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Knowledge, Attitudes, Practices and Psychological Response Towards COVID-19 Pandemic Among General Public in India

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ABSTRACT

In this study, we investigated the knowledge, attitudes, practices and psychological response of the people towards the ongoing novel COVID-19 pandemic crisis. We conducted an online self-administered cross-sectional study. Participants filled in two questionnaires, one measuring KAP towards COVID-19, and the other measuring psychological impact towards COVID-19 using GAD-7 questionnaire. The total sample size of participants was 1015, of whom 668 belongs to the 20-40 years age group. Around 69% of the respondents are aware of the clinical symptoms of COVID-19. And about 98% of the respondents believe that quarantine and self-isolation are the best way to contain the spread of COVID-19. Around 90%-92% of the participants have an optimistic, positive attitude and confidence that we will win the battle against COVID-19. The study revealed that majority of the respondents had positive psychological resilience to cope with the pandemic. This study gains importance amid the global lockdown, social-distancing and quarantine. Finally, this study emphasis on the need for a structured mental health support system, which focuses on the unprecedented challenge for mental health across the country due to COVID-19 pandemic. The international and national health care regulatory bodies should devise an effective strategy to combat COVID-19. A positive mental health attitude and early psychological interventions can help us to combat COVID-19.

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INTRODUCTION

The Coronavirus disease 2019 (COVID-19) belongs to the Coronaviruses family mainly RNA group viruses which trace its lineage similar to deadly viruses namely Severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) (De Groot *et al.*, 2012). In December 2019, a few group pneumonia cases of unknown origin were reported in Wuhan, China, with suspected links to the local seafood (Surveillances and Weekly, 2020). The Chinese counterpart, namely the Centre for Disease Control and Prevention (China CDC) investigated the outbreak and notified the World Health Organization (WHO) immediately. The WHO declared this disease as a public health emergency in

the early part of 2020 (Organization, 2020). Around January 7, 2020, a group of Chinese research scientists had isolated a novel coronavirus (CoV) from patients in Wuhan region, and the genetic sequencing of the 2019 novel coronavirus (2019-nCoV) was done and made available in the public forum to do further research.

Pandemics are defined as epidemics of an infectious nature that affect a large geographic area, probably the whole world. They are unpredictable and can lead to high mortality. Pandemics have taken many forms, including pneumonia, leprosy, plague, measles, yellow fever, malaria, cholera, and influenza. The earliest pandemic was the Spanish flu (1918-1919) responsible for the deaths of more than 50 million people worldwide and is remembered as one of the deadliest pandemics to date (Kaiser *et al.*, 2005).

The global influenza pandemic in 1918 caused by an H1N1 virus had a case-fatality ratio of 3%. It exhibited a worldwide transmission. It is estimated that about 500 million people or one-third of the world's population became infected with this virus. The number of deaths was estimated to be at least 50 million worldwide out of which 675,000 occurred in the United States alone. The SARS coronavirus (SARS-CoV) was an epidemic that occurred in 2003 in the Guangdong province of southern China. Bats were the natural animal reservoir of the SARS-CoV which in turn spread to civet cats. SARS-CoV affected more than 8000 cases in 26 countries leading to 774 deaths. The Middle East respiratory syndrome (MERS) coronavirus, also called MERS-CoV was first identified in Saudi Arabia in 2012 which had more than 2400 cases in 27 countries (Wang *et al.*, 2020).

The 2009 global pandemic caused by the influenza A (H1N1) strain presented a significant public health emergency of uncertain scope, threat, and long-term effect. The experience of this pandemic unfolded many deficiencies including vulnerabilities in global and national public health sectors; limitations of scientific knowledge about the novel diseases; difficulties in decision making under conditions of uncertainty especially travel restrictions and lockdown implementation; complexities in international cooperation concerning humanitarian aid; and challenges in communication among medical experts, policymakers, and the public (Fineberg, 2009).

In just a short time, a localized outbreak of COVID-19 evolved into a global pandemic with three defining characteristics of rapid spread, the severity of the outbreak and economic and social disruption (Organization, 2020). The dissemination of the novel coronavirus is at a higher rate despite strict self-isolation measures and lockdown measures. The current Case Mortality Rate is anywhere between 3.8% to 5%. This global pandemic has triggered an untenable situation, especially in developing countries like India, whose population is currently 1.36 billion. The COVID-19 has created immense consternation among the global community which has led to a psychological crisis among the general public, patients, health care professionals, young children, and older adults which needs to be addressed immediately (Cao *et al.*, 2020).

The long-lasting fight against the Novel Coronavirus (COVID-19) will leave an indelible mark in history. The COVID-19 has created an impossible situation which warrants for a "Pandemic Preparedness" in the future (Dong and Bouey, 2020). To contain the spread, people's commitment towards the quarantine and strict adherence to the health care guidelines laid down by the WHO and ICMR organizations is the need of the hour. The compliance of people towards the social distancing and lockdown measures will depend on their knowledge, attitudes, and practices (KAP) towards COVID-19 and also their psychological responses (Khan *et al.*, 2014).

Previous pandemic outbreaks such as the MERS-CoV outbreak in 2012 suggest that knowledge, attitudes and practices towards infectious diseases were adequate preparatory tools in handling the situations associated with high levels of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease (Nour *et al.*, 2017). The pandemic awareness and psychological endurance of people plays a vital role at this critical moment to contain the COVID-19 outbreak (Yao *et al.*, 2020). Studies on the psychological impact of the quarantine during the unprecedented COVID 19 outbreak reveal that people are likely to experience a wide range of symptoms of psychological trauma. They could include low mood, break down, insomnia, stress, anxiety, anger, emotional exhaustion, irritability, post-traumatic stress disorder and symptoms of depression (Cao *et al.*, 2020).

Hence to understand the levels of awareness and the mental health in the public a study was conducted to investigate the KAP towards COVID-19 and the psychological impact of the same among different population groups across varied socio-demographic characteristics.

MATERIALS AND METHODS

Study design

This was a cross-sectional questionnaire-based observational study conducted using online Google

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Table 1: Socio-demographic characteristics of the study (N=1015)

	Categories	Variable	N	%
1	Gender	Male	501	49.3
		Female	510	50.2
		Others	4	0.3
2	Age	20-30	349	34.3
		30-40	319	31.4
		40-50	183	18.0
		50-60	117	11.5
		>60	47	4.6
3	Socioeconomic Status	Upper Income	144	14.1
		Middle Income	786	77.4
		Lower Income	85	8.3
4	Educational Status	Primary	3	0.3
		Middle	10	0.9
		High School	80	7.8
		Technical/Non-Technical Diploma or Certificate	58	5.7
		Graduate and above	864	85.1
5	Area of Residence	Urban	760	74.8
		Semi-Urban	175	17.2
		Rural	80	7.8

forms platform. The participation was purely voluntary, and the responses would be anonymous. The link of the google form questionnaire was shared through e-mail and social media like WhatsApp and Telegram. The contact details of the investigators were shared with all the participants. Participants with access to a primary internet connection and who can read and write the English language were included in this survey. Only those who volunteered to participate were included in the study after obtaining informed consent through a form attached to the online google form.

Survey instrument

The study participants were shared access through a link to an online self-administered questionnaire to participate in the study. The data collection was done during the 1st week of April 2020. The socio-demographic variables included age, gender, occupation, education and area of residence. The study instrument was a validated KAP questionnaire along with the GAD-7 questionnaire, which was designed based on previous studies.

Generalized Anxiety Disorder Scale (GAD-7) Inventory

Generalized Anxiety Disorder Scale (GAD-7) was used to assess the Psychological impact of the COVID-19. The GAD-7 has seven items based on seven reliable symptoms exhibited by the respondents and measures the frequency with which respondents suffered from these symptoms within the last two weeks. The GAD-7 is an authentic validated screening instrument with excellent internal consistency (Cronbach's a = 0.911) (Cao *et al.*, 2020). Respondents usually report their symptoms using a 4-item Likert rating scale ranging from 0 (not at all sure) to 3 (Nearly every day). The interpretation is as follows None (0-5), Mild (6-10), Moderate (11-15), and Severe (16-21), such that the total score ranges from 0 to 21. (Toussaint *et al.*, 2020).

The questionnaire consisted of 25 questions divided into five parts:

1. Socio-demographic information (7 questions)

2. Assessment of knowledge (7 questions)

3. Assessment of attitudes (2 questions)

4. Assessment of practices (2 questions)

5. Assessment of Psychological impact (7 questions)

Statistical analysis

Survey responses for the 1015 participants were collated in Excel, and data were analyzed by using Stata 13.0 software. Descriptive analysis was reported as frequency, percentage, and mean

Table 2: Knowledge of the participants about COVID-19

Knowledge Related Questions	Responses		
	Yes n (%)	No n (%)	I don't Know n (%)
1. Clinical symptoms of COVID-19 are fever, fatigue, dry cough, Sore throat, and body pain	698(68.7%)	238(23.4%)	79(7.7%)
2. There currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help in the recovery	921(90.7%)	35(3.4%)	59(5.8%)
3. Persons with COVID -19 who are >60 yrs.. and having diabetes, hypertension is more likely to be severe cases.	878(86.5%)	52(5.1%)	85(8.3%)
4. Children and young adults don't need to take measures to prevent the infection by the COVID-19 virus.	130(12.8%)	838(82.5%)	47(4.6%)
5. Persons with COVID-19 cannot infect the virus to others when a fever is not present.	71(7%)	850(83.7%)	94(9.2%)
6. Ordinary residents can wear general surgical masks to prevent the infection by the COVID-19 virus.	584(57.5%)	357(35.1%)	74(7.2%)
7. Quarantine and Self-Isolation of people are effective ways to reduce the spread of the virus.	988(97.3%)	12(1.1%)	15(1.5%)
TOTAL	N= 1015		

scores. Pearson's Chi-squared test was used to analyze the relationship between the dependent (level of knowledge), and independent variables (sociodemographic characteristics). Spearman's rank correlation coefficient ($p < 0.05$) was used to evaluate the association between the level of knowledge with the attitude and practices scores. All the differences of estimated variables were considered statistically significant if $P<0.05$.

RESULTS AND DISCUSSION

Socio-demographic profile

The socio-demographic details of the 1015 participants with baseline characteristics are summarized in (Table 1). Among the 1015 participants who took part in this study, 501 were males, 510 were females, and 4 were other gender. Around 349 (34.38%) participants belong to the 20-30 years age group and 47 (4.63%) participants belong to the >60 years age group. Approximately 85% of the respondents are Graduates and above. Of the 1015 Partic-

ipants, more than 74.8% reside in the urban area, 17.2 % reside in the Semi-Urban area, and 7.8% reside in the rural area (Table 1).

Level of Knowledge about COVID-19

The results in Table 2 shows that the level of knowledge among the participants; a total of 7 questions were asked concerning the knowledge about COVID-19. About 69% of the respondents are pretty much aware of the clinical symptoms of COVID-19, yet 23% are still unaware of the symptoms of the COVID-19, which is a worrying trend. Around 90% of the participants are knowledgeable about the fact that COVID-19 doesn't have an effective drug or a treatment. Besides, around 83 % of the participants feel that the children and young adults don't have to take such safety measures against COVID-19, which is incorrect. Around 58% of the participants are conscious about the fact that wearing a general surgical mask will prevent the infection by COVID-19, which is a healthy sign. Furthermore, 98% of the respondents believe that quarantine and self-isolation are

Table 3: Comparison of Level of knowledge with socio-demographic characteristics

S.No	Variables	Level of Knowledge		Total, No (%)	Chi-square test, P-value
		Good, n (%)	Moderate-Poor, n (%)		
1	Educational Status				
	Primary	3(0.3%)	0(0%)	3(0.3%)	Chi - 37.877
	Middle	8(0.8%)	2(3.6%)	10(0.9%)	<0.001*
	High School	70(7.2%)	10(18.1%)	80(7.8%)	
	Technical/Non-Technical Diploma or Certificate	47(4.9%)	11(2%)	58(5.7%)	
	Graduate and above	832(86.6%)	32(58.1%)	864(85.1%)	
2	Area of Residence				
	Urban	724(75.4%)	36(65.4%)	760(74.8%)	Chi - 3.1282
	Semi- Urban	163(16.9%)	12(21.8%)	175(17.2%)	0.209
	Rural	73(7.6%)	7(12.7%)	80(7.8%)	
3	Age				
	20-30	334(34.7%)	15(27.2%)	349(34.3%)	Chi-0.74881
	30-40	294(30.6%)	25(45.4%)	319(31.4%)	0.126
	40-50	173(18.0%)	10(18.1%)	183(18.0%)	
	50-60	112(11.6%)	5(9.0%)	117(11.5%)	
	>60	47(4.9%)	0(0%)	47(4.6%)	
4	Gender				
	Male	474(49.3%)	27(49.0%)	501(49.3%)	Chi-0.2359
	Female	482(50.2%)	28(50.9%)	510(50.2%)	0.889
	Others	4(0.4%)	0(0%)	4(0.3%)	
5	Socioeconomic Status				
	Lower Income	78(8.1%)	7(12.7%)	85(8.3%)	Chi -6.167
	Middle Income	740(77.0%)	46(83.6%)	786(77.4%)	<0.046*
	Upper Income	142(14.7%)	2(3.6%)	144(14.1%)	

*Significant at P < 0.05 level

Table 4: Attitude of the participants towards COVID-19

Attitude-related questions	Responses		
	Yes n (%)	No n (%)	I don't Know n (%)
1. Do you agree that COVID-19 will finally be successfully controlled if we strictly follow the Health care guidelines?	912(89.8%)	94(9.2%)	9(0.8%)
2. Do you have confidence that We can win the battle against the COVID-19 virus?	939(92.5%)	19(1.8%)	57(5.6%)
Total	N= 1015		

Table 5: Practice-related questions of the participant's towards COVID-19

Practice related questions	Responses		
	Yes n (%)	No n (%)	I don't Know n (%)
1. In recent days, have you worn a mask when leaving home?	826(81.3%)	189(18.6%)	NA
2. If you think you have COVID-19 symptoms, will you self-isolate and volunteer yourself for testing?	957(94.2%)	27(2.6%)	31(3.0%)
TOTAL	N= 1015		

Table 6: Correlation between Knowledge about COVID-19 with Attitude and Practices towards it

Knowledge Related Questions	Chi-square test, P-value			
	Attitude no 1 Question	Attitude no 2 Question	Practices no 1 Question	Practices no 2 Question
1. Clinical symptoms of COVID-19 are fever, fatigue, dry cough, Sore throat, and body pain	Chi-3.147 P 0.533	Chi-11.406 P < 0.022*	Chi-5.982 P < 0.050*	Chi-15.586 P < 0.004*
2. There currently is no effective cure for COVID-19, but early symptomatic and supportive treatment can help in the recovery	Chi-34.367 P <0.000*	Chi-34.060 P < 0.000*	Chi-1.990 P < 0.370	Chi-97.434 P < 0.000*
3. Persons with COVID -19 who are >60 yrs. And having diabetes, hypertension is more likely to be severe cases.	Chi-21.263 P <0.000*	Chi-11.281 P <0.024*	Chi-1.153 P < 0.562	Chi-16.149 P <0.003*
4. Children and young adults don't need to take measures to prevent the infection by the COVID-19 virus.	Chi-12.269 P <0.015*	Chi-6.858 P <0.144	Chi-5.020 P <0.081	Chi-67.785 P <0.000*
5. Persons with COVID-19 cannot infect the virus to others when a fever is not present.	Chi-9.034 P <0.060	Chi-1.836 P <0.766	Chi-0.724 P <0.696	Chi-34.718 P <0.000*
6. Ordinary residents can wear general surgical masks to prevent the infection by the COVID-19 virus.	Chi-16.472 P <0.002*	Chi-6.573 P <0.160	Chi-53.930 P <0.000*	Chi-14.748 P <0.005*
7. Quarantine and Self-Isolation of people are effective ways to reduce the spread of the virus.	Chi-78.096 P <0.000*	Chi-49.199 P <0.000*	Chi-8.273 P <0.016*	Chi-145.655 P <0.000*

*Statistically Significant at P < 0.05 level

Table 7: Comparison of GAD Scores with Socio-demographic characteristics

Variables	Gad Score				Total-N (%)	P-Value
	Mild	Moderate	None	Severe		
Educational Status						
Primary	2(1.05%)	0(0%)	1(0.14%)	0(0%)	3(0.30%)	0.249
Middle	4(2.0%)	0(0%)	6(0.8%)	0(0%)	10(0.9%)	
High School	12(6.2%)	6(7.0%)	61(8.4%)	1(5.2%)	80(7.8%)	
Technical/ Non-Technical Diploma or Certificate	16(8.3%)	2(2.3%)	38(5.2%)	2(10.5%)	58(5.7%)	
Graduate and above	157(82.2%)	77(90.5%)	614(85.2%)	16(84.2%)	864(85.1%)	
Area of Residence						
Urban	138(72.2%)	70(82.3%)	534(54.1%)	18(94.7%)	760(74.8%)	<0.029*
Semi- Urban	42(21.9%)	13(15.2%)	119(16.5%)	1(5.2%)	175(17.2%)	
Rural	11(5.7%)	2(2.3%)	67(9.3%)	0(0)	80(7.8%)	
Age						
20-30	76(39.7%)	37(43.5%)	230(31.9%)	6(31.5%)	349(34.3%)	<0.020*
30-40	67(37.0%)	27(31.7%)	218(30.2%)	7(36.8%)	319(31.4%)	
40-50	33(17.2%)	13(15.2%)	134(18.6%)	3(15.7%)	183(18.0%)	
50-60	13(6.8%)	6(7.0%)	95(13.1%)	3(15.7%)	117(11.5%)	
>60	2(1.5%)	2(2.3%)	43(5.9%)	0(0)	47(4.6%)	
Gender						
Female	113(59.1%)	49(57.6%)	339(47.0%)	9(47.3%)	510(50.2%)	0.054
Male	78(40.8%)	36(42.3%)	377(52.3%)	10(52.6%)	501(49.3%)	
Others	0(0)	0(0)	4(0.5%)	0(0)	4(0.3%)	
Socioeconomic Status						
Lower Income	20(10.4%)	7(8.2%)	57(7.9%)	1(5.2%)	85(8.3%)	0.384
Middle Income	154(80.6%)	65(76.4%)	552(76.6%)	15(78.9%)	786(77.4%)	
Upper Income	17(8.9%)	13(15.2%)	111(15.4%)	3(15.7%)	144(14.1%)	

*Statistically Significant at P < 0.05 level

the best way to contain the spread of COVID-19.

The dissonance between knowledge and socio-demographic variables

Table 3 shows the comparison of the level of knowledge with socio-demographic characteristics like educational status and socioeconomic status, which reflects Positive correlation concerning the same.

Attitude towards COVID-19

The analysis in the (Table 4) shows the Attitude towards COVID-19, about 90% of the participants are having a positive attitude that the COVID-19 will be controlled if we all strictly follow the guidelines laid by WHO and all applicable national health regulatory bodies like Mohfw (Ministry of Health and Family Welfare), Govt of India. Around 92 % of the participants are confident that we will win the battle against CVOID-19 which is the most positive affirma-

tive attitude needed during this global psychological emergency (Ho *et al.*, 2020).

Practices towards COVID-19

Of the 1015 participants, 81% of the people had worn mask during the last three weeks, which shows their positive attitude in following the healthcare guidelines. Around 94% of the participants agreed that they would self-isolate themselves and volunteer for testing if they have the symptoms of COVID-19 (Table 5).

Correlation between Knowledge of COVID-19 about Attitude and Practices

Results of chi-square analysis done for the correlation between the knowledge component with attitude and practices are summarized in the (Table 6). For the knowledge question on clinical symptoms of COVID-19, a correlation was clinically significant

to the attitude and practice questions. Furthermore, concerning the knowledge question of COVID-19 positive patients with hypertension and diabetes, a correlation was clinically significant to the attitude and practice questions.

The psychological impact of COVID-19

The interpretation of the GAD-7 questionnaire is as follows, None (720), Mild (191), Moderate (85), and Severe (19). Of the total 1015 respondents, 70% of the respondents didn't have any signs and symptoms of anxiety. Around 18.8% of the respondents exhibited a mild level of anxiety, 8.3 % of the respondents had a moderate level of anxiety, and about 1.8 % of the people had severe symptoms of anxiety and depression as shown in the (Table 7). The association of GAD score with socio-demographic are summarized in the (Table 7).

Only few KAP studies on pandemic awareness and the psychological impact of the same on the general public have been done in the past. Similar studies had been conducted in the past to assess public perception and anxiety through the telephonic method (Rubin *et al.*, 2009). The most common symptoms of COVID-19 are fever, fatigue, tiredness, sore throat, and dry cough. Around 80 % of the COVID-19 positive cases are asymptomatic as per the findings. Most people recover from COVID-19 disease without needing any specific treatment. Around 1 out of every 6 people who get COVID-19 positive becomes fatally ill and develop severe dyspnea who require ventilator support. Older people, and people with underlying medical problems like hypertension, or diabetes mellitus, are more likely to develop severe illness (MOHFW, 2019). It has been observed that the overall level of the knowledge is around 90% for most of the questions related to knowledge which correlates with the educational status of the respondents, which is around 90%. The findings of this research study are similar to a study done in China (Zhong *et al.*, 2020).

In this study, we scrutinized various socio-demographic factors associated with KAP and psychological implications of COVID-19 these findings will be of assistance to health care professionals and policymakers (Bener and Al-Khal, 2004).

The majority of the respondents in this study had a confident, positive attitude towards the COVID-19 pandemic, 89.8% believed that COVID-19 would finally be successfully controlled, and 92.5% had confidence that India will win the battle against the novel COVID-19 virus. These results were similar to the study done by (Zhong *et al.*, 2020) in China.

The study revealed that majority of the respondents

had positive psychological resilience to cope with the pandemic (Roy *et al.*, 2020). This could be attributed to the factor that the knowledge levels of the respondents were reasonably high, and they were adopting positive health care practices (Duan and Zhu, 2020). However, among the small majority of the people who have anxiety, statistically, significant differences were found concerning the place of residence and age. This would be worth investigating in further studies. With the increasing periods of quarantine and lockdown, the psychological crisis caused by the COVID-19 is now turning out to be a very alarming trend in the world community, which needs to be addressed immediately (Bao *et al.*, 2020). Furthermore, the conspicuous shortage of essential commodities like personal protective equipment and food items is causing panic buying, anxiety, and fear (Ayittey *et al.*, 2020). The COVID-19 psychological crisis will eventually cause a catastrophic effect on millions of people around the earth both in mortality of cases and also inevitable psychological trauma in future days to come (Duan and Zhu, 2020) if proper health care precautions have not adhered.

CONCLUSION

The challenges faced by China during pandemic serves as an epitome for many countries currently struggling with the COVID-19. Pandemic fear is unleashed in developing countries like India, where lockdown and quarantine are the only options to contain the spread of COVID-19. Adopting appropriate hygienic practices, practicing social distance, wearing a mask and maintaining coughing etiquette can act as social vaccines to save us in this dark hour of pandemic distress. Access to traditional mental health care services become difficult due to distancing and quarantine; therefore, Tele counselling with the help of smartphones can help remove barriers to accessing quality mental health care. The general public mental health issues which remain unaddressed during this "pandemic unpreparedness", is mainly due to associated factors like lack of knowledge, negative attitudes and inappropriate practices. The global and regional health care regulatory bodies should design an effective and efficient strategy to combat COVID-19.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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