

Knowledge, attitude, and practices regarding COVID-19: A cross-sectional study among rural population in a northern Indian District

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ABSTRACT

Background: First case of COVID-19 was reported in December 2019 and within a timespan of few months, it has become a pandemic. It has created havoc globally and India is no exception. Globally, it is emphasized that preventive measures play an important role in controlling the rapid spread of COVID-19. In India, 68% of population is rural and this population is going to play a crucial role in the containment of the pandemic. Realizing the key position of rural population in COVID control, this study was conducted to assess the knowledge, attitude, and practices of rural population about the disease. **Method and Material:** A cross-sectional questionnaire-based study was conducted on patients and their relatives from 1st April, 2020 to 31st May, 2020. A total of 372 participants hailing from rural areas were enrolled. **Results:** Most common source of information for the participants was through television (54.8%) and radio (49.2%). Only 77% claimed that they were using face mask and 72% claimed to be following social distancing. A large (60%) proportion of the participants did not know that COVID-19 could spread from asymptomatic patients. Education of participants was a key determinant for use of social distancing and face mask as a preventive tool. With increasing age, the practice of social distancing and the use of face mask were decreasing in our study. **Conclusion:** Television/Radio channels form an important source of information and need to be used more effectively to educate the people about the disease and create awareness about effective preventive measures. People need to be educated about the role of asymptomatic carriers in spreading the disease.

Keywords: Awareness, COVID-19, India, knowledge, rural population

Introduction

Coronaviruses are a large family of enveloped, nonsegmented positive-sense RNA virus belonging to *Nidovirales* order.^[1] A prominent feature of this virus is the club-shaped spike projections emanating from its surface, giving it the appearance of a solar

corona. They are known mainly to cause a variety of diseases in animals, especially in mammals and birds. Sometimes they can cause infections in humans like severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and now the coronavirus disease 2019 (COVID-19). In December, 2019, cases of pneumonia of unknown origin were reported from Wuhan city of China. These were later diagnosed to have been caused by a novel coronavirus which was named as SARS-CoV-2 and the disease caused by it is called as COVID-19. The disease rapidly spread from China and as of 16th June, 2020 has spread to 216 countries worldwide.^[2] COVID-19 was declared a pandemic by WHO on 11th March, 2020. The disease has now

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a human-to-human spread with a very high rate of infectivity. First case was reported in India on 30th January, 2020 and since then the cases have been continuously increasing. Various efforts by the government like nationwide lockdown since 24th March, 2020, upgrading the necessary health care facility, etc. have kept a check on rapid spread of the disease. However, nation-wide lockdown cannot be extended beyond a particular period of time because of various reasons.

Since there is no vaccine and no proven treatment for the disease till date, preventive measures play an important role in breaking the chain and spread of the disease.^[3] India with its high population density faces a unique challenge to contain spread of the disease. Public awareness and their attitude toward preventive measures will play an important role in its containment. It is a relatively new disease with a very high rate of infectivity; hence, it is important to educate the public about its mode of spread and preventive measures. A large percentage of Indian population lives in rural areas and might not have access to internet to gather these information. Knowledge, attitude, and practices of these rural inhabitants are going to play a very crucial role in the prevention and control of COVID-19 pandemic in India in near future. As COVID-19 is a new phenomenon, there is a paucity of information about knowledge, attitudes, and practices among general population and rural populations in particular in India. Keeping all these points in mind, this study is an attempt to understand the knowledge and behavior of rural population regarding COVID-19, in the Sitapur district of Uttar Pradesh.

Method and Material

Study design

A prospective cross-sectional questionnaire-based study was conducted from 1st April, 2020 to 31st May, 2020 in Ophthalmology Out-Patient Department of a tertiary care Institute of north India. All patients hailing from rural areas and their relatives attending the OPD were included in the study except for very sick patients or those who did not give consent.

Sample size and statistical analysis

A sample size of 386 was calculated using *P* value as 0.5 at 95% confidence interval and 5% absolute precision, as it yields the maximum sample size.^[4] Fourteen forms were not included in the final analysis because of incomplete and inadequate information provided by the respondents. Responses of a total of 372 participants were included in the final analysis. All the forms were kept under the custody of principal investigator and descriptive analysis in the form to percentages and proportions was done using Microsoft Excel software. Appropriate statistical tests were applied as and when appropriate.

Study tool

A questionnaire was developed with the help of WHO training material for the detection, prevention, response, and control of COVID-19 keeping in mind the local needs and practice of the

population under study.^[5] All patients and their relatives attending the Ophthalmology out Patient Department were requested to fill the questionnaire form after consent. For an illiterate patient, either the patient's relative or medical personnel assisted in filling the form. The questionnaire was designed both in Hindi and English so that the participant could choose the language he/she was comfortable in.

Results

Three hundred seventy-two persons completed the questionnaire and were included in the study. Seventy-one percent of the participants were male. More than half (58%) of the participants were 25–50 years old, while 32% of them were less than 25 years. More than half of the participants had education less than 10th standard. Only 10% of the participants were graduates [Table 1].

Most (96%) of the participants knew that a pandemic due to coronavirus is going on and the most common source of information for them was through television (54.8%) and radio (49.2%) [Table 2].

In response to the preventive measures being followed by the participants, 77% claimed that they were using face mask and 72% claimed to be following social distancing. Sixty-two percent of the participants were avoiding visitors or unnecessary movement outside the home. Seventy-four percent of the participants said they were washing their hands frequently [Table 3].

Table 1: Demographic profile

Domain	Category	Number	(%)
Gender distribution (n=372)	Male	264	71%
	Female	108	29%
Age distribution (n=372)	<25 Years	117	31.5%
	25-50 Years	216	58%
	>50 years	39	10.5%
Education level (n=372)	<10 th standard	216	58%
	10 th -12 th standard	120	32.3%
	Graduate and above	36	9.7%

Table 2: Source of information

Question	Number (n)	(%)
Government	144	38.7%
Friends and relatives	93	25%
T. V.	204	54.8%
Radio	183	49.2%
Internet/Social media	126	33.8%

Table 3: Preventive measures being used

Question	Number (n)	(%)
Social distancing	270	72.5%
Face mask	285	76.6%
Avoiding social gatherings	243	65.3%
Avoiding outside movement from home	234	62.9%
Frequent hand wash and use of sanitizer	276	74.2%
Not allowing visitors at home	231	62%

On inquiring about difficulties faced by the participants in following the preventive measures, 15% of the participants reported that they were not able to buy a face mask and 18% of the participants were not comfortable with wearing a face mask [Table 4].

Regarding knowledge of the disease and its symptoms, 91% recognized fever and 87% recognized cough as the main symptom of the disease. Sixty-four percent of the participants knew that it was associated with difficulty in breathing also. A large (60%) proportion of the participants did not know that COVID-19 could spread from asymptomatic patients. Again only 27% of the participants could exactly identify the condition in which they should report to the medical facility. A little more than half (57%) of the participants knew about the Arogya Setu app which is an IT tool launched by Government of India as a weapon in fight against COVID-19. Only 50% of the participants had downloaded it. Forty percent of the participants knew the COVID-19 helpline number. Due to the pandemic of COVID-19 disease and the restrictions imposed, people had to face a lot of difficulties. Regarding the same, 56% of the participants stated that they had monetary constraints due to the restrictions implemented and around 27% felt difficulty in staying at home most of the time. Forty percent of the participants faced difficulty in withdrawing money from the bank and with online education. Only 15% of participants had difficulty with agriculture-related activities [Table 5].

On further analysis, it was evident that education was a significant predictor of knowledge about COVID-19 in the study population. Social media was found as a significant source of information in those who had higher education levels. Those who were more educated were more aware about the fact that asymptomatic persons may also be a source of infection to others. Education level also determined the awareness about Arogya Setu app. Education levels were also significant predictors of social distancing and face mask use in our study [Table 6]. In our study, males were more aware about the pandemic than females. Males were found using frequent hand washing and face mask for the prevention of COVID-19 at a significantly higher level than females [Table 7]. We also noticed that with the increasing age, the proportion of people using face mask decreased. This relation was significant on statistical analysis. It was also observed that those aged >50 years were less religiously following social distancing than younger participants. Other than that age was not a significant predictor in other domains like knowledge about the pandemic and use of Arogya Setu app, frequent hand washing, etc. [Table 8].

Discussion

COVID-19 is rapidly spreading in India. As on June 16th, 2020, India had 3,43,091^[6] cases and the numbers are rapidly increasing. With no vaccine and no proven treatment as of now, prevention is the most important measure that can be taken. For that people need to be educated about the disease,

Table 4: Difficulties faced in following preventive measures

Question	Number (n)	(%)
Inability to work with social distancing	36	9.6%
Feeling of loneliness and isolation	36	9.6%
Inability to buy face mask	15	4.0%
Finding face mask use uncomfortable	18	4.8%
Don't know the technique of preparing face mask	30	8.0%
Inability to purchase sanitizer	57	15.3%
Soap/sanitizer out of stock in market	06	1.6%
Inability to buy soap	09	2.4%

Table 5: Difficulties faced due to COVID-19 preventive measures and imposed restrictions

Question	Number	%age
Shortage of money	207	56%
Procuring day-to-day grocery items	90	24%
Inability to participate in social gatherings	117	31.5%
Accessing health care facilities	99	26.5%
Bank-related work/money withdrawal	147	39.5%
Online education of children	147	39.5%
Difficulty in agriculture-related work	54	14.5%
Going to other cities	192	51.6%
Remaining homebound for long duration	99	26.5%

Table 6: Education as a predictor of different aspect related to COVID-19

S. No	Predictor under study	Question under study	Chi-square trend, P
		Awareness about ongoing pandemic of COVID-19	
1.	Education	Yes No	$\chi^2=2.81$
	<10 th standard	204 12	$P>0.05$
	10 th -12 th standard	117 3	
	Graduate and above	36 0	
2.	Education vs. practice of social distancing		
	<10 th standard	144 72	$\chi^2=7.92$
	10 th -12 th standard	96 24	$P<0.05$
	Graduate and above	30 6	
3.	Social media as source of information about COVID-19		
	<10 th standard	54 162	$\chi^2=25.06$
	10 th -12 th standard	48 72	$P<0.05$
	Graduate and above	24 12	
4.	Can asymptomatic person transmit the disease?		
	<10 th standard	69 147	$\chi^2=18.43$
	10 th -12 th standard	57 63	$P<0.05$
	Graduate and above	24 12	
5.	Do you know about Arogya Setu app?		
	<10 th standard	99 117	$\chi^2=23.09$
	10 th -12 th standard	87 33	$P<0.05$
	Graduate and above	27 9	
6.	Education and use of face mask		
	<10 th standard	144 72	$\chi^2=23.53$
	10 th -12 th standard	108 12	$P<0.05$
	Graduate and above	33 3	
7.	Education and frequent hand wash		
	<10 th standard	156 60	$\chi^2=1.57$
	10 th -12 th standard	90 30	$P>0.05$
	Graduate and above	30 6	

Table 7: Gender as a predictor of different aspect related to COVID-19

S. No	Predictor under study	Question under study		Chi square value, P
		Awareness about ongoing pandemic of COVID-19		
1.	Gender	Yes	No	$\chi^2=19.707, P<0.05$
	Male	261	3	
	Female	96	12	
	2.	Gender vs. practice of social distancing		
	Male	186	78	$\chi^2=2.06, P>0.05$
	Female	84	24	
3.	Social media as source of information about COVID-19			$\chi^2=0.747, P>0.05$
	Male	93	171	
	Female	33	75	
	4.	Can asymptomatic person transmit the disease?		
	Male	117	147	$\chi^2=6.033, P<0.05$
	Female	33	75	
5.	Do you know about Arogya Setu app?			$\chi^2=0.072, P>0.05$
	Male	150	114	
	Female	63	45	
	6.	Gender and use of face mask		
	Male	210	54	$\chi^2=4.36, P<0.05$
	Female	75	33	
7.	Gender and frequent hand wash			$\chi^2=4.50, P<0.05$
	Male	204	60	
	Female	72	36	

its mode of spread, and methods of prevention and they also have to be motivated enough to inculcate these lifestyle changes. India is the second-most populous country with a population of 1,352,642,280^[7] and has a significant number of people living in the rural area (68.8%).^[8] With a high population density (382 persons per square kilometer)^[8] it might be difficult to follow the preventive measure like social distancing. Some states have further high population density like for Uttar Pradesh, it is 828,^[8] making social distancing even more difficult.

In our study, 77% of the population claimed that they were using face mask and 72% claimed to be following social distancing. This is much lesser from a study done by Tomar *et al.*^[9] in which 90.7% males and 97.1% females claimed to be taking adequate protective measures while leaving home. This can be due to the difference in population studied as most of the participants in our study were from rural area. A vast majority of rural population might not have access to internet and social media and rely only on television and radio for the information. This may further limit their information about the disease and the preventive measures to be followed. In our study, for 55% of the participants, the most common source of information was from television. This was different from studies done by Pandey *et al.*^[10] (48.1%) and Wang *et al.*^[11] (93.5%) where the main source of information for the participants was through social media and internet, respectively. A study done by Erfani *et al.*^[12] showed that participants whose sources of information was from social media, scientific articles, and journals had a significant higher knowledge of the disease ($P \leq 0.001$) as compared

to news media users who had significantly lower knowledge regarding the transfer routes and groups at higher risk regarding COVID-19 ($P = 0.006$). In our study, more than half (58%) of the participants had only primary education or less. This is much less than many studies like of Roy *et al.*,^[13] Abdelhafiz *et al.*,^[14] and Tomar *et al.*^[9] where at least more than half of the studied population was graduate. This is because most of the studies done regarding the knowledge and awareness used mails and social media to distribute the questionnaires but a significant proportion of rural population might not be educated enough to use mails and social media. In our study, though most of the participants knew that fever (91%) and cough (87%) were the most common presenting symptoms of the disease, only 64% knew it could be associated with breathing difficulties also. Only 27% of the participants knew that about the criteria for reporting immediately to a health care facility and only 40% of the participants had the COVID-19 helpline number. A significant (60%) of the studied population thought that the disease could not be spread by an asymptomatic carrier. This was in contrast to a study done by Abdelhafiz *et al.*^[14] where 81.8% of the population knew that the disease could be transmitted by asymptomatic carriers. With this misconception, people might decrease their guard and not use preventive measures properly and all the time. We need to focus more to spread the correct information and educate the rural population about the methods of spread and prevention techniques. Hence, in our study, we also tried to find out if people were aware of Government of India's Arogya Setu app and were using it. Only half (51%) of the studied population had downloaded the app and only 57% knew that there is such an app. In our study, 56% of the participants faced problems due to shortage of money. Monetary constraints might not allow people to buy and use mask.

Conclusion

A very limited number of studies have been done on rural population which constitutes 68.8% of the Indian population. To limit the spread of COVID-19, we need to educate this population regarding the disease and its preventive methods aggressively. A vast majority of rural population does not have access to internet; hence, we need to utilize the television/radio channels more effectively for the same and also emphasize to the population about the role of asymptomatic carriers in spreading the disease.

Limitation

This was a hospital-based study so might not be exactly representative of the general population. This is also a self-reported questionnaire-based study regarding the preventive practices being followed and participants might have not reported accurately.

Ethical consideration

The study was approved by the Institutional Ethics Committee.

Table 8: Age as a predictor of different aspect related to COVID-19

S. No	Predictor under study	Question under study		Chi-square for trend, P
S. No	Awareness about ongoing pandemic of COVID-19			
1.	Age	Yes	No	$\chi^2=2.45$ $P>0.05$
	<25 years	114	3	
	25-50 years	207	9	
	>50 years	36	3	
2.	Age vs. practice of social distancing			$\chi^2=5.96$ $P<0.05$
	<25 years	93	24	
	25-50 years	153	63	
	>50 years	24	15	
3.	Social media as source of information about COVID-19			$\chi^2=0.53$ $P>0.05$
	<25 years	48	69	
	25-50 years	60	156	
	>50 years	18	21	
4.	Can asymptomatic person transmit the disease?			$\chi^2=0.03$ $P>0.05$
	<25 years	54	63	
	25-50 years	72	144	
	>50 years	24	15	
5.	Do you know about Arogya Setu app			$\chi^2=7.32$ $P>0.05$
	<25 years	75	42	
	25-50 years	123	93	
	>50 years	15	24	
6.	Age and use of face mask			$\chi^2=9.88$ $P<0.05$
	<25 years	99	18	
	25-50 years	162	54	
	>50 years	24	15	
7.	Age and frequent hand wash			$\chi^2=1.18$ $P>0.05$
	<25 years	93	24	
	25-50 years	153	63	
	>50 years	30	9	

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Conflicts of interest

There are no conflicts of interest.

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