



Knowledge, Attitude and Practices (KAP) of General Population towards COVID-19 in India

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Authors' contributions

This work was carried out in collaboration among all authors. Author RMG and Author SKM designed the study and did data collection and Author RMG wrote the manuscript. Author SKM and Author AN managed the data analyses. Author AN did literature searches. All authors read and approved the final manuscript.

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ABSTRACT

COVID-19 was declared a pandemic by the World Health Organization (WHO) in January 2020. Considering its unprecedented mortality and morbidity, a global lockdown was imposed worldwide which resulted in the halt of all economic and social activity. Most countries including India applied strict prevention and control measures to control the spread of COVID-19, which include general lockdown, obligatory home quarantine, a ban on public gatherings, international flight restrictions, etc. In this regard a KAP analysis was conducted to understand the public knowledge, reactions, adherence to, and acceptance of measures for protection against COVID-19 during first and second wave of COVID-19. Individuals above the age of 15 years were selected as the sample. The data were collected during both waves of the COVID-19 pan India from 500 respondents using a self-administered questionnaire in Google form. The results revealed that the majority of the respondents were knowledgeable regarding the spread, prevention and control of the COVID virus. Most of the respondents had positive attitude regarding control measures imposed by the government which was consistent with their attitude and practices during first wave. A negative change in the attitude of the respondents and practices was seen despite rise in knowledge due to compelling variables like economic crisis, emotional crisis and individual's reduced functioning.

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1. INTRODUCTION

On 31, December 2019, The World Health Organization (WHO) reported the occurrence of an unknown virus causing respiratory problems. The virus was later named by the International Committee as Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) that causes COVID-19 or the Corona virus disease [1]. Considering unprecedented mortality and morbidity due to COVID-19 and its impact on humankind, WHO declared it as a serious public health emergency of international concern on January 30, 2020 [2]. Since then, COVID-19 has taken a heavy toll on the world, claiming many lives. The virus spreads between humans by coughing discharge that contaminates the surfaces. It can also be highly transmitted by asymptomatic individuals during the virus incubation period. The virus can last on surfaces up to 5 days depending on the type of surfaces, although infected people may be asymptomatic, others may develop flu-like symptoms including fever and coughing, which may deteriorate in some cases [3]. To prevent the infection socially, a global lockdown was imposed worldwide which resulted in the halt of all economic and social activity.

Most countries applied strict prevention and control measures to control the spread of COVID-19, which include general lockdown, obligatory home quarantine, a ban on public gatherings, international flight restrictions, etc. Also, effective preventive measures were recommended to the public including hand washing, social distancing, mask-wearing, respiratory hygiene (covering mouth and nose while coughing or sneezing), household ventilation and disinfection, and reduction of interpersonal contacts by avoiding visiting crowded spaces [4].

India, being one of the largest democratic countries in the world and home to 138 crore people, had its first case as early as 30th January 2020 in the Kerala state [5]. Subsequently, the number of cases drastically rose. On 22 March, 2020 the Indian Government imposed a nationwide lockdown to curb the rising cases of Corona virus. An estimated of 32 lakh people died of COVID-19 from June 1, 2020 to July 2021 in India [6]. Daily cases peaked mid September 2020 with over 90,000 cases per day dropping to below 15,000 in January 2021.

Second wave began in March 2021, was much more devastating than the first with shortage of beds, hospitals, vaccines, oxygen cylinders etc. in different parts of the country. On 30th April 2021, India became the first country to report over 400,000 new cases in 24 hours period.

Amidst pandemics, educating, engaging, and mobilizing the public to become active participants help achieve public health emergency preparedness, reducing the overall population's vulnerability [7]. Distributing proper information can not only guide society through such events but can also increase epidemic preparedness that might occur in the future. On the other side, negative attitudes and practices towards new infectious diseases can aggravate epidemics which may eventually result in pandemics [8]. When people collectively engage in preventive behaviors, including practicing personal hygiene and maintaining social distance, it is possible to control the spread of the disease. Individual behaviors may dramatically decrease morbidity and mortality rates of COVID-19 [9]. The knowledge, awareness, and practice (KAP) studies, helps to understand the public knowledge, reactions, adherence to, and acceptance of measures that affect psychologically, socially, and physically the daily life of people [10]. The information improves the awareness level of the citizens as well as encourage positive attitudes, which could help in the fight against COVID-19 and similar future threats [11]. Keeping in view the above scenario the present study was conducted to assess the difference in the knowledge and attitude of the people regarding COVID-19 as well the practice adopted by the Indians to fight against the disease during first two waves.

2. MATERIALS AND METHODS

The study was based on data collected from 500 respondents selected from different zones of India namely North, South, Central, East and West during the years 2020 and 2021. For the study, a web based survey was conducted to evaluate public's knowledge, attitudes, and practices during the COVID-19 epidemic, using a self-administered questionnaire in Google form. Individuals above the age of 15 years were selected as the sample. The questionnaire consisted of four parts. The first part covered the demographic profile of the respondents. The second part was about the knowledge of the

respondents about COVID-19. Attitude of the respondents regarding COVID-19 was seen in the third part and lastly COVID appropriate practices adopted by the respondents were noted in the fourth part.

Respondents' knowledge about COVID-19 was assessed using a self-structured questionnaire consisting thirteen questions regarding the symptoms, prevention and control of the disease comprising of 6 negative and 7 positive statements. The responses were recorded under three categories as "true", "false" and "I don't know" with score of 3, 2 and 1 respectively for positive statements. The scoring was reversed for the negative statements. The attitude of the respondents was measured using a three point rating scale consisting of 6 statements, the response of which were recorded as "Agree", "Neutral" and "Disagree" with score of 3, 2 and 1 respectively for positive statements. The scoring was reversed for the negative statements. To curb the spread of the virus Government suggested several practices for the people to follow. In this regard 10 statements were developed to test the adherence of the population to those practices. The responses were recorded as 'Always', 'Often', 'Sometimes' and 'Never' with the score of 4, 3, 2, and 1 respectively.

Social media platforms such as Facebook, What's App etc., were used to disseminate the questionnaire which was accessible by clicking on the link. The respondents were requested to click on the link and fill in the information. During the first wave, 569 respondents filled the questionnaire. These respondents were again requested to fill the same questionnaire via emails during second wave. Overall 500 questionnaires received back thus the present analysis is based upon 500 respondents.

3. RESULTS AND DISCUSSION

The results of the study are discussed under four headings namely demographic profile of the respondents, Knowledge of the respondents regarding COVID-19, Attitude of the respondents towards COVID-19 and practices followed by the respondents during COVID-19 pandemic.

Table 1 represents the demographic profile of the respondents. The results reveal that nearly half of the respondents (48.4%) were from Northern zone of India followed by Central zone with 19.8% respondents. Approximately equal

number of respondent's i.e. 13% and 12.6% were from East and West zone respectively while only 6.2% of the respondents belonged to South zone. The male population was 52.40% and while women contributed 47.60% of the population. Majority of the respondents (61.2%) were between 15 to 30 years of age followed by 32% in the age group of 31 to 45 years. The data further revealed that majority of the respondents (56.2%) were graduate, followed by 20.4% postgraduate while few (2.0%) respondents had education below secondary level. Majority of the respondents (41.1%) were engaged in service sector while 39% of the respondents were students.

3.1 Knowledge of the Respondents Regarding COVID-19

A glance at Table 2 depicts the knowledge of the respondents regarding COVID-19 during first and second wave. The data reveals that majority of the respondents were knowledgeable regarding the spread and prevention of the COVID-19 virus. This finding is consistent with the cross-sectional study done across the Saudi population by [12], where the participants achieved a mean of 81.64% in the knowledge questionnaire.

The data further depicts the positive percentage change in the knowledge of the respondents from 79.28 % in 2020 to 93.69% in 2021 which accounts for 14.41% increase in the knowledge. The similar change in knowledge was seen in the study conducted in 2020 by Nazar, et al. [13], in which, at the beginning of the pandemic many people were not much familiar with disease. News websites and social media were the main sources of knowledge. However in the second wave the respondents indicated using other sources of knowledge such as governmental and science-oriented websites with up to date information and findings presented in scientific knowledge sources.

Majority of the respondents in both the years had knowledge regarding the mode of transmission of the disease as 89.8% respondents in 2020 and 94% in 2021 agreed that the "COVID-19 virus spreads via respiratory droplets of infected individuals" nearly 65% of the respondents in 2020 and 94% in 2021 said that "wearing a mask will reduce the risk of COVID 19 infection". This result is congruent with the results of the study conducted by Tran [14] where the majority of participants displayed knowledge about the "clinical and pathogen characteristics of COVID-19".

Table 1. Demographic profile of the respondents

Profile	Frequency (f)	Percentage (%)
Zone		
North	242	48.4
South	31	6.2
Central	99	19.8
East	65	13
West	63	12.6
Area of Residence		
Rural	301	60.2
Urban	199	39.8
Gender		
Male	262	52.4
Female	238	47.6
Age		
15-30yearsold	306	61.2
31-45yearsold	160	32
46-60yearsold	24	4.8
above60yearsold	10	2.0
Educational qualification		
Secondary level (10 th)	10	2.0
Senior secondary(12 th)	61	12.2
Graduate	281	56.2
Postgraduate	102	20.4
Doctorate	30	6.0
Others	16	3.2
Profession/occupation		
Student	195	39
Home-maker	24	4.8
Business	58	11.6
Unemployed	11	2.2
Service	207	41.4
Farmer	5	1

As far as clinical symptoms were concerned majority that is cent percent of the respondents in 2021 and 91% in 2020 were knowledgeable about the symptoms of corona virus. Hand hygiene (98% in 2021 and 94.6% in 2020) and Isolation and treatment of people infected with the COVID-19 virus (100% in 2021 and 95% in 2020) were reported as the effective ways to reduce the spread of the virus. Similar results were revealed in the study conducted by Alahdal et.al. [8] where majority of the respondents were aware that virus could be transmitted from an infected person (99%), through touching contaminated surfaces and shaking hands (98%), using COVID-19-infected personal tools (94.9%) and through coughing (92%). Further in2021, 98% of the respondents agreed that the person could be re-infected by COVID-19 virus

even if he/she has successfully recovered from the first infection.

It was interesting to note that 47.10% of the respondents in 2020 believed that the warm weather will end the COVID-19 virus, however in 2021 (92%) of the people were aware of the fact that corona virus was unaffected by the weather changes. Majority of the respondents (90%) till 2021 said that there was no cure for the corona virus. The study conducted by Weitz et. al. [15] also revealed the similar results where majority of respondents agreed that there are neither available vaccines (56%), nor the use of antibiotics is sufficient to kill the virus (60%). Further 96% of the respondents in 2021 knew that people of all age groups were susceptible to COVID-19 infection.

Table 2. Comparison of knowledge about COVID-19 pandemic during first and second wave

Knowledge statements	First wave F (%)	Second wave F (%)	Percent Change
The COVID-19 virus spreads via respiratory droplets of infected individuals.	449(89.8)	500(100)	+10.2
Wearing a mask will reduce the risk of COVID 19 infection.	325(64.9)	470(94)	+29.1
The main clinical symptoms of COVID-19 are fever, dry cough and Myalgia.	456(91)	500(100)	+9.0
There is currently no effective cure for COVID-19.	417(83.2)	450(90)	+6.8
Early symptomatic and supportive treatment helps the patients to recover from the infection.	364(72.7)	415(83)	+10.3
People of all age groups are susceptible to infection by COVID-19.	448(89.4)	480(96)	+6.6
Hand hygiene is the most important way to prevent the spread of the virus.	474(94.6)	490(98)	+3.4
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	476(95)	500(100)	+5.0
Eating Vegetarian or Non-vegetarian food has nothing to do with COVID 19 infection.	358(71.7)	425(85)	+13.3
COVID-19 virus remains on different surfaces for more than 10 hours to 3 days.	370(73.9)	450(90)	+16.1
This disease can spread from currency notes, newspapers etc.	389(77.6)	460(92)	+14.4
A person can be infected by COVID-19 for the second time also.	370(73.9)	490(98)	+24.1
COVID-19 will not end even if the weather is warm.	265(52.9)	460(92)	+39.1
Overall knowledge percent	79.28	93.69	+14.41

3.2 Attitude of the Respondents towards COVID-19

The data in Table 3 represents the mean values regarding attitude of the respondents towards COVID-19 during first and second wave. The data shows that the attitude of the respondents became neutral during second wave while it was positive during first wave. This is because second wave was more devastating which resulted in fear about its repercussions. Moreover people were psychologically depressed with the lockdown and suffered financial losses due to lock down. A study conducted by Witteveen and Velthorst [16] indicated a striking positive relationship between instantaneous economic hardships during the COVID-19 lockdown and expressing feelings of depression and health anxiety.

Majority of the respondents agreed on taking precautions against the pandemic with mean

scores of 2.95 and 2.86 during first and second wave respectively. A lady, who lost her husband as well as her younger son during pandemic, regretted their families' careless attitude toward preventive measures. Another 23 year old boy, who lost his mother during first wave, said that they initially thought COVID-19 was just a superstition but it ruined his life as his father also could not survive after that. During first wave, the respondents had positive attitude towards isolating themselves if they showed any symptoms of the disease. The results were in line with findings of the study conducted in 2020 in which over 90% of the respondents had favorable attitude in limiting the spread of COVID-19 as "staying at home" and "isolating the infected individuals" ranked first with 99.7% and 99.9% respectively. These measures have been taken by many countries and have shown to be significantly successful in controlling the spread of the virus [9].

Table 3. Comparison of the attitudes of the respondents towards COVID-19 pandemic during the two COVID waves

Statements	First wave (Mean score)	Second wave (Mean score)
To fight against this pandemic disease, taking precautions are better than.	2.95	2.86
I will not isolate or quarantine myself if I had fever and cough.	2.55	1.67
India's decision of lock-down was correct	2.95	2.25
There is no need to keep a distance of one meter or more from others when coughing or sneezing.	2.77	2.80
COVID-19 will finally be successfully controlled.	2.60	2.56
Donating money to the NGOs who are working against COVID-19 is more beneficial than donating it to the PM/ CM care fund.	1.77	2.12
Overall mean	2.60	2.38

However during second wave attitude towards isolation was not that positive. This could be due to various socio-economic consequences of pandemic. The global impact of the COVID-19 pandemic increased the loans required by people, which was a financial catastrophe for many workers and employees who lost their jobs [17]. UNESCO estimated that approximately 900 million learners have been affected due to the disruption in education due to COVID-19 [18]. People had difficulty in accessing healthcare services, which may increase the risk of chronic disease deterioration [19]. Many people (17.9%) reported a physical and/or verbal abuse episode from family members, (11.9%) reported abuse outside the family, and (7.9%) reported abuse from enforcers, during the lockdown [20].

During first wave participants were also in favor of Government's decision of lockdown during

pandemic as indicated by the mean score of 2.95 in first wave. This finding is consistent with the studies conducted in China and Saudi where majority of the participants were convinced that their Government will combat the disease [12,21]. The agreement to lockdown however reduced drastically during second wave. This is obvious as many people suffered financial crunch due to lock down. As far as social distancing was concerned majority of the respondents said that it was best to keep a distance of one meter or more from others while coughing or sneezing. Majority of the respondents had positive attitude that COVID-19 will be successfully controlled with nearly similar mean score (2.60 and 2.56) for both the years. People had neutral attitude towards donating money to the NGO's working against COVID-19 than donating it to the PM/ CM care fund during both waves.

Graphical depiction of the respondent's attitude during COVID -19 in 2020 and 2021

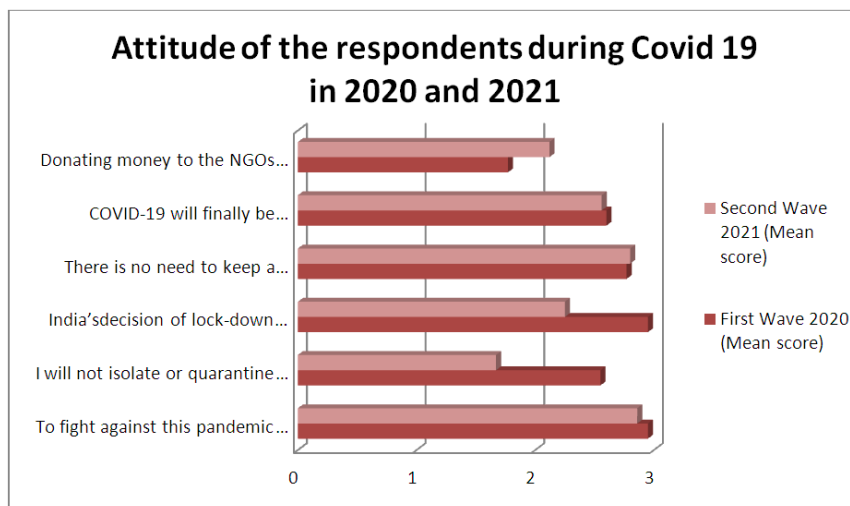


Fig. 1. Attitude of the respondents during COVID-19 in 2020 and 2021

3.3 Practices Followed by the Respondents during COVID-19 Pandemic

The data in Table 4 represented the comparative analysis of the practices followed by the

respondents during the pandemic in the years 2020 and 2021. A glance of the table shows that people followed the practices for the prevention and control of the virus more during first wave as compared to second wave.

Table 4. Comparison of the practices followed by the respondents to safeguard themselves from the COVID-19 infection

Statements	First wave Mean value (1-4)	Second wave Mean value (1-4)
Avoid going out during lock-down	2.71	2.43
Wash/sanitize hands after coming back home.	2.94	2.51
Wash hands at least for 20 sec with soaps	2.74	2.32
Wear face mask when leaving home	2.80	2.17
Changed the routine food pattern during lock- down to increase immunity.	2.19	1.85
Sanitize your mobile phones, TV remotes and kids play toys.	2.06	1.72
Increased the consumption of vitamin C rich foods during this lock-down.	2.16	2.40
Take extra care and other precautionary measures while going for grocery shopping.	2.71	2.31
Keep groceries aside for 2-3 days after bringing home.	2.04	1.36
Discard the container/poly bags of groceries in a closed dustbin.	2.56	1.25
Overall mean	2.50	2.03

Graphical depiction of the practices followed by the respondents during COVID-19 in 2020 and 2021

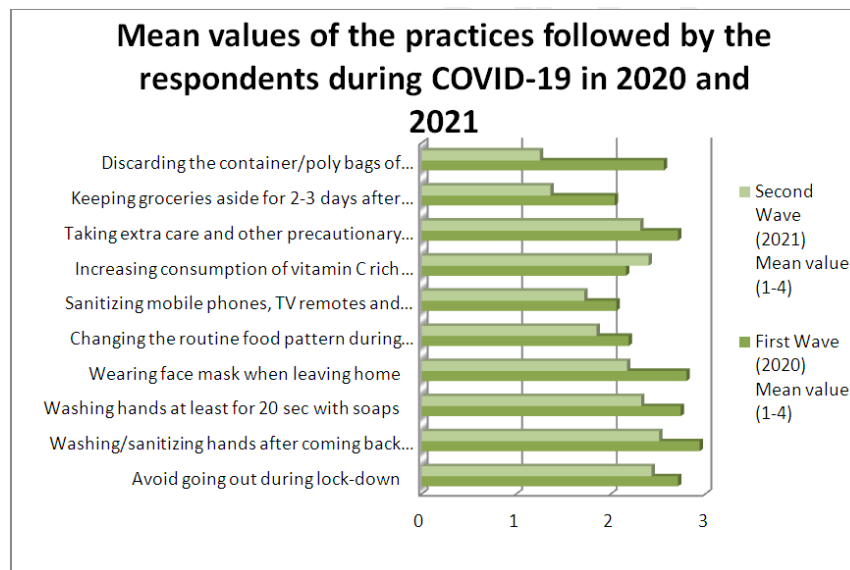


Fig. 2. Mean values of the practices followed by the respondents during COVID-19 in 2020 and 2021

From the results it is revealed that a greater number of people avoided going out during lockdown during first wave than during second wave as the mean scores went down from 2.71 to 2.43. This could be due to the reduced fear in public as it was impairing their businesses and work. Kelvin [22] put forward that the amount and severity of anxiety that is faced is important in determining whether it will impair the individual's functioning. Majority claimed to sanitize/wash their hands after coming back to home however its frequency also went down from always to sometimes as indicated by the change in the mean score from 2.94 to 2.51. The frequency of using face mask when going outside also went down from 2.80 to 2.17. The consumption of vitamin C rich foods by the respondents was increased during lock down as indicated by the mean scores of 2.16 and 2.40 while nearly half of the respondents in both the waves reported to have changed their routine food pattern during lock- down to increase their immunity.

Majority of the respondents (2.71 and 2.31) took extra care and precautions while going for grocery shopping while they were not very precautionous during second wave. In the year 2020, nearly half of the respondents would keep their groceries aside for 2-3 days after bringing home however this number declined in 2021 as the mean scores went from 2.04 to 1.36. As far as sanitizing mobile phones, TV remotes and kids play toys were concerned half of the respondents said that they always sanitized them. Majority of the respondents (2.56) practiced discarding the container/poly bags of groceries in a closed dustbin.

The study revealed that respondents had knowledge regarding prevention and control of the disease which became apparent in their attitude and COVID- appropriate practices during second wave. This observation was in congruence with the results of the study conducted by Erfani et. al. [23] in which higher knowledge score regarding COVID-19 was significantly associated with a higher likelihood of having positive attitude and good practice at the time of COVID-19 pandemic. The result of the current study, points towards other intervening compelling variables like economic crisis, which may not allow people to comply with knowledge. The results also show that psychological needs are more important than safety needs consistent to Maslow's need hierarchy. Besides it also

indicates that fear was reduced during second wave as it was impairing individual's functioning.

4. CONCLUSION

As far as practices were concerned majority of the respondents followed the practices strictly in the year 2020 however they seemed reluctant to do so in the year 2021. This was due to their psychological needs, reduction of individual's output due to fear and anxiety. Given the present situation of the pandemic, new strains of the virus are identified every year thus making it highly unpredictable whether the virus could be contained or not therefore public adherence to preventive and control measures and a routine practice of precautionary behaviors must become the new status quo. Wearing masks when outdoors, avoiding large gatherings, getting vaccinated, avoiding contact with infected people, taking balanced diet, doing regular exercise are some of the measures which should be judiciously followed by the people. Strict infection prevention, mitigation, and containment strategy must be skillfully charted out by the State health departments.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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