



ASSESSMENT OF KNOWLEDGE GAPS, ATTITUDE AND FEAR OF THE GENERAL PUBLIC TO COVID 19 IN KERALA: A CROSS SECTIONAL STUDY.

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ABSTRACT **BACKGROUND** First case of COVID 19 was reported in India on 30th January 2020, in Kerala. Due to lack of definitive treatment and vaccine, the government-imposed lockdown and educated the people about various preventive measures to curb the spread of the virus. People's adherence to these measures is indicative of their knowledge, attitude and fear towards the pandemic. **METHODS** This is a cross sectional study and data was collected from a self-reporting online questionnaire from 450 participants. Univariate and multivariate analysis of the data was done to assess differences in mean scores and factors associated with Knowledge, attitude and fear. **RESULTS** Most were knowledgeable about COVID 19. 80.41% was calculated as the overall correct response while 64.2% of the sample reported better knowledge. Females, older age group and married individuals reported the highest mean score of knowledge questionnaire Most Keralites, showed positive attitude towards preventive measures and healthcare workers. However, 53.1% reported high fear. Women were found to have greater fear and anxiety regarding the pandemic as compared to men.

KEYWORDS : COVID 19, Knowledge, Attitude, Fear

INTRODUCTION:

COVID-19, an emerging pandemic, spread to India in January 2020. As of 21 May 2021, statistics report 26,031,991 cases, and 291,331 deaths in India.^[1] The importance of physical distancing, handwashing and using face masks were stressed on through the 'Break the chain campaign'.

KAP theory proves that adherence to these preventive measures is mostly affected by people's knowledge, attitude and practices towards COVID 19.^{[2][3]} Hence, knowledge attitude and fear to COVID 19 of the general was assessed in Kerala. The association between knowledge and fear is also assessed through this study.

Subjects and Methods:

Study design and study setting:

A cross-sectional study was conducted online among the working-class population from all districts in Kerala using pre-validated questionnaires during the pandemic (from October 12 to 30 December 2020).

Selection of participants:

A questionnaire gathering demographic data, knowledge, attitude, and fear of COVID-19 was made using google forms and distributed through online platforms like WhatsApp and Email. Individuals from all districts of Kerala above the age of 19 years and below 61 years, who can understand English and have access to WhatsApp or other social media platforms, and willing to be a part were eligible for the study. Subjects below the age of 20 years and above 60 years and Healthcare professionals were excluded from the study.

Method of measurement:

The questions one to 12 related to knowledge were adapted from a validated questionnaire developed by Bao-Liang Zhong et al for a similar study conducted among Chinese residents,^[4] while questions one to six related to attitude were adapted from information collected from CDC^[5] Atlanta and Ministry of Health and Family Welfare (MoHFW), India^{[6][7]} and questions one to seven related to fear were based on the seven-item Fear of COVID-19 Scale (FCV-19S) developed by Ahorsu et al^[8]. The online questionnaire contained the following four sections related to socio-demographic details, knowledge, attitude, and fear of the general public during the novel coronavirus pandemic.

In the knowledge section, there were 12 questions to answer on truth or false basis with an additional 'I don't know' alternative. A correct answer received one point, while an incorrect answer received zero points, better knowledge indicated by a higher score.

There were six questions regarding attitude. Questions were based on a multiple-choice format where the respondents chose the option they think was most right. The percentages of respondents who have selected each option are represented in tables.

To assess fear regarding COVID-19, the seven-item Fear of COVID-19 Scale (FCV-19S) was used. The responses were recorded using a five-point Likert scale varying from Strongly Disagree (one) to Strongly Agree (five), five being the maximum and one being the minimum score calculated. Each item score was added to attain the final score (ranging from seven to 35). A higher score indicates a greater fear towards COVID-19.

Data collection and processing:

From October to December 2020, the questionnaire was circulated online, targeting those belonging to the inclusion criteria through email and social media. Questionnaire recipients were advised to fill it out themselves and to circulate it to four nearest family members or neighbors belonging to the inclusion criterion for completion. After completion, the questionnaire was requested to be returned by submitting the form. Out of the total questionnaires sent, 516 questionnaires were returned. After excluding 52 respondents who were healthcare professionals and 14 respondents who did not agree to fill the questionnaire, the final sample size consisted of 450 responses belonging to the inclusion criteria which was used and analyzed in the study. A pilot study of 20 responses was conducted before the study. All the respondents were from Kerala.

Statistical methods used:

The empirical data collected with the help of a questionnaire entered in Microsoft Excel 2010 was analyzed using statistical software, IBM SPSS version 21. The scales of knowledge and fear have got Cronbach alpha values above 0.7 and thus, the scales are reliable (Fear – 0.813, Knowledge – 0.798). Non-parametric tests are employed for knowledge and fear as the data is not normally distributed. Man Whitney-U test/ Kruskal Wallis test was used to evaluate the relationship with demographic characteristics. To establish the association between fear and knowledge the Chi-square test was adopted. The attitude of the sample population toward the different

steps taken to monitor the COVID-19 spread was analyzed using descriptive statistics. Simple and multiple logistic regression analyses were used to find the association of knowledge and fear with demographic characteristics. *P*-value <0.05 was taken as statistically significant with a 95% confidence interval.

Ethical guidelines:

Ethical permission was obtained from the IRB Committee of Amrita Institute of Medical Science, Kochi. The participants' participation was entirely voluntary, and they were automatically led to a message explaining the study's purpose and the consent form that accompanied it. When they clicked the link, consent was obtained by answering a yes/no question to confirm their desire to participate. On confirming, the participant was instructed to fill the questionnaire, and confidentiality of the data was guaranteed.

RESULTS:

Socio-Demographics:-

Among 450 respondents, 243(54%) were females. The mean population age is 29 years with a Standard deviation of 8.23. The ages of the participants ranged from 20 years to 60 years, and most participants were 20-29 years of age 345(76.7%). The majority of the respondents were never married 304(67.6%). There was a larger response among those with graduation 285(63.3%). The majority of the respondents were students 236 (52.4%). Sociodemographic characteristics are described in Table 1.

Table 1: Percentage frequency distribution of all participants

Demography	Variables	No: of respondents	Percentage(%)
Gender	Female	243	54.0
	Male	205	45.6
	Prefer not to say	2	0.4
	Others	0	0
Age groups(yrs)	20-29	345	76.7
	30-39	41	9.1
	40-49	47	10.4
	50-60	17	3.8
Marital Status	Married	119	26.4
	Never married	304	67.6
	Others	27	6.0
Education	Middle school and below	0	0
	High school	33	7.3
	Graduation	285	63.3
	Post-graduation	132	29.3
Occupation	Physical labor	63	14.03
	Unemployed	66	14.7
	Students	236	52.4
	Mental labor	85	18.9

significantly higher number of the participants in the study reported good knowledge regarding COVID-19 (64.2%). Fear regarding COVID-19 was higher in 53.1% of respondents (Table 2).

Table 2: Assessing the levels of Knowledge and Fear.

Parameters	No: of respondents	Percentage(%)	Mean Score ± SD
Knowledge			
Good	289	64.2	9.65±1.594
Bad	161	35.8	
Total	450	100	
Fear			
Low	211	46.9	15.94± 4.834
High	239	53.1	
Total	450	100	

Knowledge:-

In the population Knowledge score, the mean was 9.65 out of 12 with a Standard deviation of 1.594, indicating an overall correct rate of 80.41% on the knowledge test. There was a significant relationship found between knowledge scores with gender (*P*<0.05), with females reporting higher Knowledge (9.77 ±1.675) than males (9.53 ± 1.490). Knowledge scores were significant with age groups (*P*<0.05), with respondents belonging to 50-60 age groups have higher Knowledge (10.59 ± 0.712) when compared to other age groups. A significant relationship was also found between Knowledge scores and marital status (*P*<0.05), with married people having more knowledge (10.21 ± 1.024). No significant differences in knowledge scores were found in education and occupation (Table 3).

Table 3: Relationship of demographic characteristics with Knowledge.

Demography	Variables	No.of persons	Knowledge score (Mean ± SD)	Man - Whitney U test/ Kruskal Wallis test	P-value
Gender	Female	243	9.77 ±1.675	21782.5	0.018*
	Male	205	9.53 ±1.490		
Age groups(yrs)	20-29	345	9.56 ±1.564	16.776	0.001*
	30-39	41	10.02 ± 0.851		
	40-49	47	9.74 ±2.279		
	50-60	17	10.59 ± 0.712		
Marital Status	Married	119	10.21 ± 1.024	28.178	<0.001*
	Never married	304	9.57 ± 1.499		
	Others	27	8.26 ± 3.071		
Education	High school	33	9.82± 1.610	1.197	0.550
	Graduation	285	9.64± 1.636		
	Post-graduation	132	9.67± 1.507		
Occupation	Physical labor	63	9.76± 1.266	2.924	0.404
	Unemployed	66	10.00± 0.911		
	Students	236	9.57± 1.619		
	Mental labor	85	9.56± 2.073		

*statistically significant.

Univariate analysis showed a significant association between knowledge scores and gender (*P* < .05) with females showing an odds ratio of 1.53 when compared to males. Binary logistic regression associations were seen between knowledge and age groups, with the highest knowledge scores found in 50-60 age groups with an odds ratio of 10.29 compared to 20-29 age groups (*P*<0.05). Married respondents reported significantly higher knowledge with an odds ratio of 4.70 than the 'others' category. (*P* <0.05). On performing multivariate analysis, only marital status showed significance. (Table 4).

Table 4: Binary logistic regression analysis of levels of Knowledge with demographic characteristics

Variables	Groups	Knowledge		Univariate analysis			Multivariate analysis		
		Bad	Good	Odds ratio	95% CI	p-value	Adjusted Odds ratio	95% CI	p-value
Gender	Male	84(41%)	121(59%)	1			1		
	Female	76(31.3%)	167(68.7%)	1.53	1.034-2.25	0.033	1.45	0.94-2.26	0.096
Age	20-29	135(39.1%)	210(60.9%)	1			1		
	30-39	12(29.3%)	29(70.7%)	1.55	0.77-3.15	0.22	0.69	0.25-1.94	0.486
	40-49	13(27.7%)	34(72.3%)	1.68	0.86-3.30	0.131	0.68	0.24-1.99	0.480
	50-60	1(5.9%)	16(94.1%)	10.29	1.35-78.46	0.025	3.88	0.42-35.94	0.233
Marital Status	Others	15(55.6%)	12(44.4%)	1			1		
	Never Married	121(39.8%)	183(60.2%)	1.89	0.86-4.18	0.116	1.89	0.85-4.33	0.132
	Married	25(21.0%)	94(79.0%)	4.70	1.95-11.31	0.001	5.36	1.72-16.71	0.004
Educational	High school	10(30.3%)	23(69.7%)	1					
	Graduation	104(36.5%)	181(63.5%)	0.757	0.35-1.65	0.484			
	Post-graduation	47(35.6%)	85(64.4%)	0.786	0.35-1.79	0.567			

Occupation	Physical labor	25 (39.7%)	38 (60.3%)	1				
	Unemployed	17(25.8%)	49(74.2%)	1.89	0.89-4.0	0.093		
	Students	90(38.1%)	146(61.9%)	1.07	0.61-1.89	0.823		
	Mental labor	29(34.1%)	56 (65.9%)	1.27	0.65-2.49	0.487		

Attitude: -

Over 78.9% of respondents wisely suggested that they would immediately isolate themselves when experiencing symptoms associated with COVID infection. Regarding the management, 36.9% of respondents would first get themselves screened for COVID-19. Usage of a facemask was perceived as the best method (73.1%) for prevention of infection followed by social distancing/lockdown (72.6%). Only 52.6% of respondents replied that handwashing was a sufficient method to eliminate the transmission of infection. Around 52 percent of respondents indicated that, in compliance with the biomedical waste disposal guidelines, they disposed of facemasks, gloves, hand sanitizer bottles, etc. possibly in the presence of evident guidelines. As responsible citizens, 48.9% of the respondents isolated themselves and their families to eliminate the transmission of COVID 19. It was heartening to see that 75.6% of participants had a positive change in their attitude towards the frontline workers (police and Health Care Workers) during the pandemic. (Table.5)

Table.5:-Attitude of the people towards COVID-19

1.Reaction to symptoms of COVID-19	Frequency	Percent
Fear and anxiety	37	8.2
Exploring alternative (non medical) modes of treatment	46	10.2
Not disclose to members outside the family	12	2.7
Isolate yourself from the family	355	78.9
2. Management of symptoms	Frequency	Percent
Go to hospital	103	22.9
Immediately consult family physician(phone)	117	26
Stay at home and self medicate	64	14.2
Get yourself tested	166	36.9
3. Effective strategies for prevention of spread of COVID -19 infection	No. of persons	Percentage
Hand Washing	237	52.7
Using face Mask	329	73.1
Quarantine	121	26.9
Social distancing/lockdown	327	72.7
Personal Hygiene	167	37.1
4. Method of disposal after use	Frequency	Percent
Dispose separately from household waste.	123	27.3
Dump in ground or burn your facemasks, gloves, sanitizer bottles or caps after use	73	16.2
Reuse Facemasks, gloves, sanitizer bottles or caps after use	20	4.4
Dispose according to biomedical waste guidelines in the hospital	234	52
5.Self contribution	Frequency	Percent
Isolate myself and my family to prevent the spread of infection	220	48.9
Helping the NGOs and social workers	21	4.7
Monetary contribution	7	1.6
Educate the people about social distancing and isolation	202	44.9
6. Attitude towards "health care worker/police personnel"	Frequency	Percent
Positively, as they are working as saviors for the community	340	75.6
Negatively, as they can get infected and further spread the infection	3	0.7
No change in attitude, always respected them	91	20.2
No change in attitude as they are just doing their job	16	3.6

Fear: -

The mean fear score of the population was 15.94 out of 35, with a

standard deviation of 4.834. The fear score was significant with gender ($P < 0.05$), with females reported a higher score (16.44 ± 4.467). Relationship of demographic characteristics with fear respectively is shown in Tables 6.

Table 6: Relationship of demographic characteristics with Fear.

Demography	Variables	No.of persons	Fear score (Mean ± SD)	Man - Whitney U test/ Kruskal Wallis test	P
Gender	Female	243	16.44±4.467	21261	0.007*
	Male	205	15.41±5.173		
Age groups(yrs)	20-29	345	16.06±4.941	2.371	0.499
	30-39	41	16.07±4.808		
	40-49	47	15.66±4.234		
	50-60	17	14.00±4.123		
Marital Status	Married	119	15.39±4.312	1.843	0.398
	Never married	304	16.06±4.992		
	Others	27	15.39±5.091		
Education	High school	33	14.97±5.235	0.725	0.696
	Graduation	285	15.96±4.922		
	Post-graduation	132	16.14±4.540		
Occupation	Physical labor	63	14.43±4.648	8.052	0.045*
	Unemployed	66	15.32±3.864		
	Students	236	16.43±5.128		
	Mental labor	85	16.19±4.592		

**statistically significant.

Fear scores and occupation had a significant relationship ($P < 0.05$), with students reporting a higher score(16.43 ± 5.128). (Table 6). On performing univariate analysis, only females showed a significantly higher odds ratio for a high level of fear compared to their counterpart males in the study population. (Table 7).

Table 7: Binary logistic regression analysis of levels of fear with the demographic profile.

Variables	Groups	Fear		Univariate analysis		
		Low	High	Odds ratio	95% CI	p-value
Gender	Male	108 (52.7%)	97 (47.3%)	1		
	Female	101 (41.6%)	142 (58.4%)	1.56	1.07-2.28	0.019
Age	20-29	165 (47.8%)	180 (52.2%)	1		
	30-39	16 (39%)	25 (61%)	1.43	0.74-2.78	0.288
	40-49	22 (46.8%)	25 (53.2%)	1.04	0.57-1.92	0.896
	50-60	8 (47.1%)	9 (52.9%)	1.03	0.38-2.74	0.951
Marital Status	Others	10 (37%)	17 (63%)	1		
	Never Married	147 (48.4%)	157 (51.6%)	0.628	0.28-1.42	0.262
	Married	54 (45.4%)	65 (54.6%)	0.708	0.29-1.67	0.432
Education	High school	16 (48.5%)	17 (51.5%)	1		
	Graduation	131 (46%)	154 (54%)	1.11	0.53-2.27	0.783
	Post graduation	64 (48.5%)	68 (51.5%)	1	0.47-2.15	1
Occupation	Physical labor	35 (55.6%)	28 (44.4%)	1		
	Unemployed	33 (50%)	33 (50%)	1.25	0.63-2.49	0.528
	Students	104 (44.1%)	132 (55.9%)	1.58	0.91-2.77	0.106
	Mental labor	39 (45.9%)	46 (54.1%)	1.47	0.77-2.84	0.245

DISCUSSION

The study was conducted to explore the Fear, knowledge gap and attitude of the general public to COVID-19 in Kerala and to establish any association, if any, between knowledge and fear. To the best of our knowledge, no such study has been conducted so far in Kerala. Questions of Knowledge^[4] attitude^[5,6,7] and fear^[8] have been adapted from Chinese and Indian studies respectively.

FEAR

More than half (53.1%) were said to have high fear with significant association with gender. Females scored a higher mean fear score. A similar finding was observed in a study conducted by Wang et al^[9] and Lim et al^[10] where women were reported to be more prone to depression, stress and anxiety during an outbreak. Some studies imply that people experience fear of being infected, coming in contact with possibly contaminated surfaces, xenophobia, fear from the socioeconomic impact of COVID 19, traumatic stress symptoms about the pandemic^[11] Several incidents across the country have proven that COVID 19 has taken a toll on the mental well-being of the population which has also influenced their behavior towards other people. A report by DW^[12] has shed light on Xenophobia which has been reported in several parts of the country towards north-eastern people due to the similarities in their racial appearance with the Chinese. Self-harm and suicide rates have increased due to the psychological distress on people's mind.^[13] No association was found between knowledge and fear.

Knowledge

Most participants from the sample are knowledgeable about the pandemic. Compared to a similar study done in Bangladesh, where the overall mean score was 8.71 out of 12 our study shows better results.^[14] This was expected as our study was done during the later stages of the epidemic and the government was also willing to share information about the pandemic through live press conferences daily. More than half of the respondents had 'good knowledge'. Age, gender and marital status shows significant association with knowledge ($p < 0.05$). This finding is supported by a study done in Malaysia and Saudi Arabia where older participants and females are better knowledgeable about the pandemic.^{[15][16]} Knowledge also shows significant association ($p < 0.05$) with marital status as married people had more knowledge than people who belonged to the 'others' category for marital status. This could be due to increased sense of concern and love for their families which leads them to rely on reliable sources to learn more about the pandemic and preventive measures to avoid falling sick. No significant differences in knowledge scores were found in education and occupation.

Attitude

Most respondents reported that would isolate themselves if they ever experience symptoms similar to COVID 19 symptoms, this is supported by a similar finding in a study conducted by Paul G et al where most from the sample would isolate themselves under similar circumstances.^[17] Awareness was spread through media channels and live press conferences by the Chief Minister, hence people were aware about the appropriate measures to be taken if suspicion of infection arose.

Most respondents have chosen social distancing and face masks as effective strategies to control the spread of the virus. Fortunately, almost half of the sample has a positive attitude towards the preventive measures as they reported to isolate themselves and their families to prevent the spread. This shows that initiatives like break the chain campaign by the government, directed to educate people about the importance of personal and public hygiene had been successful in spreading awareness about the importance of face masks, hygiene and social distancing.

The Central Pollution Control Board issued guidelines for disposal of waste which were broadcasted by news channels daily throughout the early months of COVID 19 in Kerala. Therefore, our study shows a positive and significant increase in the number of people who disposed waste according to biomedical waste guidelines as compared to the study held across India by Paul G et al where only 1% of the GPP disposed waste according to the guidelines.^[17]

Most had a positive attitude for frontline workers. It shows that most people in Kerala recognizes the efforts taken by the police personnel to ensure that laws to curb the spread of the virus.

CONCLUSION

This study will shed light on awareness of public on government initiatives to curb the spread of COVID 19 and thus help policymakers design programs with better penetration based on public's expectations. It will also aid researchers and scholars for future KAP studies to explore newer avenues with longer time frame with trend analysis. Findings of fear reveals vulnerable groups prone to panic, stress and anxiety, these groups can be targeted for intervention and behavior change programs mediated by the government.

Peoples attitude and behavior can also be predicted for future outbreaks and pandemics and training plans for students can be devised to combat similar public health emergencies in future.

The study has a few limitations. The findings cannot be generalized to individuals of all socio-economic strata as the questionnaires were designed only in English. The number of individuals who received the questionnaire could not be noted. The data could have multiple biases since it was collected using an online, self-reporting questionnaire.

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