6)
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	446(20.4)	322(14.7)	536(24.5)	644(29.4)	238(10.9)
It bothers me when people sneeze without covering their mouths	392(17.9)	62(2.8)	136(6.2)	318(14.5)	1280(58.5)

\*For item 1-3, 6, 9 (0 – never; 1 - almost never; 2 – sometimes; 3 - fairly often; 4 - very often)

\*For item 7 & 8 (4 – never; 3 - almost never; 2 – sometimes; 1 - fairly often; 0 - very often)

### Level of direct and indirect contact history with diagnosed COVID19 cases



**Figure 1: Shows the level of susceptibility of the respondents following their contact history**



Respondents reported their level of susceptibility as per their experience and understanding. Around 11.2% of the respondents reported that they had close contact with a confirmed case, and 10.5% were not very sure of any such incident, while 78.2% faced no such circumstances. 20.9% had a non-close contact, 9.6% had an indirect connection with a confirmed case, while 12.9% had contact with a hypothetical case.

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## Discussion

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The outcome of this study has expanded our limited understanding about the influence of the coronavirus pandemic and the associated psychological impacts<sup>14</sup>, raising a key concern against the negative impact held by the news, social distancing and quarantine in modern times. As it has been identified that COVID-19 spreads mainly through close contact from the droplets generated during spitting and sneezing from infected individuals<sup>15</sup>. Although quarantine and social distancing are recommended to lessen the disease transmission, the long-lasting implications associated with the diseases affecting people psychologically must also be considered before implementing these protective measures. We have the evidence indicating a positive history of psychological distress among the SARS survivors back in 2004<sup>16</sup>. After the SARS outbreak in 2003, the survivors suffered from stress and anxiety even after one year of the outbreak<sup>16</sup>. Despite knowing the adverse and long-term impacts of these preventive measures, we continue to follow the trend. Social distancing & quarantine has been accepted and implemented globally to minimize the disease spread.

Unstable mental health is prominent among the general public and the sufferers of COVID-19<sup>17</sup>. It was revealed that more than 32.3% felt agitated because the things that happened were outside their control, and

18.6% frequently felt stressed, nervous and fearful because of the unprecedented happening of COVID-19. The study reveals an association between participants' risk perceptions built on individual experiences and existing circumstances. A wide range of literature depending on health actions and risk of communication provides a context for understanding this link. The risk of transmission should be considered as a critical element in encouraging people to adopt healthy behaviors<sup>18</sup>. That has been proven by both the health belief model and protective motivation theory, indicating that positive behavioural change is associated with risk prevention. Belief in one's ability to make the necessary change and belief that making the change may result in the health benefits for oneself has long been known and practiced<sup>19</sup>.

Some of the respondents also ignored protective measures; for instance, 26.9% were not wearing masks, whereas others created new stricter rules for themselves. For example, 45% revealed washing hands after touching possibly contaminated objects, 56% showed washing hand with soap, while 54% cover their mouth while sneezing or coughing (Figure 1). Similar studies indicated that societal, psychological, and cultural influences modulate risk perceptions<sup>20,21</sup>. Literature suggests that the perceived level of risk associated with any event can be overstated compared to the originality, which might be due to the unmanageability of the associated risks<sup>22,23</sup>.

The psychological health influence of COVID-19 among the patients, caretakers, and hospital employees is overwhelming compared to those disasters where contact to a threat was brief. Moreover, the perceptual vulnerability, stress, and psychological responses to COVID-19 significantly differ amongst people as per the present study's findings. Previously, research conducted on



perception-related responses to the SARS epidemic indicated that increased fear, sense of social isolation, and occupational stress were significantly associated with PTS symptom levels<sup>24</sup>. We also assessed the level of suppressibility of COVID-19 among the general population as per their understanding. It appears that 11.2% of the respondents had close contact with a confirmed case in the last two months while 78.2% had no close contact, 20.9% had a non-close contact, and 9.6% had an indirect connection with a confirmed case (Figure 1). The study presenting the epidemiological analysis of COVID-19 among different age groups indicated that the infection rate and associated mortality is high among older age groups<sup>25</sup>.

Moreover, the stress induced by the COVID-19 outbreak is evident and accepted. WHO states that this pandemic has widely increased the general population's stress levels, mainly due to unfamiliarity and high mortality within a short duration of time<sup>5</sup>. The mean PSS score was  $19.98 \pm 6.08$ , which lies under the moderate category, i.e. most of the respondents (66.6%) had mild perceived stress due to this pandemic for helping the psychological sufferers. WHO highly recommends minimizing the exposure to COVID-19 associated news is the primary reason behind anxiety and depression<sup>5</sup>. Moreover, the exposure must only be limited and acquired only at certain times in a day or two and only from a reliable source giving practical and authentic information<sup>5</sup>. During this health crisis, it is imperative to bring up facts to combat fear among the population. The information regarding the disease, either related to spreading, prevention, or protective measures, must be scrutinized before implementation and dissemination. One must be very careful while sharing the news, as the intensity of the disinformation and myths depends on how many people believe it and share it.

This article outlines the perceived and psychological concerns associated with COVID-19 that must be known and considered by healthcare providers, front-line personnel, and the general population while taking preventive measures. Social distancing and quarantine are more likely to induce psychological distress because of increased fear of disease, limited knowledge, and altered risk perceptions due to varying emotional states<sup>7</sup>. The incomplete and evolving understanding of this catastrophic condition has promoted psychological suffering among the general population.

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## Conclusion

In conclusion, COVID-19 has shown to be a strong reason for psychological distress within the global population as perceived by many with moderate intensity. Moreover, the state of fear, perceived vulnerability, social distancing, and global panic seem to major contributing factors in causing this stress that can further impact the general population's health and well-being. One of the primary reasons behind the fact is an unknown and unusual situation as the current generations face a pandemic for the first time. The reactions are more precisely associated with one's psychological response towards a new threat. The study can help get some insight and propose any interventional measures to combat the psychological impacts of COVID-19 that will curtail the sufferings during this period of uncertainty.

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