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Original Research Article

Knowledge, attitudes and practices of rural population towards COVID-19 appropriate behaviour in pandemic situation: a cross-sectional study in central India

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ABSTRACT

Background: India is facing a third wave of infection of coronavirus. For controlling the pandemic, it's very crucial that everyone should follow the control measures which is ultimately depended upon the factors like knowledge, attitudes, and practices (KAP) of people towards coronavirus according to KAP theory. At such a critical moment to manage the COVID-19 pandemic in India arises an urgency for understanding people's awareness of COVID-19. So, we plan to present a study in view of investigating the KAP for COVID-19 in rural populations during the outbreak of COVID-19 disease.
Methods: A cross-sectional design with a cluster sampling method from the field practice area of a rural medical college was selected. Participants were above 18 years. Data collection was done after taking informed consent. Data were analysed with R studio software with appropriate statistical tests.
Result: A good knowledge of COVID-19 was found in rural population. Majority of population has good knowledge about COVID-19 epidemiology, signs, and symptoms. Good knowledge corresponds to appropriate behaviour and proper practices in population. Overall participants were confident that India will win war against COVID-19.
Conclusions: Our study findings suggested that the rural population of India with a comparatively high level of education, specifically Health care services people, had proper knowledge, cheerful way of attitude, and appropriately practicing measures towards COVID-19 during the rapid rise period of the COVID-19 cases. Whereas age, gender, and socioeconomic status didn't show any significant association with the knowledge score. We conclude that KAP towards COVID-19 by vulnerable populations warrants special attention for research.

Keywords: COVID 19, Primary health care, Knowledge, Attitude, Practice, KAP

INTRODUCTION

The coronavirus has spread so fast that it disrupted life everywhere in the world. COVID-19 is an illness of the respiratory tract and the novel virus-corona virus is the causative agent. Its first case was identified in December 2019 in Wuhan, China. The newly identified strain of virus is known as severe acute respiratory syndrome coronavirus-2 From Wuhan, it has spread all over the world within a time period of 3 months. The coronavirus has affected every country and territory in the world and also two international conveyances with more than 37 lakh cases and 2.6 lakh deaths.[1,2] This disease is highly infectious, and the patient presents mainly with symptoms like fever, cough, myalgia, and dyspnea. Globally, 3% of patients ended to the late stage and presented with symptoms of acute respiratory distress syndrome or metabolic acidosis also septic shock, coagulation, or

bleeding dysfunction.[1,2] The observed case fatality rate for COVID-19 is 17% in the world and 11% in India as shown by the data.[3,4]

Considering the seriousness of the situation, the world health organization declared COVID-19 as an emergency on 30th January 2020, and to prevent its rapid spread, united efforts are mandatory from all countries.[4]

The world has been highly threatened by this pandemic, and some precautionary measures needed to be adopted in India and all over the world to control the transmission. The measures included suspending public transportation facilities, closing public spaces to avoid gathering, and closing the management of communities. To isolate infected people and suspected cases, district boundaries within the country were locked down. GOI initiated lockdown on 25th March 2020 for India and extended it four times as required due to an increase in the number of cases. Still many public places are not allowed to open or open with some restrictions. There was an attempt to open the schools and colleges in a phased manner but drop out due to the increase in the number of cases. Relaxation is provided as per zone of districts which are updated from time to time based on the number of cases and doubling rate.[5-7]

Presently India is facing the third wave of infection of coronavirus. For controlling the pandemic, it's very crucial that everyone should follow the control measures which is ultimately depended upon the factors like knowledge, attitudes, and practices (KAP) of people towards coronavirus according to KAP theory.[6,7] Experience gained from the outbreak of SARS in 2003 showed as factors like knowledge and attitudes of people toward infectious diseases are proportional to the degree of panic emotion thus complicating efforts for preventing disease spread.[8,9]

At such, a critical moment to manage the COVID-19 pandemic in India arises an urgency for understanding people's awareness of COVID-19. So, we plan to present a study in view of investigating the KAP for COVID-19 in rural populations during the outbreak of COVID-19 disease with objective to assess the knowledge, attitude, and practices of the rural population towards COVID-19 in India during an outbreak.

METHODS

Study design

In the proposed study, a survey was conducted by giving a structured questionnaire to the people in the field practice area of JNMC Savangi, PHC Allipur (Wardha District). As we consider 50% hypothesized frequency of outcome factor in the population (p), with 95% Confidence limits, the required sample size came to 384. We decided to do 500 interviews of 472 agree to participate in study.

A cluster sampling was done to identify the areas from where the samples were to be taken. Clusters were selected at the Gram Panchayat level and all villages falling under the selected Gram Panchayats were included in the survey. 30×15 Cluster sampling method was used for the selection of participants. In each cluster, we chose 5 sub-clusters, and from each sub-cluster, we included three individuals in the study to cover the entire village. Sub-cluster were identified as any prominent landmarks in the village/ urban ward from where the survey team moved in a random direction and included three individuals from consecutive households who consented to participation in the study above 18 years of age. Subclusters were chosen so that all the areas of the village will be included and participants should be representative of all strata.

Study duration

The present study was conducted in the year 2020 from May-August.

Data collection

Data was collected by giving pretested and predesigned structured questionnaires in the local language by an investigator with the help of a front-line worker (FLW). The help of ASHA, AWW, and Local NGOs was taken for explaining the purpose of the study. Data collection was done by the researcher and trained volunteers who were well versed with a questionnaire.

The questionnaire presented the following two parts: firstly, demographics data, and secondly KAP. Demographic variables consisted of gender, age, married status, occupation, education level, and residence. Based on the guidelines of MoHFW (India) and by review of literature, a COVID-19 knowledge questionnaire was prepared. It had 13 questions with regard to clinical symptom presentations of patients, routes of transmission of the virus, and prevention of the COVID-19 pandemic. Questions were answered as true or false, and the additional option was "I don't know". The correct answer was assigned one point and an incorrect/ unknown answer was assigned zero points. The score of knowledge ranged from 0 to 13, with 13 being the highest score meaning good knowledge of COVID-19. Cronbach's alpha coefficient of the questionnaire on knowledge was 0.71 in our study sample, denoting acceptable internal consistency.[10-14] Attitudes toward COVID-19 were measured by a total of four questions regarding the agreement on the control of COVID-19 and the confidence in winning the battle against the opposed COVID-19 situation. To assess respondents' practices four questions were given regarding behaviour. The first question has a reverse marking, with going outside to crowded places having zero scores whereas the remaining three have given scores of one for the positive response and zero for negative and reverse in the first question as it frames reverse.

Data entry and analysis

Data was collected with help of a questionnaire and entered into an excel sheet. Frequencies of correct answers for knowledge, attitudes, and practices were described. Knowledge scores, attitudes, and practices of different persons according to demographic characteristics were compared with independent samples t-test, one-way analysis of variance (ANOVA), or Chi-square test as appropriate. Data analysis is done with the help of Epi info and R software version 3.5.3.[15] The statistical significance level was set at p<0.05(two-sided).

RESULTS

A total of 472 study participants completed the given questionnaire. Of the final study participants, the mean age was 37.0 years (standard deviation [13.8]: range: 18-80). The 205 (43.4%) were male and 267 (56.6%) were female. When data is plotted age group wise and sex, no significant difference was observed in male and female respondents (X-squared=1.8433, df=3, p=0.6056) (Table 1).

Table 1: Distribution of male and female study participants as per age group.

Age (years)	Male	Female
18-25	51	69
25-40	73	107
40-55	55	65
55-80	26	26
Total	205	267

Pearson's Chi-squared test, X-squared=1.8433, df=3, p=0.6056.

About 89% of participants belong to the less than 55 years age group whereas the majority of participants belong to the age group 18-25 years consisting 25.42% and 11.2% were above 55 years (Table 2). Though we have more female participants in the study (56.6%), male and female distribution was not significantly different (Table 2).

The mean year of schooling was up to standard 10th with a standard deviation of 3.3. The 11.9% were graduates and above, while 3.6% never attended school (illiterate). Of the total participants, 76.4% were married and 1.1% were divorced (Table 2). The mean annual income of the family was 36036 (range 4000-450000). The 28.2% fall in the income range of 30000-4000, followed by 20000-30000 income range with 26.3% (Table 3). Socioeconomic status is determined by a ration card. The 218 (46.2%) belong to the above poverty line, 241 (51.1%) belong to BPL, and 13 (2.8%) were Anantyadoyi. The 153 (32.4%) were laborers by occupation, 189 (40%) were engaged in Farming related work, and 56 (11.9%) were students (Table 4).

Correct answers to the 13 questions for the knowledge questionnaire on COVID-19 were 47.2-96.4% with the mean score of 09.62 (SD:1.68, range: 0-13), suggestive of an overall, 73.85% (9.6/13×100) correct rate on the knowledge test. Mean scores of knowledges across males and females were 9.60 and 9.63 resp. We didn't find a significant difference in Knowledge scores across genders, age groups, or categories of marital status (Table 2). Also, village \wise difference is found in the knowledge of respondents which is significant (p<0.0001). When the COVID19 Knowledge score was plotted against income groups (Table3), we don't find any significant difference in the score. But when the mean Knowledge score is plotted against education level (Table 2) and occupation (Table 3) significant difference is found between better knowledge in students and health care workers (p<0.001).

Correct attitude rates were 68.7% to 97.0% for the different questions. 91.1% of respondents opined that COVID-19 can be controlled successfully showing a positive attitude toward COVID-19 preventive efforts by the government authority. The younger age group has more positive attitudes towards control of COVID-19.

The 97% has of opinion that lockdown is essential for the control of the pandemic, though the percentage of people having an opinion that lockdown is essential goes on decreasing, as lockdown extended in phase wise manner, till the fourth lockdown only 68% were agreed with the lockdown. In lockdown one 97% felt that it is essential, whereas as we reached the fourth lockdown from lockdown one to lockdown four, people become more reluctant towards lockdown and become of the opinion that further lockdown is not essential and should be discontinued. But, 92.2 % of people agreed that if needed, again lockdown should be imposed and 94.6% of people were confident as India will definitely win this battle against the COVID-19, of this younger age group has a more positive attitude.

We found the correct practice among 62.9-94.4% of participants. Total mean score were 3.4 (SD=0.8, range-1-4). The 297 (62.9%) of people avoiding to crowded places unnecessarily and stay home. But 175 (37.1%) didn't follow this practice which is significantly high. The majority of the population follows covid appropriate behaviours like wearing masks (91.3%), washing hands (94.3%), and advising people to avoid going to crowded places (94.1%). These practices will definitely help in controlling COVID-19 spread. COVID-appropriate behaviour is better in Higher education people and younger age group.

Farmer (32.3%), laborers (43.3%), housewives (52.2%) visited crowded places more due to their work patterns, whereas students, service people avoided same more.

Table 2: Demographic characteristics of study participants and knowledge score on COVID-19 according to demographic variables.

Variables		No. of study participants, N (%)	Knowledge score	T/F	P value
Gender	Male	205 (43.4)	9.60±1.89	-0.1978	0.8433
	Female	267 (56.6)	9.63±1.49		
Age group (Years)	18-25	120 (25.42)	9.39±2.08	1.048	0.371
	25-40	180 (38.14)	9.72±1.47		
	40-55	120 (25.42)	9.67±1.57		
	55-80	52 (11.2)	9.67±1.53		
Marital status	Married	360 (76.3)	9.63±1.64	01.243	0.292
	Unmarried	96 (20.3)	9.54±1.78		
	Divorced	5 (1.1)	8.8±2.28		
	Other	11 (2.3)	9.0±1.42		
Education	Illiterate	17 (3.6)	9.00±1.36	2.413	0.03
	1-4	42 (8.9)	9.42±1.86		
	5-8	101 (21.4)	9.51±1.83		
	9-10	127 (26.9)	9.66±1.71		
	11-12	129 (27.3)	9.97±1.47		
	Graduate and above	56 (11.9)	9.25±1.59		

Table 3: Socio economic status (Income group) of participants and COVID-19 knowledge mean score.

Income groups (INR)	Frequency (%)	Mean score	SD	F value	P value
4000-10000	26 (5.5)	9.6	1.01	0.784	0.562
10000-20000	87 (18.4)	9.75	1.47		
20000-30000	124 (26.3)	9.43	2.06		
30000-40000	133 (28.2)	9.57	1.47		
40000-50000	62 (13.1)	9.75	1.48		
>50000	40 (8.5)	9.6	1.98		

Df=5, sum squared=11.1, Mean square=2.213, F value=0.784, p=0.562

Table 4: Mean score of COVID-19 knowledge as per occupation.

Occupation	Frequency (%)	Mean score	SD	F value	P value
Business	5 (1.1)	10.4	0.548	2.602	0.0172
Farmer	189 (40)	9.6	1.50		
Health care worker	11 (2.3)	10.9	0.7		
House wife	46 (9.7)	9.97	1.59		
Labourer	153 (32.4)	9.56	1.71		
Service	12 (2.5)	10.00	1.12		
Student	56 (11.9)	9.12	2.22		

Df=6, sum squared=43.1, Mean square=7.183, F value=2.602, p=0.0172.

DISCUSSION

In this survey, predominantly participants were farmer/labourer population from rural parts, with a greater number of female respondents. We found correct answer rate of 73.85% for questions on knowledge which indicated that a large number of participants possess knowledge about COVID-19. IEC effort by different authorities is reaching rural part of India and people are aware of the preventive efforts and appropriate behaviour regarding COVID-19 and has awareness about it. A major proportion of study participants positive about pandemic. The 91.1% had strong belief COVID-19 will controlled while 94.6% had confidence about winning this battle.

As with like attitude of the study population, the practices were very average: only 62.9% avoided visiting congested places and 91.3% used masks while going out from home. We pointed out certain demographic factors related to KAP after analysing relevant characteristics and features for COVID-19. We suppose to relate these findings to be meaningful for policy-makers of public health thereby health department can guide workers for recognizing correct target populations and pandemics can be prevented through health education. The finding on

COVID-19 knowledge in residents was as expected, the reason being the epidemiological survey was administered in the initial days of the pandemic, when the majority of cases were restricted to Urban areas, and at the rural level, there were very limited or negligible cases. We consider the result could have been principal because of the sample characteristics: as only 11.9% of the study participants were graduates or higher. As the rural population has very limited access to news and social media, the majority of health information was spread by frontline workers and Primary health centres through one-to-one communication. This may lead to the limited knowledge about the pandemic situation and it depended upon the access of the population to a health care facility. Access to health services was mainly very limited, due to the logistics factors and in turn the proper knowledge.[16-22]

The significantly positive result of the association between education level with COVID-19 knowledge score props up the postulation (Table 4). At the time of the pandemic, 91.1 % of the respondent held the belief that the pandemic can be controlled and 94.6% were confident about India winning the battle against SARS. A major portion of the sample was confident about India overcoming this bad situation successfully. But a small proportion presented concern about survival chances after being affected. 95% of the study participants had thought about patients' isolation. These results can possibly be correlated with a lack of knowledge about important preventive and isolation modalities and the availability of treatment facilities.[23-28] Our findings are similar to other studies conducted on KAP for the criteria like the rates of final success and confidence of winning in the battle against COVID-19.

The very optimistic attitude of the participants could be related to the controlling measures such as traffic limitations all throughout the country, shutting down cities and state boundaries, lockdown, and travel restrictions, which increased everyone's confidence regarding winning the battle. Secondly, collective efforts from all over the country escalated confidence in overcoming the pandemic, like supporting the COVID-19 virus controlling measures, training and sending a large number of health workers plus providing a large number of medical kits for the outbreak, building isolation/ quarantine facilities, recruiting health staff, etc. Thirdly, fair knowledge of the virus can also explain this situation, because good COVID scores are significantly related to the low likelihood of "disagree" or "I don't know" type answers to questions about attitude. Even though attitudes toward the COVID-19 virus were positive, many residents took precautionary measures to avoid infection by COVID-19: like keeping themselves away from congested places, hand washing, advising friends/family to avoid crowding, and wearing masks while going away from home. Such strict practices could be possibly ascribed to the proper strict prevention and controlling measures executed through local governing bodies as a ban on public get-togethers, and a complete lockdown in the country. It also could have been the effect of people's higher knowledge with respect to the higher infectivity of COVID-19 virus disease, that's very easily transmitted from one to another through invisible respiratory droplets. Sadly, our study found that 37.1% of participants visited congested places and 8.7% were not serious for use of masks when going out from home recently.

It is appropriate to mention that in the present study higher COVID-19 knowledge scores were found to be significantly associated with unlikely wrong attitudes and practices towards the COVID-19 pandemic. Present findings obviously indicated the import of upgrading people's COVID-19 knowledge through ways like health education, ameliorating their attitudes and practices toward COVID-19. Our study findings of demographic factors related to KAP in regards to COVID-19 are found same as other studies on COVID-19.[29-30]

Present study findings suggested that educating people would be more efficacious if specific demographic groups are targeted, meaning thereby, COVID-19 knowledge of people be highly improved if health education facilities are specifically prepared for a particular area, occupations, and individuals with less level of education.

The importance of the present study reclines in its rural database collected during the stage prior to the COVID-19 outbreak in India. If the educational level and occupation of residents are used as the basis for socioeconomic status, fairly speaking, the present study findings can now be generalized to Indian populations of the same socioeconomic level.[22] As access to the internet is marginal, also online health information resources are fairly unavailable in rural areas, rural populations of society under the COVID-19 pandemic are more apparent to have low knowledge, dismissive attitudes, or improper preventive practices with regard to COVID-19. Thereby so, KAP towards COVID-19 by vulnerable populations warrants special attention for research. As the sample size was not properly represented, the next limitation of the present study is the inadequate assessment of attitudes and practices for COVID, which must be encouraged via focus group discussion, and in-depth interviews and be constructed as multi-dimensional measures.

CONCLUSIONS

To summarize, our study findings suggested that the rural population of India with a comparatively high level of education, specifically health care services people, have had proper knowledge, cheerful way of attitude, and appropriately practicing measures towards COVID-19 during the rapid rise period of the COVID-19 cases. Whereas age, gender, and socioeconomic status didn't show any significant association with the knowledge score. To add up, good COVID-19 knowledge is related to positive attitudes and appropriate practices with regard to COVID-19 disease. It is suggested that health programs that aimed to the improvement of COVID-19

knowledge are meaningful for encouraging an optimistic attitude and maintaining proper practices. As proper knowledge has a high association with positive attitudes, the goals of the coming educational programs must focus on the population with low-level knowledge which will improve the rate of positive attitudes subsequently. Precautionary and preventive health advisories to upraise knowledge, attitude, and practice are crucial to prevent and control the transmission of COVID-19. This study provides evidence that knowledge is an essential predictor of attitudes and behaviours, contributing to advancing intervention strategies to promote and sustain the public's precautionary behaviours in the context of the COVID-19 pandemic.

To increase preventive behaviours among the public, health officials and policymakers must promote knowledge and efficacy belief. Future interventions and policies should also be developed in a 'person-centered' approach considering the work pattern of the communities, targeting vulnerable subgroups, embracing them, and closing the gap of KAP toward COVID-19. Community needs are an important aspect of the lockdown implementation. To avoid overcrowding and in turn prevent the spread of diseases lifestyle, behaviour, and attitude along with a willingness to follow the rules and guidelines is an important aspect in any community which ultimately leads to any plan to success. This study provides critical insights into how the government and public health organizations establish and implement appropriate policies and interventions that do not overlook and deprioritize those in urgent need of any pandemic situation. We hope that the current study will facilitate the implementation of effective healthcare policy by enabling healthcare officials in the area to understand better the knowledge, attitude, and practice done by the population toward COVID-19.

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