

COVID-19 apprehension in the post pandemic era

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ABSTRACT

Background: A novel coronavirus was identified in Wuhan, China in December 2019. The pandemic brought all people closer to internet to access information about the disease and its prevention. However, this intention of gaining knowledge is a spinal reaction to an adverse situation and once that has passed, the same knowledge and practices decline. **Aims and Objectives:** The aim of the study was to assess the apprehension regarding COVID-19 along with its demographic correlates in the post-pandemic era. **Methodology:** A cross-sectional study was conducted in district Ghaziabad using a pre-designed, pre-tested and semi-structured questionnaire regarding the awareness and knowledge levels of COVID-19. Regression analysis was performed to determine the factors significantly associated with the knowledge of the study participants. **Results:** In this study, 277 (69.25%) were males and 123(30.75%) were females. The mean knowledge score was 25.09 ± 6.85 (range 4-41). Knowledge regarding various aspects of COVID-19 was better among the study participants with higher education levels. **Conclusion:** Even after the pandemic had passed, good knowledge levels were retained. Participants had a huge disparity in the individual levels of information. Overall higher levels of education, younger age group and nuclear family were associated with better knowledge regarding the disease.

KEYWORDS

Awareness; COVID 19; Knowledge; Pandemic; Viral; Epidemiology; Treatment.

INTRODUCTION

A new virus was reported from Hubei in China in December 2019.(1) World Health Organization (WHO) named this outbreak as the sixth 'Public Health Emergency of International Concern (PHEIC)' in January 2020 and on 11th March 2020, it was declared a "Pandemic" due to its rapid spread worldwide.(2)

Interventions like social distancing, quarantine and isolation of infected individuals were known to be very effective for curbing the

transmission of epidemics.(3,4) Therefore, when the pandemic began, "complete lockdown" was the most popular method adopted by governments all across the world.(5,6) On 25th March 2020, a nationwide lockdown was imposed in India leading to social and psychological hardships on people.(7,8)

Viral infections are notorious for having no specific treatment till date and thus, public health intervention strategies are of utmost

importance in control and prevention of such diseases. (8,9) However, these interventions cannot be successfully implemented unless people are well informed, highly motivated and responsible enough to abide by the necessary measures.(9,10) It was observed that once the stressful stage of any epidemic is over, people tend to forget all the day to day precautions necessary to prevent future outbreaks.(11)

This study therefore, aims to assess

- knowledge among people for different domains of COVID-19 in the post-pandemic era
- related sociodemographic factors influencing knowledge

MATERIAL & METHODS

Study type, and study setting: This cross-sectional study was undertaken among the adult urban population of district Ghaziabad in 2023.

Sample size calculation: The total sample size was calculated to be 384 at awareness levels 50% and relative precision 10%. However, for ease of study, the total study participants included were 400.

Sampling technique: The study sample was selected using multistage random sampling. Ghaziabad city is divided into five zones. From each zone, one ward was randomly selected. Then 80 households were selected randomly from each of these wards and a total of 400 study participants were interviewed. From each household, only one adult was selected for the study. Data was collected from 5th October 2023 to 28th December 2023.

Data collection strategy: A semi-structured questionnaire, pre-tested in a pilot study was used for data collection. It included socio-demographic details and questions regarding knowledge about COVID-19. Section regarding knowledge was further divided into five subgroups for the purpose of better analysis. Questions related to the epidemiology, transmission, symptoms, treatment and prevention of COVID-19 were included in the

five subgroups respectively. Each correct response was given a score of +1 and incorrect response was marked as zero. Maximum Knowledge score achievable was 46. A cut-off score was established after taking mean of this score. If the score was above the cut-off the study subjects were categorized into having good knowledge and if the score was below the cut-off, it was considered as poor knowledge.

Inclusion criteria: The households in the selected wards of the urban area.

Exclusion Criteria: Any household where respondent refused to give consent and where the respondent was below 18 years of age were excluded from the study.

Ethical approval: Approval was taken from the institutional ethics committee (SU/R/2023/2493(1)).

Data Analysis: The collected data was analyzed using MS Excel 2020 and SPSS software trial version 16. After finding the associations between categorical variables by Chi-square test (taking p-value <0.05 as statistically significant), regression analysis was performed (with 95% confidence interval) to determine significant associations between dependent and independent categorical variables.

RESULTS

In the present study, majority of the participants were males 277 (69.25%). Participants in the age group of 31-40 years were 146 (36.50%), followed by 139 (34.75%) participants in the age group of 18-30 years. The majority of participants, 300 (75%) lived in nuclear families and 100 (25%) in joint families. More than three-fourths, 303 (75.75%) of the study participants were married.

Most of the study participants 153 (38.25%) had completed graduation. More than half 213 (53.25%) of the subjects, were either self-employed or had their own business. Maximum number 150 (37.5%) of subjects were from lower middle class. (Figure 1 & Figure 2)

Figure 1 Socio-demographic characteristics of the study population

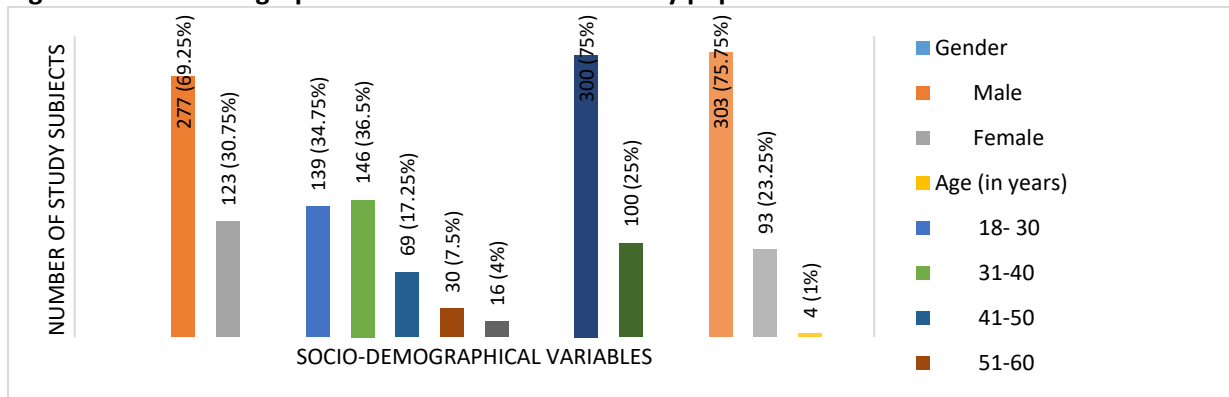


Figure 2 Socio-economic characteristics of the study population.

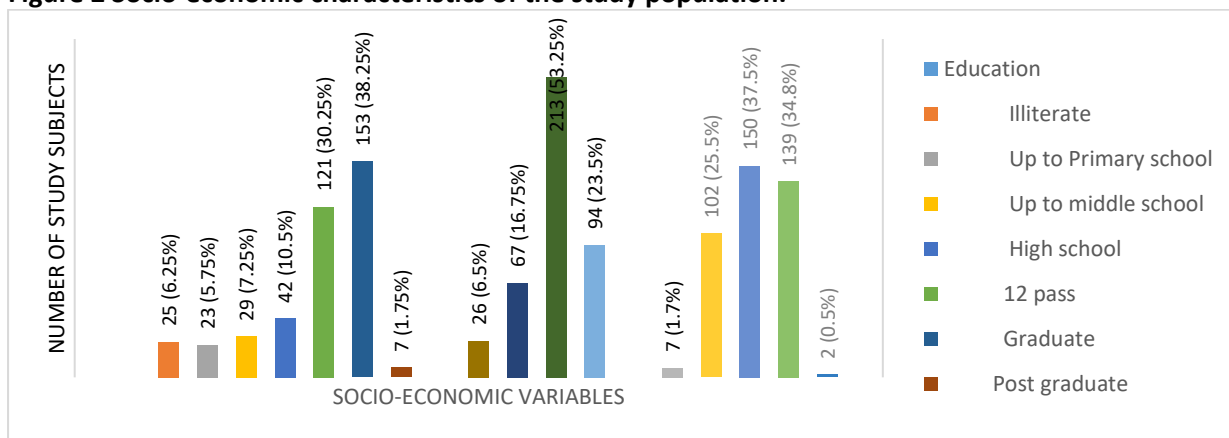


Table 1 Socio-demographic variables associated with knowledge of epidemiology and transmission of COVID-19

Socio-demographic variables		Knowledge about epidemiology		Total n=400	p-value	aOR	95% CI
		Good n(%)	Poor n(%)				
Education*	Upto 12th Pass	92(38.3)	148(61.7)	240	<0.001*	Reference	1.822-4.163
	Graduate and above	101(63.1)	59(36.9)	160			
Knowledge about transmission							
Education*	Upto 12th Pass	110(45.8)	130(54.2)	240	<0.001*	Reference	1.453-3.315
	Graduate and above	104(65)	56(35)	160			
Type of family	Nuclear	172(57.3)	128(42.7)	300	0.008*	Reference	1.173-2.935
	Joint	42(42)	58(58)	100			

Table 1 shows that the study participants who had at least completed graduation were having almost 2.8 times better knowledge regarding epidemiology than those who only studied only till Class 12 [OR 2.754 (95% CI 1.822-4.136)]. Similarly, better educated study subjects had almost two times better

knowledge about COVID-19 transmission modes [OR 2.195 (95% CI 1.453-3.315)]. It was also seen that people living in joint families had 1.8 times poor knowledge about mode of transmission than nuclear families [OR 1.856(95% CI 1.173-2.935)].

Table 2: Socio-demographic variables associated with knowledge about COVID-19 symptoms and treatment

Socio-demographic variables		Knowledge about symptoms		Total n=400	p-value	aOR	95% CI
		Good n (%)	Poor n (%)				
Age (in years)	18-30	37(26.6)	102(73.4)	139		Reference	
	31-40	62(42.5)	84(57.5)	146	0.005*	2.035*	1.235-3.352
	41-50	29(42)	40(58)	69	0.026*	1.999*	1.088-3.672
	51-60	4(13.3)	26(86.7)	30	0.133	0.424	0.139-1.297
	Above 60	4(25)	12(75)	16	0.889	0.919	0.279-3.028
Family type	Nuclear	114(38)	186(62)	300	0.004*	Reference	
	Joint	22(22)	78(78)	100		0.460*	0.272-0.780
Education	Upto 12th Pass	54(22.5)	186(77.5)	240	<0.001	Reference	
	Graduate and above	82(51.3)	78(48.8)	160	*	3.621*	2.347-5.586
Socioeconomic status	Upper	2(66.7)	1(33.3)	3	0.186	5.143	0.454-58.229
	Upper Middle	60(43.5)	78(56.5)	138	0.006*	1.978*	1.212-3.229
	Lower Middle	42(28)	108(72)	150		Reference	
	Upper Lower	30(29.4)	72(70.6)	102	0.808	1.071	0.615-1.867
	Lower	2(28.6)	5(71.4)	7	0.974	1.029	0.192-5.508
Knowledge regarding treatment							
Age group (in years)	18-30	102(73.4)	37(26.6)	139		Reference	
	31-40	113(77.4)	33(22.6)	146	0.432	1.242	0.724-2.132
	41-50	41(59.4)	28(40.6)	69	0.042*	0.531*	0.289-0.978
	51-60	20(66.7)	10(33.3)	30	0.458	0.725	0.311-1.693
	Above 60	7(43.8)	9(56.3)	16	0.019*	0.282*	0.098-0.812

The mean knowledge score of the participants was found to be 25.09 ± 6.85 (range 4-41) and 51% of the subjects showed good knowledge about COVID 19. Table 2 shows that 31-40 and 41-50 years age groups had almost twice as good a knowledge about major symptoms of COVID-19 than 18-30 years old [OR 2.035 (95% CI 1.235-2.352) and [OR 1.999 (95% CI 1.088-3.672) respectively. It was also seen that nuclear families had 2.2 times better knowledge regarding symptoms of this viral infection than people living in joint families [OR 0.460 for joint families (95% CI 0.272-0.780)]. Study subjects with graduate and post graduate degrees had 3.6 times better

knowledge about the presenting clinical features and symptoms of SARS-CoV-2 infection [OR 3.621 (95% CI 2.347-5.586)]. Study subjects belonging to Upper middle class had twice as good a knowledge about symptoms of this viral disease than those of Lower middle class as per Modified Kuppaswamy classification [OR 1.978 (95% CI 1.212-3.229)]. This table also shows that study subjects of 18-30 years had 1.8 times better knowledge about COVID-19 treatment than participants of 41-50 years [OR 0.531 for 41-50 age group (95% CI 0.289-0.978)] and almost 3.5 times better knowledge than the participants above the age of 60 years [OR 0.282 (95% CI 0.098-0.812)].

Table 3: Socio-demographic variables associated with knowledge regarding COVID-19 prevention

Socio-demographic variables		Knowledge regarding prevention			p-value	aOR	95% CI
		Good n (%)	Poor n (%)	Total n=400			
Gender	Male	148(53.4)	129(46.6)	277	<0.001*	Reference	
	Female	83(67.5)	40(32.5)	123		2.517*	1.554-4.075
Family type	Nuclear	182(60.7)	118(39.3)	300	0.083	Reference	
	Joint	49(49)	51(51)	100		0.655	0.406-1.057
Education	Upto 12th Pass	113(47.1)	127(52.9)	240	<0.001*	Reference	
	Graduate and above	118(73.8)	42(26.3)	160		3.811*	2.407-6.032
Socioeconomic status	Upper	2(66.7)	1(33.3)	3	0.834	1.297	0.115-14.622
	Upper Middle	91(65.9)	47(34.1)	138	0.354	1.255	0.776-2.031
	Lower Middle	91(60.7)	59(39.3)	150		Reference	
	Upper Lower	45(44.1)	57(55.9)	102	0.010*	0.512*	0.307-0.852
	Lower	2(28.6)	5(71.4)	7	0.114	0.259	0.049-1.381

Table 3 shows knowledge about prevention was two and a half times better in women than men [OR 2.517 (95% CI 1.554-4.075)]. Knowledge regarding prevention was better with increasing education levels [OR 3.811 (95% CI 2.407-6.032)].

It was also seen that people belonging to Lower Middle class had almost two times better knowledge regarding preventive measure about COVID-19 than people belonging to Upper lower class [OR 0.512 (95% CI 0.307-0.852)].

DISCUSSION

The present study revealed a mean knowledge score of 25.09 ± 6.85 (range 4-41). Good knowledge about COVID 19 was reported in 51% of the subjects. It was observed that 31-40 years old and 18-30 years old had better knowledge about major symptoms and treatment of COVID-19 respectively. In this study, significant association was observed between education and knowledge regarding COVID 19 epidemiology and prevention. It was also seen that study participants living in nuclear families had better knowledge regarding transmission as well as symptoms of the disease as compared to those in joint

families. Women were found to have two and a half times better knowledge about prevention of COVID-19 than men. Study subjects belonging to Upper middle class had twice as good a knowledge about symptoms of this viral disease than those of Lower middle class.

Since there is a dearth of studies done during the post pandemic phase to find out the awareness levels of people, a direct comparison of findings could not be possible. Nevertheless, during the pandemic many studies were done trying to find the socio-demographic correlates with knowledge of the general population.

Similar to the findings of this study, Singh PK et al (2022) (12) also found approximately 58% of respondents as having high knowledge. Paul A et al (2020) (13) in their study in Bangladesh found a high degree of knowledge in only 30% participants. In an American study by Clements JM (2020) (14) around 80% had good knowledge about COVID-19. Kutikuppala LMS et al (2021) (15) also found 81% of the study participants to have good knowledge regarding COVID-19. Such high information levels could be due to prompt information dissemination by the government authorities since the

pandemic began. The present study has been done in the post pandemic era and therefore, might be showing decreased knowledge scores due to the same.

Similar to the findings of this study which showed that higher education was associated with good knowledge, Bawazir A et al in their study in 2017(16) also found that education of general population was directly associated with knowledge about emerging infections. Zhong et al (2020) (17) also reported similar findings in China. As majority of the respondents (70.25%) had completed schooling (12th pass) and higher education, their access and understanding of correct information is a major reason for this finding.

The knowledge about prevention was two and a half times better in women than men. Higher knowledge scores were obtained among women participants as well by Azlan AA et al (2020) (18). This can be attributed to the serious disposition of women rather than men, who are known to have casual approach towards health issues. In an online study done by Tomar BS et al (2020) (19) in the Indian community, males had better knowledge about COVID-19. However, Padmanabhan S et al (2021) (20) did not find any such association between gender and knowledge levels regarding COVID-19.

Zhong et al (2020) (17) found that 16–29 years old had significantly higher knowledge regarding COVID-19. Ferdous MZ et al (2020) (21) also found younger age group (12-20 years) to have more accurate knowledge. However, in this study it was seen that people in the higher age brackets of 31-40 years had almost twice as good knowledge about major symptoms of COVID-19 than 18-30 years old. Singh PK et al (2022) (12) also found higher knowledge scores in the age group of 31 and above. Awareness of major signs and symptoms of the disease is necessary for early recognition of the disease followed by early initiation of treatment as well.

In this study, 18-30 years old had 1.8 times better knowledge about the treatment of COVID-19. In a recent study done by Luo S et al (2024) (22), they also found that younger populations are more likely to know about proper protective measures in the post-

pandemic times as they spend more time on the internet.

Al-Hanawi MK et al (2020) (8) in their study observed that higher income levels were associated with higher knowledge regarding coronavirus, may be because it led to better education and better access to important and correct information. Zhong et al (2020) (17) also found higher incomes associated with better knowledge and thus, better preventive practices. Similarly, in an Egyptian study done by Abdelhafiz A S et al (2020) (23), mean knowledge scores were significantly associated with income as knowledge being lower in lower monthly income groups. These findings are similar to our study.

The most prominent suggestion of the study is that focused approach regarding awareness and correct knowledge dissemination especially to vulnerable sections should be encouraged to reduce the potential risk of an outbreak. The Indian government made exceptional efforts in educating people regarding COVID-19. In the long run, such endeavors will be operative in the control and prevention of such infections.

CONCLUSION

This study was undertaken to assess the levels of knowledge among the urban community after a pandemic subsides and to find associated factors influencing the same. It was observed that even after the pandemic had passed, good knowledge levels were retained. Participants had a huge disparity in the individual levels of information. Higher levels of education, younger age group and nuclear family were associated with better knowledge regarding the disease.

RECOMMENDATION

In this study, knowledge about prevention was better in women than men and in people with higher education levels. This fact makes them better equipped to deal with infectious diseases as good knowledge translates into positive attitudes and better practices for protection.

For public health policies to become successful in reducing the risk of disasters, it is imperative to have adequate community participation.

Therefore, empowering and educating the public through regular and focused awareness sessions is a must.

LIMITATION OF THE STUDY

Firstly, the study was limited to the urban Ghaziabad. Secondly, the factors associated with public's information seeking behaviours were not dealt with extensively. Therefore, more studies delving into the perceptions of people regarding information about epidemics and its impact on their routine lives are needed.

RELEVANCE OF THE STUDY

There are very few studies done to understand post pandemic awareness levels of the people regarding COVID-19. This study gives valuable insights into the levels of knowledge retention and the factors influencing it in the post pandemic period.

AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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