Introduction

COVID-19 which emerged from Wuhan city of China in December last year has rapidly spread across the world in a short span of few months.\[1\] On 9 January 2020, the novel coronavirus SARS-CoV-2 was officially identified as the cause of the COVID-19 and it was declared as pandemic on 11 March 2020 by World Health Organization (WHO).\[2\]

The disease is characterized by rapid transmission and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. Severe cases usually need Intensive Care Unit admission and resultant high mortality.\[3\]

With no vaccines or drugs to combat the infection/disease, quarantine, patient isolation, travel restrictions, and contact tracing remain the only means of limiting transmission. That is public knowledge, attitudes, and practices toward COVID-19: An online cross-sectional study in the Union territory of Jammu and Kashmir

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ABSTRACT

Background: COVID-19, since its emergence, has become a global health problem with countries adopting unprecedented measures to control the spread of this pandemic. Adherence of the populations to control measures is affected by their knowledge, attitude, and practices (KAP) towards the disease. It was with this aim that the present study was conducted among the residents of UT of J&K to assess their KAP toward COVID-19. Methodology: A cross-sectional online survey of 464 J&K residents was conducted between 1st May and 10th May 2020. Survey Monkey tool was used to develop a link and KAP questionnaire was used for data collection. The survey instrument consisted of demographic characteristics, 11 items on knowledge, 5 items on attitudes, and 7 items on practices. Data collected was represented in descriptive statistics, and one-way analysis of variance was the test of significance. Results: Mean knowledge, attitude, and practice scores were 7.69 ± 0.74, 4.70 ± 0.57, and 4.32 ± 0.68, respectively, among the respondents. Majority (99%) knew the sign and symptoms, mode of transmission of the disease and avoided attending large gatherings. Use of mask was almost universal and about 38% were taking supplements like vitamins or herbal medicines. Good knowledge, positive attitude, and appropriate practices among the respondents about COVID-19 suggest that community based health education programs play a key role in containment and mitigation of this disease. Conclusion: Sustained messaging and updates from the national and local health authorities on COVID-19 to the public are likely to help control the transmission of the disease.

Keywords: Attitude, COVID-19, knowledge, practices

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why, people’s adherence to the control measures is essential and is largely affected by their knowledge, attitudes, and practices (KAP) toward COVID-19.6-8 Studies show that level of knowledge and attitudes toward infectious diseases is associated with level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease.6,7  

It was in this context that the current study was planned to assess KAP about COVID-19 in residents of UT of Jammu and Kashmir.

Materials and Methods

This study was designed as a cross-sectional web-based survey conducted in the month of May 2020. The surveymonkey application tool was used to create survey questionnaire and the link and generate a quick response (QR) code.8-9 The link was then forwarded to the various respondents via various online/social media platforms which included WhatsApp, Facebook messenger, and e-mail.

Persons aged 18 years or more living in UT of Jammu and Kashmir were eligible to participate in the study. After clicking on the link to the survey, a brief introduction of purpose of the survey was provided and anonymity of the respondents was ensured. Then each respondent was asked if they were willing to participate in the survey and all the participants who gave the consent by clicking on ‘yes’ started the survey. The study was approved by the institutional ethics committee vide reference no:ASCOMS/IEC/RP&T/2020/367 dated 25/07/2020.

Study instrument

The survey instrument was developed from already available literature on KAP toward COVID-19.5-11 The questionnaire consisted of four main themes: 1) demographics, with surveyed participants’ sociodemographic information, including gender, age, state of residence, education and employment status; 2) knowledge about COVID-19; 3) attitudes toward COVID-19; and 4) practices relevant to COVID-19.

Knowledge section had 11 questions (K1-K11), attitude section had 5 questions (A1-A5), and practice section had 7 questions (P1-P7).

Statistical analysis

For this study, the collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 26. Descriptive analysis focused on proportions and one-way analysis of variance (ANOVA) was utilized to determine the differences between groups for selected demographic variables. The statistical significance level was set at \( P < 0.05 \).

Results

A total of 464 participants constituted the study population. 61.42% of the study population comprised of males and only one participant belonged to other gender category. Almost half (48%) of the participants were aged less than 30 years, followed by the age group of 31–45 years (39.6%). Majority of participants (53.8%) were educated up to 12th class. As far as occupation was concerned, almost equal proportion of the subjects belonged to student category and service class (24.35% and 24.78%, respectively).

As apparent from the Table 1, all the participants had heard about COVID-19. The source of information for majority of participants was media (62.28%). Nearly, 59% of them self-rated their knowledge level related to corona virus as good, whereas 19.61% reported it to be very good. Over 95% of the participants correctly answered as virus to be the cause of COVID-19. More than 99% were aware of correct signs and symptoms of the disease, modes of transmission and precautions related to COVID-19. Nearly, 20% were either not sure or believed that consumption of dairy/meat/animal contact could transmit COVID-19. The mean knowledge score was 7.69 ± 0.74. Data presented in Table 2 reveal that the participants in the age group of 46–60 years had significantly higher knowledge about the COVID-19 as compared to other age groups and the association was found to be statistically significant. Similarly with regard to the gender, females had significantly more knowledge about COVID-19 as compared to males. Association of education and occupation was also found to be statistically significant with the knowledge score of participants (\( P < 0.05 \)). As seen in the Table 3, majority of the participants seemed to have an overall positive attitude toward various aspects of COVID-19. More than 95% of all of the participants in the present study were of the opinion that health education can help to prevent COVID-19, early detection can improve treatment outcome and believed nationwide lockdown to be a good step. Only about 17% were either not sure or felt unlikely of COVID-19 being successfully controlled. The mean attitude score was 4.70 ± 0.57. Table 4 shows that a statistically significant difference was seen for education and occupation with regards to the attitude score. However, attitude toward COVID-19 had no significant differences across age and gender. Table 5 depicts various practices of participants related to COVID-19. Nearly, 98% of the participants reported that they were avoiding going to any crowded places lately and wore a mask while going out. About 98% reported to be paying more attention to their personal hygiene as a preventive measure from COVID-19. While only 38% reported to be taking a vitamin supplement/any traditional or herbal medicine for prevention from COVID-19. Nearly, 85% reported that they cover their mouth while coughing or sneezing. About 88% reported to either always or usually avoiding touching their eyes, nose, and mouth with unwashed hands. Mean score for practice was 4.32 ± 0.68. On analysis, it was found that practices related to COVID-19 were found to be significantly associated with the educational status and the occupation of the participants (\( p < 0.05 \) as shown in Table 6.

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Table 1: Knowledge of participants regarding COVID-19 (n=464)

| Questions                                                                 | Response | Number | Percentage |
|---------------------------------------------------------------------------|----------|--------|------------|
| Have you heard of COVID-19.                                               | Yes      | 464    | 100.00     |
|                                                                           | No       | 0      | 0.00       |
| What is your source of information about COVID-19?                        | Media    | 289    | 62.28      |
|                                                                           | Social media | 96   | 20.69      |
|                                                                           | Health officials | 67   | 14.44      |
|                                                                           | Friends/neighbors/relatives | 9   | 1.94       |
|                                                                           | Other (Internet) | 3    | 0.65       |
| How would you rate your knowledge level on novel corona virus?            | Very poor | 2      | 0.43       |
|                                                                           | Poor     | 1      | 0.22       |
|                                                                           | Average  | 97     | 20.91      |
|                                                                           | Good     | 273    | 58.84      |
|                                                                           | Very good | 91   | 19.61      |
|                                                                           | Bacteria | 2      | 0.43       |
|                                                                           | Virus    | 441    | 95.04      |
|                                                                           | Fungus   | 0      | 0.00       |
|                                                                           | Immunodeficiency | 4  | 0.86       |
|                                                                           | Parasite | 2      | 0.43       |
|                                                                           | Not sure | 15     | 3.23       |

Table 2: Knowledge score of participants toward COVID-19 (n=464)

| Questions                                                                 | True | False | Not Sure |
|---------------------------------------------------------------------------|------|-------|----------|
| The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, myalgia, difficulty breathing? | 461  | 0     | 3        |
| The disease can be transmitted directly through cough, contact with infected individuals (e.g., handshaking, hugging), contact with infected surfaces? | 462  | 0     | 2        |
| The disease can be transmitted directly through the consumption of dairy and meat or contact with an animal. | 16   | 376   | 72       |
| The disease is more dangerous in people with weakened immune systems, in people with diseases like cancer, diabetes, and chronic respiratory diseases in pregnant women and old individuals? | 456  | 3     | 5        |
| COVID-19 can be avoided by proper precautions like avoiding large gatherings, hand hygiene, etc.? | 460  | 0     | 4        |
| Isolation and treatment of people who are infected with the COVID-19 are effective ways to reduce the spread of the virus? | 445  | 5     | 14       |
| People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days? | 455  | 4     | 5        |

Table 1: Knowledge of participants regarding COVID-19 (n=464)

| Questions                                                                 | True | False | Not Sure |
|---------------------------------------------------------------------------|------|-------|----------|
| Have you heard of COVID-19.                                               | 464  | 0     | 3        |
| What is your source of information about COVID-19?                        | 289  | 0     | 2        |
| How would you rate your knowledge level on novel corona virus?            | 97   | 20.91       |
|                                                                           | 273  | 58.84      |
|                                                                           | 91   | 19.61      |
|                                                                           | 2    | 0.43       |
|                                                                           | 441  | 95.04      |
|                                                                           | 0    | 0.00       |
|                                                                           | 4    | 0.86       |
|                                                                           | 2    | 0.43       |
|                                                                           | 15   | 3.23       |

Table 2: Knowledge score of participants toward COVID-19 (n=464)

| Demographic variables | No. of participants (%) | Knowledge score (mean±SD) | F      | P      |
|-----------------------|-------------------------|---------------------------|--------|--------|
| Age (years)           |                         |                           |        |        |
| <30                   | 226 (48.71)             | 7.64±0.87                 | 2.99   | 0.031  |
| 31-45                 | 184 (39.66)             | 7.53±0.75                 |        |        |
| 46-60                 | 46 (9.91)               | 7.91±0.28                 |        |        |
| >60                   | 8 (1.72)                | 7.63±0.52                 |        |        |
| Gender                |                         |                           |        |        |
| Male                  | 285 (61.42)             | 7.63±0.76                 | 7.56   | 0.001  |
| Female                | 178 (38.58)             | 7.92±0.82                 |        |        |
| Others                | 1 (0.22)                | 8.00±0.00                 |        |        |
| Education             |                         |                           |        |        |
| Primary               | 14 (3.02)               | 7.49±0.82                 | 2.80   | 0.039  |
| 10th                  | 25 (5.39)               | 7.89±0.39                 |        |        |
| 12th                  | 250 (53.88)             | 7.78±0.73                 |        |        |
| Graduate & above      | 175 (37.72)             | 7.59±0.90                 |        |        |
| Occupation            |                         |                           |        |        |
| Student               | 113 (24.35)             | 7.83±0.49                 | 6.68   | 0.0002 |
| Service class         | 115 (24.78)             | 7.90±0.36                 |        |        |
| House maker           | 33 (7.11)               | 7.47±0.87                 |        |        |
| Business              | 203 (43.75)             | 7.64±0.79                 |        |        |
COVID‑19, a relatively new viral disease, is causing catastrophic effects across the world. To reduce infection rates and spread of disease, preventive measures play a key role. It is important to study the KAPs of the population since public adherence to preventive and control measures is reflected by their KAP.

In the current study, the mean knowledge score among the respondents was 7.69 ± 0.74 and this correct knowledge is related to characteristics of the sample with majority having graduate and postgraduate degrees. It could also be due to responses being taken in the middle of outbreak when lot of information about pandemic is available on electronic and print media. The results are in agreement with those reported by other authors. Zhong et al[1] from China and Al‑Hanawi et al[12] from Saudi Arabia also reported knowledge results consistent with the results of the current study. However, Haque et al[13] from Bangladesh reported contrasting results. Previous studies from different parts of the world have identified good knowledge in infection control as a predictor of good practice, and also highlighted that major gaps in disease knowledge could result in uncertainties and nonstringent control measures.

**Table 3: Attitude of participants toward COVID‑19**

| Question                                                                 | Agree No. (%) | Disagree No. (%) | Not sure No. (%) |
|--------------------------------------------------------------------------|--------------|-----------------|------------------|
| Do you think that health education can help to prevent COVID‑19?         | 449 (96.7%)  | 5 (1.07%)       | 10 (2.15%)       |
| Do you think that Early detection of COVID‑19 can improve the treatment and outcome? | 442 (95.2%)  | 4 (0.86%)       | 18 (3.87%)       |
| Do you think that COVID‑19 disease results in death in all cases?        | 9 (1.93%)    | 441 (95.04%)    | 14 (3.01%)       |
| Do you think that nationwide lockdown is a good step taken by authorities to prevent the further spread of disease? | 449 (96.7%)  | 7 (1.50%)       | 8 (1.72%)        |
| Do you think that COVID‑19 will finally be successfully controlled?       | 375 (80.81%) | 27 (5.81%)      | 62 (13.36%)      |

**Table 4: Attitude score of participants toward COVID‑19 (n=464)**

| Demographic variables | No. of participants (%) | Attitude score±SD | F   | P    |
|-----------------------|-------------------------|-------------------|-----|------|
| Age (years)           |                         |                   |     |      |
| 18‑30                 | 226 (48.71)             | 4.62±0.67         | 0.96| 0.413|
| 31‑45                 | 184 (39.66)             | 4.66±0.61         | 2.38| 0.123|
| 46‑60                 | 46 (9.91)               | 4.74±0.57         | 0.87| 0.654|
| >60                   | 8 (1.72)                | 4.38±0.52         | 2.40| 0.119|
| Gender                |                         |                   |     |      |
| Male                  | 285 (61.42)             | 4.62±0.63         | 0.64| 0.527|
| Female                | 178 (38.58)             | 4.68±0.65         | 0.08| 0.935|
| Others                | 1 (0.22)                | 5.00±0.00         |     |      |
| Education             |                         |                   |     |      |
| Primary               | 14 (3.02)               | 4.20±0.70         | 2.63| 0.049|
| 10th                  | 25 (5.39)               | 4.63±0.46         | 0.10| 0.921|
| 12th                  | 250 (53.88)             | 4.67±0.60         | 0.85| 0.356|
| Graduate & above      | 175 (37.72)             | 4.64±0.70         |     |      |
| Occupation            |                         |                   |     |      |
| Student               | 113 (24.35)             | 4.66±0.53         | 3.97| 0.008|
| Service class         | 115 (24.78)             | 4.85±0.50         |     |      |
| House maker           | 33 (7.11)               | 4.55±0.66         |     |      |
| Business              | 203 (43.75)             | 4.67±0.59         |     |      |

**Table 5: Practices of participants toward COVID‑19**

| Question                                                                 | Yes No. (%) | No No. (%)   |
|--------------------------------------------------------------------------|-------------|--------------|
| Have you gone to any crowded place recently?                            | 10 (2.15%)  | 454 (97.84%) |
| Did you wear a mask while leaving the home recently?                    | 457 (98.49%)| 7 (1.50%)    |
| Do you pay more attention to personal hygiene as a protective measure against COVID‑19? | 456 (98.27%)| 8 (1.72%)    |
| Do you take any vitamin supplements, any traditional/herbal medicine to prevent? | 177 (38.14%)| 287 (61.85%) |

| Question                                                                 | Yes No. (%) | No No. (%) | Rarely (%) | Never (%)   |
|--------------------------------------------------------------------------|-------------|------------|------------|-------------|
| Do you cover your mouth while coughing or sneezing?                      | 395 (85.12%)| 62 (13.36%)| 4 (0.86%)  | 3 (0.64%)   |
| Do you avoid touching your eyes, nose, and mouth with unwashed hands?    | 234 (50.43%)| 177 (38.14%)| 44 (9.48%) | 9 (1.93%)   |

**Discussion**

Most of the participants had optimistic attitude in the fight against the infection. This attitude could have contributed to good practices like majority of the respondents not visiting crowded places, wearing masks whenever they go out of levels of positive...
Attitudes were also detected in the KAP studies conducted elsewhere. In contrast, attitude and practices which were not impressive were reported by Haque et al. In India, the swift action taken by the government in enforcing lockdown may have also contributed to these positive attitudes. Positive attitudes were higher among those working in the health sector. This may be due to their direct involvement in containment and mitigation of the virus. High levels of knowledge usually translate into good and safe practices which were amply reflected in the practices of the respondents. Primary care physicians will play a significant role in providing social support to populations across geographies during this epidemic. As the tertiary care settings come under strain to mitigate the major impact of COVID-19, primary care physicians will be required to ensure effective provision of necessary health care services for other ailments like HIV/AIDS, tuberculosis, diabetes mellitus, etc., as also in strengthening the home base management of COVID-19 cases.

**Limitations**

Convenience sampling method using KAP instrument may limit its large-scale usefulness. As this study used self-reported data, it is possible that participants may have answered attitude and practice questions positively based on what they perceive to be expected of them. However, the study is able to provide an insight into human response to COVID-19 pandemic, a key to deal with the pandemic on a long-term basis.

**Conclusion**

Adequate KAPs are considered initial stepping stone of any health activity to be implemented. As we continue to see an upsurge in cases, primary care physicians will be required to play a role in managing COVID-19 in community-based settings and ensuring regular supply of essential primary care services.

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Nil.

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**Table 6: Practice score of participants toward COVID-19 (n=464)**

| Characteristics      | No. of participants (%) | Practice score±SD | F     | P     |
|----------------------|-------------------------|-------------------|-------|-------|
| **Age (years)**      |                         |                   |       |       |
| <30                  | 226 (48.71)             | 4.22±0.60         | 0.98  | 0.400 |
| 31-45                | 184 (39.66)             | 4.29±0.68         |       |       |
| 46-60                | 46 (9.91)               | 4.33±0.70         |       |       |
| >60                  | 8 (1.72)                | 4.00±1.31         |       |       |
| **Gender**           |                         |                   |       |       |
| Male                 | 285 (61.42)             | 4.27±0.67         | 0.28  | 0.759 |
| Female               | 178 (38.36)             | 4.23±0.64         |       |       |
| Others               | 1 (0.22)                | 4.00±0.00         |       |       |
| **Education**        |                         |                   |       |       |
| Primary              | 14 (3.02)               | 3.79±0.70         | 6.59  | 0.0002|
| 10th                 | 25 (5.39)               | 4.00±0.58         |       |       |
| 12th                 | 250 (53.88)             | 4.21±0.68         |       |       |
| Graduate & above     | 175 (37.72)             | 4.39±0.61         |       |       |
| **Employment status**|                         |                   |       |       |
| Student              | 113 (24.35)             | 4.19±0.58         | 12.49 | 0.0001|
| Service class        | 115 (24.78)             | 4.64±0.58         |       |       |
| House maker          | 33 (7.11)               | 4.18±0.81         |       |       |
| Business             | 203 (43.75)             | 4.23±0.71         |       |       |

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**Conflicts of interest**

There are no conflicts of interest.

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