Original Article

# Perception and Practices of COVID Appropriate Behavior: A Cross-Sectional Study among Adult Populations in Rural and Urban West Bengal

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## Abstract

**Introduction:** Recent COVID-19 pandemic is an unprecedented public health problem worldwide. Knowledge about the disease and adoption of COVID Appropriate Behavior (CAB) are of utmost importance in combating the pandemic. The study was conducted to assess and compare the knowledge, attitude, and practice and to determine different misconceptions and wrong practices related to the disease among urban and rural populations. **Materials and Methods:** A community-based analytical study with cross-sectional design was conducted from January 2021 to March 2021 among 144 adult residents from urban and rural West Bengal. Multistage sampling was adopted and a predesigned, pretested, semistructured schedule was used for interviewing study subjects. **Results:** Urban people were significantly more knowledgeable and more appropriate in attitude and practice than rural people ($P < 0.05$). The mean knowledge and attitude scores of urban population were significantly higher than the rural population across age groups, gender, occupation, and education ($P < 0.05$), whereas mean practice score was significantly higher across gender and occupation in the urban population compared to the rural population ($P < 0.05$). Many cultural and indigenous practices such as drinking warm water, using mouth wash, using home remedies were more common in urban areas and consumption of homeopathy medicines, lighting candles, making sound with utensils, blowing conch shells, and worshipping corona were observed more in rural areas. **Conclusions:** Wide gap exists in knowledge, attitude, and practice between urban and rural population and there were many wrong perceptions and practices surrounding COVID-19 among both urban and rural population. Appropriate policy for improving knowledge, attitude, and CAB is the need of the hour.

**Keywords:** Covid Appropriate Behavior, COVID-19, hand hygiene, mask wearing, perception

## Introduction

Currently, the human civilization is experiencing an extraordinary public health emergency called "COVID-19 pandemic." COVID-19 is an infectious disease caused by novel coronavirus (SARS-CoV-2) affecting every nation globally.[1] Cases first reported from Wuhan city, China in December, 2019 caused by SARS-CoV-2 rapidly spread to the rest of the world and was declared a pandemic by the World Health Organization (WHO) on March 11, 2020.[2]

In India, the first case of COVID-19 was reported in Kerala on January 27, 2020.[3] and on December 31, 2020, India's total coronavirus caseload reached 10,266,674, including 257,656 active cases, 9,860,280 recoveries, and 148,738 total deaths.

In the beginning of pandemic, WHO was sceptical about the mask use by the general population. However, there was a gradual adoption of face masks to prevent COVID-19 transmission effectively in the areas of community transmission.[4] Two recent meta-analysis on the preventive role of mask wearing on COVID-19 has shown reduction of primary infection

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by 6%–61% and in either the incidence, hospitalization, or mortality, or a combination of these outcomes.[5,6] Gradually, face mask has been accepted as a suitable measure[7-11] and also as "precautionary principle" when nothing is available during an acute crisis.[12,13]

Although many vaccines are available till date and many more are in the pipeline, the ultimate preventive role of vaccine against corona is yet to be proved as the virus is rapidly mutated leading to appearance of newer strains. Although existing COVID-19 vaccines are expected to provide at least some protection against new virus variants, at the same time every possible step should be undertaken to stop the spread of the virus.[14] Safe and effective vaccines are a game-changer but for the upcoming future, wearing masks, cleaning hands, ensuring good ventilation indoors, physically distancing, and avoiding crowds must be followed to prevent the disease, especially caused by mutated coronavirus.[15]

As per the WHO, human behavior including knowledge, attitude, and practices toward COVID-19 is going to play a very crucial role in the prevention and control of this global pandemic in near future.[16] The personal and collective understanding of people's behavior and attitudes toward preventive practices appears essential for planning and designing more effective health communications about the COVID-19 pandemic.[17] In India, high population density, especially in urban area, huge migration of labor force, and reluctance to adopt Covid Appropriate Behavior (CAB) provide a great challenge to control the spread of the disease. Despite extensive Institutional Ethics Committee (IEC) about CAB via electronic, print and social media, many people are reluctant to adopt the behavior in India. A survey in September 2020 showed that although 90% are aware of mask, only 44% are wearing mask.[18] Owing to its high population density, maintenance of social distancing is found to be another challenge in India.[19]

Research on the issue is still meager till date especially in West Bengal. With this background, the current study was undertaken to assess knowledge, attitude, and practice regarding COVID-19 and CAB in part of urban and rural West Bengal and to find out prevailing myths and misconception regarding CAB.

## Materials and Methods

### Study design, study area, and study participants

The community-based analytical study with cross-sectional design was conducted among 144 adult residents in two urban municipalities and two villages of West Bengal during January 2021 to March 2021. There were two districts, namely Nadia and Hooghly, and one municipality and one village were selected randomly from each district.

### Sampling

The sample size was calculated using the formula $Z\alpha^2pq/L^2$ where $Z = 1.96$, $P$ = prevalence of 45.44% for handwashing taking 20 s in the Indian population,[20] $q = (1 - p)$ and $L$ = absolute precision of 12%. Considering design effect 2 and nonresponse rate 10%, sample size calculated was 146.

The study areas were selected using the multistage random sampling technique. Among total 23 districts of West Bengal, two districts (Nadia and Hooghly) were selected randomly. From the list of urban municipalities and villages of the two districts, one municipality and one village from each district were selected using random number method.

From the list of families available in Panchayats or municipality office of selected urban and rural areas, 37 families in each urban or rural area were selected by random sampling to get required sample population.

One adult individual from each family, preferably the head of the family and who fulfils the inclusion criteria was selected after taking prior informed consent. Persons who were Covid symptomatics or diagnosed with COVID-19 and in isolation during the period of data collection were excluded from the study.

A total of 144 eligible individuals provided consent to participate in the study and data were collected by house-to-house visit from January 2021 to February 2021. Each participant was interviewed and observed by the researchers. Data were collected with the help of a predesigned, pretested, and semistructured schedule. COVID-19 protocol was strictly followed during the data collection process.

### Data collection

The study tool was prepared in the English language with the help of public health experts and reviewed literature. The schedule was peer reviewed and was validated by a panel of experts of public health. The Cronbach's alpha coefficient for knowledge and attitude domain was 0.8 and for practice domain was 0.7. The validated questionnaire was then translated in Bengali and was back-translated to English by a language expert. Pretesting of the tool was undertaken among 10 people from one rural and one urban area who were excluded from main study and minor modifications were made. The first part of the schedule contained sociodemographic variables which included age, gender, religion, marital status, education, occupation, family type, and residence. The second part contained items on knowledge, attitude, and practice.

### Statistical analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 23.0 (Chicago, Illinois, USA). A uniform scoring system was adopted to get overall idea about knowledge, attitude, and practice. The knowledge section comprised 12 items regarding type of virus, modes of transmission, and prevention of COVID. There were six and seven items, respectively, in attitude and practice sections to assess attitude toward Covid and preventive measures and their CAB as observed during the period of data collection.

The correct and favorable response for each item was assigned one point and incorrect or "don't know" response was marked

with 'zero' except for the item on 'special remedy taken'. Thus, total attainable knowledge, attitude, and practice scores ranged from 0 to 20 for knowledge, 0–16 for attitude and 0–6 for practice.

The scores of knowledge, attitude, and practice were tested for normality of distribution using one-sample Kolmogorov–Smirnov test. Independent sample *t*-test was used for comparing scores in each domain with respect to age, gender, education, and occupation. The participants were considered having "good" score in each domain of knowledge, attitude, and practice if the scores attained were more than that of the mean value. Association of knowledge, attitudes, and practices (KAP) score with sociodemographic characteristics was shown using the Chi-square test. $P < 0.05$ was taken as statistically significant.

### Ethical considerations

Ethical approval was obtained from the IEC, RG Kar Medical College (vide letter no. RKC/240 dated 30.12.2020). Written informed consent was obtained from each respondent before the interview, and they were assured about the confidentiality of information. The research followed the guidelines laid down in the Declaration of Helsinki, updated in 2013.

## Results

Among 144 study participants, 72 belonged to urban areas and 72 were from rural areas. Nearly half of the population of both areas (35 [48.6%]: Urban; 32 [46.4%]: Rural) belonged to the 20–40 years' age group. Proportion of males was higher in rural (43/72, 59.7%) than in urban areas (40/72; 55.7%). Half of the urban participants ($n = 36$, 50%) were graduate and 37.5% ($n = 27$) of the rural participants had completed higher secondary level. Majority of both urban and rural respondents were homemakers by occupation (urban: 23 [32.8%]; rural: 15 [20.8%]), followed by businesspersons (urban: 21 [28.6%]; rural: 15 [20.8%]). Most of the urban participants ($n = 65$; 91.4%) belonged to nuclear family, whereas majority of their rural counterparts ($n = 44$; 6.0%) were from joint families [Table 1].

**Table 1: Sociodemographic characteristics of study population ($n=144$)**

| Sociodemographic characteristics | Urban, *n* (%) | Rural, *n* (%) | Total, *n* (%) | *P* |
|---|---|---|---|---|
| Age group (years) | | | | |
| 20-40 | 35 (48.6) | 32 (46.4) | 67 (46.5) | 0.30 |
| 40-60 | 29 (40.0) | 25 (36.2) | 54 (37.5) | 0.34 |
| >60 | 8 (11.4) | 15 (18.4) | 23 (15.9) | 0.42 |
| Gender | | | | |
| Male | 40 (55.7) | 43 (59.7) | 83 (56.7) | 0.31 |
| Female | 32 (44.3) | 29 (40.3) | 61 (42.4) | 0.52 |
| Religion | | | | |
| Hindu | 56 (78.6) | 41 (56.9) | 97 (67.4) | 0.01 |
| Muslim | 16 (21.4) | 31 (43.1) | 47 (32.6) | 0.01 |
| Marital status | | | | |
| Married | 56 (80.2) | 53 (74.3) | 109 (75.7) | 0.21 |
| Unmarried | 12 (14.1) | 11 (14.3) | 23 (15.9) | 0.24 |
| Widowed | 4 (5.7) | 8 (11.4) | 12 (8.3) | 0.32 |
| Educational status | | | | |
| Up to primary school | 7 (9.7) | 14 (19.4) | 21 (14.6) | 0.63 |
| Secondary completed | 9 (12.5) | 15 (20.8) | 24 (16.7) | 0.45 |
| HS completed | 20 (27.8) | 27 (37.5) | 47 (32.7) | 0.53 |
| Graduation and above | 36 (50.0) | 16 (22.3) | 52 (36.2) | 0.61 |
| Occupation | | | | |
| Service | 16 (21.4) | 14 (19.2) | 30 (20.9) | 0.46 |
| Business | 21 (28.6) | 15 (20.8) | 36 (25) | 0.34 |
| Homemaker | 23 (32.8) | 28 (38.6) | 51 (35.5) | 0.51 |
| Unemployed | 3 (4.3) | 6 (8.5) | 9 (6.25) | 0.16 |
| Retired | 4 (5.7) | 5 (7.1) | 9 (6.25) | 0.23 |
| Others | 5 (7.2) | 4 (5.8) | 9 (6.25) | 0.25 |
| Family type | | | | |
| Nuclear | 65 (91.4) | 28 (3.6) | 93 (64.6) | 0.00 |
| Joint | 7 (8.6) | 44 (61.4) | 51 (35.4) | 0.00 |

Percentages are to be calculated in terms of independent variables. HS: Higher secondary

Knowledge about CAB was poorer among rural participants. All urban participants (100%) knew the four most effective preventive behaviors, namely wearing mask, washing hand with soap and water, and avoiding crowded place or maintaining social distance, whereas 41 (56.9%), 31 (41.1%), 32 (44.4%), and 20 (23%) rural subjects knew about them, respectively. All (100%) urban participants reported fever and cough as two common symptoms of Covid whereas only 50 (69.4%) and 54 (75.0%) rural subjects were aware of them, respectively. Only 16 (22.2%), 23 (31.9%), and 9 (12.5%) rural study subjects could tell that coronavirus can spread through sneezing, coughing, and through direct contact, respectively, whereas 100%, 100%, and 67 (93.1%) urban subjects, respectively, could tell the same, respectively [Table 2].

It was observed that almost all the study population ($n = 69$, 95.8%) in urban area and 61 (84.7%) in rural area were using face cover while going outside during the period of data collection. Usage off cloth masks was found to be higher among rural subjects (rural: 44 [72.1% of total user; urban-30 [43.5% of total user]).

However, usage of surgical mask and N95 mask was higher among urban than rural participants. Thirteen (21. 3%) and 12 (15.9%) of urban study subjects used other materials to cover faces such as dupatta, pallu of sarees, handkerchief, and plastic packets. All study population in urban areas reported use of soap for hand washing and 60 (83.3%) had used sanitizer in last 7 days. In rural areas, 57 (79.2%) used soap, 25 (34.7%) used sanitizer, 11 (15.3%) used both soap and sanitizer, and 15 (20.8%) used plain water to wash their hands after coming from outside. The practice of carrying sanitizer was observed in 41 (56.9%) of urban and 22 (30.55%) of rural study subjects. Half of total study subjects (32 [44.4%] of urban and 22 [30.55%] rural) reported that they were unable to maintain social distance of six feet in most of the time during last 1 month [Table 3].

**Table 2: Distribution of the study population according to correct knowledge and attitude (*n*=144)**

| Items | Urban, *n* (%) | Rural, *n* (%) |
|---|---|---|
| Are you aware of corona virus or COVID-19? | 72 (100) | 72 (100) |
| What are the symptoms of the disease that you know? | | |
| Fever | 72 (100) | 50 (69.4) |
| Cough | 72 (100) | 54 (75) |
| Sore throat | 35 (48.6) | 28 (38.9) |
| Respiratory distress | 35 (48.6) | 15 (20.8) |
| Currently is there any effective cure for COVID-19? | 53 (73.6) | 43 (59.7) |
| Can early symptomatic and supportive treatment help most patients to recover? | 42 (58.3) | 34 (47.2) |
| Who can develop severe illness? | | |
| Elderly | 72 (100) | 20 (27.8) |
| Children | 53 (73.6) | 37 (51.4) |
| Co-morbidities | 70 (97.2) | 19 (26.4) |
| Anyone | 68 (94.4) | 42 (58.3) |
| According to you how does corona virus spread? | | |
| Sneezing | 72 (100) | 16 (22.2) |
| Cough | 72 (100) | 23 (31.9) |
| Contact | 67 (93.1) | 9 (12.5) |
| Can wearing mask in public prevent the disease transmission? | 72 (100) | 41 (56.9) |
| Can washing your hands frequently stop the spread of corona virus? | 72 (100) | 30 (41.7) |
| Can COVID-19 infection be prevented by individuals not going to crowded place? | 72 (100) | 32 (44.4) |
| Do you think social distancing is essential to stop the virus spread? | 72 (100) | 23 (31.9) |
| Can isolating a person with symptoms stop the spread of COVID-19? | 72 (100) | 35 (48.6) |
| Should people who have contact with infected person be immediately isolated? | 72 (100) | 15 (20.8) |
| Can infection spread from any person who has travelled from other place? | 72 (100) | 47 (65.3) |
| Where do you get information regarding COVID-19 from? | | |
| TV | 72 (100) | 60 (83.3) |
| News paper | 72 (100) | 26 (36.1) |
| Social media | 39 (54.2) | 33 (45.8) |
| Others | 4 (5.6) | 8 (11.1) |
| Will patients with corona infection who are declared cured be allowed to stay within the community at this time? | 11 (15.3) | 60 (83.3) |
| What will you do if you get infected with corona virus? | | |
| Self-isolation only | 25 (34.7) | 18 (25) |
| Contact health facility | 47 (65.3) | 54 (75) |
| Inform local administration | 39 (54.2) | 9 (12.5) |
| What will you do if your family member gets corona virus infection? | | |
| Self-isolation only | 25 (34.7) | 20 (27.7) |
| Contact health facility | 47 (65.3) | 54 (75) |
| Inform local administration | 39 (54.2) | 9 (12.5) |
| What will you do if your neighbour gets corona virus infection? | | |
| Helps with foods and medicine | 47 (65.3) | 22 (30.6) |
| Contact health facility | 52 (72.2) | 15 (20.8) |
| Inform local administration | 41 (56.9) | 51 (70.8) |
| Avoid visiting them | 52 (72.2) | 58 (80.6) |
| Will you rent your house to any corona infected person? | 14 (19.4) | 32 (44.4) |

**Table 3: Distribution of the study population according to COVID appropriate behaviour (*n*=144)**

| Practice of COVID appropriate behaviour | Urban, *n*1 (%) | Rural, *n*2 (%) | *n*1 + *n*2 (%) |
|---|---|---|---|
| Wearing face cover while going out side | 69 (95.83) | 61 (84.72) | 130 (90.27) |
| Cloth mask | 30 (43.47) | 44 (72.13) | 74 (56.92) |
| N95 mask | 15 (21.73) | 2 (3.27) | 17 (13.07) |
| Surgical mask | 13 (18.84) | 2 (3.27) | 15 (11.53) |
| Other material | 11 (15.94)* | 13 (21.31)* | 23 (17.69) |
| Self-reported washing hands after from coming out side# | | | |
| With soap and water | 72 (100) | 57 (79.16) | 129 (89.58) |
| With sanitizer | 60 (83.33) | 25 (34.72) | 85 (59.02) |
| Both soap and sanitizer | 60 (83.33) | 11 (15.27) | 71 (49.30) |
| With plain water | 0 | 15 (20.83) | 15 (10.41) |
| Carrying hand sanitizer (observed) | 41 (56.94) | 22 (30.55) | 63 (43.75) |
| Maintaining social distance in last 7 days (reported) | 40 (55.55) | 32 (69.44) | 72 (50.0) |

*Handkerchief, dupatta, end of saree,random piece of cloth, leaves, #Those who reported that they washed their hands with soap and water after coming from outside in most of the time .the hand washing activity was not observed by the reserchers

Drinking warm water, repeated gurgling with betadine mouth washing, taking homeopathic medicine, and vitamin tablets were some of the home remedies adopted by the respondents during pandemic. Out of total, 48 (66.7%) of urban participants and 35 (48.6%) of rural participants drank warm water. Sixty-four (88.9%) of urban participants used gurgle as preventive measures as compared to 17 (23.6%) in the rural areas. Mouth washing was considered as a special remedy by 57 (79.2%) of urban participants and 14 (19.4%) of rural participants. However, use of homeopathic medication as remedy for prevention was more prevalent in the rural areas (63 [87.8%]) than in urban areas (17 [23.6%]). About 68.05% ($n$ = 49) of urban and 29.2% ($n$ = 21) of rural participants consumed vitamin tablets. About 64 (88.9%) of rural participants lighted candle, whereas 52 (72.2%) of urban participants performed the same during the pandemic. Many of the rural participants (65.3%, $n$ = 47) had blown conch shells (*sankha*) to prevent the virus.

Almost all participants (65 [90.3%] in urban and 71 [98.6%] in rural) worshipped corona during the pandemic. Thirty-five (48.6%) of urban participants and 49 (68.05%)

of rural participants drank holy water as a special measure to prevent COVID-19.

It was observed that the mean knowledge score of the urban people (17.8, standard deviation [SD] ± 1.3) was significantly higher ($P < 0.00$) than that of the rural people (9.9, SD ± 2.4). Urban participants showed more favorable attitude (mean attitude score urban-8.7, SD ± 1.9, rural-6.8 SD ± 1.4: $P = 0.001$) and practice (mean practice score urban-4.3 ± 1.1, rural-3.9 ± 1.5: $P = 0.003$) regarding CAB compared to their rural counterparts [Table 4].

Overall, younger people aged 20–40 years were more knowledgeable than people aged >40 years ($P = 0.013$) and education above primary level was associated with better knowledge level compared to that up to primary level ($P = 0.000$). However, no significant association was found with attitude and practice of the whole study population with sociodemographic variables [Table 5].

Urban males were more knowledgeable than rural males (mean score: 17.9 vs. 9.8, $P < 0.05$). Similarly urban females were found to be more knowledgeable than rural ones (mean score: 17.8 vs. 6.9, $P < 0.05$). Males had statistically significant superior knowledge than females in rural areas (mean score male: 9.8 vs. female: 6.9, $P < 0.05$), whereas the difference in urban areas was not significant [Table 6].

**Table 4: Distribution of study population according to mean scores ($n$=144)**

| Type of score | Mean±SD | | *P* | Total, mean±SD |
|---|---|---|---|---|
| | Urban | Rural | | |
| Knowledge score | 17.8±1.3 | 9.9±2.4 | 0.000 | 13.2±5.2 |
| Attitude score | 8.7±1.9 | 6.8±1.4 | 0.001 | 7.7±2.2 |
| Practice score | 4.3±1.1 | 3.9±1.5 | 0.003 | 3.6±1.5 |

SD: Standard deviation

Significant difference ($P < 0.05$) was observed between mean knowledge scores of urban and rural participants across all the levels of education. Difference between mean knowledge scores of urban and rural study participants with respect to their occupations was statistically significant ($P < 0.05$) among servicepersons, businesspersons, homemakers, retired persons, and others.

Mean attitude score, too, was found to be significantly higher among urban study subjects than rural counterparts across all age gender, occupation groups and in most of the education groups. Urban males showed favorable attitude compared to their rural counterparts. (Mean score: Urban-8.4 vs. rural 6.8, $P < 0.05$).

Similar difference was also observed among female subjects (mean score urban 8.9 and rural-6.57, $P < 0.05$). In rural areas, significantly lower attitude score was found particularly among unemployed population than among urban unemployed population.

Statistically significant difference was observed between urban females and rural females regarding CAB (urban female: 4.0 [1.6] vs. rural female: 2.8 [1.8], $P < 0.013$) although such difference between males of urban and rural areas was not significant [Table 6].

## Discussion

The present study observed that urban people were more knowledgeable and their attitude and practice related to CAB were better than their rural counterparts. However, many myths and unscientific practices prevailed among both the groups regarding COVID-19.

Many studies on assessing KAP regarding COVID-19 have been conducted in India and all over the world. Nevertheless, majority of Indian studies were hospital based or were conducted in either rural or urban study setting and the most preferred method of data collection was through online survey owing to pandemic situation.[21-25]

**Table 5: Association of sociodemographic variables with knowledge, attitude and practice about COVID-19 ($n$=144)**

| Variables | Knowledge | | | Attitude | | | Practice | | |
|---|---|---|---|---|---|---|---|---|---|
| | Good (>50% score) | Poor (≤50% score) | *P* | Favourable (>50% score) | Unfavourable (≤50% score) | *P* | Good (>50% score) | Poor (≤50% score) | *P* |
| Age (years) | | | | | | | | | |
| 20-40 | 51 | 17 | 0.013 | 46 | 22 | 0.215 | 30 | 38 | 0.388 |
| >40 | 42 | 34 | | 37 | 39 | | 39 | 37 | |
| Gender | | | | | | | | | |
| Male | 62 | 21 | 0.234 | 45 | 38 | 0.856 | 39 | 44 | 0.266 |
| Female | 40 | 21 | | 34 | 27 | | 23 | 38 | |
| Education | | | | | | | | | |
| Upto primary | 7 | 14 | 0.000 | 9 | 12 | 0.119 | 10 | 11 | 0.179 |
| Above primary | 88 | 35 | | 75 | 48 | | 40 | 83 | |
| Occupation | | | | | | | | | |
| Service and business | 44 | 66 | 0.476 | 43 | 23 | 0.432 | 30 | 36 | 0.052 |
| Homemaker | 25 | 26 | | 29 | 22 | | 16 | 35 | |
| Unemployed, retiredand others | 10 | 17 | | 14 | 13 | | 16 | 11 | |

**Table 6: Comparison of urban rural difference of mean score on knowledge, attitude and practice about COVID-19 (*n*=144)**

| Variables | Knowledge score (mean±SD) | | | Attitude score (mean±SD) | | | Practice score (mean±SD) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | *P* | Urban | Rural | *P* | Urban | Rural | *P* |
| Age | | | | | | | | | |
| 20-40 | 18±1.4 | 9.2±2.4 | 0.003 | 9.2±1.9 | 7.06±1.87 | 0.001 | 4.6±1.2 | 4±1.9 | 0.065 |
| 40-60 | 17.8±1.2 | 8.3±3.2 | 0.004 | 7.6±1.8 | 6.67±1.88 | 0.005 | 4.3±1.6 | 3.7±1.9 | 0.600 |
| >60 | 17.7±1.7 | 6.9±3.4 | 0.001 | 9.9±1.3 | 5.83±1.58 | 0.000 | 4.7±1.3 | 4.1±1.5 | 0.667 |
| Gender | | | | | | | | | |
| Male | 17.9±1.3 | 9.8±2.4 | 0.000 | 8.4±2.1 | 6.79±2.09 | 0.001 | 4.6±1.2 | 4.7±1.3 | 0.003 |
| Female | 17.8±1.2 | 6.9±2.8 | 0.000 | 8.9±1.9 | 6.57±1.52 | 0.000 | 4.0±1.6 | 3.4±2.7 | 0.013 |
| Education | | | | | | | | | |
| Up to primary | 18.7±1.1 | 7.9±1.5 | 0.000 | 8.3±2.5 | 5.7±2.3 | 0.027 | 5±1.4 | 3.6±2.5 | 0.939 |
| Secondary completed | 17.2±1.3 | 9.3±2.5 | 0.000 | 7.1±1.8 | 7.1±2.2 | 0.124 | 4.6±1.8 | 4.1±1.5 | 0.654 |
| HS completed | 17.8±1.7 | 10.1±2.6 | 0.000 | 8.8±1.7 | 6.7±2.01 | 0.019 | 4.9±1.2 | 4.3±1.7 | 0.202 |
| Graduation and above | 17.9±1.2 | 7.6±1.4 | 0.000 | 9.1±1.9 | 6.7±1.8 | 0.011 | 4.9±1.1 | 4.4±1.1 | 0.088 |
| Occupation | | | | | | | | | |
| Service | 18±1.2 | 9.8±2.7 | 0.000 | 8.7±2.2 | 7.4±1.8 | 0.000 | 3.9±1.02 | 3.6±1.7 | 0.000 |
| Business | 18±1.6 | 9.1±1.8 | 0.000 | 8.1±1.9 | 7.5±1.6 | 0.006 | 4.2±1.5 | 3.4±2.0 | 0.006 |
| Homemaker | 17.8±1.2 | 6.8±3.0 | 0.000 | 8.7±2.2 | 6.3±1.8 | 0.004 | 4.1±1.5 | 3.5±2.0 | 0.004 |
| Unemployed | 17.3±0.6 | 7.7±3.0 | 0.068 | 8.3±1.5 | 4.8±0.4* | 0.000 | 4.7±1.5 | 3.8±1.6 | 0.000 |
| Retired | 18±1.4 | 8.8±1.8 | 0.000 | 10.2±1.3 | 5.4±2.3 | 0.000 | 4.1±0.7 | 5±1.4 | 0.000 |
| Others | 17.8±1.5 | 8±2.2 | 0.001 | 8.6±0.9 | 7.5±1 | 0.010 | 4.6±1.5 | 4±1.4 | 0.010 |

SD: Standard deviation, HS: Higher secondary, *The *P* values which are < 0.05

Similar to the current study, Roy *et al*. reported overall poor knowledge on Covid among rural people.[23] Most of the Indian studies[26-28] conducted in urban settings reported overall good knowledge about COVID-19 which is similar to the current study findings among urban subjects.

Education above the primary level was associated with better knowledge on COVID-19 in the current study. A China study also reported significantly better knowledge in people with higher education.[29]

The current study noted that about 96% in urban and 85% in rural area used face cover but actual mask wearing was low as observed by the researchers. The use of surgical and N95 mask was even lower because higher proportion was using cloth masks. In contrast, studies conducted in China revealed that wearing actual mask during the pandemic was higher (90%–99%).[30,31] The use of surgical mask (93.8%) and N95 (26.2%) mask was found to be higher in one of the recent China studies.[31] Lower purchasing power and lack of awareness in Indian population could explain the difference. Chakrawarty *et al*. reported higher mask use (93.1%).[20] However, the Srinagar study reported lesser mask use (73%) compared to the current study findings.[26]

The present study observed high handwashing practice (80%) similar to that reported by Roy *et al*. with frequent hand washing/sanitizing by 63.59% and washing hands for at least 20 s by 45.44% study population.[20] However, the Srinagar study reported slightly better finding (87%).[26] Roy *et al*. also reported that participants failed to follow social distancing because of overcrowding and lack of space akin to the result of the present study.[20]

The current study explored various faulty perceptions about COVID-19 among people of both areas. It was observed that most of the measures followed to prevent COVID-19 were unscientific. Tasks such as lighting candle, blowing conch shells, worshipping corona, and drinking holy water were performed by majority of the rural population as well as urban ones. Among urban people, practices of taking vitamins, mouth wash, and home remedies as preventive measure were more than that among rural people. Ajmer study reported several myths among few of the participants such as belief of spreading COVID-19 through Chinese foods, bat soup, mosquito/flies, infected blood, urine/faeces, and cattle/pets.[28] Another Indian survey noted the use of herbal medicines by study subjects.[27]

This study suggested that significant difference in of knowledge persists between urban and rural population irrespective of age, gender, education, and occupation. This can be explained by higher educational status in urban area, higher incidence of diagnosed COVID-19 cases, better IEC campaigns and better access to such campaign leading to more awareness of urban people. Yue *et al*. and Tomar BS *et al*. also provided similar explanations.[32,33] Agarwal *et al*. reported higher basic knowledge on Covid among urban subjects.[34] The China study showed people who lived in rural areas were less likely to wear masks.[16] Study conducted by Chakrawarty *et al*. reported that female participants and people residing in metropolitan and small cities had better preventive practices.[20]

Gupta *et al*. also reported that males were more aware about the pandemic than females and education was a significant predictor of knowledge about COVID-19.[35] Current study

noticed that although gender was unrelated to knowledge, attitude and practice in whole population, males are more knowledgeable than females among rural subjects. In contrast to the present study, Abdel Hafiz *et al*. in Egypt observed that both rural and urban areas demonstrated positive attitude toward Covid.[36] Similar to the present study, Narayana *et al*. in India noted better practice among urban compared to rural study subjects.[37]

### Limitations

In spite of difficulties faced in the middle of restrictions imposed upon because of COVID pandemic, data were collected by house to house visits and actual practices of wearing mask and carrying sanitizer were observed by the researchers. However, it would have been better if a larger study involving wider and larger population could have been conducted. Adding qualitative research methods to explore reasons behind noncompliance of CAB would have been more illuminating.

## Conclusions

The study reported that wide gap exists between urban and rural population related to COVID awareness and CAB. The study also explored wrong perceptions and practices surrounding COVID-19 among both urban and rural population which could be considered vital barriers for adopting CAB. Despite global partial and complete lockdown and availability of several COVID vaccines, the course of COVID pandemic is still uncertain owing to behavior and nature of the virus. In this situation, adopting correct CAB is the need of the hour to halt the progress of the pandemic. Appropriate policy should be taken to increase the awareness of the general population, especially the rural ones by consistent BCC approaches through all available channels.

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### Conflicts of interest

There are no conflicts of interest.

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