



Original Research Article

KNOWLEDGE, ATTITUDE, AND PRACTICES IN RELATION TO COVID – 19 PANDEMIC AMONG PEOPLE RESIDING IN URBAN AREA OF MUZAFFARNAGAR CITY, UTTAR PRADESH, INDIA

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Received : 16/03/2024
Received in revised form : 18/05/2024
Accepted : 01/06/2024

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DOI: 10.5530/ijmedph.2024.2.109

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (2); 564-569

ABSTRACT

Background: The COVID-19 pandemic has posed unprecedented challenges worldwide, necessitating a comprehensive understanding of knowledge, attitudes, and practices (KAP) among populations to inform effective public health interventions. This study aims to assess KAP regarding COVID-19 among individuals in urban areas of Muzaffarnagar city, Uttar Pradesh, India.

Materials and Methods: A community-based cross-sectional study was conducted between July 2022 and November 2022. Purposive sampling was used to recruit 428 participants aged 18 years and above, proficient in Hindi. Data were collected using a semi-structured questionnaire covering demographics, COVID-19-related KAP. Descriptive and inferential statistical analyses were conducted to unveil patterns and associations.

Results: Participants exhibited a robust understanding of COVID-19, with high knowledge scores across various domains, including symptoms, modes of transmission, and preventive measures. Positive attitudes towards the severity of the pandemic and trust in public health authorities were prevalent, although concerns about personal and societal impacts persisted. While adherence to preventive behaviours such as hand hygiene and mask-wearing was generally high, compliance with quarantine guidelines was suboptimal. Demographic factors such as age, education, and occupation significantly influenced KAP scores.

Conclusion: This study provides valuable insights into KAP dynamics related to COVID-19 among urban populations in Muzaffarnagar city, Uttar Pradesh, India. The findings underscore the importance of targeted interventions to address knowledge gaps, promote positive attitudes, and enhance adherence to preventive measures. Tailored strategies considering demographic nuances are essential for effective pandemic control and mitigation of socio-economic impacts.

Keywords: COVID-19, knowledge, attitudes, practices, urban population, India.

INTRODUCTION

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has posed significant

challenges to global health and societal well-being.^[1] With over 774 million confirmed cases and over 7 million of deaths worldwide as of January 2024, understanding the knowledge, attitudes, and

practices (KAP) of individuals towards the pandemic is crucial for effective public health responses.^[1]

Knowledge about COVID-19, including its transmission, symptoms, prevention, and treatment, varies widely among populations and is influenced by factors such as education, access to information, cultural beliefs, and government communication strategies. Attitudes towards the pandemic, ranging from fear and anxiety to skepticism and complacency, shape individual behaviours and compliance with public health measures such as mask-wearing, social distancing, and vaccination.^[2,3,4]

Practices related to COVID-19 prevention and control encompass a broad spectrum of behaviours, including hygiene practices, adherence to quarantine and isolation guidelines, and utilization of healthcare services.^[5] These practices are influenced by personal beliefs, social norms, economic constraints, and perceived risk of infection.^[6,7]

Some studies on Knowledge, attitude and practices of the people in relation to COVID-19 Coronavirus are done outside India, but very limited in our country.^[8,9,10] In this context, study exploring the KAP of individuals in relation to the COVID-19 pandemic, is critical for informing public health policies, risk communication strategies, and interventions aimed at promoting community resilience and recovery. By identifying knowledge gaps, addressing misconceptions, and leveraging positive attitudes and practices, we can collectively navigate through this unprecedented global health crisis and emerge stronger and more prepared for future challenges.

MATERIAL AND METHODS

Study Design

This study adopted a comprehensive community based cross-sectional study design to assess the multifaceted dimensions of knowledge, attitudes, and practices (KAP) regarding the COVID-19 pandemic, among individuals residing in urban area of Muzaffarnagar city, Uttar Pradesh, India. The study was conducted in the Urban Health Training Centre Khalapar Field Study Area under the department of Community Medicine, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India, between July 2022 to November 2022, after obtaining ethical approval from institute.

Study Participants and Sample Size

Participants were recruited employing purposive sampling techniques, ensuring representation across diverse demographics, geographical locations, and socio-economic strata. The inclusion criteria encompassed individuals aged 18 years and above, proficient in the Hindi language of the survey, and voluntarily willing to participate. Informed consent, elucidating the study's objectives, risks, benefits, and confidentiality measures, was obtained from all participants before their inclusion. Participant

anonymity and data confidentiality were ensured throughout the study, adhering to established data protection protocols. Exclusion criteria for this study encompassed, individuals lacking proficiency in the survey language to ensure comprehension, and those exhibiting cognitive impairments or intellectual disabilities.

Sample Size

To calculate the sample size for estimating the prevalence of good practice regarding the COVID-19 pandemic among individuals residing in urban areas, we use the formula for a single proportion:

$n = Z^2 \times p \times (1-p) / E^2$, where n is the sample size, Z is the Z-score corresponding to the desired confidence level (typically 1.96 for a 95% confidence level), p is the estimated prevalence of good practice (0.50 for 50% Singh et al.), and E is the margin of error (0.05 for a 5% margin).^[10]

Plugging in these values, the initial sample size estimate is calculated as 384.16, which is rounded up to 385 individuals. Assuming a non-response rate of 10%, the adjusted sample size formula is applied:

$n_{adjusted} = n / (1 - non\ response\ rate)$, where n is the initial sample size estimate (385) and $non_response_rate$ is the proportion of non-responses (0.10). Thus, $n_{adjusted} = 427.78$, which is rounded up to 428 individuals.

Therefore, to ensure adequate representation and account for a non-response rate of 10%, a sample size of 428 individuals was finalized. A simple random sampling technique was used to ensure representation across different demographic groups, including age, gender, education level, and socio-economic status.

Data Collection

A semi-structured questionnaire, developed through expert consensus and piloted for validity and reliability, served as the primary data collection tool. Data gathering occurred via online platforms, telephone interviews, and face-to-face interactions, catering to participants' preferences and accessibility. The questionnaire comprised multiple sections addressing, demographics, COVID-19-related knowledge, attitudes towards the pandemic, and preventive practices.

Study Measurement Tools

Knowledge about COVID-19: Participants were asked about their awareness of COVID-19 symptoms, modes of transmission, preventive measures, and sources of information.

Attitudes towards the COVID-19 pandemic: Participants' attitudes towards the severity of the pandemic, trust in public health authorities, risk perception, perceived efficacy of preventive measures, concerns about personal and societal impacts, adherence to preventive measures, and vaccination intentions. were assessed using Likert-scale questions.

Practices related to COVID-19 prevention and control: Participants reported their adherence to recommended preventive behaviours, including

hand hygiene practices, mask-wearing behaviours, adherence to social distancing norms, compliance with quarantine guidelines, healthcare-seeking behaviours, and vaccination status. Practices were evaluated based on self-reported frequency and consistency.

Data Analysis

Data were subjected to rigorous statistical analysis, employing both descriptive and inferential statistics to unveil patterns, associations, and determinants. Descriptive analyses encompassed summarizing demographic characteristics, knowledge scores, attitude distributions, and practice frequencies. Inferential statistics independent t-tests, were employed to examine associations between demographic variables (age, gender, education) and KAP outcomes. Statistical significance was set at $p < 0.05$. All analyses were conducted using SPSS version 20.0, ensuring robustness and reliability of findings.

RESULTS

A total of 428 individuals were included in the analysis, with diverse representation across various demographics. Regarding age distribution, the majority of participants were aged below 30 years (35.1%), followed by those in the 30-45 age group (29.9%). Gender distribution showed a slight predominance of males (55.1%) over females (44.9%). In terms of education level, the largest proportion of participants had completed high school/intermediate education (40.2%), followed by primary/middle school education (25.0%). Socio-economic status varied among the participants, with a significant portion falling into the middle-income category (45.1%). Regarding marital status, the majority were married (55.6%), while a smaller proportion were single (30.8%) or widowed/divorced (13.6%). Occupational diversity was observed, with the majority being employed (48.1%), followed by students (21.0%) and homemakers (18.2%). [Table 1]

Middle class, and Lower includes: Lower middle and Lower class

Overall, participants demonstrated relatively high levels of knowledge across most domains. For symptoms of COVID-19, 291 participants (68.0%) provided correct responses, indicating a good understanding of common symptoms associated with the disease. Similarly, a significant proportion of participants correctly identified modes of transmission (63.1%) and preventive measures (72.0%). Furthermore, the majority of participants (80.1%) reported accurate sources of information regarding COVID-19, suggesting a high level of awareness about reliable information sources. However, knowledge about treatment options and risk factors was comparatively lower, with 65.8% and 56.9% of participants providing correct responses, respectively. Despite variations in

knowledge across different domains, the overall mean knowledge score was 4.12 ± 0.74 , indicating a generally sound understanding of COVID-19-related information among the study population. [Table 2]

A significant proportion of participants (47.7%) agreed with the severity of the pandemic, while 34.1% remained neutral, and 18.2% disagreed with this perception. Trust in public health authorities was reported by 42.5% of participants, with 36.9% expressing neutrality, and 20.6% disagreeing. Risk perception varied, with 35.0% agreeing, 29.0% remaining neutral, and 36.0% disagreeing. Participants generally perceived preventive measures to be effective (51.6% agreement), with 28.0% expressing neutrality and 20.3% disagreeing. Concerns about personal and societal impacts were prevalent, with 56.8% of participants expressing agreement, 23.6% remaining neutral, and 19.6% disagreeing. Regarding adherence to preventive measures, 49.1% reported adherence, while 31.5% remained neutral, and 19.4% disagreed. The overall mean score for attitude was calculated as 0.78 ± 0.81 , indicating the average level of agreement with attitudinal aspects related to the COVID-19 pandemic among the study participants. [Table 3]

A majority of participants reported consistently adhering to hand hygiene practices (57.5%) and mask-wearing behaviours (75.7%), while a substantial proportion also followed social distancing norms (43.5%). Compliance with quarantine guidelines varied, with fewer participants consistently adhering (30.8%). However, a significant majority reported always seeking healthcare when necessary (65.0%). Regarding vaccination status, 75.7% of participants reported being vaccinated. The overall mean score for preventive behaviours was calculated as 3.46 ± 0.52 , suggesting a generally high level of adherence to recommended preventive measures among the study participants. [Table 4]

Participants under 45 years of age demonstrated significantly higher knowledge scores (4.21 ± 0.72) and more favourable attitudes (0.82 ± 0.49) compared to older participants ($p = 0.017$ and $p = 0.031$, respectively), with similar trends observed in practice scores ($p < 0.0001$). While no significant gender differences were observed in knowledge or attitude scores, females exhibited significantly higher practice scores (3.58 ± 0.49) compared to males (3.45 ± 0.53 , $p = 0.009$). Education level significantly influenced knowledge ($p = 0.004$) and attitude ($p = 0.002$) scores, with participants having a high school education or above showing higher scores, and similar patterns were observed for practice scores ($p < 0.0001$). While socio-economic status did not significantly influence knowledge or attitude scores, significant differences were observed in practice scores ($p < 0.0001$), with participants from upper socio-economic status exhibiting higher scores. Marital status did not significantly influence any of the scores ($p > 0.05$).

However, occupation significantly influenced knowledge ($p = 0.002$), attitude ($p = 0.005$), and practice ($p < 0.0001$) scores, with employed

participants demonstrating higher scores compared to others. [Table 5]

Table 1: The demographic characteristics of the study participants (N=428)

Demographic Variables	Frequency	Percentage (%)
Age (years)		
<30	150	35.1
30-45	128	29.9
46-60	86	20.1
>60	64	15.0
Gender		
Male	236	55.1
Female	192	44.9
Education Level		
Illiterate	85	19.8
Primary/Middle school	107	25.0
High school/Intermediate	172	40.2
Graduate/Postgraduate	64	15.0
Socio-economic Status*		
Lower	129	30.1
Middle	193	45.1
Upper	106	24.8
Marital Status		
Single	132	30.8
Married	238	55.6
Widowed/Divorced	58	13.6
Occupation		
Employed	206	48.1
Unemployed	54	12.7
Student	90	21.0
Home maker	78	18.2

*BG prasad classification: Upper includes: Upper and Upper middle class, Middle includes: Middle class, and Lower includes: Lower middle and Lower class.

Table 2: The distribution of correct and incorrect responses across various knowledge domains among the study participants (N=428)

Knowledge Domains	Frequency (%)	
	Correct response	Incorrect response
Symptoms	291 (68.0%)	137 (32.0%)
Modes of Transmission	270 (63.1%)	158 (36.9%)
Preventive Measures	308 (72.0%)	120 (28.0%)
Sources of Information	347 (80.1%)	81 (19.9%)
Treatment Options	282 (65.8%)	146 (34.2%)
Risk Factors	244 (56.9%)	184 (43.1%)

Table 3: The attitudinal aspects of the study participants towards various dimensions of the COVID-19 pandemic (N=428)

Attitudinal Aspects	Frequency (%)		
	Agree	Neutral	Disagree
Perception of Severity of the Pandemic	204 (47.7%)	146 (34.1%)	78 (18.2%)
Trust in Public Health Authorities	182 (42.5%)	158 (36.9%)	88 (20.6%)
Risk Perception	150 (35.0%)	124 (29.0%)	154 (36.0%)
Perceived Efficacy of Preventive Measures	221 (51.6%)	120 (28.0%)	87 (20.3%)
Concerns about Personal and Societal Impacts	243 (56.8%)	101 (23.6%)	84 (19.6%)
Adherence to Preventive Measures	210 (49.1%)	135 (31.5%)	83 (19.4%)

Table 4: The preventive behaviours adopted by study participants in response to the COVID-19 pandemic (N=428)

Preventive Behaviours	Frequency (%)				
	Always	Often	Sometimes	Rarely	Never
Hand Hygiene Practices	246 (57.5%)	109 (25.5%)	47 (11.0%)	18 (4.2%)	8 (1.8%)
Mask-Wearing Behaviours	324 (75.7%)	66 (15.4%)	20 (4.7%)	10 (2.3%)	8 (1.9%)
Social Distancing Norms	186 (43.5%)	154 (36.0%)	65 (15.2%)	14 (3.3%)	9 (2.0%)
Compliance with Quarantine Guidelines	132 (30.8%)	118 (27.7%)	105 (24.5%)	45 (10.5%)	28 (6.5%)
Healthcare-Seeking Behaviors	278 (65.0%)	92 (21.5%)	34 (7.9%)	16 (3.7%)	8 (1.9%)

Table 5: The association between demographic variables and knowledge, attitude, and practice scores regarding the COVID-19 pandemic among study participants (N=428)

Demographic Variables	Scores (Mean ± SD)		
	Knowledge	Attitude	Practice
Age			
<45 (n=278)	4.21 ± 0.72	0.82 ± 0.49	3.54 ± 0.49
>45 (n=150)	4.03 ± 0.78	0.72 ± 0.39	3.29 ± 0.55
p value	0.017	0.031	<0.0001
Gender			
Male (n=236)	4.12 ± 0.75	0.81 ± 0.40	3.45 ± 0.53
Female (n=192)	4.23 ± 0.71	0.85 ± 0.42	3.58 ± 0.49
p value	0.123	0.304	0.009
Education			
High school and above (n=236)	4.25 ± 0.74	0.86 ± 0.41	3.64 ± 0.52
Middle school and lower (n=192)	4.05 ± 0.70	0.74 ± 0.39	3.36 ± 0.48
p value	0.004	0.002	<0.0001
Socio-economic Status			
Upper (n=106)	4.28 ± 0.76	0.88 ± 0.44	3.75 ± 0.57
Middle and Lower (n=322)	4.12 ± 0.73	0.80 ± 0.40	3.44 ± 0.51
p value	0.053	0.082	<0.0001
Marital status			
Married (n=238)	4.16 ± 0.75	0.82 ± 0.41	3.54 ± 0.53
Others (n=190)	4.05 ± 0.73	0.78 ± 0.39	3.47 ± 0.50
p value	0.127	0.306	0.164
Occupation			
Employed (n=206)	4.26 ± 0.77	0.85 ± 0.83	3.65 ± 0.56
Others (n=222)	4.04 ± 0.71	0.74 ± 0.79	3.35 ± 0.49
p value	0.002	0.005	<0.0001

DISCUSSION

The findings of this study shed light on the multifaceted dimensions of knowledge, attitudes, and practices (KAP) regarding the COVID-19 pandemic among individuals residing in urban areas of Muzaffarnagar city, Uttar Pradesh, India. Our results reveal several noteworthy insights into the factors influencing KAP scores and their implications for public health interventions.

In terms of knowledge, participants exhibited a relatively high level of awareness regarding COVID-19 symptoms, modes of transmission, preventive measures, and sources of information. The mean knowledge score of 4.12 ± 0.74 indicates a robust understanding among the study population, which is consistent with findings from previous studies conducted in India and other countries.^[11,12,13] In study by Kutikuppala et al., overall, 81% of the participants had good knowledge.^[11] The study by Shrestha et al., showed that 93.3% of respondents had knowledge of overall preventive practices, whereas only 32% had knowledge of overall symptoms of COVID-19.^[12] However, it is important to note that certain knowledge gaps persist, particularly regarding treatment options and risk factors, where correct responses were relatively lower. This emphasizes the need for targeted educational campaigns to address specific areas of misinformation and enhance overall knowledge levels. In a study by Al-Hanawi et al., the mean COVID-19 knowledge score was 17.96 (SD = 2.24, range: 3–22), indicating a high level of knowledge.^[14] Similarly in a study by Kundu et al., the mean knowledge score was 14.49 (SD 1.8, range 0–17).^[15]

Regarding attitudes towards the pandemic, participants generally demonstrated a positive perception of the severity of the situation and a high level of trust in public health authorities. However, concerns about personal and societal impacts were prevalent, reflecting the psychological and socio-economic toll of the pandemic. These findings align with studies conducted globally, highlighting the universal challenges faced by individuals in navigating the uncertainties of the pandemic.^[16,17] In a study by NeJhaddadgar et al., 61.19% (n = 235) of participants had favourable attitudes.^[16] In a study by Rahman et al., the prevalence of good positive attitude toward COVID-19 epidemic was 51.8%. The positive attitudes observed could be attributed to effective risk communication strategies, which have been shown to influence public perceptions and behaviours during health crises.^[18]

In terms of preventive practices, while a majority of participants reported adherence to recommended behaviors such as hand hygiene, mask-wearing, and social distancing, there remains room for improvement, particularly in compliance with quarantine guidelines. These findings are consistent with studies conducted in similar settings, underscoring the importance of sustained efforts to promote and reinforce preventive behaviours.^[19,20,21] In a study by Yoseph et al., 24.4% of the study participants had demonstrated proper practice.^[19] In study by Rabbani et al., 192 out of 359 respondents (53.5%) had poor practices toward COVID-19.^[20] The observed discrepancies in practice may be attributed to various factors, including socio-economic constraints, access to healthcare facilities, and cultural beliefs, highlighting the need for context-specific interventions tailored to local realities.

Comparison with other studies suggests both similarities and differences in KAP outcomes across different populations and settings.^[22,23] While our findings corroborate existing evidence regarding the general trends in KAP scores, variations in specific domains underscore the influence of contextual factors such as socio-economic status, cultural norms, and healthcare infrastructure.^[22,23] In a study by Roy et al., factors associated with poor knowledge, and practices were being male, aged >70 years, having a primary education, less income <5000BDT, and multimorbidity ($p < 0.05$).^[22] In a study by Gautam et al., the gender had a negligible impact on the average knowledge score, while the score differed significantly across education levels and occupation categories.^[23] These nuances highlight the importance of localized approaches to pandemic response and the need for ongoing surveillance to monitor evolving trends and tailor interventions accordingly.^[24]

CONCLUSION

Overall, our study contributes valuable insights into the KAP dynamics surrounding the COVID-19 pandemic in urban areas of Muzaffarnagar city, Uttar Pradesh, India. By identifying key determinants and areas for improvement, our findings can inform targeted interventions aimed at enhancing public awareness, fostering positive attitudes, and promoting adherence to preventive measures, thereby contributing to effective pandemic control efforts at the community level. Further research is warranted to explore the long-term impacts of the pandemic and evaluate the effectiveness of intervention strategies in mitigating its consequences on public health and well-being.

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