Original Research Article

Knowledge, practices and precaution regarding COVID-19 among the residents of Kolkata city, West Bengal, India

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ABSTRACT

Background: Corona virus disease 2019 (COVID-19) has been declared a global public health emergency affecting thousands of people across the world. The knowledge, attitude and practice related to the transmission and prevention of COVID-19 are regarded as the most critical and effective control measures. Therefore, the purpose of this study was to assess the knowledge of, attitude to along with precautionary practices related to COVID-19 adopted by the people of the city of Kolkata, the capital of West Bengal.
Methods: A cross-sectional survey was conducted by the interview method through a telephone conversation-based study from July to October 2020. The responses (n=321) were collected using a non-random convenience sampling method. All data were analysed through SPSS software (Ver. 27).
Results: A total of 321 participants were included in the present study. Gender, education, and occupation-wise, statistically significant mean knowledge, practices, and overall score differences were found (p<0.001 and <0.05). People without literacy were found to had lesser knowledge (35.1%) and adopted fewer preventive practices and precautionary measures (32.4%). This section also scored lower in overall scores (48.6%) than others. Males scored better in terms of knowledge and practices compared to females; statistically, the gender-wise association was found to be significant (p<0.001 and<0.05).
Conclusions: The present study demonstrates a moderate level of knowledge and a significantly high practice (41.4% and 60.7%) about COVID-19 among the study participants. Males have higher knowledge and adopted more preventive practices and precautions than females, and the overall score is high in respect of males as compared to females.

Keywords: COVID-19, KAP, Kolkata, Pandemic

INTRODUCTION

The Coronavirus disease-2019 (COVID-19) that originated in China in December 2019 was declared a pandemic by the World Health Organisation (WHO) on March 11th, 2020.[1] In India, the first case of COVID-19 was reported from Kerala in February 2020, with a travel history from China.[2] Kolkata recorded its first case of COVID-19 after a man returned from the UK in March 2020.[3] The most contagious SARS-CoV2 strains are the alpha strain (UK variant), beta (South Africa variant),

gamma (Brazilian variant) and delta strain (Indian variant).[4] Among these strains, the delta strain of Indian origin is considered to have the highest rate of transmission, increased virulence, and potential for death among the other novel coronavirus strains.[4]

India is a country of vast socio-cultural diversity, health inequalities and economic disparity, which presents challenges and threats due to the growing pandemic of COVID-19. The virus is primarily spread through nasal and oral droplets directly or through surfaces (fomites)

contaminated by these secretions.[5] In densely populated countries like India, controlling person-to-person transmission of such a virus is a big challenge. As per WHO, one of the best preventive measures is physical distancing and strict avoidance of social gatherings.[6] WHO has recommended personal hygiene (using face masks, washing hands with warm water and soap, use of alcohol-based hand sanitisers, avoiding touching the mouth, eyes, and nose, cleanliness), social distancing, and careful handling of purchased products as effective preventive measures for COVID-19 disease.[7,8]

Males, old-aged, hypertension and diabetes mellitus patients were at higher risk of death among all COVID-19 patients worldwide.[9,10] COVID-19 morbidities were found to be influenced by chronic lung disease, chronic heart disease, and cardiovascular disease.[10] The government has taken different measures to combat the outbreak, but the success or failure of these efforts is largely dependent on public behaviour. Specifically, public adherence to preventive measures is of prime importance to prevent the spread of the disease. According to the knowledge, attitude, and practices (KAP) theory, the state of society, behaviours, understanding, and habits significantly impact willingness to consider behavioural improvement and adherence to preventive strategies.[6] Individuals' knowledge, attitude, and practices (KAP) towards preventive and precautionary measures for COVID-19 is essential to control the spread of the disease. The study aimed to assess the knowledge, practices, and precautionary measures adopted during the COVID-19 situation in residential areas of Kolkata, West Bengal, India.

METHODS

Study area

Present study has been conducted in Kolkata city, West Bengal, India. Participants were drawn from various parts of the city. A detailed and structured questionnaire was formulated, pre-tested and finalized after conducting a reliability test, and the data were collected through phone calls. The questionnaire contains demographic profiles, knowledge, attitude and practices, including precautions regarding infection control during the COVID-19 pandemic. Kolkata is a densely populated region (22,000 persons per km^2) in West Bengal with sprawling trade and commerce, shops, markets, and street vendors amid sparse residential, commercial, and settlement areas and a warm sultry climate that may be conducive to strong epidemic challenges.[11]

Study design and duration

A cross-sectional study was conducted from July 2020 to September 2021.The telephonic interviews were conducted for a period of 4 months between July to October 2020. All the conversations were transcribed verbatim in English by the data collectors between November 2020 to January 2021. The initial data extraction was made by two interns from January 2021-March 2021. 10% of transcriptions were revisited by the researchers to assert the inter-consistency in data extraction, while another 10% of transcriptions were inter-changeably done by interns to know the intra-consistency. Kappa tests were conducted to know the level of intra and inter-intern consistency, and it was found that there was consistency in data extraction (0.82). Then from August 2021 to September 2021, the data were further revisited for extraction, rechecking, cleaning and preparing the final dataset.

Sample size and sampling

A systematic sampling method and a mixed design were followed. This work was done by a chain of network, where each research investigator (n=10) had asked their relatives, friends, neighbours, and friends of friends to send the telephone numbers of the maximum number of would-be participants they knew, covering all age groups (18 and above), of both genders. A list of telephone numbers of the participants was prepared. The total size of the population was 469 people, who were divided into age-group-wise and gender-group-wise cohorts. A lottery method was used for the selection of participants from various cohorts as per the population dispersion model. After data collection, the data enumerators gathered all the data and entered them in excel format. After data cleaning, 321 participants (148 male and 173 female) were included in the present study. Necessary information was provided to the subjects that the interview would be recorded for ready reference for posterity. It was not shared with any outsider under any circumstances, and no names were registered.

Inclusion criteria

All residents of Kolkata city (both males and females) who lived in the city for at least 3 years were included in the present study. Only one participant from a household was included in the age group of 18 years and older. Before including it in the current study, obtain verbal consent.

Exclusion criteria

Interviews with incomplete data were excluded from the study. People <18 years of age were also excluded.

Study duration

Present study was conducted from July 2020 to September 2021.

Data collection

A detailed structured questionnaire was prepared, containing demographic profiles and questions related to

knowledge, awareness, and practices during the COVID-19 situation. To determine the test-retest reliability of the questionnaire, the study tool was pretested on 25 participants (5% of the calculated sample size) prior to actual data collection. The participants were interviewed twice at intervals of 15 days. Test-retest reliability was assessed using the intra-class correlation coefficient. The intra-class correlation coefficient was found to be 0.70, indicating internal reliability.

Assessment of the data

The questionnaire consists of two parts: demographic variables and COVID-19-related data. Demographic variables include Age (adult age groups 18 to 35 years, middle age groups 36 to 55 years, older age groups 56 to 70 years), gender (male or female), level of educational achievement (illiterate, primary, madhyamik- higher secondary, graduate and above), occupation (business, government, part-time/private, housewife, and students).

The COVID-19-related questionnaire consisted of two different sections, namely knowledge/awareness-related questions and practice/precautionary measures adopted-related questions. Knowledge was measured by using 4 items of questions that consisted of the source of infection spread, mode of transmission, how COVID-19 spreads from person to person, and of the surfaces where COVID-19 does not survive. Preventive practice and precautionary measures adopted were measured by using 9 items of questions that consisted of: hand washing during COVID-19, type of hand sanitizer, wearing a mask, following social distancing, practices to boost immunity during pandemic situation, home disinfection measures, washing bed sheets regularly and uses for cleaning bed sheets. The total score on knowledge, attitude and practice/precautionary measures adopted and the overall score was calculated by scoring each correct answer with a score of '1' and an incorrect answer with a score of '0'. Similar techniques have been used in many earlier research studies to calculate the result score.[12,13] Knowledge, practice, and precautionary measures adopted, as well as the overall score, were divided into three categories based on the scores: low (25th percentiles), moderate (25th-75th percentiles), and good (>75th percentiles).

Statistical analysis

The data were gathered, compiled, and entered into MS Excel before being analysed with SPSS Version 27 (SPSS Inc, Chicago, IL, USA). All the categorical variables were presented as frequencies and percentages. Gender-wise association with knowledge, practices, and precautions and the overall score were calculated through the Chi-square test (χ^2). Demographic variables, mean knowledge, practices, and precaution scores, as well as overall score differences, were determined by F and t-tests.

RESULTS

Demographic details of the participants are shown in Table 1. Overall, 45.8% (n=147) of males and 54.2% (n=174) of females participated in the present study. The majority of respondents belonged to the adult age group 18-35 (n=152; 47.4%). Overall, 11.5% of participants were illiterate, and females had a higher prevalence of illiteracy. Most of the participants were engaged in part-time work.

Table 1: Gender-wise distribution of the demographic variables among the studied participants.

Age groups	Male		Female		Gender combined	
	f	%	f	%	f	%
Adult age groups (18-35 years)	79	53.7	73	42.0	152	47.4
Middle age groups (36-55 years)	55	37.4	76	43.7	131	40.8
Older age groups (56-70 years)	13	8.8	25	14.4	38	11.8
Age combined	147	100.0	174	100.0	321	100.0
Education						
Illiterate	6	4.1	31	17.8	37	11.5
Primary	27	18.4	23	13.2	50	15.6
MP- HS	31	21.1	30	17.2	61	19.0
Graduate and above	83	56.5	90	51.7	173	53.9
Occupation						
Business	27	18.4	5	2.9	32	10.0
Govt	16	10.9	10	5.7	26	8.1
Part time/private	78	53.1	48	27.6	126	39.3
HW/ students	26	17.7	111	63.8	137	42.7

Table 2: Demographic factors wise mean knowledge score, practice and precautionary measures adopted score and overall score differences among the study participants.

Demographic variables	Category	N	Knowledge score		Practices and precaution score		Overall score	
			Mean	SD	Mean	SD	Mean	SD
Age (years)	18-35	152	3.40	0.654	6.99	1.148	10.39	1.353
	36-55	131	3.40	0.687	6.85	1.019	10.24	1.319
	56-70	38	3.39	0.679	6.87	1.234	10.26	1.465
			F=0.002 NS		F=0.657 NS		F=0.470 NS	
Gender	Male	147	3.57	0.573	7.06	1.074	10.63	1.200
	Female	174	3.25	0.709	6.80	1.122	10.05	1.415
			t=4.451***		t=2.136*		t=3.980***	
Education	Illiterate	37	2.81	0.845	6.46	1.426	9.27	1.880
	Primary	50	3.66	0.626	6.96	0.348	10.62	0.725
	MP- HS	61	3.39	0.585	7.08	1.173	10.48	1.337
	Graduate and above	173	3.45	0.595	6.95	1.132	10.40	1.266
			F=13.952***		F=2.671*		F=9.431***	
Occupation	Business	32	3.69	0.471	7.38	.871	11.06	0.878
	Government job	26	3.42	0.703	6.50	1.304	9.92	1.354
	Part-time	126	3.47	0.701	6.83	1.115	10.30	1.509
	HW/students	137	3.26	0.645	6.97	1.077	10.23	1.232
			F=4.489***		F=3.485***		F=4.297***	

*** means p<0.001; * means p<0.05; NS= Not significant.

Table 3: Demographic variables wise prevalence (%) of knowledge, practices and overall score among the study participants.

Demographic variables	Category	Knowledge			Practice			Overall		
		Low	Moderate	Good	Low	Moderate	Good	Low	Moderate	Good
Age (years)	18-35	9.2	41.4	49.3	9.2	57.2	33.6	22.4	23.7	53.9
	36-55	8.4	42.0	49.6	9.9	63.4	26.7	22.9	26.0	51.1
	56-70	10.5	39.5	50.0	7.9	65.8	26.3	26.3	15.8	57.9
Education	Illiterate	35.1	43.2	21.6	32.4	37.8	29.7	48.6	18.9	32.4
	Primary	8.0	18.0	74.0	-	96.0	4.0	12.0	16.0	72.0
	MP- HS	4.9	50.8	44.3	6.6	55.7	37.7	11.7	21.3	59.0
	Graduate and above	5.2	44.5	50.3	8.1	57.2	34.7	22.0	27.7	50.3
Occupation	Business	11.5	34.6	53.8	7.7	73.1	19.2	23.1	46.2	30.8
	Govt. job	8.7	34.1	57.1	11.9	61.9	26.2	25.4	19.0	55.6
	Part-time	-	31.3	68.8	3.1	50.0	46.9	3.1	12.5	84.4
	HW/ Students	10.9	51.8	37.2	8.8	59.9	31.4	25.5	26.3	48.2

Low= <25th percentiles, Moderate= 25th-75th percentiles and Good = >75th percentiles.

Table 2 shows the demographic factors-wise mean knowledge, practice and precautionary measures adopted score, and the overall score of the study participants. A significantly higher knowledge status was observed in males as compared to females, and significant mean gender differences were found in knowledge score (t=4.451, p<0.001), precautionary measures adopted score (t=2.136, p<0.05) and overall score (t=3.980, p<0.001). Education-wise, statistically significant differences were found in knowledge score (F=13.952, p<0.001), precautionary measures adopted score (F=2.671, p<0.05) and overall score (F=9.431, p<0.001). Occupation-wise, statistically significant differences were found (p<0.001) in all scores. Only age-wise significant differences were not observed.

Table 3 shows the demographic-wise prevalence of knowledge, practice and precautionary measures adopted scores and the overall score of the study participants. Age category-wise, all prevalence scores have fluctuated. Illiterate people show low knowledge (35.1%), low practice and low precaution measures adopted (32.4%), and also low overall scores (48.6%). Part-time workers have a higher prevalence of knowledge, practice, and overall score (68.8%, 46.9% and 84.4%) than that of other professions.

Table 4: Gender-wise association with knowledge, practices and precaution and overall score among the study participants.

Category	Male		Female		Gender combined		Chi square test (χ^2)
	f	%	f	%	f	%	
Knowledge							
Low (<25th percentiles)	6	4.1	23	13.2	29	9.0	$\chi2$= 17.820***, df=2, p value=0.000
Moderate (25th-75th percentiles)	51	34.7	82	47.1	133	41.4	
Good (>75th percentiles)	90	61.2	69	39.7	159	49.5	
Practice							
Low (<25th percentiles)	8	5.4	22	12.6	30	9.3	$\chi2$= 7.242*, df=2, p value=0.027
Moderate (25th-75th percentiles)	87	59.2	108	62.1	195	60.7	
Good (>75th percentiles)	52	35.4	44	25.3	96	29.9	
Overall							
Low (<25th percentiles)	25	17.0	49	28.2	74	23.0	$\chi2$= 6.547*, df=2, p value=0.038
Moderate (25th-75th percentiles)	34	23.1	42	24.1	76	23.7	
Good (>75th percentiles)	88	59.9	83	47.7	171	53.3	

*** means p<0.001; * means p<0.05.

Table 4 shows the gender-wise association with knowledge, practices, and overall score among the study participants. Males have a higher knowledge (M versus F- 61.2% and 39.7%), practices and precautions (M versus F- 35.4% and 25.3%) and overall score (M versus F- 59.9% and 47.7%) compared to the females. Gender wise statistically significant association was found with knowledge (χ^2=17.820***, df=2, p value <0.001), practices and precautionary measures adopted (χ^2=7.242*, df=2, p value <0.05) and overall score (χ^2= 6.547*, df=2, p value <0.05).

DISCUSSION

The current study found that males had significantly higher knowledge score as compared to females, with gender wise significant mean differences in knowledge score (t=4.451, p=0.001), precautionary measures adopted score (t=2.136, p=0.05), and overall score (t=3.980, p=0.001). However, some previous studies carried out in 8 countries in 5 continents and one in a developing country show the reverse results with significant gender-wise differences.[7,14] In this study, the males had a higher knowledge (M versus F- 61.2% and 39.7%), practices and precautionary measures adopted (M versus F- 35.4% and 25.3%) and overall score (m versus F- 59.9% and 47.7%) compared to the females. Our study has a gender-wise statistically significant association with knowledge (χ^2=17.820***, df=2, p value =0.001), practices and precautionary measures adopted (χ^2=7.242*, df=2, p value <0.05) and overall score (χ^2=6.547*, df=2, p value <0.05). These results resonated in a study carried out in West Bengal, reporting male participants' awareness to be 51% and that of females being 48%, but no significant association was found.[15]

In our study, participants with no literacy had the lowest mean score compared to other participants. Statistically significant mean differences in knowledge score (F=13.952, p=0.001), precautionary measures adopted score (F=2.671, p=0.05), and overall score (F=9.431, p=0.001) among such participants were found. Several other studies have found statistical differences between education and mean knowledge scores and have reported better knowledge among the higher education groups, such as studies carried out in Pakistan and Saudi Arabia; a study carried out in 8 countries of 5 continents and India.[14,16,17-19] Based on our findings, illiterate people show low knowledge (35.1%), low practice and adoption of precautionary measures (32.4%), and low overall scores (48.6%). Part-time workers scored higher in knowledge, practice, and overall score compared to full-time workers. The current study found statistically significant mean differences (p<0.001) between occupation and knowledge score (F=4.489, p=0.001), precaution score (F=3.485, p=0.001), and overall score (F= 4.297, p=0.001). This finding is in line with many existing studies.[15,20]

Our findings show that education and occupation are positively related to COVID-19 knowledge and practises and resonate with one existing study reporting a positive association between KAP (knowledge, attitude, and practices) and education and another in West Bengal reporting a positive association between education, occupation, knowledge, and practices.[12,21] So, the present study and many previous studies conclude that education and occupation-wise, significant knowledge differences were observed in respect of COVID-19.

Our current study found that 53.3%, 23.7%, and 23.0% of participants had good, moderate, and low knowledge and practices, respectively, about COVID-19. A study conducted at Geetanjali Medical College and Hospital, Udaipur, Rajasthan, found that the knowledge accuracy rate of study participants was 84.5%.[13] But the findings of the present study are almost similar to the findings of another survey carried out in West Bengal, which found

that 56% of participants had good knowledge regarding COVID-19.[12]

These findings point toward an urgent need to re-examine the effectiveness of current risk communication strategies related to COVID-19. A focus on positive messages with culturally appropriate words may be helpful in this regard. Messages that create unnecessary fear may also be omitted and not be used for the purpose. They should focus on compassion, love, respect, dignity and empathy and avoid words which may create hate and fear among people. There is also a need to embrace the Indian socio-cultural aspects so that societies start appreciating and voluntarily following physical distancing. This will improve the confidence of people, as anticipated, to let them protect themselves not only from the current pandemic but also from all other unforeseen infections, provide care to patients, and contribute towards the country's economic build-up by maintaining livelihood resilience with continued presence and productivity at the workplace. This should improve the confidence of people to let them protect themselves effectively and care for COVID-19 patients.

There are some limitations to the present study. The study was conducted in a short period of time. As a result, taking a large sample size was not possible. Data was collected through telephonic conversation, so conversation gaps and errors were found. Moreover, it was not a community-based survey; hence, inference cannot be drawn for the entire city. In addition, as it was limited to the Kolkata city area, the findings may not generalise to other parts of the state and the country.

CONCLUSION

Gender, education, and occupation-wise, significant mean differences were found among overall scores, knowledge scores, practices, and precautionary measures adopted scores (except age groups). Gender differences in overall score, knowledge score, practices, and precautionary measures adopted score were found to be statistically significant. To address this difference female oriented campaign programmes may be given preference. Women may lead the campaign, which may be based on the transtheoretical model (stages of change) or protection motivation theory. However, there is a need to study the community-level assessment of knowledge of COVID-19 in designing target-oriented health communication programmes based on the said theories. In addition, behaviour change communication interventions, particularly targeting individuals with little or no formal education, will go a long way towards encouraging the adoption of good practices and enhancing knowledge. A mass media campaign with a special impetus on personal anecdotes will also be helpful, as cited by the participants. Findings can help concerned people to redesign current policies and interventions to best prepare our country against such infectious diseases like the coronavirus. Government officials, health policy leaders, and other stakeholders should cooperate to increase awareness of the COVID-19 situation, transmission risks, and preventive behavioural practices.

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