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Original Article

Community Section

Adoption of Safety Measures against COVID-19 by Tribal Families in Southern Rajasthan- A Cross-sectional Study

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ABSTRACT

Introduction: The outbreak of COVID-19 pandemic during early 2020 forced the people to make drastic changes in their lifestyle. The people's response to preventive measures initiated by the Government to control COVID-19 is the focus of the study.

Aim: To assess the knowledge for prevention and adoption of safety measures against COVID-19 by the tribal masses.

Materials and Methods: The cross-sectional study, covering 300 selected tribal families, was conducted in a tribal belt during the period September 2020 to December 2020. The questionnaire covered socio-demographic profile, knowledge aspects and adoption pattern regarding preventive measures of COVID-19. The head of the family or in his/her absence any available adult family member has been the respondent to provide the required information. Based on maximum score of 15 for correct knowledge, the families were categorised as poor (≤5), average (6-10) and good (11-15). With a maximum score of 24 for correct adoption, the categorisation was made as poor (≤8), average (9-16) and good (17-24). The association of socio-demographic factors with knowledge and practice level was tested through Chi-square test and correlation coefficient between knowledge and adoption scores.

Results: Among the 300 families studied, the nuclear type tribal families dominated in the study area 204 (68%) and the average age of respondents was 61 years. The mean knowledge score was 7.6 (50.67%) and adoption score was 11.22 (46.75%). The percentage shares of respondents in poor, average and good categories were 31.33%, 35.33% and 33.33% for knowledge and 32.66%, 34.66% and 32.66%, respectively for adoption scores. The education level, income of the family and access to media sources were found to have significant association between knowledge and adoption scores.

Conclusion: The highest education level of family members, family income and access to media sources were significantly associated with knowledge as well as practice. The positive correlation between knowledge and adoption scores indicated that the adoption level can be improved by enhancing knowledge to the socially backwards tribal communities. Socially visible practices like mask wearing were well adopted by tribals whereas the adoption level of invisible components like immunity building was relatively low.

Keywords: Coronavirus disease-2019, Knowledge, Practice, Severe acute respiratory syndrome-coronavirus-2, Tribal population

INTRODUCTION

There has not been outbreak of any communicable diseases in recent years anywhere in the world which is comparable to Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) in terms of number of cases, mortality rate and geographical spread and more than 100 countries in the world enforced lockdown to combat COVID-19 by the end of March 2020 [1]. The COVID-19 with similar symptoms of common cold is a type of respiratory infection and 210 countries of the world have been reported as affected with varying magnitude of intensity. Cough, fever, fatigue, headache, myalgia, shortness of breath and sputum production are the major symptoms of the COVID-19 infection [2]. The first case of novel COVID-19 was reported from the Hubei province of China on 31st December 2019 which subsequently became the epicenter of the disease [3,4].

The World Health Organisation (WHO) on 11th March 2020 has declared the novel coronavirus (COVID-19) outbreak a global pandemic with 118,000 cases and 4,291 deaths globally [5]. Since the health and safety being the utmost priorities, Government of India imposed lockdown on 24th March 2020 along with restrictions on freedom of movement, social and physical distancing, self-isolation and quarantine measures were followed by closing all private and public sector establishments [6].

With considerable decline in positive cases, the phased unlock process was initiated with effect from 1st June 2020. During lockdown and unlock periods, all efforts were made to educate people nationwide to practice effective preventive and control measures to combat the COVID-19 transmission. In fact, all sections of the society were sensitized to adopt and follow safety measures [7]. With the unlock process, the sensitivity towards control measures also got diluted to some extent. The need to overcome economic setback due to lockdowns by way of resuming halted work in private and public sectors, work from home and online classes/meetings were made effective irrespective of any rural-urban divide [8].

India was dealing with relatively low number of positive cases of COVID-19 because of the constricted transmission due to strict implementation of lockdown and social distancing measures which pushed up the recovery rates also in India [9]. At the initial stage, the pandemic was more grave in all the major metro and capital cities of Indian states and then gradually spread to rural areas and hence people from both rural and urban sectors faced a real traumatised situation [9]. The home return of migrant laborers and other workers from infected areas to their respective villages and also the movement of village dwelling people for essential activities caused to have varying magnitude of problem from COVID-19 in rural areas also [10]. Public education through media and other sources was considered as one of the most important measures that could help control the diseases, as has been the case regarding Severe Acute Respiratory Syndrome (SARS) [11]. Hence, it is of prime importance to assess the knowledge level and adoption of safety measures against COVID-19 by rural masses in general and by the resource constrained and less educated tribal masses in particular.

The present study was designed to address the issues related to knowledge level and adoption rate of safety measures against COVID-19 by the tribal masses in southern Rajasthan with the

specific objectives: (i) to assess the knowledge level of rural tribal masses about COVID-19; and (ii) to examine the extent of adoption on use of mask, hand washing, social distancing and others.

MATERIALS AND METHODS

The cross-sectional study was conducted during September to December 2020 among Bhil-Meena tribal families settled around Rural Health Training Centre (RHTC) of Pacific Institute of Medical Sciences (PIMS), Udaipur. The study was approved by the Institutional Ethics Committee of PIMS, Udaipur vide letter no. STU/PIMS/IEC/2020/91 dated 18/09/2020. The RHTC caters the health needs of about 7000 families which include both tribal and non tribal families living in villages around it. The study was confined to tribal families only.

Sample size calculation: Based on the family survey data of RHTC, the list of tribal families was made and a sample of 300 tribal families was selected against calculated sample size of 246 (80%) [12] using simple random sampling from the identified villages.

Inclusion criteria: The tribal respondents who were more than 18 years of age and permanent residence of the village with more than six months of constant stay were included in the study.

Exclusion criteria: The doubtful cases of being tribal, temporarily home returned migrants and the respondents who were not available after second visit were excluded.

Questionnaire

A prestructured and validated questionnaire reviewed by a panel of experts and translated into local language was used to collect the required information on knowledge about COVID-19 and the adoption of safety measures to minimise the risk. A team of four trained medical social workers were engaged for the purpose of data collection. Each medical social worker was given a list of 75-80 selected families. The head of the family or in his/her absence any available adult family member was contacted to get the required information by asking response to each aspect of identified domains. In case the respondent was not available during the first visit, a second visit was made on a preinformed date. All the COVID-19 appropriate safety measures were adhered by the team during data collection. The support and help of the local Anganwadi, Accredited Social Health Activist (ASHA) and local body representatives was taken wherever necessary. The basic information included the type of the family, the highest educational level obtained by any of the family member, family occupation, family income and the media sources accessible to the families.

The knowledge and practice domains covered aspects like symptoms, nearest test and treatment sources, use of mask, handwashing, social distancing and immunity building. The knowledge component had 15 questions with range of 0-15 and the adoption part had 24 questions with range of 0-24 scores. Based on maximum score of 15 for knowledge, the families were categorised as poor (≤5), average (6-10) and good (11-15) and with a maximum adoption score of 24, the families were categorised as poor (≤8), average (9-16) and good (17-24). The questions were framed in such a way that the responses were dichotomous in nature with 'Yes or No' options.

STATISTICAL ANALYSIS

The Chi-square test was used to ascertain association of knowledge and adoption with socio-demographic factors like family type, family occupation, educational level, family income and media exposure. The extent of association between knowledge score and adoption score was worked out using Karl Pearson coefficient of correlation and tested for its statistical significance using 'Student's t-test'.

RESULTS

Out of 300 selected families, 204 (68%) were nuclear, 30 (10%) were extended families and remaining 66 (22%) were three generation families. The education level of 212 (70.66%) respondents was upto middle level (up to 8th class). The household income of 255 families (85%) was below Rs.6000 per month. Two third households had any two sources of information like news paper, TV, radio and mobile, while 57 (19%) households had access to only one media source and remaining 42 (14%) had access to three or more media sources. There was no family without at least any one of these media sources [Table/Fig-1].

Socio-demographic profile	Particulars/Type	Respondents	
		Number (n)	Percentage (%)
Family type	Nuclear	204	68
	Extended	30	10
	Three Generation	66	22
Education level	Illiterate	37	12.33
	Upto middle	175	58.33
	High school and above	88	29.33
Occupation	Labour work	58	19.33
	Agriculture	206	68.66
	Business/service	36	12
Monthly income	<Rs.3000	67	22.33
	Rs.3000-6000	188	62.66
	>Rs.6000	45	15
Media Access	One source	57	19
	Two sources	201	67
	Three or more sources	42	14

[Table/Fig-1]: Distribution of selected tribal families based on socio-demographic profile (n=300).

The overall average of correct knowledge was 51.22% which varied between 45.33% for symptoms to 60% for mask related correct responses. The knowledge domains consisted of 15 questions on six domains like symptoms (2), test and treatment (2), mask usage (3), handwashing (3), social distancing (3) and immunity building (2). The highest correct response was found for mask usage (60%) followed by handwashing (57.33%), social distancing (54.66%), symptoms (45.33%), test and treatment (45%) and immunity building (45%). Alternative materials for mask like handkerchief, gumcha, scarf, etc., emerged with the highest correct response of 220 (73.33%) out of 300 respondents. The frequency of correct response on knowledge aspect related to the possibility of having asymptomatic COVID-19 positive cases was the lowest (29.33%) followed by awareness on nearest COVID-19 treatment hospital (43.33%) and immunity building through improved food consumption (43.33%) [Table/Fig-2]. The overall average of correct adoption response was 46.78%. For different adoption domains, mask related domains topped among the others with 51.50% followed by handwash (49.60%), social distancing (46%) and immunity building and other practices (40%). The practice of frequent handwashing with the frequency of 215 (71.67%) topped among all adoption practices followed by mask wearing with the frequency of 202 (67.33%). The adoption of immunity building practices was relatively low with an average of 40%. The overall average adoption score was 11.22 (46.75%) which varied from 3.4 (14.16%) for poor adoption category to 18.5 (77.08%) for good adoption category [Table/Fig-3]. The overall average knowledge score was 7.6 (50.67%) which varied from 2.3 (15.33%) for poor knowledge category to 12.2 (81.33%) for good knowledge category [Table/Fig-4].

The knowledge and adoption scores were found statistically significant with the highest educational level of any family members, the household income and access to number of media sources. [Table/Fig-4,5]. The correlation between knowledge and adoption scores was found statistically significant (correlation coefficient r=0.3764 and p <0.00001) which implied that the correct knowledge leads to correct adoption of safety measures.

Domains	Aspects	No. of correct responses (n)	Percentage (%)
Symptoms	COVID-19 symptoms similar to common cold	184	61.33
	COVID-19 transmitted from asymptomatic patients	88	29.33
	Average per aspect	136	45.33
Test and treatment	Nearest COVID-19 testing centre	140	46.67
	Nearest COVID-19 care/Treatment hospital	130	43.33
	Average per aspect	135	45.00
Mask	Alternative to surgical mask (handkerchief, towel, gumcha, scarf etc.,)	220	73.33
	Frequently changing or washing the mask	161	53.67
	Family members use separate mask	159	53.00
	Average per aspect	180	60.00
Hand-washing	Handwashing a preventive measure against COVID-19	181	60.33
	Washing hands many times a day	174	58.00
	Using soap or ash for handwashing	161	53.67
	Average per aspect	172	57.33
Social distancing	Keeping distance from other people	197	65.67
	Adequacy of six feet distance to avoid close contact	146	48.67
	Avoiding gathering and visiting crowded places	149	49.67
	Average per aspect	164	54.66
Immunity building	Immunity building through consumption of citrus fruits like orange and lemon	130	43.33
	Vaccination as a means to minimise morbidity and mortality	140	46.67
	Average per aspect	135	45.00
Overall average per aspect		154	51.22

[Table/Fig-2]: Extent of correct responses on knowledge domain about COVID-19 (n=300).

Domains	Aspects	No. of positive responses (n)	Percentage (%)
Mask related	Wearing mask at home	106	35.33
	Wearing mask outside	202	67.33
	Using homemade mask	184	61.33
	Washing/Changing mask when necessary	134	44.67
	Exchanging masks between family members	200	66.67
	Disposal of used masks at safe places like dustbin, village garbage area, public bin	101	33.67
	Average per aspect	154	51.50
Hand wash related	Washing hands frequently	215	71.67
	Washing hands on arrival from other places	170	56.67
	Using soap/ash etc., for washing hands	147	49.00
	Changing clothes after visiting hospitals/Crowded places/Markets	112	37.33
	Taking bath immediately after reaching home from crowded places	100	33.33
	Average per aspect	149	49.60
Practice of social distancing	Maintaining adequate distance with other people outside	178	59.33
	Unnecessary movement outside the home	209	69.67
	Freedom of family members to go out for any purpose	133	44.33
	Social visits to visit relatives/Neighbours house	143	47.67
	Avoiding organisation of social function	109	36.33
	Avoiding participation in social function	101	33.67
	Avoiding out-station visits to distant places	97	32.33
	Restricting home visits of family members staying outside	80	26.67
	Avoiding participation in spiritual/Religious gathering	181	60.33
	Avoiding participation in village level cultural programs	140	46.67
	Average per aspect	137	46
Immunity building and other practices	Taking measures to improve immunity like consumption of citrus fruits and green leafy vegetables	105	35
	Following respiratory hygiene/cough etiquette	109	36.33
	Encouraging out stationed family members to be at their respective places only	146	48.67
	Average per aspect	120	40
Overall average per aspect		140	46.67

[Table/Fig-3]: Extent of positive responses on adoption domains about COVID-19 (n=300).

Socio-demographic profile	Particulars/Type	Knowledge category (Number of respondents)				Calculated $\chi 2$	p-value
		Poor (≤5)	Average (6-10)	Good (11-15)	Total		
Family type	Nuclear	68	72	64	204	4.18	0.38
	Extended	5	11	14	30		
	Three generation	21	23	22	66		
	Total	94	106	100	300		
Education level	Illiterate	21	12	4	37	32.86	**0.0001***
	Upto middle	41	62	72	175		
	High school and above	13	25	50	88		
	Total	75	99	126	300		
Occupation	Labor	22	20	16	58	1.63	0.803
	Agriculture	68	69	69	206		
	Business/Service	10	12	14	36		
	Total	100	101	99	300		
Income	<Rs 3000	30	21	16	67	10.74	**0.029***
	Rs 3000-6000	56	60	72	188		
	>Rs 6000	9	14	22	45		
	Total	95	95	110	300		
Access to media sources	One source	30	20	7	57	35.42	**<0.0001***
	Two sources	50	67	84	201		
	Three or more sources	5	10	27	42		
	Total	85	97	118	300		
Mean score		2.3	7.9	12.2	7.6		

[Table/Fig-4]: Association of knowledge score with socio-demographic factors (n=300).
*(p<0.05) Significant

Socio-demographic profile	Particulars/Type	Adoption category (Number of respondents)				Calculated χ^2	p-value
		Poor (≤8	Average (9- 16)	Good (17-24)	Total		
Family type	Nuclear	73	67	64	204	4.59	0.331
	Extended	10	12	8	30		
	Three generation	15	25	26	66		
	Total	98	104	98	300		
Education level	Illiterate	19	13	5	37	27.24	**<0.0001***
	Up to middle	36	63	76	175		
	High school and above	16	22	50	88		
	Total	71	98	131	300		
Occupation	Labor	18	22	18	58	0.476	0.097
	Agriculture	65	71	70	206		
	Business/Service	11	14	11	36		
	Total	104	107	99	300		
Income	<Rs.3000	28	24	15	67	9.48	**0.049***
	Rs.3000-6000	52	60	76	188		
	>Rs.6000	10	16	19	45		
	Total	90	100	110	300		
Access to media sources	One source	28	22	7	57	19.82	**0.0005***
	Two sources	55	60	86	201		
	Three or more sources	11	13	18	42		
	Total	94	95	111	300		
Mean		3.4	11.7	18.5	11.22		

[Table/Fig-5]: Association of adoption score with socio-demographic factors (n=300).
*(p<0.05) Significant

DISCUSSION

The emergence of global pandemic COVID-19 during early months of 2020 has been a matter of serious concern for almost all the countries in the world. The phased lockdown implemented from last week of March 2020 and unlock process from June 2020, though caused serious impact on the economic development process in our country, made the people sensitive to adopt preventive measures against the pandemic. The experiences gained during the first phase of COVID-19 in terms of knowledge and adoption of safety measures by the people in general and by the weakest section of the society like tribal in particular assume great significance for health sector managers at various levels. The tribal people are generally apathetic about health until any medical emergency occurs. The tribal lifestyle, belief, culture is different from the rest of the country's population

[13]. Hence, the present cross-sectional study on knowledge and adoption of safety measures against COVID-19 was taken up in a tribal community of southern Rajasthan. The selected household for the present study belonged to Bhil-Meena communities having agriculture and wage work as their main occupations.

The present study revealed that 37 (12.33%) participants were illiterate and remaining were literate including 88 (19.00%) having education above high school. The study by Morshed MM et al., done in the tribal area observed that 138 (39.65%) participants were illiterate and 45 (12.93%) attained education above high school [13]. The knowledge and perception study conducted by Morshed MM et al., in the Chakma, Marma and Tripura tribal communities of Bangladesh district observed that 138 (39.65%) participants were illiterate and 45 (12.93%) attained education above high school [13]. In the present study, it was found that knowledge score was significantly associated with education level. The study done by Tomar BS et al., among general population of India showed that high knowledge score was associated significantly with higher education ($p<0.001$) [12]. The same study also revealed that the knowledge score was associated significantly with family occupation while in contrast, the present study revealed that knowledge score was not significantly associated with occupation, agriculture and wage work been major source of occupation for the respondents family [12].

The extent of access to communication and media by the tribal community was assessed for its impact on knowledge and adoption of safety measures against COVID-19. In the present study, about 57 (19%) families had access to one media source, 201 (67%) families had access to two media source and 42 (14%) families had access to three or more sources. While the study done by Gupta P et al., among rural population of northern Indian district revealed that 204 (54.80%) had television and 183 (49.20%) had radio [14]. In a study done by Srivastava A et al., the access to multiple sources of media was found to be 4850 (58.37%) which is less when compared with the current study [15]. The study by Dkhar SA et al., among social media users in Jammu and Kashmir, showed that 934 (60.97%) participants got the knowledge about COVID-19 through various modes of social media [16].

The web-based study conducted by Shukla S and Deotale P among general population of Maharashtra, revealed that 423 (74.21%) participants had family income above 20000 rupees per month while the current study showed that only 45 (15.00%) families had family income of more than 6000 rupees per month [17]. Again the low family income is attributable to the tribal social background of the family on one side and decline in income due to COVID-19 restrictions in many families on the other side.

The study done by Srivastava A et al., among the population of north eastern states of India revealed that 4133 (49.74%) participants knew that the COVID-19 infection can be transmitted from asymptomatic individuals while in the current study only 88 (29.33%) participants knew the COVID-19 infection can be transmitted from asymptomatic individuals [15].

The present study revealed that 220 (73.33%) participants had correct knowledge of wearing face mask. In a study done by Srivastava A et al., found that 7607 (91.55%) respondents had correct knowledge on wearing facemask [15]. The present study revealed that 202 (67.33%) respondents were wearing mask to prevent COVID-19 transmission while the other studies like Gupta P et al., Morshed MM et al., and Srivastava A et al., concluded that 285 (76.60%), 295 (84.77%) and 7069 (85.08%) respectively were wearing mask [13-15]. The better knowledge on mask use reflected in higher adoption of same in the study area which indicated that if knowledge is made available to socially weak tribal communities, they will not hesitate to adopt the practices which are good for their health.

The present study concluded that 215 (71.67%) respondents were washing their hands frequently while the various studies done by Gupta P et al., Srivastava A et al., and Kartheek AS et al., showed the frequency of handwashing was 276 (74.20%), 6462 (77.77%) and 733 (97.60%) respectively [14,15,18]. In various other studies conducted by Morshed MM et al., Kartheek AS et al., and Molla KA and Abegaz SB, it was found that washing hands with soap were 207 (59.48%), 389 (30.60%), and 149 (36.90%), respectively [13,18,19]. While the current study showed usage of soap while hand washing was 147 (49.00%) which is comparable to the above mentioned studies.

The present study revealed that 197 (65.67%) respondents knew the importance of following social distancing to prevent COVID-19 which is low when compared to a study done by Srivastava A et al., 6769 (81.47%) [15]. The present study revealed that 178 (59.33%) respondents were actually following the norms of social distancing, while the various other studies done by Molla KA and Abegaz SB, and Gupta P et al., concluded that the extent of practice of social distancing was 134 (33.16%) and 270 (72.58%) [14,19].

In relation to practice, it was found that 234 (62.90%) participants were avoiding visitors or unnecessary movement outside the home in a study by Gupta P et al., when compared to 209 (69.67%) in the current study which is almost similar [14]. The study done by Molla KA and Abegaz SB, among general population of Woldia town, Northeast Ethiopia found that out of 404 respondents, 26.73% and 55.94% of the respondents were obeying the government restriction strategies by avoiding wedding ceremonies and funeral ceremonies [19]. The present study found that 101 (33.67%) participants were avoiding the social functions.

It was observed that in selected tribal families, the adoption of respondents was low as compared to the knowledge part in relation to usage of mask, hand washing with soap and social distancing. In the present study, the mean COVID-19 knowledge score was 7.6 (50.57%) and adoption score was 11.22 (46.75%). The study conducted by Kartheek AS et al., found that mean COVID-19 knowledge score was 16.28 (74.00%) [18]. The study done by Srivastava A et al., found that the mean score of knowledge was 7.137 (71.37%) and practice score was 9.379 (78.15%) [15].

Both knowledge score and adoption pattern were found to have significant association with education level, family income and access to media sources in the present study. Also, the knowledge score was positively correlated with adoption score in the present study. The study done by Srivastav A et al., found that knowledge score and practice score had significant association with the educational level which was similar in the present study [15].

The study conducted by Tripathy S on the effect of COVID-19 pandemic on four tribes of India covering Bedia of Jharkhand, Bodo of Assam, Bhil of Madhya Pradesh and Santahal of Odisha brought out the extreme remoteness of their villages, the dietary habits building immunity and forced stay at home during the pandemic helped them to minimise the spread of the disease [20]. The present study, contrary to the above revealed that the knowledge about immunity building was very low among the respondents.

The positive and significant association of knowledge as well as adoption measures with socio-demographic domains like education level, family income and access to media revealed that media sources played a major role in giving knowledge and translating the knowledge into practice by the weaker section like tribal communities. The gap in knowledge and adoption may be due to socio-demographic constraints of the tribal families, especially because of low level of education, income and access to media sources.

Limitation(s)

The study period coincided with COVID-19 period with many restrictions and regulations for free movement of the people. The attitude component could not be included as it was intended to complete the survey with minimum contact period of time with the respondents.

CONCLUSION(S)

The Bhil-Meena tribal community of southern Rajasthan was found to have moderate knowledge about the use of mask and specific alternative materials that can be used in place of surgical mask. The community was found with relatively poor knowledge on immunity building measures. The good knowledge on use of mask was reflected in its better adoption also. The factors like highest education level for family members, family income and access to media sources were found to have significant association with knowledge as well as adoption of preventive measures. The significant association between knowledge and adoption could be indicative of the fact that better practices against communicable diseases like COVID-19 is possible through enriching the knowledge level of tribal communities. Socially visible practices followed by general population like mask wearing was adopted by tribals also whereas the adoption level of invisible components for immunity building was relatively low. The knowledge and adoption domains having lowest score like immunity building could be given priority in enhancing the knowledge of tribal masses through tailor made interventions.

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