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COVID-19- a public health emergency: what do we know? A cross-sectional study on community awareness level towards COVID-19 in Uttar Pradesh, India

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ABSTRACT

Background: The aim of this survey study was to assess the level of awareness amongst the population of Uttar Pradesh province of India regarding the Coronavirus disease 2019 (COVID-19) pandemic.

Methods: A cross-sectional survey was conducted in the month of August 2020 amongst 1024 respondents in Uttar Pradesh province, to assess their awareness towards COVID-19 pandemic and its preventive measures.

Result: Majority of respondents are aware about some aspects of COVID-19 which are highlighted by media but there also exist a significant knowledge gaps. Awareness level of respondents is high for some aspects of COVID-19, such as; animal responsible for anthropozoonosis, prevention, symptoms, contagiousness of COVID-19. Respondents also expressed the importance of proper nutrition and balanced diet to strengthen the immune system and recover from COVID-19 infection. Also, a considerable percentage of respondents are not fully aware about the risk imposed by COVID-19 on different age groups.

Conclusion: Upon the understanding of awareness level of the respondents regarding different aspects of COVID-19, it is clear that there exists a certain knowledge gap, which should be rectified by direct contact of population with the healthcare providers and government health agencies. Government and healthcare agencies should utilize social networking websites as a platform of direct information communication. Intense education program regarding COVID-19 should be initiated by Indian Government enabling direct interaction and ensuring only authentic and complete information is imparted in the population. Government could develop their own program incorporating World Health Organization open course program regarding COVID-19.

Keywords: COVID, Awareness, Anthropozoonosis, Coronavirus, Nutrition, Public health

INTRODUCTION

Corona virus disease (COVID-19) is a viral infectious disease caused by Corona novel virus 19. This virus is also known as Severe acute respiratory syndrome coronavirus-

2 (SARS-CoV-2), which was first identified in December 2019 in Wuhan, China. This disease is recognized as a pandemic and became a life threatening health issue on a global level. ¹⁻⁴ As per the World Health Organization (WHO) situational report published on 10th August 2020,

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COVID-19 has effected over 19.7 million people globally and have claimed over 720000 lives, and India is at 3rd position in most effected countries by COVID-19.5 COVID-19 infection outbreak was declared a Public health emergency of international concern (PHEIC) on 30th January 2020. Later, it was declared a pandemic on 11th March 2020.^{1,6} To tackle this ongoing COVID-19 pandemic, WHO has proposed guidelines that include eight aspects which are also known as pillars of support: country level coordination, planning and monitoring; risk communication and community engagement; surveillance, rapid response teams and case investigations; points of entry; national laboratories; infection prevention and control; case management; operational support and logistics. 6 In a research conducted by June and David, they found that the virus has spikes on its surface which resembles a crown. Hence, they coined the name of the virus "coronavirus". The name "coronavirus" was derived from Latin corona, meaning "crown" or "wreath".7 COVID-19 has a wide range of symptoms depending upon the severity. In mild to moderate infections, symptoms like raised body temperature, muscle pain, shortness of breath, cough, sputum production, sore throat, diarrhea, abdominal pain and loss of smell, are present. Whereas in severe conditions, it leads to viral pneumonia and multiorgan failure along with above symptoms. 3,4,8,9 The SARS-CoV-2 virus primarily affects respiratory system and lungs by attacking the host cells via angiotensin converting enzyme 2 (ACE2) enzyme, which is most abundant in type 2 alveolar cells of lungs. 10-12 The surface glycoprotein named "spike" is present on the virus surface which connects with ACE2 and gain entry to the host cells. The SARS-CoV-2 also significantly affects the gastrointestinal system as ACE2 is also present in the cells of small intestine and the epithelium layer of rectum and duodenum.3,15 As per WHO, among all the countries reporting confirmed cases, the United States of America, Brazil, and India are the top three most affected countries in August 2020.5 COVID-19 cases are increasing in India at an alarming rate. As per current statistics by the Ministry of health and family welfare (MOHFW), Government of India, on 16th August, there were 25,89,682 reported cases out of which 6,77,444 are active cases. In India alone COVID-19 has caused 49980 deaths.14 Considering the current scenario, more than 12,70,000 people are affected by this virus in more than 180 countries leading to 69,500 deaths and 2,64,000 people have been recovered by this disease till now. This virus spreads through respiratory droplets and by close contact from among people. 16 The number of corona cases are higher in denser and populated regions. Uttar Pradesh is the most populated province with highest population density of 828 /km². 15 Uttar Pradesh is also following a spiking trend of incidence rate. There are 1,50,061 cases of COVID-19 and 2,393 deaths due to COVID-19 in Uttar Pradesh.¹⁷ The cause of dramatically increasing number of COVID-19 cases in India is because of transmission by droplets through breathing, coughing or sneezing. Even though COVID-19 is not an airborne infection, but it can be transmitted by fomites, direct contact with contaminated items or surfaces, and then

touching nose, mouth or eyes.¹⁶ Yang and collaborators concluded in their research that SARS-CoV-2 can survive on surfaces up to 72 hours. 18 This result was corroborated by the study conducted by Dietz et al. The incubation period of COVID-19 virus is 2-14 days.¹⁹ The diagnosis of COVID-19 virus is done by reverse transcription polymerase chain reaction (rRT-PCR) from nasopharyngeal swab. Chest radiograph can also be used to detect COVID-19. In an infected symptomatic case, the chest radiograph will reveal pneumonia like features. 20,21 Many big pharma companies and health agencies of developed nations are competing to discover the vaccines. So far there is no WHO approved vaccine is available, but with the help of preventive measures, balanced healthy diet, social distancing and self-quarantine the situation could be mitigated. In a study conducted by Pandey, et al it was found that there is lack of awareness in Indian population regarding aspects like risks involved with different age groups and mode of transmission of COVID-19 virus.²² Community awareness is a pivotal factor in controlling this pandemic, which can be achieved by identifying knowledge gaps and strategically developing and implementing COVID-19 awareness program.

METHODS

The study was carried out from August 2020 to August 2020. This is a cross-sectional research which is done by using a modified version Kharma et al survey questionnaire. The questionnaire has 2 sections, first section contains two demographic characteristics; age and gender of respondents. The second section of questionnaire comprises of 15 questions, all questions were multiple choice and close ended in nature (Table 1). The survey questionnaire was created on google forms and a web-link was shared with respondents via using email, social networking websites and other electronic mediums.

Sampling technique

The selection of sample (respondents) is done using snowball sampling (convenient sampling), residing in 5 selected cities of Uttar Pradesh, namely Agra, Lucknow, Aligarh, Noida and Kanpur. This questionnaire was sent to 1,600 individuals out of which 1030 responded.

Sampling inclusion criteria

The sample inclusion criteria for the study was as follows: respondents must be residing in Uttar Pradesh province of India, for last 6 months (i.e. from mid of February 2020), the age of sample (respondent) should be above 13 years or above and questionnaire should be filled completely.

Sampling exclusion criteria

The sampling exclusion criteria was as follows: respondents not residing in Uttar Pradesh for at least 6 months, the age of respondents below 13 years and incomplete or partially filled responses.

Statistical method

Data in the form of cumulative pivot is tabulated, then graphs are plotted based on these pivot table to depict the relative percentage of responses for each question.

All respondents who answered the survey questions were clearly informed about the purpose of conducting this survey and were also informed about the confidentiality of their response.

RESULTS

Total 1030 responses were generated out of which 1024 were included, which showed that 47.3% of respondents learnt about COVID-19 and received related information by news via television (TV)/newspaper, whereas 34.3% of respondents received information by online social media websites. 9.8% of respondents received information about COVID-19 by interacting with their friend and family directly. 6.3% of respondents learnt about the COVID-19 from healthcare workers and 2.0% received information about COVID-19 from Indian government sources such as Department of health and family welfare etc (Figure 1). Most used source of information in age group 13-35 years is social media, whereas in age groups above 35 years it is news on TV/newspaper. About 45% respondent between age group 13-35 years selected social media as a source of information whereas 58% respondents of age over 35 years selected news on TV/newspaper. 91.9% respondents

considered COVID-19 as a contagious disease whereas only 3.8% of respondent considered it non-contagious disease, and 4.3% of respondents were not aware about this. About 70.2% or respondents knew the full form of abbreviation SARS, whereas 29.8% either not able to recall correct full form of SARS or wasn't aware about it (Figure 2). About 56.4% respondents were aware about the incubation period of COVID-19 which is 2-14 days, rest 29.5% opted for 10-14 days, 9.6% opted 5-10 days, and 4.5% selected 5-14 days (Figure 3). 94.7% respondents selected bats as an animal responsible for carrying and spreading of SARS-CoV-2. 2.0% of respondents believed its spread from pigs, 1.7% respondents opted either camels or domestic animals as an animal responsible for spreading of COVID-19 virus, approximately 1.7% respondents were not aware about this. About 76.7% respondents selected 14 days self-quarantine for a person (with no symptoms) who is exposed to a COVID-19 positive case, 14.7% respondents selected 5-10 days quarantine, 3.4% of respondents opted for no quarantine required, about 2.3% respondents were not aware about this (Figure 4). 97.5% respondents were aware about the primary symptoms of COVID-19 that are fever, cough, sore throat, headaches, pneumonia. About 2.5% respondents either opted for incorrect symptoms or didn't knew about the symptoms of COVID-19. In terms of signs and symptoms, 60.4% respondents opted that COVID-19 is similar to SARS, 23.1% selected that COVID-19 is similar to malaria, 12.2% selected tuberculosis, and 4.3% respondents were not aware about this (Figure 5).

Table 1: Modified version of Kharma et al survey questionnaire for assessment of awareness of respondents regarding COVID-19.

Questions	Options for responses
Your age (in years)	13-17
	18-24
	25-30
	31-35
	36-40
	41-45
	46-50
	51-55
	56-60
	61-65
	Above 65
Your gender	Male
	Female
	Prefer not to say
From where did you learn about COVID-19?	Social Media (Facebook, Instagram, etc)
	Friends/Family
	Health Professionals
	News on TV/Newspaper
	Indian Govt. Sources example, Deptartment of
	Health and Family Welfare, NHM
	No idea
Is this COVID-19 disease contagious?	Yes
	No
	No idea

Continued.

What is SARS? What is the incubation period COVID-19? What is the incubation period COVID-19? From which animal did COVID-19 spread? For how many days a person should quarantine himself if he/she is exposed to the COVID-19 infection having no symptoms at all?	Severe acute respiratory syndrome Severe asthmatic respiratory syndrome No idea 2-14 days 0-14 days 5-10 days 5-14 days No idea Bat Camel Domestic animals Pigs No idea No quarantine required Fill the person develop symptoms At least 14 days No idea No idea No idea Servere acute respiratory syndrome Severe asthmatic respiratory syndrome Severe asthmatic respiratory syndrome Severe acute respiratory syndrome Seve
What is the incubation period COVID-19? What is the incubation period COVID-19? From which animal did COVID-19 spread? For how many days a person should quarantine himself if he/she is exposed to the COVID-19 infection having no symptoms at all?	Severe asthmatic respiratory syndrome No idea 2-14 days 0-14 days 5-10 days 5-14 days No idea Bat Camel Domestic animals Pigs No idea No quarantine required Fill the person develop symptoms At least 14 days 5-7 days
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For how many days a person should quarantine himself if he/she is exposed to the COVID-19 infection having no symptoms at all?	No idea No quarantine required Fill the person develop symptoms At least 14 days 5-7 days
For how many days a person should quarantine himself if he/she is exposed to the COVID-19 infection having no symptoms at all?	No quarantine required Fill the person develop symptoms At least 14 days 5-7 days
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he/she is exposed to the COVID-19 infection having no symptoms at all? A	At least 14 days 5-7 days
symptoms at all?	5-7 days
	Fever, cough, sore throat, headaches, pneumonia
D	Dizziness, blurred vision, acute cardiac pain
What are the primary symptoms of COVID-19?	Gastritis, hearing loss, acute renal failure
	No idea
	Tuberculosis
To which diseases COVID-19 is similar to? (in terms of signs & symptoms of disease)	Malaria
	SARS
	No idea
What to do for prevention of COVID-19?	Washing hands and using alcohol based hand
	anitizer
	Cover nose mouth while coughing and dispose it
	mmediately and use mouth-masks
	Social distancing
	All of the above
	No idea
What is the treatment of SARS and COVID-19 (in current scenario)?	There are specific drugs (medicines) for COVID-19
	Symptomatic and supportive treatment only
	Vaccination Vaccination
	No idea
How does COVID-19 virus spreads?	Airborne
	Respiratory droplet and personal contact
	Mosquito bite
	No idea
	Mildly obese people
Which of the following group is more likely to get sick and develop symptoms if infected by COVID-19?	Severely malnourished people
	No idea
Does a balanced diet helps in recovering from COVID-19 infection?	Yes
	No
	No idea
Which is the following is most important in enhancing the immune system?	Protein rich diet
	Balanced diet with rich vitamins and minerals
	Carbohydrate rich diet
	No idea
Are all age groups effected equally and at equal risk from COVID19?	Yes
	No
	No idea
infection? Which is the following is most important in enhancing the immune system? Description: B C N	No idea Protein rich diet Balanced diet with rich vitamins and minerals Carbohydrate rich diet No idea

About 92.6% respondents were aware that preventive measure of COVID-19 is following all safety protocols namely, hand hygiene, use of personal protective equipment (PPE) and social distancing, whereas rest 7.4% selected only one preventive measure, either hand hygiene, use of PPE or social distancing.

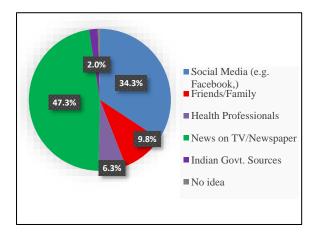


Figure 1: Showing source of knowledge regarding the COVID-19 in the respondents.

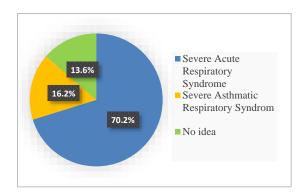


Figure 2: Depicting responses for full form of SARS.

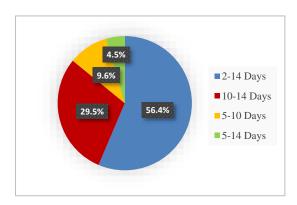


Figure 3: Depicting responses during incubation period of COVID-19.

It was found that 64.0% respondents were aware that in present situation, the treatment of SARS/COVID-19 is symptomatic and supportive only, 26.0% respondents believed there are specific drugs for treating COVID-19 patients, 6.0% respondents selected vaccine as treatment,

rest 4.0% didn't have any idea about the treatment of SARS and COVID-19 (Figure 6). About 78.4% respondents opted respiratory droplets and personal contact as medium of transmission of COVID-19, 20.2% selected transmission if COVID-19 is airborne, rest 1.4% respondents either selected mosquitos or were not aware about the transmission (Figure 7).

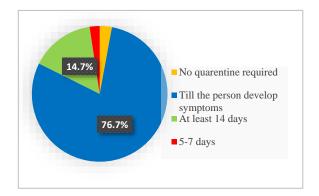


Figure 4: Responses regarding quarantine period if exposure to infection occurs.

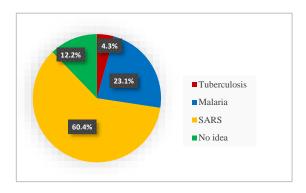


Figure 5: Responses regarding the most similar disease to COVID-19 in terms of signs and symptoms.

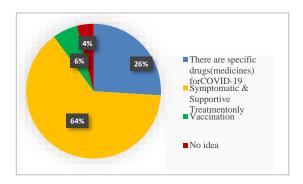


Figure 6: Knowledge of respondents regarding treatment of COVID-19 in current situation.

About 84.3% respondents believed severely mall nourished people are more likely to get sick and develop symptoms if gets infected by COVID-19. About 92.7% respondents believed that a balanced diet helps in recovering from COVID-19 infection, whereas 7.3% respondents either believed balance diet is not important or were not aware about the importance of balanced diet. For

enhancing immunity, 85.3% respondents selected a balanced diet, whereas 9.5% selected protein rich diet, 3.2% selected carbohydrate rich diet and rest 2% didn't had any idea (Figure 8). About 63.9% respondents believed there is different degree of risk for different age group, whereas 29.4% respondent believe all age groups are affected and at risk equally, and 6.7% wasn't aware about the relation of age and risk involved due to COVID-19 (Figure 9).

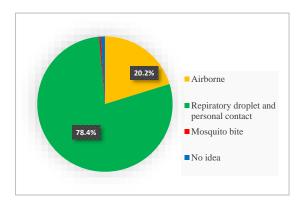


Figure 7: Knowledge of respondents regarding mode of transmission of COVID-19 virus.

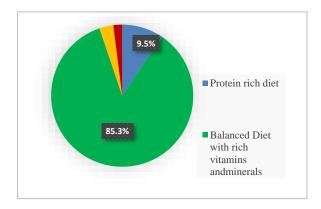


Figure 8: Knowledge of respondents regarding type of diet responsible for enhancing immune system.

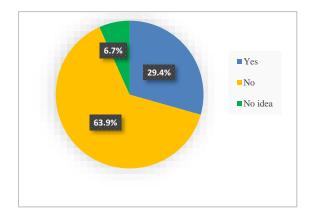


Figure 9: Knowledge of respondents whether different age groups are affected equally or not by COVID-19 and have equal risk if get infected.

DISCUSSION

Most used source of information in age group 13-35 is social media, whereas in age groups above 35 years it is news on TV/newspaper. About 45% respondent between age group 13-35 years selected social media as a source of information, whereas 58% respondents of age over 35 years selected news on TV/newspaper. The younger age groups are the primary users of social networking websites and comfortable with computer and mobile technology, whereas in age groups above 35 years watch news on TV and read newspaper. A very small proportion (6.3%) of respondents received information about COVID-19 directly from healthcare professionals, and only 2% respondents learned about COVID-19 directly from Indian government organizations. Information gets lost or gets hampered if the source and receiver are not directly connected. In case of COVID-19, many people who doesn't have any medical background and didn't have complete understanding about the COVID-19 gather information from healthcare professionals and sometimes unauthentic sources or heath agencies then developed their own version and posted it in the form of videos and pictures on social media. Government health agencies and healthcare provider should consider it as a challenge as well as an opportunity. Government should also monitor news media regarding the accuracy of the information communicated to the community. Majority (91%) of respondents considered COVID-19 contagious and 94.7% are ware that bats are carrier animal for COVID-1918, but there is substantial lack of knowledge about the incubation period of COVID-19 infection, only 56.4% respondents knew the correct incubation period of the COVID-19 virus. This finding is corroborated by the result that 23.3% respondents didn't knew about the quarantine period for a person exposed to a positive case of COVID-19. Majority (97.5%) respondent showed the awareness about the most common and primary symptoms and 92.6% respondents consider prevention is done following hand hygiene protocols, use of PPE and social distancing, but there is a significant lack of knowledge about the treatment protocol of COVID-19. 63.9% or respondents were aware about the symptomatic supportive treatment of COVID-19. The team of researchers at National institute of virology (NIV), Pune, India have isolated 11 different strains of SARS-CoV-2, it will take approximately 1.5 years to 2 years to prepare the vaccine. The Indian council of medical research (ICMR), has stated that isolation of the virus which is the first step towards the development of vaccines, drugs and diagnostic kits in India. Hence, currently no drug and no vaccine is available, only supportive treatment is given. 26.0% respondents believe there are specific drugs for treatment of COVID-19 and 23.1% respondent believe COVID-19 is similar to malaria. This may be due to the fact that certain healthcare practitioners are using anti-malarial drugs for the treatment of COVID-19. SARS is very similar to COVID-19, in terms of symptoms, prevention, treatment and nature of virus.²⁶ Result revealed, most of the respondents knew about the symptoms but about only 60.4% were able to

relate COVID-19 with SARS. This is due to the fact that respondents are not aware about the SARS, as 29.8% respondents were not able recall the full form of SARS abbreviation. This virus mainly affects the person with lower immunity levels such as immunocompromised people, people with chronic conditions, diabetes and people on radiation therapy. 23-25 The current study revealed that there is a high level of awareness among respondents regarding importance of nutrition and balanced diet in developing immunity against COVID-19, as 84.3% respondent believe malnourished individuals are more likely to get sick and develop symptoms if infected by COVID-19. This finding is corroborated by the result that 92.7% respondent believe balance diet plays a vital role in recovery from COVID-19 infection. The current study also found that there exists a lack of understanding among respondents about relation of age of individual and risk imposed by COVID-19, 36.1% respondents believed there is no all age groups effected equally and at equal risk. COVID-19 is not an airborne infection, the virus is transmitted by respiratory droplets from one person to another. About 21.6% respondents believed it is airborne infection, which may result in panic and mental stress on community level.

Limitations

This study is shows awareness of respondents at a given point of time, which may change over a period of time. As this research is not funded by any institution or organization, it was carried-out in only 5 major cities of Uttar Pradesh, the awareness may vary if different cities were selected or more cities were selected. Some respondents were more aware because of socioeconomic status and level of education. Because of the human nature of subjectivity biasness may have occurred while filling out the questionnaire. Due to less time and no funding, researcher were not able to capture responses from more respondents. In future similar researches should be conducted overcoming these limitations.

CONCLUSION

The current study aims at assisting healthcare providers and government organizations by analysing and finding out the knowledge gap of the population of Uttar Pradesh province in India regarding the awareness, prevention and treatment of COVID-19 pandemic. Majority of respondents refer to social media such as Facebook, Instagram, or news broadcast and newspapers to receive information about the COVID-19. Majority of respondents are aware about some aspects of COVID-19 which are highlighted by media but there also exist significant knowledge gaps. Awareness level of respondents is high for some aspects of COVID-19, these are animal responsible for anthropozoonosis, prevention, symptoms, contagiousness of COVID-19. Respondents also showed understanding towards the importance of nutrition and balanced diet for enhancing immune system and recovery from COVID-19 infection. There are certain aspects in

which there is a significant lack of knowledge such as incubation period of COVID-19, quarantine period if exposed, treatment and risk involved with different age groups. Given the condition of drastic increase in COVID-19 cases as mentioned earlier, government needs to develop education strategy and run intense awareness campaign by utilizing social media websites to disable intermediate parties, in order to prevent information loss and information distortion. Official government webpages on social networking website could be made and information in the form of video could be uploaded. Awareness program regarding COVID-19 should be initiated by the Indian government enabling direct interaction and ensuring only authentic and complete information is imparted in the population. Government could develop their own program incorporating WHO open course program regarding COVID-19.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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