# Knowledge, Attitudes, and Practices towards COVID-19 Pandemic among Residents of the Jharkhand State, India: An Online Survey

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## ABSTRACT

**Background:** People's adherence to control measures is imperative in the fight against COVID-19. The present study was done to evaluate knowledge, attitudes, and practices towards COVID-19 among residents of Jharkhand and to assist the government in deciding further course of action during the COVID-19 outbreak.

**Methods:** This study was an online cross-sectional survey. The link to the questionnaire was displayed on the official website of Rajendra Institute of Medical Sciences, Ranchi, National Health Mission, Jharkhand, official website of all districts under Jharkhand state administration, Integrated Disease Surveillance Programme and Information & Public Relations department. Participation of residents in the survey was extensively propagated using mass media mainly local television networks, radio channels and newspapers.

**Results:** A total of 4683 responses were received from all districts of Jharkhand. The majority of the participants were young adults (47.5%) and the number of male participants was more than the females (81.4%). The mean correct knowledge score for participants of this study was 10.73+2.2 (maximum attainable score was 14) while the mean practice score for the participants was 4.5+0.69 (maximum attainable score was 5). The knowledge score of the participants was significantly associated with their age, education status and economic class (p<0.0001). The participants largely held an optimistic attitude and healthy practices towards COVID-19.

**Conclusion:** Participants had a positive attitude but were also logically worried and uncertain about the near future. Adequate knowledge of participants was visible in their practices. There was however a gap across age groups, gender, literacy and income levels which should be addressed in future campaigns.

## 1. INTRODUCTION

The novel coronavirus disease 2019 ("COVID-19") has grown into pandemic proportions making it one of the most serious infectious diseases affecting mankind [1]. The disease carries a spectrum of complications in moderate and advanced stages including bronchitis, pneumonia, severe acute respiratory syndrome (SARS) and sepsis and multi-organ involvement [2,3]. Keeping in mind the rapid spread of disease, WHO took an early stance and declared it as a public health emergency of international concern (PHEIC) on 30 January 2020 [4]. Globally, as of 12 November, 2021 more than 220 countries and territories globally have reported a total of 251,788,329 confirmed cases of the coronavirus, with a death toll of 5,077,907 [5]. In India, the COVID-19 has spread to all the 36 states and Union territories with 463,435 deaths reported so far [6,7].

Jharkhand, ("The land of the forest") is a state in eastern India having 5 administrative divisions and 24 districts [8]. In the national context, it is the 15th largest state by area with a total population of more than 39 million as per the Census of India, 2011 [9]. Jharkhand is one of the least developed states of the country based on the index of (under) development proposed by the Committee for Evolving a Composite Development Index of States in 2013 [10-13].

There is still a virtual lack of any treatment specifically approved for COVID-19. The most important factor in preventing the spread of the virus locally is to empower the citizens with the right information, busting myths and misconceptions and taking precautions as per the advisories being issued by the Ministry of Health & Family Welfare [14]. It is imperative to measure the extent of a known situation about COVID-19 among Jharkhand residents, assess the effectiveness of government policies to contain COVID-19, establish the reference value for use in future assessments, design preventive strategies and interventions and make evidence-based adjustments as the outbreak evolves based on the felt need of the population. Hence this study was planned to evaluate knowledge, attitudes, and practices (KAP) towards COVID-19 among residents of Jharkhand state and to assist the state government in deciding further course of action during the COVID-19 outbreak.

## 2. MATERIALS AND METHODOLOGY

### 2.1 Study Design, Study Group

This study was a descriptive, cross-sectional online survey. The study group comprised of the residents of India above 18 years of age, residing in Jharkhand state and having access to the internet. Diagnosed COVID-19 cases and quarantined individuals were excluded from the study.

### 2.2 Permission and Approvals

Permission to carry out this study was obtained from i) The Principal Secretary, Department of Health, Medical Education & Family Welfare, Government of Jharkhand ii) Director, Rajendra Institute of Medical Sciences, Government of Jharkhand iii) Mission Director, National Health Mission, Government of Jharkhand iv) Nodal Officer, Non-Communicable Disease, Government of Jharkhand.

### 2.3 Sample Size Estimation

It was done using epi-info software (version3.01) [15]. Sample size estimation was based on a similar study done among Chinese residents to assess their knowledge, attitudes, and practices towards COVID-19 [16]. Based on the reported 90% prevalence of correct responses in the study and allowable error of 5%, the required sample size for the study came out to be 139. To compensate for the difference in the awareness levels of the residents in the two regions, a design effect of 1.5 was applied to make the final sample size to be 208.

### 2.4 Sampling Methodology

It was an online survey with voluntary participation of the state residents. However, the purpose of the study, eligibility criteria and the anonymity and confidentiality clause was highlighted for respondents before filling up the questionnaire. The link to the survey questionnaire in both Hindi and English was displayed on the official website of all districts of the state along with their e-portals like Facebook, Twitter, WhatsApp. It was also available on the official website of Rajendra Institute of Medical Sciences, National Health Mission (NHM, Jharkhand), all online portals under NHM, Jharkhand, Integrated Disease Surveillance Programme, and was propagated extensively by the Information & Public Relations Department.

Survey information with the link to the questionnaire was also promoted through local television networks, radio channels and newspapers so that the maximum number of participants could be achieved.

### 2.5 Survey Tool

A self-structured questionnaire was used to record the responses of the candidates. A thorough review of the various studies already conducted in various parts of the world through structured, semi-structured, or non-structured interview schedules or self–administered questionnaires were taken into account for item selection of this tool [16-19]. Since data on COVID-19 is scant, we also considered the questionnaires developed for the MERS and H1N1 [20-21].To generate a comprehensive set of items relevant to the Indian scenario we used information available on the MyGov #IndiaFightsCorona COVID-19 dashboard of the Ministry of Health and Family Welfare, Government of India [6]. The questionnaire consisted of four sections; 1st section included questions on the demographic profile of the candidate in both closed and open-ended format. 2nd section consists of fourteen closed-ended questions to assess participants' knowledge under three domains; clinical aspects (4 questions), spread (4 questions) and prevention & control of COVID-19 (6 questions). 3rd section includes a set of five closed-ended questions to assess participants' attitudes towards COVID-19. 4th section included a set of 5 closed-ended and 1 open-ended questions to assess participants' practices towards COVID-19. In the study, we have kept the threshold value for calculating correct rates of knowledge and practices at the 50% value of the maximum possible score. A threshold value for classifying knowledge and practices to be adequate were 7 for knowledge and 3 for practice. One question in the practices, "Do you verify news regarding COVID-19 before forwarding on social media" was not used in the calculation of the practice score of the participants. This method is a commonly used method of determining the threshold values in the absence of any standardised tool. The threshold values thus obtained to classify knowledge and practice scores were also found to be of relevance to epidemiological and public health experts in the state. Content validity of the questionnaire was ensured with the help of ten experts in the field. The final questionnaire in English was translated into the Hindi language. Hindi to English back translation was carried out

to check the quality of translation. A pilot study was carried out on 25 subjects to check the reliability (Cronbach's alpha) and comprehensibility of the questionnaire. It took a participant approximately 3-5 minutes to complete the questionnaire. The knowledge section of the questionnaire was formulated in form of a quiz with the highest attainable score of 14. The participants could view their scores as well as the correct responses at the end of the submission. This was one as a measure to improve the respondent's knowledge about COVID-19. Additionally, the participants were given an option to view others responses so that they could update themselves with the current status of responses concerning this questionnaire. The final questionnaire version was adapted in Google Forms and an online link for the same was created.

## 2.6 Statistical Analysis

Data obtained was entered in Microsoft excel and subjected to statistical analysis using SPSS version 18.0 [22]. Descriptive analysis was done to classify demographic details and responses to KAP questions. Correct responses were given a score of 1 and incorrect responses were scored as 0 for assessment of knowledge and practice of the participants. Responses were be added up to calculate the correct knowledge and practice scores of the participants. Participants were classified to be aware/unaware and following good/bad practices as per the threshold value. Mean correct score for knowledge and practices was also calculated. Chi-square test/Fisher's exact test was used to find an association between demographic variables and knowledge & practices of participants.

## 3. RESULTS

A total of 4683 responses were received from all the 24 districts of Jharkhand state. The majority of the participants were males (81.4%) below 30 years of age. Most of the participants were of the level of graduate or above (81.7%). A mix of responses was received from different work categories and 30.6% of total participants had a monthly income of up to Rupees 10,000. The mean correct knowledge score was 10.73+2.2.

More than 70% correct response rate was observed for most of the questions except regarding the usage of an appropriate type of sanitizer. Approximately 4% of the participants confused the symptoms of common flu and gastro-intestinal ailments clinical symptoms of COVID-19 infection. Approximately 29% of respondents were not aware of the ways of the spread of COVID-19, more importantly, regarding spread from asymptomatic patients (Table 1).

Approximately 90% of the participants were in the view that COVID-19 will finally be controlled in India. However, 27.2% believed that the virus is going to stay for at least 6 months time period and 21.1% of them were unsure about the time duration required to contain the virus (Table 2).

An analysis of the type of fear among those who are worried about COVID-19 revealed that fear of death was the single most common fear among the participants across all the age groups (Fig. 1).

The mean practice score for the participants was 4.5+0.69. More than 92% of the participants followed the lockdown as per the government guidelines and did not go outside of their homes without any compelling reason. Around 98% of the participants did wear a mask while going out and but around one-third of the participants did not make efforts to avoid touching the eyes, nose, and mouth with their hands (Table 3).

A very significant finding from this study is that majority of participants were updating themselves through the authentic information provided by central and state government (57.2%) or by using dedicated COVID-19 dashboard #IndiaFightsCorona by MyGov.in (49.5%) (Fig. 2).

Female participants and those of the higher age groups were more aware of COVID-19 (p<0.05). Education status was significantly associated with the knowledge and practices about COVID-19 (p<0.05). Similarly, those falling in the higher economic classes were more aware of COVID-19 (p<0.05) however practices were similar across all economic strata (Table 4).

**Table 1. Knowledge regarding COVID-19**

| S. No. | Domains of knowledge assessment | Question | The proportion of individuals with correct responses | Mean + SD (range) |
|---|---|---|---|---|
| 1 | **Clinical aspects of COVID-19** | Knowledge regarding symptoms of COVID-19 | 4507 (96.2) | 3.18 **+**0.89 (0.00 – 04.00) |
| | | People easily affected by COVID-19 are | 3364 (71.8) | |
| | | How long can it take for COVID-19 to appear after infection? | 3284 (70.1) | |
| | | Who should go to the COVID-19 screening facility? | 3734 (79.7) | |
| 2 | **Spreadability of COVID-19 virus** | How does the COVID-19 virus spread? | 3341 (71.3) | 3.09 **+**0.94 (0.00 – 04.00) |
| | | Can a COVID-19 infected person infect others even when symptoms are not present? | 3394 (72.4) | |
| | | How many meters distance is required from another person to ensure safety from COVID-19 | 3543 (75.6) | |
| | | What are effective ways to reduce the spread of COVID-19? | 4191 (89.4) | |
| 3 | **Prevention and control of COVID-19** | How long should you wash your hands with soap for protection from COVID-19? | 4087 (87.2) | 4.46 **+**1.08 (0.00 – 06.00) |
| | | If you come in contact with someone infected with the COVID-19 virus, how many days should you stay in isolation? | 4278 (91.3) | |
| | | Has the Jharkhand government made it mandatory for COVID-19 to wear masks when going out for protection? | 3469 (74.07) | |
| | | What is the minimum appropriate percentage of alcohol in hand sanitizer? | 2681 (57.2) | |
| | | Is the COVID-19 vaccine currently available? | 4401 (93.9) | |
| | | Are national / Jharkhand helpline numbers or emails dedicated for COVID-19? | 4314 (92.1) | |
| 4 | **Total knowledge** | | | 10.73**+**2.20 (0.00 – 14.00) |

**Table 2. Attitude against COVID-19**

| S. No. | Question | Responses |
|---|---|---|
| 1. | **Do you agree that COVID-19 will finally be successfully controlled in India?** | |
| | Strongly disagree | 117 (2.4) |
| | Disagree | 150 (3.2) |
| | Neutral | 226 (4.8) |
| | Agree | 2081 (44.4) |
| | Strongly agree | 2109 (45.3) |
| 2. | **How long do you think it will take to contain the COVID-19 outbreak in India?** | |
| | Minimum 1 month | 594 (12.7) |
| | Minimum 2 months | 1830 (39.0) |
| | Minimum 6 months | 1273 (27.2) |
| | Not sure | 989 (21.1) |
| 3. | **Do you agree that a nationwide lockdown of 21 days is the best way to reduce the spread of COVID-19?** | |
| | Strongly disagree | 125 (2.7) |
| | Disagree | 143 (3.1) |
| | Neutral | 103 (2.2) |
| | Agree | 1956 (41.8) |
| | Strongly agree | 2356 (50.3) |
| 4. | **How much has your daily life been disturbed by COVID-19?** | |
| | Less affected | 2346 (50.1) |
| | Not affected | 532 (11.4) |
| | Disturbed | 1805 (38.5) |
| 5. | **Do you worry about getting infected from COVID-19?** | |
| | Yes | 3115 (66.5) |
| | No | 1568 (33.5) |



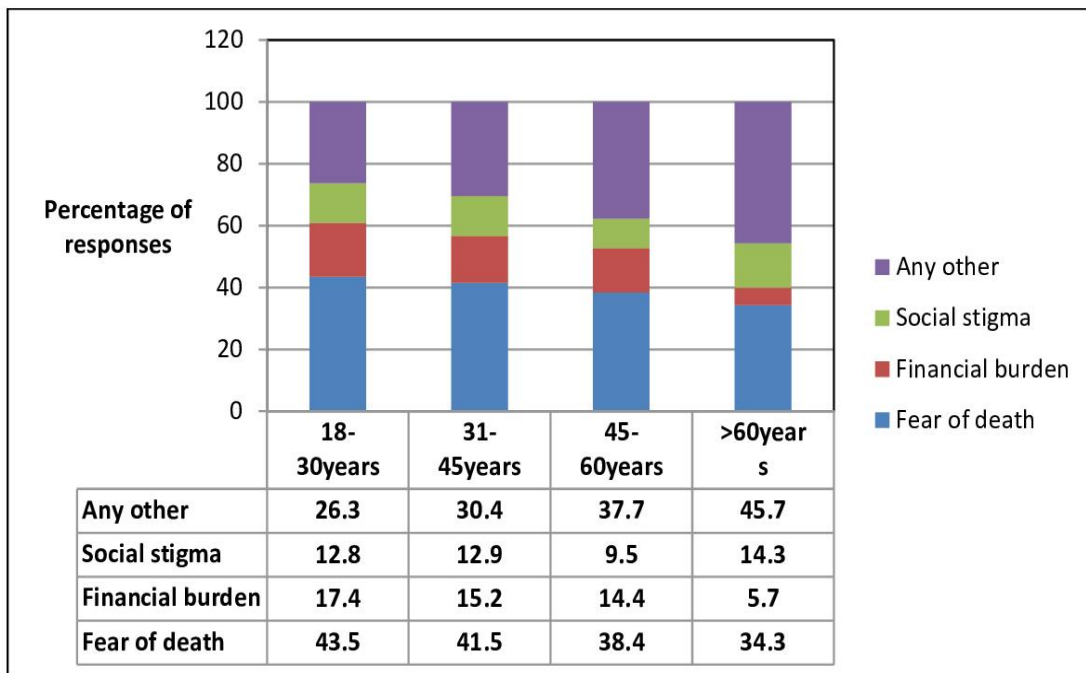| | 18-30years | 31-45years | 45-60years | >60years |
|---|---|---|---|---|
| **Any other** | 26.3 | 30.4 | 37.7 | 45.7 |
| **Social stigma** | 12.8 | 12.9 | 9.5 | 14.3 |
| **Financial burden** | 17.4 | 15.2 | 14.4 | 5.7 |
| **Fear of death** | 43.5 | 41.5 | 38.4 | 34.3 |

**Fig. 1. Major concern among participants who are worried about COVID-19**

**Table 3. Practices regarding COVID-19**

| S.No | Question | Responses | Mean + SD (range) |
|---|---|---|---|
| 1 | **In recent days, have you gone outside without any compelling reason?** | | 4.5298 + 0.69 (0 – 5.00) |
| | Yes | 343 (7.3) | |
| | No | 4340 (92.7) | |
| 2 | **Do you wear a mask when going out?** | | |
| | Yes | 4576  (97.7) | |
| | No | 107 (2.3) | |
| 3 | **Do you consciously make an effort to avoid touching the eyes, nose, and mouth?** | | |
| | Always | 3165 (67.6) | |
| | Often | 898 (19.2) | |
| | Sometimes | 419 (8.9) | |
| | Rarely | 106 (2.3) | |
| | Never | 95 (2.0) | |
| 4 | **Do you cover your nose and mouth when coughing or sneezing?** | | |
| | Yes | 4627 (98.8) | |
| | No | 56 (1.2) | |
| 5 | **Have you downloaded the blue tooth based COVID-19 tracker "ÄarogyaSetu App"** | | |
| | Yes | 3607 (77.0) | |
| | No | 828 (17.7) | |
| | Not aware | 248 (5.3) | |
| 6 | **Do you verify news regarding COVID-19 before forwarding it on social media?** | | |
| | Yes | 4156 (88.7) | |
| | No | 272 (5.8) | |
| | Sometimes | 255 (5.4) | |
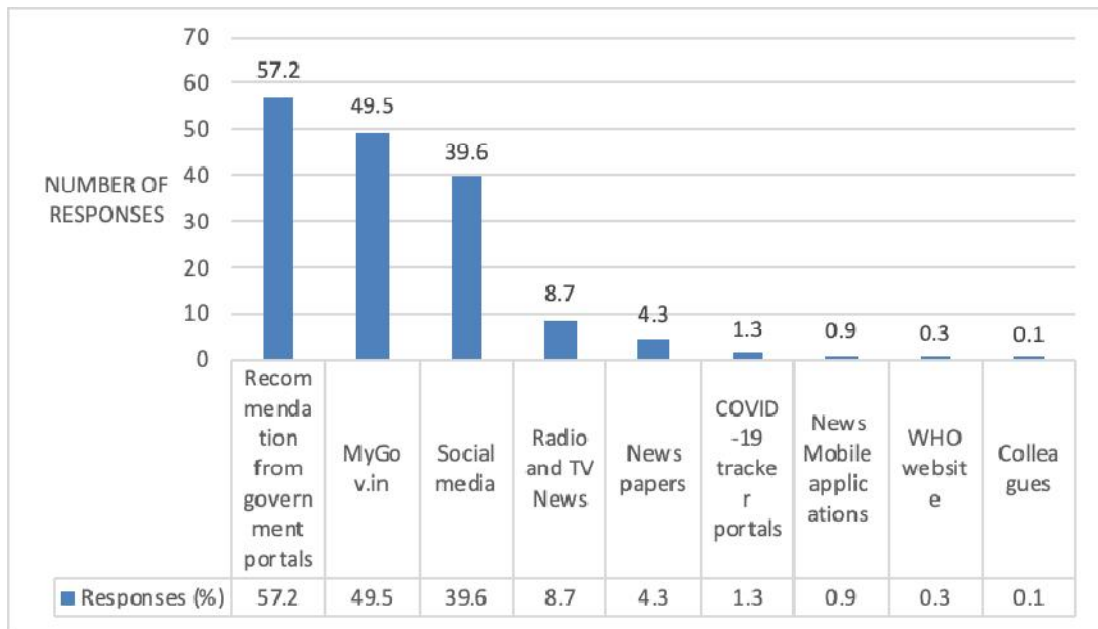


**Fig. 2. Source of information regarding COVID-19? (*multiple options could be marked for this question)**

**Table 4. Association between different study variables using Chi-square test**

| Independent variables | Dependent variables | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Aware n (%) | Unaware n (%) | Total | Chi-square (p-value) | Good Practices n (%) | Bad practices n (%) | Total | (p-value) |
| **Age** | | | | | | | | |
| ≤ 30 years | 1968 (88.4) | 258 (11.6) | 2226 | **<0.0001** | 2189 (98.3) | 37 (1.7) | 2226 | **0.061** |
| 31 to 45 years | 1707 (95.1) | 88 (4.9) | 1795 | | 1780 (99.2) | 15 (0.8) | 1795 | |
| 46 to 60 years | 540 (97.1) | 16 (2.9) | 556 | | 545 (98.0) | 11 (2.0) | 556 | |
| 60 ≥ | 41 (93.2) | 3 (6.8) | 44 | | 44 (100.0) | 00.0 (.0) | 44 | |
| **Gender** | | | | | | | | |
| Male | 3513 (92.1) | 300 (7.9) | 3813 | **<0.0001** | 3766 (98.8) | 47 (1.2) | 3813 | **<0.0001** |
| Female | 785 (92.4) | 65 (7.6) | 850 | | 836 (98.4) | 14 (1.6) | 850 | |
| **Education** | | | | | | | | |
| Primary school or less | 44 (77.2) | 13 (22.8) | **57** | **<0.0001** | 55 (96.5) | 2 (3.5) | **57** | **<0.0001** |
| Middle school | 73 (81.1) | 17 (18.9) | 90 | | 84 (93.3) | 6 (6.7) | 90 | |
| High school | 196 (74.2) | 68 (25.8) | 264 | | 256 (96.9) | 8 (3.1) | 264 | |
| Intermediate | 428 (87.9) | 59 (12.1) | 487 | | 482 (98.9) | 5 (1.1) | 487 | |
| Graduate | 2017 (93.4) | 142 (6.6) | 2159 | | 2129 (98.6) | 30 (1.4) | 2159 | |
| Above graduation | 1550 (95.3) | 76 (4.7) | 1626 | | 1611 (99.1) | 15 (0.9) | 1626 | |
| **Monthly income** | | | | | | | | |
| ≤ 10,000 | 1279 (86.8) | 194 (13.2) | 1473 | **<0.0001** | 1455 (98.8) | 18 (1.2) | 1473 | **0.092** |
| 10,001 – 25,000 | 825 (93.9) | 53 (6.1) | 878 | | 868 (98.9) | 10 (1.1) | 878 | |
| 25,001 – 50,000 | 659 (97.2) | 19 (2.8) | 678 | | 672 (99.1) | 6 (0.9) | 678 | |
| 51,000 – 1,00,000 | 464 (98.5) | 7 (1.5) | 471 | | 466 (98.9) | 5 (1.1) | 471 | |
| 1,00,000 ≤ | 175 (97.2) | 5 (2.8) | 180 | | 175 (97.2) | 5 (2.8) | 180 | |

*Fisher's exact test was used if the cell frequency was less than five*

## 4. DISCUSSION

To the best of our knowledge, this is the first study in India that was done at a statewide level to examine the KAP towards COVID-19 among general residents. The area of study is especially important given the impact of disease on mankind with world leaders quoting the pandemic as an important landmark in the history of the world, dividing the timelines into pre-corona and post-corona periods. The study findings shall be utilised by the state government to effectively design future courses of action in wake of COVID-19.

In the study we found an overall high correct rate in the knowledge questionnaire, indicating that most respondents are knowledgeable about COVID-19. The transmission rate of COVID-19 in the state is also low when compared to the national average. The serious situation of the epidemic and the overwhelming news reports on this public health emergency are also responsible for a high correct rate of knowledge and good practices [23]. A high level of awareness among the study population regarding COVID-19 has been reported from other studies too [16-19]. However, many areas of concern have been identified based on the survey findings. The majority of the population is not aware of the symptoms related to COVID-19 and the days taken to appear the symptoms. It is unknown to many that elderly age groups and those with co-morbidities are more prone to getting infected. Previous research has shown that patients with older age and co-morbidities like hypertension, diabetes, cardiovascular disease and respiratory system disease need careful observation and early intervention to prevent the potential development of severe COVID-19 [24]. Ways of viral spread and suitable distance to be maintained with other people were not recognised by a significant number of the participants. R naught value of the disease is higher than one, implying a faster and rapid spread of disease before it ceases down [25,26]. Addressing issues related to the spreadability of disease will help prevent its exponential spread given the highly contagious nature of the disease.

The majority of the participants also held a hopeful attitude towards the COVID-19 pandemic. Most of them believed that COVID-19 will finally be successfully controlled, and had confidence that India will ultimately get through the situation. This is in synchronisation with the results of a study carried out in another region of India where people also held an optimistic attitude about an infectious disease outbreak. The confident attitude of the Jharkhand residents could be related to the unprecedented COVID-19 control measures such as country-wide lockdown, mandatory wearing of masks and banning of pan masala by the state of Jharkhand, sealing of hotspots, developing dedicated COVID-19 hospitals with isolation, quarantine and management facilities for COVID-19 infected and suspected patients, sanitisation drives and rigorous contact tracing of which enhance people's confidence in winning the battle against the virus [27]. Similar to the results of another study carried out in China, in our study also respondents feared death the most among all age groups. The fear among participants to a certain extent is being answered in newer government campaigns that emphasise increasing the body's immunity so that even if the disease is encountered one may remain asymptomatic and well. Also, gradually with increased understanding of the disease, we have more treatment options and better recovery rates [28]. Newer campaigns should take into account social stigmas attached to the disease. For example "Hate Disease but not the Diseased" is already been promoted across COVID-19 campaigns.

The sound knowledge and optimistic attitude of the participants were also reflected in their practices in this period [16-19]. But there are concern areas; especially mask hygiene should be emphasised; firstly, wearing a mask for their as well as others safety is important and secondly, that outer surface of the mask should never be touched. Also, the indigenously developed corona tracker mobile application "AarogyaSetu" is not been used by all. Rigorous emphasis on its utility among masses in terms of daily updates, self-risk assessment and option for applying of e-pass could prove beneficial. The Source of information for more than half of the participants was government recommendations or state-run online dashboards. It confirms that national and state governments are putting efforts to connect and reach the people.

The age of the participants did have an impact on the knowledge of participants but the practices did not significantly improve with increasing age. Since it can be assumed that people of all groups were sensitised and worried in the present scenario so everyone tried to perform good practices. Similar to the results of

a previous study, females out-performed male participants in awareness regarding COVID-19 but males followed better practices than the females [16].

At present, generic awareness campaigns are being carried out throughout the country and in the state as well. These campaigns are not being designed keeping in mind the felt needs, current knowledge and practice are performed by the residents. The areas identified with a knowledge lag could be specifically targeted using behavioural change communication techniques. The domains where already acceptable knowledge levels have been reached can only be targeted through sensitisation and re-enforcement strategies. Future campaigns should take the socio-cultural and economic context into account. Key stakeholders like non-government organizations which are active in the region can be involved suitably. Many people believe that corona is going to stay for longer. Hence future information education communication/behavioural change communication campaigns should be more than just awareness-raising campaigns government [25]. They should also teach people how to live with a corona in times to come. Social taboos related to COVID-19 infection among residents should also be addressed so that people do not avoid visiting COVID screening facilities. Development of standard operating procedures for all job sectors shall help in the early resumption of services to ease down financial worries besides preventing the spread of corona at the workplaces [29-30]. Social media was the source of information for a significant proportion of the population. Hence, social media platforms like WhatsApp and Facebook should be utilised for the dissemination of authentic updates on COVID-19.

The study was a web-based survey of the KAP practices among the residents of Jharkhand state, India. Opinion of a considerable population which might not have internet access might have been left in the survey. However, the large sample size involved in the study validates the findings to an extent. Responses from all ages, educational & occupational classes and economic strata have been received with varying proportions that correspond to their population size. There was a possibility of the Hawthorne effect in this study but the clause of anonymity and study being an online survey would have limited the bias. The study also touched the areas related to mental health, economic issues but did not take an elaborated opinion. Hence future studies examining the impact of COVID-19 on mental health and economic aspects of individuals can be planned to bring a comprehensive policy or guidelines concerning the pandemic. The health impact of COVID-19 should be assessed to reorient the health care delivery system in the current situation demanding limited mobility of people.

## 5. CONCLUSION

The study identified thrust areas for future awareness campaigns. Participants had a positive attitude but were also logically worried and uncertain about the near future. Adequate knowledge of participants was visible in the practices of residents. There is however a gap across age groups, gender, literacy and income levels which should be addressed in future campaigns.

## CONSENT

Participation in the survey was purely voluntary. The survey link had an information sheet and consent for the survey participants. Participation in the survey was only possible after the consent was given by a participant.

## ETHICAL APPROVAL

The proposal was approved by Research and Project Committee and Institute Ethics Committee, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand vide number 12130419.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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