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Original Article

A Study on Risk Assessment and Behavioral Change during COVID-19 Pandemic among Residents of Delhi-NCR

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Abstract

Background: COVID-19 pandemic represents a major global health crisis. It has affected large number of populations all over the world. It is not only causing physical derangement of health but also affecting mental health. The study was conducted to access the change of behavior and risk assessment among people due to COVID-19-induced lockdown.

Materials and Methods: A cross-sectional survey using Google forms was conducted among 300 people of age group 18–60 years and above in India. The link of the questionnaire was sent through E-mails, WhatsApp, and other social media for the collection of the data. Fear of COVID-19 scale (FCV-19S) was applied to assess the fear regarding COVID-19.

Results: The study was conducted among 300 participants. It was observed that 49.3% of people who worried about the current situation, 51.7% experienced depressive symptoms, 60.7% did not leave the house due to fear of acquisition of infection, 68.3% often listened to news, and engaged with apps for finding information regarding COVID-19 had higher mean COVID-19 fear score than their counterparts.

Conclusion: Our study concluded that FCV-19 is engraved among Indian population with respect to risk of acquiring the disease and behaviors associated with it.

Key words: Behavioral change, COVID-19, Risk assessment

INTRODUCTION

The new public health crisis threatening the globe with the emergence and spread of 2019 novel coronavirus (nCoV) or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus originated in bats and transmitted to humans through yet unknown intermediary animals in Wuhan, Hubei province, China in December 2019.[1] On February 11, 2020, the world health organisation (WHO) Director-General, Dr. Tedros Adhanom Ghebreyesus, announced that the disease caused by this new CoV was a "COVID-19."[2] Due to the rapid spread in the disease across the globe, on March 11, 2020, the WHO declared it as a pandemic.[3] Globally, as of 9:20 am CEST, July 15, 2020, there were 13,119,239 confirmed cases of COVID-19, including 573,752 deaths, as reported. It is known that there are three types of human CoV (HCoV) existing presently which are HCoV-229E, SARS-associated CoV, and HCoV-OC43.[4] In late December 2019, many patients were admitted to the hospital suffering from virus presenting pneumonia like symptoms and were diagnosed as pneumonia of unknown etiology. The people affected by the virus were linked epidemiologically to wholesale market of wet animals and sea food in Wuhan, Hubei Province, China.[5]

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The first known case of nCoV was identified in Wuhan, China in December, 2019. The very first reported laboratory-confirmed case of COVID-19 in India was from Kerala on January 30, 2020. On March 31, 2020, a total of 2245 cases and 56 deaths were confirmed in India.[6] The incubation period of CoV is 5–7 days, that is, the syptoms starts to appear after 5–7 days after coming in contact if the infected person. The period of CoV infection ranges from 7 to 41 days with the average of 14 days and number of days usually depends on the age of the patient, any pre-existing disease and also on the immune system of the body. The most common presenting complaints by the patient are fever, cough, fatigue, pharyngitis, and in late stages followed by cough with expectoration, breathlessness, decrease in oxygen saturation point below 95, respiratory distress, diarrhea, acute cardiac injury, and kidney failure. Nationwide lockdown was announced by the government on March 24, 2020 as a containment strategy. After this, three cycles of lockdown for the prevention of the transmission of disease were opted in the country. India is facing multiple major challenges on the COVID-19 front. It is densely populated: 464 people/km^2 compared with Italy's 206, Spain's 91, Iran's 52, and the USA's 36. It has a huge population: 1380 million (USA 330 million, Iran 83 million, Italy 60 million, and Spain 46 million). Social distancing without total shutdowns is unthinkable, especially within the big cities with crowded streets, trains, buses, and offices.[7]

This lockdown cycle might have caused significant distress in the form of fear, anxiety, and confusion among the public. Apart from reducing the transmission rate, considering an individual's risk and change in behavior is a vital aspect for their psychological wellbeing. This may also largely influence the manner, in which an individual may adhere to preventive measures toward COVID-19. Hence, the aim of our study is to examine the reaction of population toward Covid-19 outbreak and to access the psychological response in terms of fear, depressive symptoms, and change in behavior during the nationwide lockdown.

MATERIALS AND METHODS

The cross-sectional online study was carried out in India. An online semi-structured questionnaire was developed using google forms. An informed consent was attached to it. The link of the questionnaire was sent through E-mails, WhatsApp, and other social media for the collection of the data.

Participants

The participants of this study consisted of 300 individuals, including 195 (65.05%) females and 105 (35.0%) males. The age of the participants ranged between 18 and 29 years. Participants with access to the internet could participate in the study.

Data Collection Tools

The data collection was initiated on May 20, 2020. The online self-reported questionnaire contained the five sections related to change of behavior and risk assessment during COVID-19 induced lockdown. The seven-item fear of COVID-19 scale (FCV-19S) was used to assess fear regarding COVID-19. The FCV-19S was developed by Ahorsu *et al.* (2020).[10] It is a unidimensional scale with seven items. It has a 5-point Likert-type rating system (ranging from 1: Strongly disagree to 5: Strongly agree). The responses were recorded on a five-point Likert scale ranging from strongly disagree to strongly agree. The higher the score, the greater the FCV-19. The sociodemographic variables included age, gender, occupation, education, marital status, and native state were also collected. Informed consent was taken from the study participants and institutional ethical approval has been taken.

Data Collection and Analysis

Preliminary data of the participants were indexed in Microsoft Excel. Later, interpretation of the indexed data were done in Microsoft word. Data were analyzed using SPSS Version (SPSS., Chicago, IL,USA) software. Descriptive statistics have been used in the study to analyze the findings. A significant relationship between variable $P < 0.05$ was consider statistically significant.

RESULTS

The study was conducted among 300 participants among which maximum belong to the age group 18–29 years (67.1%), in which majority were female (65.0%) with 56.3% were educated up to higher secondary level. Majority of the participants were working (51.3%) with 28.0% which were medical/paramedical professional. About 55.0% of the participants were unmarried and majority of them resided in urban area (94.3%), along with family (93.0%). Proportion of people suffering from illness such as asthma, cancer, diabetes, heart ailment, and hypertension was 10.7% [Table 1]. We found that majority of people in sample population were worried about the current situation (49.3%). In general, 57.7% thought that they were susceptible for getting CoV infection if they do not take appropriate measures. In response to the fear due to current situation, 51.7% were already experiencing depressive symptoms such as anxiety, depression, panic, and stress. In response to change in behavior during COVID-19 phase, 62.0% spent most of their time thinking about COVID-19 with a severity of 52.3%. Majority reported change in daily routine including usage of hand sanitizer

Table 1: Distribution of participants according to the socio-demographic variables

S. No.	Characteristics	Number of participants	Percentage of participants (%)
1	Age (Years)		
	18-29	185	61.7
	30-44	67	22.3
	45-59	36	12.0
	60 and above	12	4.0
2	Gender		
	Female	195	65.0
	Male	105	35.0
3	Education		
	Upto 12 grade	169	56.3
	Undergraduate	121	40.3
	Postgraduate and above	10	3.3
4	Occupation		
	Students	104	34.7
	Working*	154	51.3
	Housewife	42	14.0
5	Marital status		
	Unmarried	165	55.0
	Married	135	45.0
6	Locality		
	Urban	283	94.3
	Rural	17	5.7
7	Currently residing with		
	Family	279	93.0
	Friends	2	0.7
	Hostel	4	1.3
	Alone	15	5.0
8	Associated with any essential service/work		
	Yes	64	21.3
	No	236	78.7
9	Into medical/paramedical professional		
	Yes	84	28.0
	No	216	78.0
10	Suffering from any illness		
	Illness	32	10.7
	Not at all	268	89.3

(97.3%), wearing mask (97.3%), and staying in house for most of the time (60.7%). Most of the participants denied to visit any Chinese restaurants after the lockdown (72.0%), along with travelling abroad during the year 2020 (94.0%). Majority of the participants were users of Arogya Setu app (76.3%) [Table 2]. On applying independent *t*-test and one-way ANOVA [Table 3] to assess the distribution of mean COVID-19 fear score among different variables, it was seen that being worried about the current COVID-19 situation ($P = 0.001$), the thought of COVID-19 affecting the body's way of response to infection ($P = 0.001$), experiencing any depressive symptoms in response to FCV-19 ($P = 0.001$), fear of leaving the house ($P = 0.001$), listening to news related to COVID-19 ($P = 0.001$), and being engaged in mobile apps for retrieving information related to COVID-19 ($P = 0.02$) were significant with mean COVID-19 fear score. Also among the significant factors, those who were very worried about the current situation (20.52 ± 5.73), experiencing depressive symptoms (20.28 ± 5.68), not leaving the house due to fear of acquisition of infection (20.14 ± 5.35), often listening to news, and engaged with apps (20.38 ± 5.36) for finding information regarding COVID-19 had higher mean COVID-19 fear score than their counterparts.

DISCUSSION

COVID-19 is an emerging, expeditiously transmuting global health challenge affecting all sectors.[8,9] The present study explored predictors of fear and behavior change in response to the COVID-19 pandemic. The FCV-19S has been utilized in this study as it has proven to have robust psychometric properties, with comparability among both genders and across all age groups to assess and allay fears in individuals.[10,21] COVID-19 is associated with decreased physical and environmental well-being. In our study, females participants were predominant as seen in congruence with other studies.[11-14] Majority of the participants were from urban areas which were similar to a study conducted on COVID-19 in India.[11] Our results coincide with the findings from previous studies. Particularly as depicted in the 2009–2010 Swine flu pandemic, the 2015–2016 Zika virus outbreak and recent 2020 COVID-19 study, consciousness regarding health was significant factor regarding increased fear due to the current CoV pandemic.[15-17] Furthermore, our study reported that exposure to media for information was significantly associated with fear which was found similar in others studies.[18,19] Furthermore, a positive association was seen between fear due to COVID-19 and depressive symptoms (anxiety, depression, panic, and stress) which coincide with the findings of other studies.[20-23] People have started using hand sanitizers more than usual and wearing mask every time they step out of their house with maximum cancelling the plan of visiting abroad this year due to fear of CoV infection. A study conducted in Tamil Nadu reported changing their daily routines in response to the pandemic, including reducing social gatherings, increasing social distancing, and informing others about COVID.[24] They also reported an increase in cell phone/internet use and increasing housework (e.g., cooking and cleaning). Furthermore, a study in Iran shows scores on the FCV-19S were significantly and positively correlated with instruments assessing depression and anxiety.[25] However, it is not clear if scale scores would be correlated with individuals carrying out preventive COVID-19 behaviors (e.g., handwashing, social distancing, and respiratory hygiene). However, the association between fear and health-related behaviors is complex. Since the data were collected through an online application on a voluntary basis using convenience sampling strategy, it restricts the generalized recruitment. As the data are based on the participant's personal statements, it may show some bias regarding social acceptance of fear. Studies

Table 2: Risk and behaviour assessment table

	Risk and behaviour variable	No. of participants	Percentage of participants (%)
1	How often do you think about Covid-19?		
	Rarely	114	38.0
	Often	186	62.0
2	How severe do you think Covid-19 is?		
	Very Severe	125	41.7
	Severe	157	52.3
	Not Severe	18	6.0
3	Are you worried about the current situation?		
	Very worried	92	30.7
	Worried	148	49.3
	Not worried	60	20.0
4	Do you think that, in general, you are susceptible, to getting coronavirus infection, if you take no preventive measures?		
	Very Susceptible	102	34.0
	Susceptible	173	57.7
	Not at all susceptible	25	8.3
5	Do you think if it affects you how would your body respond to the infection?		
	No effect	68	22.7
	Moderate effect	131	43.7
	Severe effect	101	33.7
6	Have you experienced any of the following in response to a fear of covid19?		
	Depressive symptoms	155	51.7
	No symptoms	145	48.3
7	Have you experienced any trouble in sleep due to COVID 19?		
	Yes	43	14.3
	No	257	85.7
8	How often are you listening to news related to covid19?		
	Rarely	159	53.0
	Often	141	47.0
9	How often you use sanitizer on a daily basis?		
	Rarely	94	31.3
	Often	206	68.7
10	Do you use any hand sanitizer as a precautionary measure?		
	Yes	292	97.3
	No	8	2.7
11	Have you started wearing the mask because of COVID -19?		
	Yes	292	97.3
	No	8	2.7
12	Will you every time wear a face mask, when you step out of your house?		
	Yes	282	94.0
	No	18	6.0
13	Do you stock up your grocery because of fear of running them out?		
	Yes	138	54.7
	No	136	45.3
14	Do you fear to leave your house?		
	Yes	182	60.7
	No	118	39.3
15	Do you know about the immunity boosters advised by the AYUSH ministry?		
	Yes	190	63.3
	No	110	36.7
16	Will you be calling domestic help during the lockdown?		
	Yes	75	25.0
	No	225	75.0
17	Will you be calling domestic help after lockdown gets over?		
	Yes	135	45.0
	No	165	55.0
18	Will you visit any Chinese restaurant after lockdown gets over?		
	Yes	84	28.0
	No	216	72.0
19	Will you travel abroad this year?		
	Yes	18	6.0
	No	282	94.0

(*Contd...*)

Table 2: *Continued*

	Risk and behaviour variable	No. of participants	Percentage of participants (%)
20	Do you have the Aarogya Setu Mobile app?		
	Yes	229	76.3
	No	71	23.7
21	How often are you engaged with mobile apps for the information regarding COVID-19?		
	Rarely	205	68.3
	Often	95	31.7

Table 3. Testing Mean COVID Fear Scale with Respect to Sociodemographic Profile

S. No	Characteristics	No. of participants		Mean±Standard Deviation	
		Frequency	(%)	COVID-19 fear score	*P*- value
1.	Age (Years)				0.82##
	18-29 years	185	61.7	19.23±5.67	
	30-44 years	67	22.3	19.25±5.54	
	45-59 years	36	12.0	20.00±5.20	
	More than 60 years	12	4.0	18.42±4.83	
2.	Gender				0.18#
	Male	105	35.0	18.70±5.36	
	Female	195	65.0	19.61±5.62	
3.	Education				0.59##
	Upto 12 grade	10	3.3	19.03±6.95	
	Undergraduate	121	40.3	18.89±5.42	
	Postgraduate and above	169	56.3	19.57±5.55	
4.	Occupation				0.36##
	Housewife	42	14.0	20.40±4.63	
	Student	104	34.7	19.23±5.76	
	Working	154	51.3	19.03±5.60	
5.	Marital Status				0.71#
	Married	135	45.0	19.42±5.60	
	Others (Divorcee/separated, widow, unmarried)	165	55.0	19.19±5.50	
6.	Locality				0.06#
	Rural	17	5.7	21.76±5.03	
	Urban	283	94.3	19.14±5.54	
7.	Currently residing with				0.59#
	Family	279	93.0	19.34±5.55	
	Others (Alone, friends, hostel)	21	7.0	18.67±5.48	
8	Associated with any essential service work				0.71#
	Yes	64	21.3	19.06±5.58	
	No	236	78.7	19.36±5.53	
9	Into Medical/Paramedical professional				0.68#
	Yes	84	28.0	19.08±5.86	
	No	216	72.0	19.38±5.42	
10.	Suffering from any illness				0.91#
	Illness (Asthma, Cancer, Diabetes, Heart ailment, Hypertension)	32	10.7	19.19±5.08	
	Not at all	268	89.3	19.31±5.60	

#Indicates the Independent T-Test; ##Indicates the One-way ANOVA

conducted on different samples utilizing different sapling methods are highly recommended. Furthermore, this study used a cross-sectional design which did not depicts the exact cause-effect relationship between the variables.

CONCLUSION

Our study concluded that FCV-19 is engraved among Indian population with respect to risk of acquiring the disease and behaviors associated with it. This study depicts a dire need to conduct an epidemiological study across the nation to determine the level of fear as well as other associated issues concerning behavioral changes in response to COVID-19. The findings of this study may help in structuring of effective intervention strategies to maintain optimal health of peoples in this global crisis situation.

REFERENCES

1. Singhal T. A review of coronavirus disease-2019 (COVID-19). Indian J Pediatr 2020;87:281-6.

2. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation, and Treatment of Coronavirus. Treasure Island, FL: StatPearls Publishing; 2020.
3. World Health Organization. WHO Director-general's Opening Remarks at the Media Briefing on COVID-19-11 March 2020. Available from: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020. [Last accessed on 2021 Dec 04].
4. Van der Hoek L, Pyrc K, Jebbink MF, Vermeulen-Oost W, Berkhout RJ, Wolthers KC, *et al*. Identification of a new human coronavirus. Nat Med 2004;10:368-73.
5. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. J Autoimmun 2020;109:102433.
6. Gupta N, Praharaj I, Bhatnagar T, Thangaraj JW, Giri S, Chauhan H, *et al*. Severe acute respiratory illness surveillance for coronavirus disease 2019, India, 2020. Indian J Med Res 2020;151:236-40.
7. Kamath S, Kamath R, Salins P. COVID-19 pandemic in India: Challenges and silver linings. Postgrad Med J 2020;96:422-3.
8. Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda; 2020. Available from: https://www.frontiersin.org/articles/10.3389/fpubh.2020.00181/full. [Last accessed on 2021 Dec 04].
9. COVID Economics Vetted and Real Time Papers; 2020. Available from: https://www.cepr.org/sites/default/files/CovidEconomics39.pdf. [Last accessed on 2021 Dec 04].
10. Ahorsu DK, Lin C, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 scale: Development and initial validation. Int J Ment Health Addict 2020;2020:1-9.
11. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety and perceived mental healthcare need in Indian population during COVID-19 pandemic. Asian J Psychiatry 2020;51:102083.
12. Erfani A, Shahriarirad R, Ranjbar K, Mirahmadizadeh A, Moghadami M. Knowledge, attitude and practice toward the novel coronavirus (COVID-19) outbreak: A population-based survey in Iran. 2020;3:149-228.
13. Zhong B, Luo W, Li H, Zhang Q, Liu X, Li W, *et al*. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: A quick online cross-sectional survey. Int J Biol Sci 2020;16:1745-52.
14. Alkot M, Albouq M, Shakuri M, Subahi M. Knowledge, attitude, and practice toward MERS-CoV among primary health-care workers in Makkah Al-Mukarramah: an intervention study. Int J Med Sci Public Health 2016;5:952-9.
15. Blakey SM, Abramowitz JS. Psychological predictors of health anxiety in response to the zika virus. J Clin Psychol Med Settings 2017;24:270-8.
16. Wheaton MG, Abramowitz JS, Berman NC, Fabricant LE, Olatunji BO. Psychological predictors of anxiety in response to the H1N1 (Swine flu) pandemic. Cogn Ther Res 2011;36:210-8.
17. Mertens G, Gerritsen L, Duijndam S, Salemink E, Engelhard IM. Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. J Anxiety Disord 2020;74:102258.
18. Garfin DR, Silver RC, Holman EA. The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. Health Psychol 2020;39:355-7.
19. Van den Bulck J, Custers K. Television exposure is related to fear of avian flu, an ecological study across 23 member states of the European Union. Eur J Public Health 2009;19:370-4.
20. Harper CA, Satchell LP, Fido D, Latzman RD. Functional fear predicts public health compliance in the COVID-19 pandemic. Int J Ment Health Addict 2020;2020:1-4.
21. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, *et al*. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health 2020;17:1729.
22. Satici B, Tekin EG, Deniz ME, Satici SA. Adaptation of the fear of COVID-19 scale: Its association with psychological distress and life satisfaction in Turkey. Int J Ment Health Addict 2020;8:56.
23. Taylor S, Landry CA, Paluszek MM, Fergus TA, McKay D, Asmundson GJ. Development and initial validation of the COVID stress scales. J Anxiety Disord 2020;72:102232.
24. Kuang J, Ashraf S, Das U, Bicchieri C. Awareness, risk perception, and stress during the COVID-19 pandemic in communities of Tamil Nadu, India. Int J Environ Res Public Health 2020;17:7177.
25. Pakpour AH, Griffiths MD. The fear of COVID-19 and its role in preventive behaviors. J Concurr Disord 2020;2:58-63.

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