Awareness, practices, and myths related to coronavirus disease-19 among rural people in Kolar District, South India: A community-based mixed-methods study

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Abstract:

BACKGROUND: Capturing the baseline information on awareness, practices, and prevailing myths related to the ongoing coronavirus disease-19 (COVID-19) pandemic in rural India will help in planning interventions to improve the health literacy on COVID-19. The aim of the study was to assess the level of awareness, practices, and myths regarding COVID-19 among rural population of Kolar district in South India.

MATERIALS AND METHODS: A concurrent mixed-methods study with a quantitative community-based cross-sectional analytical design and a qualitative phenomenological design was conducted in five randomly selected villages during June 2020. A prevalidated and pretested semi-structured questionnaire was administered to one adult in the households selected using systematic random sampling to capture the sociodemographic details and their awareness, practices, and myths related to COVID-19. The supervisors additionally and concurrently used a nonparticipant observation technique to record the real-time behaviors and preventive practices adopted by the villagers. Quantitative analysis was done using STATA and included multivariable regression analysis, and the association was reported using prevalence rates along with their 95% confidence intervals (CIs). Qualitative analysis was done manually as per discussion and concordance among supervisors and reported as categories along with supporting statements.

RESULTS: Among the 298 respondents, "poor awareness" was seen in 128 (43.0%, 95% CI: 37.5%–48.6%). Among the responders, 89 (29.9%) believed in the myth that "*Corona disease is due to God's wrath or curse.*" The field observations were categorized under three categories – "avoidance of masks," "nonexistent social distancing," and "rampant spitting."

CONCLUSION: About two in five villagers were found to have "poor awareness" to COVID, and practices related to COVID were found to be largely unsatisfactory. Lower level of education and belonging to nuclear family were associated with "poor awareness." Various myths were identified that has to be debunked on priority basis by the government, especially targeting the people having low level of education in rural India.

Keywords:

Coronavirus disease-19, health literacy, health promotion, prevention and control

Introduction

The ongoing coronavirus disease-19 (COVID-19) pandemic is at various phases across different countries. India saw a late surge in cases after an initial nation-wide lock down and unlock with a total detected cases amounting to more than 26 million as on May 22, 2021.[1] This could be mainly due to heterogeneous matrix of locking and unlocking actions across states. This heterogeneity was not only in terms of time frame but also rural areas escaped the attention as compared to urban counterparts of India.[2] Once thought to be safe, the rural areas are no longer immune to COVID-19 due to unabated migration from urban areas as an aftermath of frequent phases of locking and unlocking.[3,4] To curtail the rise in number of cases due to COVID-19, one of the effective measures is to create awareness and also put the knowledge so gained into practice that would eventually block the transmission pathway of COVID-19.

With about half of a year already living with COVID-19 pandemic in India, it is anticipated that there would be a good level of awareness and also translation of the knowledge into actions among people belonging to all sections. However, there is lack of evidence to prove the same, especially from rural areas. There are various studies done across countries and also a study from India which have tried to capture the same. However, there were serious limitations in all these studies ranging from sampling issues, usage of only online mode of questionnaires thus restricting the study population, usage of only questionnaire method to capture practices, and also confining of all these studies to urban areas.[5-8]

Studies from Iran have shown that having a good knowledge and skill level could positively impact the development of COVID appropriate behaviors among general public.[9] As shown in some other studies, various sources of health information ranging from social media to virtual networks can be counterproductive by generating fear and rumor mongering.[10,11] Capturing the baseline information on awareness and practices in rural India will help in identifying key areas of focus to plan for interventions in increasing the awareness and strengthening the practices. There is also a need to identify the myths prevalent in relation to COVID-19 among rural people that could lead to risky behaviors facilitating the disease transmission.

With this background, this study was planned to capture the level of awareness and practices regarding COVID-19 and sociodemographic factors associated with "poor awareness" to COVID-19 among rural population of Kolar district in South India.

Materials and Methods

Study design and study setting:

A concurrent mixed-methods study comprising a quantitative community-based cross-sectional analytical design and a qualitative phenomenological design was conducted in five randomly selected villages that are catered to by the Rural Health Training Center (RHTC) of a medical college in Kolar district during the month of June 2020.

Study participants and sampling
Quantitative

All the adults (18–60 years) residing in the households from the selected five villages for the preceding 6 months formed our study population. We adopted a cluster random sampling technique where "villages" formed the clusters. Five villages were randomly selected by using simple random sampling technique out of 20 villages catered by the RHTC. Systematic random sampling technique was used in each village to complete the required number of samples in that village.

Assuming that "poor awareness" to be among 50% of the population, with an absolute precision of 7% and a design effect of 1.5, the minimum sample size was calculated to be 294 (calculated by using OpenEpi version 3.01).[12] All the households currently residing in the selected villages were included in the study. Considering equal distribution of samples among the five villages, 60 households were selected from each village. Systematic random sampling technique was used to select the 60 households from each village.

Qualitative

Nonparticipant observations were done in all the five selected villages during transect walk by the supervisors.

Data collection tool and technique
Quantitative

A prevalidated and pretested semi-structured questionnaire was devised for the collection of the sociodemographic details and capturing the awareness, attitude, and practices related to COVID-19. The questionnaire was designed by a panel of five experts from the field of community medicine who had worked at least for 3 years in the rural area where the study was done keeping the local context in picture. The developed questionnaire was translated to local language (Kannada), and the translated questionnaire was checked for content validity by two linguistic experts separately. The corrected Kannada questionnaire was then back translated to English. The final questionnaire was administered to five people not part of the study to check for any incongruence in both language and content. The final questionnaire thus developed was used for the survey. Depending on the interval of systematic random

sampling, households were approached and one adult was interviewed from each household. If more than one eligible adult was present at the time of data collection, lottery method was used to select the respondent. After obtaining written informed consent, the questionnaire was administered by a team of trained healthcare workers and the details were captured. Each team consisted of one healthcare worker working in that area for at least last 3 years and one medical intern. There were three supervisors of the rank of assistant professors and above from the Department of Community Medicine, one each for three teams who supervised the data collection. In case the selected household was locked, the next household in the sequence was selected. Only one visit was made to a particular household for collecting the information regarding COVID 19.

Qualitative

The three supervisors additionally and concurrently used a nonparticipant observation technique to record the real-time behaviors and preventive practices adopted by the villagers. The supervisors conducted a transect walk in the villages under study and observed at various places in the villages, and the findings were recorded in the form of field notes using their mobile phones. In each village, about 30 minutes was spent on recording the field observations. These field notes were then expanded by the supervisors upon mutual agreement regarding their findings. This method was chosen so as to overcome the social desirability bias of the respondents (which is a drawback of the questionnaire-based survey), especially with respect to the preventive practices adopted by them.

Data entry and analysis
Quantitative
A single data entry was done using EpiData version 3.1 (EpiData Association, Odense, Denmark) and later exported to Stata Version 12.0 (StataCorp LP, College Station, TX, USA) for data analysis. Age was reported using mean and standard deviation (SD). The other sociodemographic variables and responses to the questionnaire were reported using frequencies and percentages.

A set of 21 responses to questions regarding awareness was used to group an individual's level of awareness as *"good"* or *"poor."* Each response was coded as "1" for correct response and "0" for wrong, giving a total score ranging from 0 to 21 [Table 1]. A cutoff value at 50th percentile (score of <14 out of 21) was used to categorize a responder as having "poor awareness." We used frequency and percentage along with its 95% confidence interval (CI) to report the level of "poor awareness."

Univariate analysis was done using binary logistic regression, and multivariable analysis was done using generalized linear model with family link "Poisson" with cluster-adjusted variance correction estimates (at village level) to find the sociodemographic variables associated with "poor awareness." All the variables used for univariate analysis were used in the multivariable model. Collinearity was checked using variance inflation factor (there was no collinearity seen) before doing the adjusted analysis. All associations were reported using prevalence ratio (PR) along with 95% CI. A $P < 0.05$ was considered statistically significant.

Qualitative
The results from the expanded field notes from all the five villages under survey were reported in categories and observations as statements supporting them. Identification of these categories and statements was done by mutual agreement between the supervisors on the same day of the visit. The categories were formulated after an oral discussion among the three supervisors, and also, the supporting statements were documented as results. This method was chosen to overcome the survey interview social desirability bias.

Ethical considerations
The study protocol was approved by the Institutional Ethics Committee for human studies, and the corresponding protocol/approval number is No. SDUMC/KLR/IEC/124/2020-21. We also obtained a formal permission from all the village heads before starting the data collection. Written informed consent was obtained from all the participants who participated in the survey before the start of interview.

Results

Quantitative
A total of 300 households comprising 1526 individuals covering five villages were surveyed. Of the total 300 adults interviewed, the mean age ± SD was 35.9 ± 11.5 years and 157 (52.3%) of them constituted women folk. Among them, 80 (26.7%) had no formal education, whereas 82 (27.3%) of them had at least 10 years of schooling. Two-thirds of the households belonged to nuclear family (66.7%), and nearly half of them (144, 48%) belonged to lower socioeconomic status [Table 2].

Of the 300 interviewed, two (0.7%) of them were not aware of the ongoing COVID-19 pandemic. Among the 298 who were aware of COVID-19, 168 (56.4%) knew that it was caused by a virus. The most common symptom they identified with COVID-19 was cough (275, 95.3%), and the most common preventive practice they felt should be adopted was "wearing masks" (271, 90.9%). Of the 298, 91 (30.5%) knew that currently there was no cure for COVID-19. Among the responders, 89 (29.9%)

Table 1: Awareness to corona virus disease-2019 among people living in rural area of Kolar district, Karnataka (*n*=298)*

Awareness question	Responses	*n* (%)
Corona disease is caused by?	Virus[†]	168 (56.4)
	Don't know	130 (43.6)
What are the symptoms of corona disease? (multiple responses allowed)	Fever[†]	228 (76.5)
	Tiredness[†]	12 (4.0)
	Cough[†]	275 (92.3)
	Difficulty in breathing[†]	78 (26.2)
	Diarrhea[†]	2 (0.7)
	Sore throat[†]	12 (4.0)
Does corona disease affect any age group severely? (multiple responses allowed)	Children[†]	218 (73.2)
	Older people[†]	286 (96.0)
	Affects all same[‡]	6 (2.0)
If someone is a suspect of corona disease, should he/she be quarantined?	Yes[†]	291 (97.7)
	No	7 (2.3)
What are the practices you can adopt to prevent from getting corona disease? (Multiple Responses allowed)	Hand hygiene[†]	238 (79.9)
	Social distancing[†]	114 (38.3)
	Wearing masks[†]	271 (90.9)
Does food play any role in corona disease?	Yes	7 (2.4)
	No[†]	291 (97.6)
Is drinking alcohol protective against corona disease?	Yes	52 (17.5)
	No[†]	246 (82.5)
Is smoking protective against corona disease?	Yes	13 (4.4)
	No[†]	285 (95.6)
Taking hot water bath can prevent oneself from getting corona disease?	Yes	177 (59.4)
	No[†]	121 (40.6)
Can mosquitoes or any insect transmit corona disease?	Yes	68 (22.8)
	No[†]	230 (77.2)
Do you think that alternative medicines like Ayurveda, Siddha can cure corona disease?	Yes	69 (23.2)
	No[†]	229 (76.8)
Do you consider that corona disease is due to God's wrath or curse?	Yes	89 (29.9)
	No[†]	209 (70.1)

*Out of 300 respondents two of them were not aware of Corona disease, [†]Were considered as correct responses, [‡]Was reverse coded in calculating the "awareness score," Both [†]and [‡]were included in calculating the "awareness score" with equal weightage for all responses (1 score for each correct response)

believed in the myth that *"Corona disease is due to God's wrath or curse"* [see Table 1].

When assessed for practices, wearing of masks was found to be adopted by 272 (91.3%) and conforming to the social distancing norms was the least (111, 37.3%). Of the 47 (15.8%) who resorted to practices to improve their immunity status, 21 of them practiced yoga or any other kind of physical exercise and 15 took multi-vitamin tablets.

As per the attitudes of the responders concerned, 284 (95.3%) wanted to avail the government healthcare facility for COVID-19 care. A similar faith on government for its handling of the current COVID-related crisis was expressed positively by 270 (90.6%) responders. When asked to enlist the sources of information with regard to COVID-19, 274 (92.0%) mentioned about television, whereas 29 (9.7%) mentioned about healthcare providers being their source.

Among the 298 respondents, "poor awareness" was seen in 128 (43.0%, 95% CI: 37.5%–48.6%). On adjusted

analysis, it was seen that having a lower level of education (<10 years of schooling) and belonging to nuclear family had higher prevalence of "poor awareness" [Table 3].

Qualitative
The field observations regarding behaviors and preventive practices to COVID-19 were categorized under three major categories.

"Avoidance of masks"
The supervisors noted that except for a few, the villagers across all five villages were not using any masks while they ventured outside of their homes for various reasons. This was similar across age groups and gender.

"Nonexistent social distancing"
On field observations made at various places across villages gave the picture that there was scanty evidence with regard to the practice of social distancing. There were various observations made across women folk, school-going children, and adults near petty shops, where

Table 2: Sociodemographic characteristics of respondents to the corona virus disease-2019 survey in rural area of Kolar district, Karnataka, June 2020 (*n*=300)

Sociodemographic characteristics	n (%)
Age (years)	
18-29	101 (33.7)
30-39	91 (30.3)
40-49	56 (18.7)
50-60	52 (17.3)
Gender	
Male	143 (47.7)
Female	157 (52.3)
Years of education	
No formal education	80 (26.7)
1-7	43 (14.3)
8-10	95 (31.7)
>10	82 (27.3)
Occupation*	
Employed	199 (66.3)
Others	101 (33.7)
Type of family	
Nuclear	190 (66.3)
Joint	110 (36.7)
Socioeconomic status†	
Class I	12 (4.0)
Class II	55 (18.3)
Class III	89 (29.7)
Class IV	95 (31.7)
Class V	49 (16.3)
Number of households with at least one under 5 child	96 (32.0)
Number of households with at least one elderly (≥65 years)	113 (37.7)

*Employed includes all unskilled, semi-skilled, and skilled workers including those who work in government or private service and also who have self-business, others included unemployed, homemakers, and students, †As per Modified B G Prasad Classification

gatherings without social distancing were markedly evident.

"Rampant spitting"

On various occasions irrespective of age and gender, the villagers resorted to spitting rampantly while in outdoors including spaces outside their homes and in closed vicinity of other fellow villagers.

Discussion

Our community-based survey on COVID-19 awareness among rural adults showed that 43% of them had "poor awareness." With regard to individual components on awareness, the knowledge was good with regard to certain symptom profile, viz., cough and fever, and also in relation to preventive practices, except for social distancing. Two factors, namely low level of education and belonging to nuclear family, were significantly associated with "poor awareness." The qualitative part of the study clearly established

that the awareness was not translated to actions in regard to preventive practices adopted by the villagers.

Studies looking at knowledge, attitude, and practices about COVID-19 among people across various sections in different countries including one such study from India have been reported.[5-8] All these studies were done using different types of online questionnaires, thereby including only fairly educated and tech savvy people. These studies were done across different time lines during the ongoing pandemic, and none of them employed any technique to confirm the practices put to action. Further, the general differences in the sociodemographic profile across countries including nonreporting of sociodemographics from the Indian study make all these studies incomparable to the current study, which employed a completely different approach in terms of study population and data collection methods.

The study findings show that about two in five had "poor awareness" to COVID. Although the awareness to symptoms and preventive practices were adequate in certain aspects, it fell short in some important areas such as recognition of sore throat and breathlessness as symptoms and "social distancing" as a preventive practice. The discordance with respect to practices wherein the response to questionnaire was not seen to be translated into actions as observed among the villagers is a major point of concern. The social networking in the villages mostly relies on interpersonal communications, and this could actually have had an impact in complying with the laid down guidelines for preventive practices as evident in qualitative observations in our study. The positive responses to 'practices' component of the questionnaire could be due to social desirability bias. This also emphasizes the need to health education regarding preventive practices. The inconsistencies between awareness and practices could be addressed by the local healthcare workers whose services have so far not utilized optimally (with <10% of health workers being a source of awareness about COVID). In addition to this, a negative practice in the form of indiscriminate spitting was observed which the community did not consider to be adverse to good health practice even during the ongoing pandemic. Since the evidence is already accumulating in linking saliva and COVID transmission, there is a need to not only educate the community but also bring in strict regulatory measures in villages to curb this practice.[13-15]

The awareness questionnaire also captured various myths related to COVID ranging from as low as 5% believing that smoking was protective against COVID to as high as 60% believing that hot water

Table 3: Sociodemographic factors associated with "poor awareness" to coronavirus disease-2019 among people living in rural area of Kolar district, Karnataka (*n*=298)

Sociodemographic characteristics	Total (*n*=298), *n* (%)	Poor awareness* (*n*=128), *n* (%)[†]	Unadjusted PR (95% CI)	Adjusted PR (95% CI)
Age (years)				
18-29	100	33 (33.0)	1	1
30-39	90	33 (36.7)	1.1 (0.8-1.6)	0.7 (0.4-1.3)
40-49	56	30 (53.6)	1.6 (1.1-2.4)[‡]	0.7 (0.4-1.3)
50-60	52	32 (61.5)	1.9 (1.3-2.7)[‡]	0.9 (0.6-1.3)
Gender				
Male	143	57 (39.9)	1	1
Female	155	71 (45.8)	1.2 (0.9-1.5)	1.1 (0.9-1.4)
Years of schooling				
No formal education	79	57 (72.2)	3.3 (2.1-5.1)[‡]	3.7 (3.0-4.5)[§]
1-7	42	22 (52.4)	2.4 (1.5-3.9)[‡]	2.5 (1.7-3.8)[§]
8-10	95	31 (32.6)	1.5 (0.9-2.5)	1.7 (1.0-2.8)[§]
>10	82	18 (22.0)	1	1
Occupation[∥]				
Employed	198	92 (46.5)	1	1
Others	100	36 (36.0)	0.8 (0.6-1.1)	0.8 (0.5-1.4)
Socioeconomic status[¶]				
Upper class	67	31 (46.3)	1	1
Middle class	88	35 (39.8)	0.9 (0.6-1.2)	0.9 (0.8-1.0)
Lower class	143	62 (43.4)	0.9 (0.7-1.3)	1.0 (0.8-1.1)
Family type				
Nuclear	188	94 (50.0)	1.6 (1.2-2.2)[‡]	1.5 (1.3-1.8)[§]
Joint	110	34 (30.9)	1	1
Presence of an under-five child in family				
Yes	95	30 (31.6)	1	1
No	203	98 (48.3)	1.5 (1.1-2.1)[‡]	1.2 (0.8-1.7)
Presence of an elderly (≥65 years) in family				
Yes	112	42 (37.5)	1	1
No	186	86 (46.2)	1.2 (0.9-1.6)	1.1 (0.8-1.4)

*Poor awareness those who scored <50 percentile in "awareness score," [†]Row percentage, [‡]*P*<0.05 in unadjusted analysis, [§]*P*<0.05 in adjusted analysis, [∥]Employed-includes all unskilled, semi-skilled, and skilled workers including those who work in government or private service and also who have self-business, others-included unemployed, homemakers, and students, [¶]As per modified B G Prasad classification (Upper class=Class I and Class II, Middle class=Class 3, Lower class=Class IV and Class V). PR=Prevalence ratio, CI=Confidence interval

bath was protective. The study also showed that one in four believed that COVID was transmitted through mosquitoes and about one in three felt that COVID was due to God's wrath. This definitely calls for an urgent intervention to dispel such myths among villagers as these myths could definitely prove to be an obstacle in creating right awareness and adopting good practices related to COVID in future. As more than 90% received information about COVID, right or wrong, from televisions, there is a need to regulate this powerful media and use it in good stead. In addition, using various communication platforms including television as a mode to debunk, the prevailing myths is the need of the hour.

Low level of education and belonging to nuclear family were associated with "poor awareness" among villagers. With increase in the level of education comes more opportunities to access multiple sources of information and the ability to rationalize the information obtained,

and thus, the awareness level could be better among more educated. Nuclear families do not have the luxury of joint families wherein more number of people at house translates to more information gathered from multiple sources.

The study has a few strengths. This was the first community-based survey wherein face-to-face interview schedule administration was done at own residences of the respondents during the ongoing pandemic (within 3 months of arrival of COVID-19 in the country). The interview was done by health workers who were imparting healthcare to the community under study and thus were able to get not only consent but also true response. Addition of qualitative component in the form of field observations ensured reporting of unbiased information related to practice adopted by the villagers. We used a percentile-generated cutoff from the awareness score to classify one has having good or poor awareness

rather than an arbitrary cutoff. The questionnaire not only captured knowledge on symptoms and preventive practices but also captured myths related to COVID. We have used random sampling technique and achieved the sample size as required giving a good internal validity to our study results. We have used PR with 95% CI to for reporting association which is known to provide precise estimates compared to odds ratio.[16]

Limitations and Recommendation

We failed to capture the information with regard to marital status of participants which could have thrown some more information. We also could not capture the practice of hand hygiene as a part of our field observations, which could have added some more evidence in terms of practices adopted. As this study was limited to single district, generalizability could be restricted. Although we adopted a rigorous method of content validation and pretesting of questionnaire, we did not find out the content validation index which could have added more credibility to the questionnaire thus developed. However, *post hoc* using scoring criteria based on percentile cutoffs could have given more credibility for classification of awareness status as "good" or "poor." At last, our qualitative component of the study included only field observations from the supervisors. The incongruence between awareness and practices can be abridged using the services of the healthcare workers as behavioral change agents. Mass media can also be optimally utilized to supplement the process. Further, identification and development of localized key messages are the need of the hour (e.g., rampant spitting habits as found in our study). The need for reinforcing communication skills among the healthcare workers, especially in pandemic situation, could augment their efficiency.[17] Enforcing of COVID appropriate behaviors should be promoted. As the nature of COVID appropriate behaviors is not uniform, localized preventive measures can only be adopted if similar such studies are conducted in different geographical areas.

Conclusion

About two in five villagers were found to have "poor awareness" to COVID, and practices related to COVID were found to be largely unsatisfactory. Lower level of education and belonging to nuclear family were associated with "poor awareness." Various myths were identified that has to be debunked on apriority basis.

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Research quality and ethics statement

The authors of this manuscript declare that this scientific work complies with reporting quality, formatting and reproducibility guidelines set forth by the EQUATOR Network. The authors also attest that NO clinical investigations were done in this study. The study protocol was approved by the Institutional Ethics Committee, and the corresponding protocol/approval number is [No. SDUMC/KLR/IEC/124/2020-21]. We also certify that we have not plagiarized the contents in this submission and have done a Plagiarism Check.

Conflicts of interest

There are no conflicts of interest.

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