



A WEB BASED CROSS SECTIONAL SURVEY TO ASSESS THE KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS THE COVID 19 AMONG THE RESIDENTS OF GUJARAT, INDIA

Dr. Meet M. Chauhan*	Assistant Professor, Department of Community Medicine, Shantabaa Medical college and General Hospital, Amreli, Gujarat. *Corresponding Author
Dr. Trusha R. Kansagara	Assistant Professor, Department of Community Medicine, Shantabaa Medical college and General Hospital, Amreli, Gujarat.
Dr. Jaydeep Oza	Assistant Professor, Department of Community Medicine, Shantabaa Medical college and General Hospital, Amreli, Gujarat.
Dr. Dipak Solanki	Professor & Head, Department of Community Medicine, Shantabaa Medical college and General Hospital, Amreli, Gujarat.

ABSTRACT **Background:** The level of knowledge, attitudes, and practices towards communicable diseases can act as barrier for community spread and infection control. It is possible to apply necessary measures in forms of health education and behaviour change communication method to prevent spread of disease.

Aims: This study aimed to examine the knowledge, attitude, and practice (KAP) toward COVID 19 among the general population.

Settings and Design: This was a cross-sectional, web based, observational study among the general population.

Methods and Material: This study was carried out from 14th April to 24th April, 2020 using google form, WhatsApp application using principle of snowball technique. Information related to demographic profile and KAP about COVID 19 was collected and analysed.

Results: The mean age of the participants were 27.5 years, with 73.1 % male and 70.8% from urban area. The mean score of knowledge, attitude and practices were 11.04, 7.04, 10.69 respectively with 72.1% good Knowledge, 78.2% had positive attitude and 62.9% had satisfactory practices to prevent the disease spread. There were a significant association between Knowledge level and practice ($p=0.01$) as well as attitude and practice ($p<0.0001$). There were significant differences regarding the knowledge, attitude and practices among age group, education levels, and place of residence. Multiple linear regression analysis showed lower level of education and rural place of living were significantly associated with lower knowledge score and increase in age, lower level of education and being male were significantly associated with poor practice. ($p<0.05$)

Conclusions: overall knowledge and attitude is good in the study population with poor practices. This will require more intensified media campaign with efforts to change their behaviours. Poor knowledge in the rural area requires targeted intervention for awareness and behaviours change communication.

KEYWORDS : COVID 19, Knowledge, Attitudes, Practices, Gujarat

INTRODUCTION:

Currently, World is experiencing global pandemic of COVID 19 (Corona Virus Disease 19/ Novel Coronavirus/SARS COV2) and this pandemic has affected all dimensions of the health catastrophically. So far, COVID 19 has affected 210 Countries and Territories around the world with 27, 24, 809 confirmed cases and a death toll of 1, 87,847 deaths which was originated from Wuhan, China. ⁽¹⁾ In India, first case of COVID 19 was reported on 30th Jan 2020. Till 26th April 2020, there are 26,384 confirm cases with mortality of 826 are reported in India. First confirm case was detected on 19th March 2020 in Gujarat and till 26th April 2020 the figures reached up to 3071. ⁽²⁾ The cases are presented with flu like symptoms and spread via droplet infection. Asymptomatic cases are also being reported who never develop symptoms in the course of diseases. ⁽³⁾ These cases are again the challenge for the containment of virus. Several Vaccine and drug trials are undergoing against COVID 19, but till the effective products are made available for the people, non pharmacological interventions like Social Distancing, Cough Etiquette, Personal Hygiene and personal protection etc, are the effective measures to limit the spread of SARS-COV2 and droplet infection of other respiratory virus. ^{(4),(5),(6)}

Lockdown has significantly declined growth rate of COVID 19 cases and had shown potential to slow down the spread of COVID 19 in China. ⁽⁷⁾ In India, Nationwide lockdown was commenced on 25th March 2020. Lockdown is the short-term measure to reduce community transmission and rapid spread, but as a long term measure an Individual's knowledge about COVID 19, their attitude and routine preventive practices plays a pivotal role in the containment of spread of the disease. Although there is wide spread media campaign already running by the Government and Civil Organizations, there is a need to understand community awareness for COVID 19 before lockdown is terminated or moderated. In the present study we aim to assess Knowledge(K), Attitude(A) & Practices(P) about COVID 19 in the resident of Gujarat during the nationwide lockdown period. The study objectives are

- 1) To assess the Knowledge, Attitude and Practice regarding COVID 19 in General Population
- 2) To know the association between socio demographic characteristics and Knowledge, Attitude and Practice of an Individual regarding COVID 19

SUBJECTS AND METHODS:

Study design and study period

This was a cross-sectional, web based, observational study carried out for period of 10 days (14th April to 24th April, 2020) during mid lockdown period among general population of Gujarat, India.

Sampling technique and Data collection tool:

An online semi-structured Gujarati Questionnaire (Local language) was developed using Google Form with reference from previous studies done by researchers, ⁽⁸⁾ and interim guideline by Ministry of Health and Family Welfare, Govt. of India. ⁽⁹⁾ The form was pilot tested in twenty participants to check the feasibility and correctness. According the feedback, revised field-tested questionnaire developed and was used in the survey. The link of google form was circulated through WhatsApp application. Individual and group contacts of the investigators and other college staff, was first communicated through this application. Later the participants were encouraged to roll out further the survey form to their WhatsApp contacts. Thus, using principle of snowball sampling technique more and more participants were included in survey. Before entering to the survey form, consent was written in the form with Objective of survey, declaration of confidentiality, anonymity and voluntary nature of participation. Once the participants show their willingness for the survey by entering "yes", they were directed to enter the details in the survey form. Form includes socio-demographic details like age, gender, occupation, education, place of residence (Urban/Rural) and district of residence along with seven questions related to Knowledge, four questions related to Attitude and six questions related to Practices regarding COVID 19. (Appendix 1)

In knowledge part, four questions were related to clinical manifestations and management of COVID 19 while 3 questions were related to prevention and control of disease. Respondents were asked to rate yes/no/don't know in four questions and multiple answers for three questions (mode of spread, symptoms and high-risk group). A score of "2" for correct answer and "0" for incorrect/don't know answer were assigned. In multiple answer questions score of 0,1 and 2 was assigned according to accuracy of answer.

In the attitude part, responses were measured on a 3-point Likert scale ranging from 0 to 2 with 0 = Disagree, 1 = Partially agree, 2 = Completely agree. Similarly, in the practices part, score was assigned as 0 = Never, 1 = Sometimes and 2 = Always. Considering median of particular score, level of Knowledge, Attitude and Practices was considered as Good/Poor Knowledge, Positive/Negative Attitude and Satisfactory/Unsatisfactory Practices (if ≥ median, it considered as good knowledge, positive attitude, satisfactory practices, and if < median score, it considered as poor knowledge, negative attitude, unsatisfactory practices).

Inclusion Criteria:

It was an online study. Participants with access to the internet, who are using WhatsApp, age more than 16 years who able to understand Gujarati language and willing to give informed consent were included in the survey.

Ethical Issue:

No ethical clearance was required and thus exempted. This is only KAP survey and does not determine the health status of any individual. The survey was anonymous and consent was taken after explanation of objective of the study in the online form.

Statistical Analysis

All statistical analyses were performed using Microsoft excel windows 2010. Quantitative data were expressed as mean and standard deviation. Qualitative data were expressed as number and percentage. For the purpose of analysis, the individual scores were summed up to yield a total score. Mean and Median of the Knowledge, Attitudes and Practice score was calculated. Score of the Knowledge, Attitudes and Practices were compared with various demographic variables by independent samples *t* test, one-way analysis of variance (ANOVA), or Chi-square test as appropriate. Multivariate linear regression analysis using all of the demographic variables as independent variables and knowledge score as the outcome variable was conducted to identify factors associated with knowledge, attitudes and practice score as an outcome variable. Unstandardized regression coefficients (β) and their 95% confidence intervals (CIs) were used to quantify the associations between variables and KAP score.

The statistical significance level was set at $p < 0.05$ (two-sided).

RESULTS:

This was a cross-sectional, web based, observational study carried out for period of 10 days (14th April to 24th April, 2020) using google form. After pilot study the link of google form was circulated through WhatsApp application to all the primary contacts of all the investigators and department faculty. After that, using principle of snowball technique link of the google form was spread as much as possible to the population. A total 1295 participants were completed the web-based questionnaire.

Table 1 showing complete demographic profile of study participants. Among this 946 (73.1%) were male and 349 (26.9 %) were female participants. The mean age (±SD) of the patients were 27.5±6.36 years and about half (49.6%) were in the age group of 26 to 40 year. In study population, three fourth respondent (75.55%) had completed graduation and half of the respondent (56%) were involved in services. There were 70.8% of the participants from urban area, and 46.6% of the participants were related to health care services (themselves or any family member). (Table 1)

Table 1: Distribution of participants according social and demographic characteristics

Characteristics	Frequency	Percentage(%)
Sex		
Male	946	73.1
Female	349	26.9
Age (completed years)		
16–25year	335	22.87

26 – 40 year	643	49.65
41 – 60 year	298	23.05
>60 years	47	3.63
Education		
Primary	29	2.2
Secondary	87	6.7
Higher secondary	202	15.6
Graduate	528	40.8
Master Degree	449	34.7
Occupation		
Business	160	12.4
Labourer	30	2.3
Service	725	56.0
Study	229	17.7
Housewife	49	3.8
Retired	35	2.7
Unemployed	35	2.7
Farmer	32	2.5
Place of Residence		
Rural	378	29.2
Urban	917	70.8
Relation with Health care		
Yes	604	46.6
No	691	53.4

The mean score of knowledge was 11.05(± 1.81 SD). The mean attitude and practice score were 7.04(±1.01 SD) and 10.69 (±1.43SD) respectively. (Table 2).

In this study, out of 1295 participants, about 94% participant were aware about spread of virus during incubation period. While 78% participants had responded correctly for required time for proper hand wash. About 94% participant were agreed that social distancing and lockdown will help in preventing further spread. About 85% participant believed that India will win this battle successfully with less mortality. Among total study participants, 72.1% had a good knowledge with 78.2% had a positive attitude towards disease prevention but 37.1% participants had still unsatisfactory practices for prevention of disease. (Table 2)

Table 2: Distribution of participants according level of knowledge, attitude and practices using median score.

Variables	Range	Score (Mean±SD)	Level	Frequency (%)
Knowledge	0–14	11.04±1.81	Good*	934(72.1%)
			Poor**	361(27.9%)
Attitude	0-8	7.04±1.01	Positive*	1013(78.2%)
			Negative**	282(21.8%)
Practices	0-12	10.69±1.43	Satisfactory*	815(62.9%)
			Unsatisfactory**	480(37.1%)

* ≥median score is considered as good knowledge/positive attitude/satisfactory practices,
 ** < median score is considered as poor knowledge/negative attitude/unsatisfactory practices

There were significant association between Knowledge and Practices (P=0.01) as well as Attitude and Practices (p<0.0001) related to COVID 19. (Table 3).

Table 3: Association Among Knowledge, Attitude And Practice

	Attitude	Practice
Knowledge	Chisquare=0.08 P=0.77	Chisquare=5.8 P=0.01*
Attitude	NA	Chisquare=23.8 p<0.0001*

*Statistically significant

In present study, Knowledge scores were considerably variable among age groups, education levels, occupation, relation with health care services and place of residence which was statistically significant (p<0.0001). Attitude scores were considerably variable among age groups, education levels, and place of residence. There was highly significant association (P < 0.0001) between attitude and education level. Practice scores significantly varied across age groups, genders, education levels, occupation and relation with health care services. (Table 4)

Table 4: Univariate analysis of demographic characteristics and Knowledge, Attitude & practice score. (n= 1295)

Characteristic	Knowledge score Mean ±SD	P value	Attitude Score Mean ±SD	P value	Practice Score Mean ±SD	P value
Age(years)						
16 – 25 year	10.69 ± 1.66	p<0.0001	7.16 ± 0.82	p=0.01	10.86 ± 1.28	p=0.002
26 - 40 year	11.23 ± 1.77		7.02 ± 0.99		10.72 ± 1.34	
41 - 60 year	10.89 ± 1.97		7.00 ± 1.19		10.49 ± 1.69	
>60 year	11.17 ± 2.11		6.70 ± 1.20		10.25 ± 1.74	
Sex						
Male	11.06 ± 1.84	p=0.4276	7.01 ± 1.06	p=0.0821	10.57 ± 1.47	p<0.0001
Female	10.97 ± 1.73		7.12 ± 0.89		11.02 ± 1.25	
Educational status						
Primary	8.69 ±3.14	p<0.0001	6.34 ± 1.91	p<0.0001	8.90 ± 3.02	p<0.0001
Secondary	9.92 ± 2.25		6.96 ± 1.36		10.28 ± 1.70	
Higher secondary	10.44 ± 1.94		7.17 ± 0.81		10.60 ± 1.47	
Graduate	11.11 ± 1.51		7.14 ± 0.83		10.86 ± 1.26	
Master Degree	11.59 ± 1.57		6.92 ± 1.09		10.73 ± 1.29	
Occupation						
Unemployed	10.20±2.58	p<0.0001	7.02±0.82	p=0.37	10.66±2.11	p=0.0002
Labourer	10.27±2.12		6.08±1.03		9.07±2.26	
Housewife	10.23±2.33		7.04±1.14		10.82±1.92	
Study	10.88±1.76		7.02±0.97		10.74±1.28	
Retired	11.17±1.93		6.86±0.97		10.20±1.64	
Farmer	10.06±2.58		6.69±1.64		10.63±1.64	
Business	11.07±1.57		7.06±1.04		10.46±1.45	
Service	11.28±1.69		7.07±0.96		10.79±1.30	
Relation with health care facility						
Yes	11.50±1.61	p<0.0001	6.97±1.03	p=0.0202	10.80±1.31	p=0.0002
No	10.64±1.88		7.10±0.98		10.59±1.52	
Place of Residence						
Rural	10.78±1.94	p<0.0001	7.06±1.06	p=0.6274	10.68±1.60	p=0.8182
Urban	11.15±1.88		7.03±0.99		10.70±1.35	

Multiple linear regression analysis showed lower level of education, rural place of living and no any relation with health care services were significantly associated with lower knowledge score (p value 0.0001, 0.02, 0.0001 respectively). It also showed that age, having no any relation with health care services and occupation of unemployment/labour work were significantly associated with lower attitude score (p value 0.004, 0.004, 0.007 respectively). It also demonstrates that age, male gender, lower level of education and occupation of unemployment/labour work were significantly associated with unsatisfactory practice score (p value 0.001, 0.000, 0.000 and 0.024 respectively) (Table 5).

Table 5: Multivariate linear regression of association between Age, Gender, Place of residence and Education with Knowledge, Attitude and Practice score

Variable	Knowledge		Attitude		Practices	
	Coefficient (95% CI)	P value	Coefficient (95% CI)	P value	Coefficient (95% CI)	P value
Age	0.003 (-0.004-0.011)	0.3944	-0.007 (-0.012-0.002)	0.004*	-0.011 (-0.018-0.004)	0.001*
Gender	-0.170 (-0.383-0.043)	0.1176	0.126 (-0.001-0.253)	0.052	0.418 (0.241-0.595)	0.000*
Education	0.512 (0.413-0.611)	0.0001*	-0.015 (-0.074-0.044)	0.619	0.160 (0.077-0.242)	0.000*
Place of residence	0.238 (0.034-0.442)	0.0220*	-0.031 (-0.152-0.091)	0.623	-0.027 (-0.1970.142)	0.754
Relation to health services	0.613 (0.423-0.803)	0.0001*	-0.165 (-0.278-0.051)	0.004*	0.067 (-0.091-0.225)	0.406
Occupation	0.045 (-0.003-0.093)	0.0645	0.040 (0.011-0.068)	0.007*	0.046 (0.006-0.086)	0.024

*statistically significant

DISCUSSION:

To the best of our knowledge, this is the first study in India examining the Knowledge, Attitude, and Practice (KAP) towards COVID-19 among general population.

The study aimed to determine the knowledge, attitude, practice towards COVID 19 among general population using a web based, semi-structured Questionnaire (In Local language). In order to respond appropriately to the outbreak of an infectious disease, people need to have basic knowledge about disease (its symptoms and mode of transmission), positive attitude and good practices for prevention of disease.

In present study, participant from rural area was only 30%, these may be due to lesser use of social media in rural areas or they may not be acquainted to use Google form like technology. In our study, participation of Graduates and post graduates was around 75.5 %,

which may be due to relatively more use of WhatsApp application and technocracy of Individual in this group. Use of Social media was reported in 60% of young pupation which supports our findings. It was observed that the mean knowledge score was 10.5 (SD: 0.71, range: 0-14). Similar finding was observed in study by Zhong BL et al. (8)

In present study nearly two third (2/3) study participants demonstrated good knowledge and positive attitude toward disease prevention and control measure but about one third (1/3) participants still having unsatisfactory practices for prevention of disease. There was no statistically significant association between Knowledge and Attitude. This maybe because of widespread dissemination of information via various platform which has improved knowledge but that is not sufficient for behaviour change. It is likely because other factors such as economic concerns or social norms are essential for enabling or disabling such change. (10)

In present study it has been found that association knowledge score with age, education and having relation with health care services

and place of residence ($p < 0.001$) is highly significant. Similar finding was observed in study by Erfani A et.al.⁽¹¹⁾ Because of the serious pandemic situation such educated participants would actively get knowledge of this infectious disease from various channels. Rural participants are having less knowledge which may be due to less access to internets or education level in the rural area. Practice is significantly different between the Gender and it is good in Female as per the mean score (Male: 10.57, Female: 11.02, $P < 0.0001$). This may be due to risk taking behaviour of Male participants. Male are more expected visit public place and outdoor work, so they should have better practice for COVID 19 prevention which is not found in the current study. As the multivariate linear regression analysis revealed that, age, being male, low level of education are associated with low level of practices. Findings of the current study of various demographic variables related to knowledge, attitude and practices are mostly similar to previous KAP studies regarding SARS and COVID-19 in China.^(11,12)

The study was carried out through web based application, so the participants who have internet access and those who are acquainted to

use google forms are only participated in the survey, so the other who are not having this access and technology may not be included in the study. So the sample is not representative to the general population. Further study, to include representative sample with focal group discussion to know their exact attitude and practice is need. Further participation from rural area is only 30 %, however in the rural areas more elderly, neglected and difficult to reach population are leaving who actually don't have access to knowledge channel, having the poor knowledge, bad practices and negative attitudes. So further research with adequate representation from this group is needed.

CONCLUSION:

It is found that overall knowledge and attitude is good in the study population with poor practices. This will require more intensified media campaign with efforts to change their behaviours. Poor knowledge in the rural area requires targeted intervention for awareness and behaviours change communication. Level of education is associated with good Knowledge, Attitude and Practice. So in the long term measures, overall improvement in the education of the community is recommended.

Appendix

Knowledge		
1.	How corona virus can spread? (you can choose multiple answer)	a)Coughing, b)Sneezing, c)Contaminated surfaces d)Sneezing in public place e)Talk f)Don't know
2.	Which are the main clinical symptoms of this disease?	a)Fever b)Dry Cough c)Difficulty in breathing d)Throat pain e)Weakness f)Pain in Abdomen g)Diarrhoea and Vomiting h)Don't Know
3.	Does any infected person can transmit the virus during incubation period?	YES /NO/DONT KNOW
4.	Is there any effective cure or vaccine for the disease?:	YES /NO/DONT KNOW
5.	Which are high risk persons for disease?	a)Elderly(>60 year) b)Chornic disease (Diabetes, Hypertension and Asthama) c)Other Heart or Lung related disease d)Smokers e)Adult(18 to 60 years) f)Children g)Don't know
6.	Does early diagnosis ,symptomatic and supportive treatment can help most patients recover from the infection?:	YES /NO/DONT KNOW
7.	How many seconds you have to wash your hand with soap for proper hand washing?	a)< 10 second b)10 to 20 second c)>20 second d)Don't know
Attitude		
1.	You immediately report health care facility if you or any of your family member develop dry cough, sore throat and fever	Strongly/Agree/Agree/Disagree
2.	You believe homemade remedies (ginger, ajwayin, ukala) are effective in preventing the infection	Strongly Agree/Agree/Disagree
3.	You believe Social Distancing and Lockdown is most effective preventing strategy in current scenario	Strongly Agree/Agree/Disagree
4.	You believe that India will win this battle against corona successfully with less mortality	Strongly Agree/Agree/Disagree
Practices		
5.	Frequency of going outside of home for the essential needs in a week	Never/1 times/2 times/3times/ 4times or more
6.	Covering of face (Mask/any kind of cloth) when going outside from home	Always/Sometimes/Not at All
7.	Proper washing of Vegetables, fruits immediately after purchasing	Always/Sometimes/Not at All
8.	Use of tissue paper, handkerchief or bend elbow while coughing and sneezing	Always/Sometimes/Not at All
9.	Avoid touching of eyes, nose and mouth while out of home	Always/Sometimes/Not at All
10.	Repeat use of the surgical mask after 6 hours	Always/Sometimes/Not at All
A.	Source of Information	a)Television/Radio b)Social Media (Facebook, Whatsapp, twitter) c)Newspaper d)Friends and Family e)Person related to Health Care Services f)Hospitals

B.	During this lockdown, any time do you feel stressed or depressed?	Yes/No
C.	If Yes (Feel stressed or Depressed) than what is the reason?(multiple option)	a)Corona Epidemic b)Lockdown c)Financial crisis

REFERENCES:

- 1) World Health Organization Coronavirus disease (COVID-19) situation Dashboard – world. <https://covid19.who.int/> (last accessed on 27th April 2020)
- 2) World Health Organization Coronavirus disease (COVID-19) situation Dashboard – Gujarat. <https://covid19.who.int/> (last accessed on 27th April 2020)
- 3) Hu Z, Song C, Xu C, Jin G, Chen Y, Xu X, et al. Clinical characteristics of 24 asymptomatic infections with COVID-19 screened among close contacts in Nanjing, China. *Sci China Life Sci.* 2020 Mar 4 [Epub ahead of print].
- 4) Lancet Infect Dis 2020. Scientific and ethical basis for social-distancing interventions against COVID-19. Published Online March 23, 2020 [https://doi.org/10.1016/S1473-3099\(20\)30190-0](https://doi.org/10.1016/S1473-3099(20)30190-0)
- 5) World Health Organization. Infection prevention and control during health care when infection is suspected: interim guidance, January 2020.
- 6) Zayas, G., Chiang, M.C., Wong, E. *et al.* Effectiveness of cough etiquette maneuvers in disrupting the chain of transmission of infectious respiratory diseases. *BMC Public Health* 13, 811 (2013). <https://doi.org/10.1186/1471-2458-13-811>
- 7) Hien Lau, Veria Khosrawipour, Piotr Kocbach, Agata Mikolajczyk, Justyna Schubert, Jacek Bania, et al, The positive impact of lockdown in Wuhan on containing the COVID-19 outbreak in China, *J Travel Med.* 2020 Mar 17. pii: taaa037. doi: 10.1093/jtm/taaa037. [Epub ahead of print]
- 8) Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci* 2020; 16(10):1745-1752. doi:10.7150/ijbs.45221. Available from <http://www.ijbs.com/v16p1745>.
- 9) <https://www.mohfw.gov.in/> (last accessed on 27th April 2020)
- 10) Neupane D., Khanal V., Ghimire K., Aro AR, Leppin A.: Knowledge, attitudes and practices related to avian influenza among poultry workers in Nepal: a cross sectional study. *BMC Infectious Diseases* 2012 12:76.
- 11) Erfani A, Shahriarad R, Ranjbar K, Mirahmadzadeh A & Moghadami M. Knowledge, Attitude and Practice toward the Novel Coronavirus (COVID-19) Outbreak: A Population-Based Survey in Iran. [Submitted]. *Bull World Health Organ.* E-pub: 30 March 2020. doi: <http://dx.doi.org/10.2471/BLT.20.256651>
- 12) Person B, Sy F, Holton K, Govert B, Liang A, National Center for Infectious Diseases SCOT. Fear and stigma: the epidemic within the SARS outbreak. *Emerg Infect Dis.* 2004; 10: 358-63.