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Original Research Article

COVID-19 and public health risk communication in Manipur: a phone-based cross-sectional study

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ABSTRACT

Background: In the fight against COVID-19, communication remains as one of its most important strategic tools. To facilitate healthy behaviour among the general public, Central and State governments has been carrying out various awareness generating activities. This study plans to assess the adequacy of these activities by investigating people's response by assessing their knowledge, attitudes and actions.
Methods: This cross sectional study was conducted among 1493 adults (≥ 18years) residents of Manipur state selected through Random Number Dialling of mobile numbers using a pre-tested interview schedule. Descriptive statistics were generated and multiple logistic regression analysis was performed to test for association. A p-value of <0.05 was taken as significant. Approval was obtained from the institutional ethics committee.
Results: The average age of the participants was 34.3 years with females constituting 51%. Majority were aware of the common symptoms i.e. Fever (94.5%), Cough (87.1%), Difficulty in breathing (74.9%) of COVID-19. Preventive measures of hand-hygiene, wearing masks and social distancing were known to 90.3%, 94.8% and 75.6% respectively. Almost 60% agree that the lockdown imposed has worsened their daily living, and more than four-fifth of the participants were stressed and worried. Increase in level of education and per capita income per month was significantly associated with the higher knowledge regarding COVID-19 ($p<0.05$). There was gap in knowledge and practice and wrong practices were seen.
Conclusions: A change in the health communication messages with emphasis on the need for correct practices through appropriate channels and community engagement is urgently required at this hour.

Keywords: COVID-19, KAP, Knowledge, North-east, Risk communication

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) which began in Wuhan, China at the end of 2019 was declared a disease of Public Health Emergency of International Concern by WHO on 30th January 2020.[1] However the disease quickly escalated across all the regions of the world and, a Pandemic was declared on 11th March 2020.[2] Today, there are 13, 150, 645 cases, with 574, 464 deaths as different countries enters different stages of COVID-19 trajectory.[3]

India detected its first case of COVID-19 on 30th January 2020 in Kerala in a student who returned from Wuhan University, China.[4] The country has since seen an increase in cases and with the steady rise, the

Government issued advisory on social distancing to be adopted for the first time on 16th March to all its States and Union-Territories.[5] Within a week (24th March), a complete lockdown of the entire country was announced.[6] Three months later, as the country enters the unlocking phase, the country is still experiencing rapid rise in cases with no sign of slowing down. The country now has the highest number of confirmed cases in Asia, and third highest in the world with 968, 876 cases, and 24, 915deaths.[7]

Manipur, a North-Eastern state of India shares international border with Myanmar to its South and East. Many products and commodities which originate in China are known to enter India through this shared border trade routes - "Moreh-Tamu"and "Moreh-Namphulong".[8] With increasing cases worldwide, the State sealed its international borders on 10th March.[9] Within two weeks, the State saw its first case on 24th March in a returnee from the UK.[10]

Following the Central government guidelines, the State went into lockdown on the same day, and with no other entry routes, the State subsequently was able to declare itself a "COVID-19 free" State on 20thApril although there was one case detected on contact tracing from the Tablighi "Super-Spreader" event attendee who also recovered.[11]

However, with the initiation of "reverse migration" to parent states,triggered by the imposition of lockdown, the number of cases started increasing among the returnees from different states of India with 1672 confirmed cases, 702 active cases, 970 recoveries and zero death as of 16th July.[7]

As the nations battle COVID-19, and as the search for vaccines and better management continues, the final success cannot be achieved without the full participation of the affected population through their strict adherence to the control measures. Sound and thoughtful risk communication at appropriate time, brings about awareness, encourages healthy behaviours, promotes acceptance of preventive measures, builds trusts, understanding and reassure the affected population, and importantly garner public cooperation; which is all the more required at this stage of pandemic in the country.[12-14]

Government of India and the State governments have since launched various awareness generating activities to equip its people with knowledge of COVID-19, giving real time updates of morbidities and mortalities on its official sites, and provide certain risk information as well through newly developed apps '*Aarogya Setu*', helplines etc.[15]

But all these communication activities can become mechanical and meaningless if unmonitored for outcomes. To assess the adequacy of the communication so far imparted so as to enhance the public health response of the states to the pandemic, there is an urgent need to see the public's understanding of disease and assess their knowledge gaps, perceptions and actions. In this study, we investigated the residents of Manipur to ascertain their COVID-19 related knowledge, attitude and actions and associated factors.

METHODS

Study design and sampling

A cross-sectional study was conducted from 15thMay to 30th June among the residents of Manipur and data were collected through mobile phone interviews (The percentage of household having mobile phones in Manipur is 97% in Urban and 93% in rural in Manipur-NFHS4).16 All adults (18 years and above) who are currently residing in Manipur, and consented to be in the study were included, but individuals belonging to medical fraternity were excluded from the study. The sample size calculated was 1297, taking p at 50% (for maximum sample size), with 3% allowable error, at 95% confidence interval and 20% non-responders. From the mobile numbers made available from the directories of the mobile networks operating in the state, through random number dialing, respondents were invited to participate in the study. Only one person per household was included in the study, and to reduce the bias due to phone ownership, after calling the eligible candidate whose birthday was closest to the date of interview was interviewed in the household.

Instrument and data collection

Interview was taken using a pre-tested, interview schedule which had both closed and open-ended questions. It consisted of two parts; the first part collected the socio-demographics of the participants and the second part knowledge, sources of information, attitude and behaviour related section. The knowledge questions pertained to sign, symptoms, routes of transmission etc. All knowledge related questions were open ended. Statements with options of agree, disagree or no comment, were given to assess their attitudes; behaviour questions to assess their response to the current situation (Behaviour related questions were asked in relation to the 2 weeks preceding their interviews). The behaviour related questions had both closed ended (answered as always, sometimes or never) and open-ended questions. The interview schedule was translated into local language from English which were then back translated into English before administering. After taking informed consent, interviews were taken in either language according to the comfort and understanding of the participants. Each interview lasted approximately 20 minutes.

Operational definition

There was 09 knowledge related questions with each correct response given a score of 01 and incorrect response as 0. The total score ranges from 0-25. Those scoring 13 and above in the knowledge score were considered as having adequate knowledge regarding COVID-19.

The data was entered into MS excel and data analysed using IBM SPSS V-20. Descriptive statistics such as mean, median, percentage were used to describe the data.

Ethical approval was obtained from institutional ethics committee of the State medical college and verbal informed consent taken from each participant before the start of interview.

RESULTS

Social and demographic characteristics

A total of 2003 calls were made, out of which 1493 completed the interviews. About 14% (201) numbers were either unreachable, or did not respond, 4.6% (87) people did not meet the inclusion criteria and nine people refused to participate. There were respondents from all the districts of the state except from three, with maximum respondents from Imphal East and Imphal West. The average age was 34.3 years, [standard deviation (SD): 15, median: 28 years, range: 18-98] with most respondents belonging to the age group of 18-25 years. There was almost equal representation from both genders. Details of Socio-Demographic characteristics are given in Table 1.

Table 1: Socio-demographic characteristics of study participants (n=1493).

Characteristics	Categories	N (%)
Gender	Male	731 (49)
	Female	762 (51)
Residence	Urban	607 (40.7)
	Rural	886 (59.3)
Religion	Hindu	635 (42.5)
	Christian	377 (25.3)
	Sanamahi	365 (24.4)
	Muslim	109 (7.3)
	Others	07 (0.5)
Marital status	Unmarried	779 (52.2)
	Married	679 (45.5)
	Divorced	08 (0.5)
	Widowed	27 (1.8)
Age-groups (in years)	18-25	646 (43.3)
	26-35	282 (18.9)
	36-45	204 (13.7)
	46-60	268 (18)
	More than 60	93 (6.2)
Socio-economic status (modified BG Prasad)	Rs 7008 and above (upper class)	766 (51.9)
	Rs 3503-7007 (upper middle class)	427 (28.9)
	Rs 2102-3503 (middle class)	167 (11.3)
	Rs 1051-2101 (lower middle class)	95 (06.4)
	≤ Rs 1050 (lower class)	21 (01.4)
Occupation	Student	632 (42.3)
	Government Jobs	273 (18.3)
	Business/ Private Companies/ Self-Employed	187 (12.5)
	Homemaker	199 (13.3)
	Unemployed	52 (3.5)
	Farmer	100 (06.7)
	Daily wage Earner	39 (02)
Educational qualification	Illiterate	37 (03)
	Some schooling (Classes ≤ 9)	66 (04)
	Completed Matriculation	139 (9)
	Completed Higher Secondary	429 (29)
	Completed Graduation	602 (40)
	Completed Post-Graduation	220 (15)

Knowledge of COVID-19

The common symptoms of COVID-19 fever, cough and 'difficulty in breathing' were known to 94.5%, 87.1%, and 74.9% respectively.

The other commonly mentioned symptoms were cold or runny nose (83%), and Sore-throat (41.7%), and less commonly known were Diarrhoea (21.8%), Loss of taste and Smell (13.8%), Myalgia (10.6%), headache (3.3%) and certain skin conditions (5.5%). Regarding the route of transmission, the most commonly mentioned was respiratory droplets and only 3.3% responded not knowing the routes. In knowledge regarding preventive measures, although 90.3% of the participants identified hand hygiene as an important safety measure, the correct duration of time for hand-washing was known only to 24.4%, and only 70% were aware of the right physical distance to be maintained although 75.6% had the knowledge for the requirement of maintaining social distance. Other measures which were mentioned are drinking of warm water to boost immunity, consumption of vitamin C, Vitamin D tablets, herbal tea etc. In all 0.6% responded 'Not knowing what to do' (Table 2).

Table 2: Responses of the participants to COVID-19 knowledge questions (n=1493).

Knowledge Questions	Response	N (%)
Is there an effective cure for COVID-19	Yes	241 (16.1)
	No	1107 (74.1)
	Don't know	145 (9.7)
Can asymptomatic COVID-19 cases can spread the disease	Yes	1055 (70.7)
	No	275 (18.5)
	Don't Know	163 (10.9)
Routes of Spread of COVID-19	Respiratory Droplets	1391 (93.2)
	Fomites	854 (57.2)
	Faeco-oral	200 (13.4)
	Don't Know	49 (3.3)
Safe Practices for COVID-19 prevention	Wearing Mask	1416 (94.8)
	Hand Hygiene	1348 (90.3)
	Not going to Crowded Places	1031 (69.1)
	Social Distancing	1128 (75.6)
	Avoid Gathering in groups	804 (53.9)
	Don't Know	09 (0.6)
Age groups that's most vulnerable	Correct response	840 (56.3)
	Incorrect Response	568 (38)
	Don't Know	85 (05.7)

Table 3: Main Sources of Information of COVID-19 (n=1493).

Communication methods	Age groups (years)				
	18-25 N (%)	26-35 N (%)	36-45 N (%)	46-60 N (%)	61 & more N (%)
Television	428(66.3)	201(71.3)	161 78.9)	204(76.1)	57(61.3)
Radio	281(43.5)	157(55.7)	140(68.6)	192(71.6)	71(76.3)
Newspaper	390(60.4)	178(63.1)	128(62.7)	185(69)	185(60.2)
WhatsApp	398(61.6)	203(72)	109(53.4)	118(44)	15(16.1)
Facebook	374(57.9)	170(60.3)	91(44.6)	85(31.7)	08(08.6)
Other OSN	308(47.7)	127(45)	67(32.8)	66(24.6)	10(10.8)
Internet	488(75.5)	202(71.6)	98(48)	119(44.4)	21(22.6)
Word of Mouth*	324(50.2)	162(57.4)	144(70.6)	176(65.7)	65(69.9)
Doctors/ Nurses	179(27.7)	62(22)	38(18.6)	39(14.6)	06(6.5)
Other HW	117(18.1)	39(13.8)	26(12.7)	23(8.6)	06(6.5)

**families, relatives and friends*

The most common source of information regarding COVID-19 were mass media [TV (70.4%), Newspaper (66.8%), Radio (56.3%)], which were followed by Internet sources, then WhatsApp (56.5%), Facebook (48.8%), other social networks (OSN) (38.7%), Word-of-Mouth [Families (58%), Friends (40.3%)] and finally through health workers Doctors/ Nurses (21.7%). Other uncommon sources mentioned were caller tunes, helplines, local announcements etc. The traditional means of communication remained an important source of

communication for people across all age groups whereas the newer methods of communication were more common among the younger age groups. "Word-of-Mouth" was another important source of information especially for the older age groups (Table 3).

Attitude towards COVID-19

Almost all disagreed to the statement that they will forbid frontline workers from entering their localities, or that they will hide their travel histories and majority opined that quarantine centres are helpful in containing the spread of the disease. But almost 60% agree that the lockdown imposed has worsened their daily living and more than four-fifth were stressed and worried.

About half of the participants also displayed a diminished trust in the authorities' actions and around two-third felt they are not listened to, although majority appreciated the relief aids distributed (Table 4).

Table 4: Attitudes of the study participants regarding COVID19 (n=1493).

Statement	Agree N (%)	Disagree N (%)	No comment N (%)
I will not allow frontline workers to enter inside my locality because they might carry the virus	108(7.2)	1269(85.0)	116(7.8)
I will hide mine or my family members' travel history, to avoid going to quarantine centre	25(1.7)	1434(96.0)	34(2.3)
Quarantine centres are helpful in infection containment	1319(88.3)	76(5.1)	98(6.6)
The entire COVID-19 situation stresses me	1288(86.3)	133(8.9)	72(4.8)
Health system of the State is adequately equipped to tackle COVID-19	830(55.6)	388(26)	275(18.4)
Bringing in stranded people from outside state is a good decision by government	765(51.2)	335(22.4)	393(26.3)
Lockdown has worsened daily living more than COVID-19	880(58.9)	465(31.1)	148(9.9)
Relief aids during COVID-19 are beneficial	1303(87.3)	98(6.6)	92(6.2)
I absolutely trust every information posted on social media	107(7.2)	1186(79.4)	200(13.4)
Authorities are listening to our needs	578(38.7)	577(38.6)	338(22.6)
Government is releasing all information needed	887(59.4)	310(20.8)	296(19.8)

Behaviours during COVID-19 pandemic

In relation to hand hygiene it was seen that almost two-third of the participants always practiced hand hygiene [washed hands with soap and water(50.3%)or used hand sanitizer (15.7 %)]but only 16% of the participants washed for the correction duration of time of 40 seconds or more in those who washed hands. It was also reported that, 70% of the participants always maintained social distance whenever they go to work or go out, and among them 86% of them correctly maintained distance. Wearing of mask was practiced by 79.9% always whenever they step out of the house. The most commonly used mask was surgical mask (66.6%), followed by N-95 respirators (24.9%). The others used were cloth mask and other home-made mask. The practice of mask re-use was reported in 92.2% of the participants. Good respiratory hygiene of covering nose and mouth either with cloth/ mask/ tissue while coughing or sneezing was seen in 41.9% and 12.4% reported coughing or sneezing into elbow. The rest of the participants either cough/ sneeze into their bare hands or do it without covering. Not leaving home unnecessarily was reported by 74.5% of the respondents (Table 5).

Table 5: Behaviour of participants during COVID-19 (n=1493).

Behaviours (in the past 2 weeks)	Always N (%)	Sometimes N (%)	Never N (%)
Hand Hygiene	985 (66)	490 (33)	18 (1)
Use of Mask	1193 (80)	282 (19)	18 (1)
Social Distancing	1060 (71)	374 (25.1)	59 (4)
Avoided leaving home unnecessarily	1107 (74.1)	302 (20)	84 (6)

Health seeking behaviour

In being asked what they would do if they develop sign and symptoms suggestive of COVID-19, 78.2% reported that they would approach doctors, 15.1% reported they will get themselves tested, while 4.5% reported they will call helpline, or self-medicate and 2.2% reported they would stay at home.

The mean (SD) knowledge score of the respondents was 14.4 (± 3.4). The participants scored a minimum of 1 and

their maximum score was 23. Majority of the respondents (1300, 87.1%) had adequate knowledge regarding COVID-19 while only 193, 12.9% had inadequate knowledge.

In the univaraiate analysis it was seen that as the level of education of the participant increased, their knowledge regarding COVID-19 also significantly increased (p=0.001). Those residing in urban areas, belonging to younger age groups, unmarried individuals and those with higher percapita income per month were significantly more likely to have higher knowledge regarding COVID-19 as shown in the univariate analysis (p<0.05). Multivariable logistic regression analysis found that only level of education and per capita income per month was significantly associated with the knowledge regarding COVID-19 (Table 6).

Table 6: Multiple logistic regression analysis with knowledge of COVID-19 as dependent variable and selected independent variables.

Variables	Categories	Crude OR	95% CI	P value	Adjusted OR	95% CI	P Value
Level of Education	Illiterate	1					
	Class 1-8	8.3	3.2-21.3	<0.001	9.1	3.3-24.3	<0.001
	Class 9-10	20.3	8.1-50.6		17.9	6.8-47.3	
	Class 11-12	29.4	12.7-68.1		22.6	8.7-58.6	
	Diploma & Graduate	32.1	14.1-73.4		23.9	9.4-60.9	
	Post graduate	49.5	19.3-127.1		36.3	12.7-104.1	
Residence	Rural	1					
	Urban	1.6	1.2-2.3	0.002	0.7	0.5-1.1	0.1
Religion	Hindu	1					
	Christian	0.8	0.5-1.1	0.2	0.7	0.5-1.2	0.2
	Muslim	0.9	0.5-1.7	0.9	0.6	0.3-1.2	0.2
	Meetei	1.7	1.1-2.7	0.01	1.8	1.2-2.9	0.01
Per capita income	Rs 7008 and above	8.2	3.3-20.1	<0.001	6.9	2.4-16.9	<0.001
	Rs 3503-7007	5.5	2.2-13.6	<0.001	5.7	2.1-15.2	<0.001
	Rs 2102-3503	4.1	1.6-10.6	0.003	4.7	1.7-13.2	0.003
	Rs 1051-2101	4.1	1.5-11.3	0.005	5.1	1.7-15.3	0.003

DISCUSSION

Communication initiates behaviour change, whether positive or negative and it remains a critical tool in management in times of public health emergencies.[17] The efficient use of it can improve collective and individual decision making, and protective behaviours adopted and can bring about better respond to threats.

In the current study, it was found that the knowledge of common symptoms 'Fever, Cough, Difficulty in Breathing' of COVID-19 which are widely circulated and publicised are known to most of the participants which clearly depicts the exposure to different sources of communication and the effectiveness of it. As for the knowledge regarding the protective measures, most of the participants were aware of the protective measures to be adopted, but the required recommendations for duration of hand-washing was known to only one-fourth (24.4%) of the participant although the required physical distancing was known to almost three-fourth (70.1%) of the population. The relative lack of knowledge regarding the right durations can be due to lack of easy availability of the information, and better knowledge regarding the social distance could be due to more frequent discussing of the topic on media. Possessing a seemingly correct incorrect knowledge can lead to false practice and subsequently a false sense of security and protection. It is imperative that corrective measures be taken up immediately. There were also participants who responded not knowing any protective measures against COVID-19 or its routes of transmission, suggesting that there are still pockets in the society where communication are yet to reach; and there were also evidence of rumours/ myth such as "drinking warm water to boost immunity" etc circulating which need to be addressed immediately.

As the traditional media (TV, Radio, Newspaper) still remain an important source of information, they may be used more extensively and creatively, and also information be tailor made according to the channels and the population it serves. Word-of-mouth was found to be another important source of information dissemination especially for the older population. Engaging community leaders, both secular and religious can help improve the quality of information that are passed on through word-of-mouth, and can help fight rumours and myths which

easily spread among communities. Online social media were found to be important source especially for the younger generation. OSN being a popular source was also found in study conducted in Egypt.[18] Medical fraternity was an uncommon source of information. This could be due to decreased contact with the health system with the declaration of lockdown, although it may also indicates the decrease in the information dissemination activities by the health workers and activists, which again may have occurred because of the sudden change in the working system due to the pandemic and its novelty.

The participants had relatively healthy attitude towards the COVID-19 pandemic containment activities, showing their willingness to co-operate in their fight against the disease by showing their agreement to allow frontline workers to work freely, and willingness to declare their travel history. But in-spite of their agreement with the works of authorities in terms of setting up of quarantine centres, and distributing relief aids, there appears to be a diminished trust in the authorities as only half of the participants opined that the authorities were doing right in bringing in stranded people of the state, and more than half opined that the health systems of the state are not adequately equipped to tackle COVID-19. And most of all, only 38.7% felt that the authorities are listening to their needs, which indicated a certain lack of community engagement from the part of the authorities. Similar dissatisfaction towards government were seen in studies conducted in other states of the Country and other parts of the World.[19-21] Building of trust remains an important pillar of risk communication which needs to be addressed.

Presence of mental stress was reported by more than four-fifth (86.3%) of the respondents. Being worried and feeling paranoia about the pandemic was also reported in study conducted in UP.[22] The distress reactions and subsequent health risk behaviours and mental health disorders can lead to major public health consequences.[23] Nonetheless whether the people are experiencing stress due to the disease, or due to economic impacts, social or security disruptions, as a consequence of the pandemic, mental health services need to be extended and up-scaled even to the general population.

As for their behaviours, although almost everyone had the correct knowledge regarding the need of hand hygiene, only 66% only were found to maintain hand hygiene regularly. This gap in knowledge and behaviour is also observed in the use of mask, maintaining of physical distance, not leaving home etc. The behaviour seems inappropriate to the risks they are exposed to. The seeming lack of risk perception and thereby action could be due to the lack of full knowledge regarding the disease and thereby indicating a deficiency in the communication or other economic and social factors which requires further research and investigations. The other problem seen is the incorrect practice among those who followed the hygiene instructions i.e. among those who practice hand-washing only 16% were found to wash hands for the recommended duration of time, and in mask re-use, surgical mask, which is a single use mask, re-use was reported by almost all its users.

The limitations of our study are that households which do not possess mobile phones or those located in remote hilly areas where network connectivity is poor could not be assessed. The study which is first of its kind in the state is able to highlight some of communication gaps in relation to the current pandemic which may be generalization to the population of Manipur.

CONCLUSION

In Conclusion, the time is ripe for a change in the message of communication, with emphasis on the need for correct practices through appropriate communication channels with more community engagement and trust building activities.

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