PEOPLE'S AWARENESS ON CORONAVIRUS DISEASE (COVID-19) IN THE CONTEXT OF ITS TRANSMISSION AND EPIDEMIOLOGY — A STUDY

M.K. Satapathy
Department of Life Science
Regional Institute of Education, Bhubaneswar
Email: mksatapathy@rediffmail.com

A study on the awareness of Coronavirus Disease (COVID-19) with 124 randomly selected people of Bhubaneswar reflected that 81 per cent of people believed it to be a killer disease. Very limited people had knowledge about symptoms of the disease. Less than 50 per cent understood about transmission of the virus, by mouth droplets. Though 42 per cent of people believed that masks could prevent disease transmission, a large number of people were found using masks improperly. A positive relation was found between education and awareness, but, age was found to have no impact on people's awareness. In the absence of a vaccine or drug to control COVID-19, the possible means of preventing the disease and people's awareness have been discussed.

Keywords: COVID-19, people's awareness, education.

Introduction

One of the major challenges faced by humanity in the current century is the threat due to the novel corona virus (COVID-19). The disease first surfaced in Wuhan City (Hudei province) of China in December 2019, which started as a Zoonotic disease — nonhuman to human transmission. Within no time, the coronavirus as a pandemic spread all over the world and altered the pace, fabrics and nature of people's lives. It has spread to over 218 countries globally, infecting about 83.8 million and killing 1.8 million till the end of December 2020, turning it into a global pandemic. India is no exception, with confirmed infection and death rates increasing in number every day. The possible source of origin of the Indian SARS-CoV is from Europe and Oceania regions besides the Middle East and South Asian regions (Mondal et al., 2020). The World Health Organization (WHO) officially declared the SARS-CoV-2 outbreak as a public health emergency of international concern on January 30, 2020 and a global pandemic on March 11, 2020.

The disease produces flu-like symptoms. With virus receptors being on the upper respiratory tract and lungs (Wu, 2020), the infection spreads easily, and the virus is more virulent than flu. Most infections cause mild disease, and the rate of fatality is 1–3 per cent depending on host factors and health care quality. The severity of SARS-CoV-2 infection is more in persons with a weak immune system and infants. A total of seven virus strains have been reported from different locations of the world (Pandey, 2020), and virulent forms are appearing over time.

In the absence of any specific drug and preventive vaccine to control COVID-19,

preventive measures such as quarantine and lockdowns are the only possible means to curtail the spread as urged by WHO. With this background, the present study was undertaken to understand public awareness about the prevention of the disease, which in turn can influence public co-operation for compliance with government guidelines.

Conceptual background

Besides being obligate parasites, viruses are host-specific and tissue-specific (Ananthanarayan and Paniker, 2012). COVID-19, though said to have originated from some wild hosts, has established in the human system and multiplies in the respiratory tract. This RNA virus is highly contagious and spreads through respiratory droplets that come out through sneezing, coughing, or talking and subsequently inhaled by a healthy person nearby. Further, when a healthy person shakes hand with an infected person or touches some objects with the virus on it and then touches their mouth, eye, or nose, the infection spreads.

Like any other non-vector-borne virus disease, COVID-19 epidemiology involves three components, host (human being), pathogen (Coronavirus) and the environment (Fig. 1).

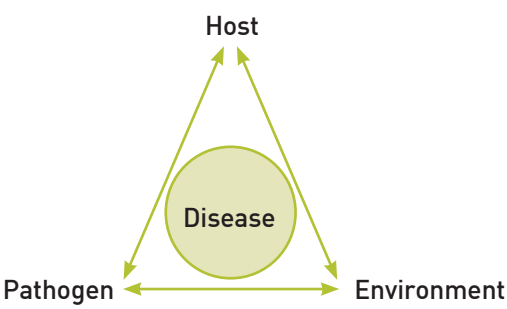

Fig. 1. The Disease Triangle

When all the three components unite forming the disease triangle, the infection takes place, and under favorable environmental conditions, disease outbreak occurs, leading to the global epidemic. It is a polycyclic disease and many disease cycles occur in a short time leading to its fast spread. Coronavirus spreads slowly in hot and humid weather compared to cool and dry conditions (Rao et al., 2020). Any break between host-pathogen or pathogen-environment, or host-environment links reduces the chances of infection, leading to a decline in disease spread.

Material and Methods

The present study was carried out in the Niladri Vihar market area of Bhubaneswar, the capital city of Odisha. The total sample population taken for the study was 124 randomly selected persons within the age of 15-65 years. There were 38 females and 86 males in the total sample population. Age-wise and education-wise distribution of the sample population has been depicted in Fig. 2a and 2b, respectively. Both qualitative and quantitative data were collected through verbal questions in this survey.

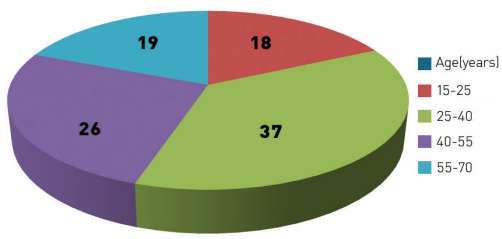

Fig. 2a. Age-wise distribution of the sample population

Out of 10 questions, six questions were related to symptoms, transmission, source of knowledge, etc. Four questions were about their practices, such as wearing masks, washing hands, social distancing in gatherings, and isolating or quarantine of those with symptoms. For practices, quantitative data were collected on 3 point scale - 0 when the answer is no, 1 when partly correct and 2 for the correct answer. The percentage of response was calculated from the total sample population.

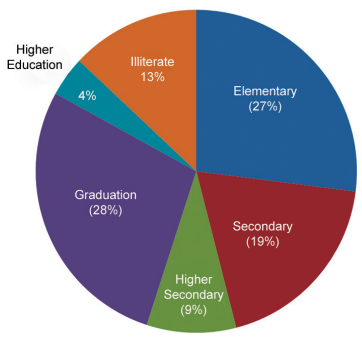

Fig. 2b. Education-wise distribution of sample population

Statistical analysis such as regression and correlations were carried out from the data following IRRISTAT 91.1 software, and the results have been presented diagrammatically (Fig. 3 and Fig. 4).

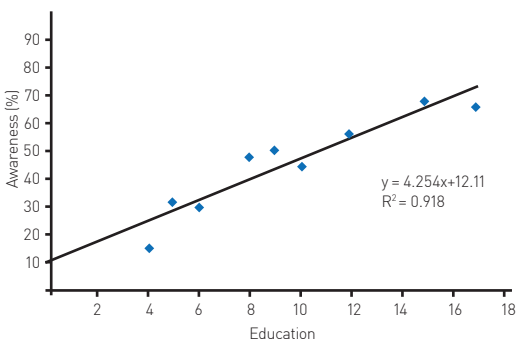

Fig. 3. Relationship between Education (Years) and Awareness.

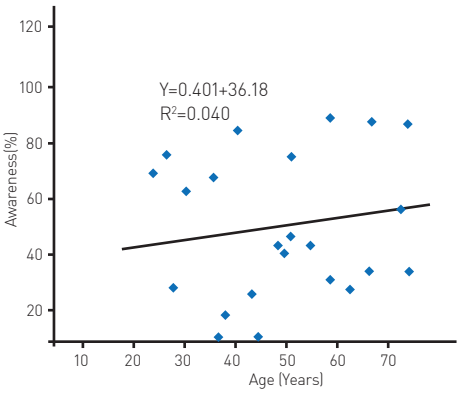

Fig. 4. Relationship between Age (Years) and Awareness

Result and Discussion

COVID-19 is a compound interest polycyclic disease. The killer disease spreads very quickly because of the fast multiplication of the virus and a relatively short incubation period (average ten days, range 3–14 days) of the disease. It is interesting to see the observation and reaction of the people about the disease (Fig. 5).

The disease has created a great panic among the people. Regarding the nature of the virus, about 60 per cent people believed it was a killer disease, 15 per cent termed it as a ghost possibly as they neither could imagine about the pathogen nor its source. About 81 per cent of people were scared of the disease as the time and place of infection is uncertain and beyond imagination. Further, this could be because the disease that kills some infected persons, which is a matter of uncertainty. Regarding symptoms of the disease, most people were aware of one or the other symptoms of the disease (Fig. 6).

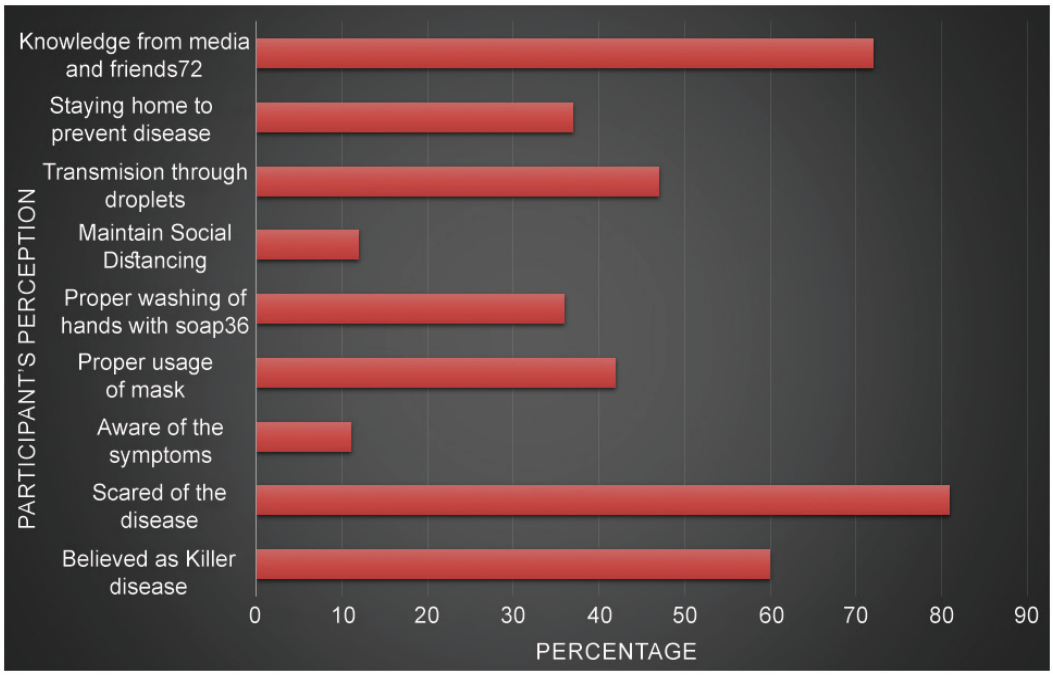

Fig. 5. Participant's perception (%) of COVID-19

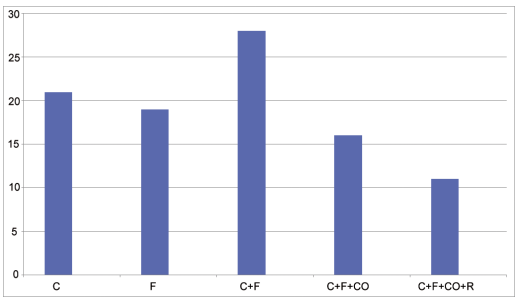

Fig. 6. Symptoms of COVID-19 as observed by the sample population (%)
Nature of symptoms: C = Cold, F = Fever, CO = Cough, R = Respiratory problem

Only 11.0 per cent of people were aware of all the major symptoms (cold, fever, cough and respiratory problems) associated with the disease, whereas 21 per cent and 19 per cent believed cold and fever, respectively, as the only symptom.

Regarding the possible method of controlling the disease spread, 42 per cent of people believed that the disease could be prevented by putting on a face mask. Thirty-seven per cent of the sample population realized that staying at home is the best possible means. Regarding the mode of transmission, 47 per cent of people believed it to be through the mouth, 31 per cent and 30 per cent said that it could be due to staying together and touching the infected person's body, respectively, but none could answer that it could be because of all possible means.

Regarding the use of masks, about 18 per cent of the sample population were found without it (face mask) and 37 per cent were found to use it improperly. Concerning washing hands, 54 per cent replied that they

do not regularly wash their hands with soap or detergent. About keeping a distance in crowded places, 98 per cent people noted they fail to keep a reasonable distance in the market and other crowded places. Looking into the source of information about the coronavirus, most people (72%) observed that they could know about the disease from print and electronic media (mostly TV) and friends.

Over time, it was observed that people are increasingly using the mask, but the disease still spreads. This could be because of an increase in inoculum (virus) load in the environment and its wide spatial distribution due to the movement and migration of workers.

The relationship between education in years and awareness scores was positively (R^2 = 0.098) co-related (Fig. 3). A unit (in year) increase in educational level was found to enhance awareness by 4.25 per cent. This reflected that increase in educational level increases people's awareness regarding the prevention of COVID-19 spread. The relationship between age in years and awareness score was poorly (R^2 = 0.04) established (Fig. 4). It reflected that age has no relationship with people's awareness.

As a whole, people do not follow appropriate practices. Further, the availability of the inoculum in terms of infected persons and the closeness between the inoculums/sick person and the healthy person determines the chances of infection and subsequent disease spread. Some of the predisposing factors, such as the host's age, morbidity issues, cold and moist weather, crowded population, lack of ventilation, etc., promote the fast spread of the disease (Rao et al., 2020).

In social distancing (keeping a gap between the diseased and the healthy person), the chances of nasal drops carrying the virus reaching a healthy person get reduced. WHO observes that with keeping a distance of at least 1.0 meter, chances of breathing in droplets gets reduced. Many countries have different guidelines. In Canada and India, it is 2.0 meter while in the USA, it is 1.8 m. In Australia and Germany, the distance is 1.5 m. China and Singapore advise keeping a distance of 1.0 m. Besides distancing, other measures that influence mitigation are the number of people in a given space, duration of proximity (how long sick and healthy person stay and work together), use of face mask, and whether people talk quietly or shout. With loud voice, the chances of droplets getting dispersed become high. In gatherings and/ or crowded habitations (such as slums), in the absence of ventilation/ free air, infection chances become still high (Ramamurthy & Srivastava, 2020). An ICMR report has shown that a COVID-19 patient can infect 406 patients if preventive measures are not followed, such as lockdown and social distancing (Anonymous, 2020). A study from quarantine centers in Odisha states that those factors have played a very important role in increasing infection levels. In complete isolation, the transmission cycle is forcefully broken, reducing inoculums level in the environment. A study from Nigeria found that most people adhered to government policy guidelines, with 92,7, 96.4 and 82.3 per cent people adhering to social distancing, improved personal hygiene and using a face mask, respectively [Rueben et. al., 2020].

In washing hands and face with soap and detergent, the viral outer lipoprotein layer gets lysed by the detergent and the viral

particles are washed out as their spike proteins are removed from the skin surface. With divergence in variation in genetic makeup in the host population (human beings), asymptomatic persons are observed. They act as potential transmitters (John, 2020) possibly being tolerant and increasing the risk of disease spread. With a change in host physiology and environment, such asymptomatic persons become potential spreaders and play an active role in disease spread without their knowledge.

Experts over the world have argued in favor of wearing a mask. If two persons meet and neither is wearing a mask, the risk of transmission is high. If one of them is wearing the mask, the risk is medium, and if both are wearing the mask, the risk is low because of double barriers that stand between the host and the pathogen. The basic philosophy of wearing a mask is "I protect you, and you protect me." However, it was noted in the present study that a good number of people wear the mask on the chin or under the nose and try to pull it up and down. This type of wearing is meaningless and increases the person's chance of contracting an infection. In the present study, it was realized that some people believed wearing a mask was troublesome and shameful. A section of people feel shy as they feel that they may not be presentable with a mask. In spite of the limitations, it is important to wear a mask that fits well, covering the person's nose and mouth.

As many people in our country are not conscious as well as do not wear a mask properly, it needs to be made mandatory. People have to develop a habit and inculcate a sense of responsibility of wearing masks as and when going outside to benefit the self as well as the community. It is interesting to note that in Malaysia though 83.4 per cent of the population avoid crowds, only 50 per cent wear a face mask [Azim et al., 2020]. Studies in many countries such as the US, UK, Italy, Jordan, and China reflected that people, as well as health workers, have good knowledge, optimistic attitude, and good practices on preventive measures, which hopefully has controlled the disease spread over time (Puspitasari et al., 2020). It has been noted that Japan has been more resilient to the disease outbreak due to good hygiene and habits like wearing masks and avoiding handshakes. In the US, it has been observed that with 80 per cent of the population wearing masks, the number of infections came down by 92 per cent, but when the percent of mask-wearing came down to 30–40 per cent, it almost had no beneficial effect. It could be due to the fact that people in the US became casual in wearing a mask with relaxation in government guidelines and people's mobility [Mukharjee, 2020].

Besides hygienic practices, there has been a considerable focus on the possible development of a vaccine in recent times. Social media is highlighting reports of the development of new vaccines every day. However, vaccine development is a slow process that needs to be executed with meticulous planning, and it seems impossible to have a vaccine very soon for immediate use [Mukharjee, 2020].

As advised by the epidemiologists, lockdown, though slows down the spread of infection considerably, does not stop infection because of minimum person-to-person contact. Further lockdown is not a possible solution

in the long run as livelihoods are lost, and the economy is pushed into the doldrums. The disease could stop only when most people develop herd immunity after getting infected and survive the infection. Under this situation, our fight against coronavirus is far from over. We have to learn to live with the virus (Ramamurthy and Srivastava, 2020), which has an important role in determining society's readiness to accept our behavioral change to avoid crowds, wearing a mask, maintaining social distance, etc.

Under this situation, masks and physical distancing besides hand-washing are very important to reduce an individual risk to exposure and subsequent disease spread. It is interesting to note that in 1918 during the Spanish flu, as many as 20-50 million people died (Ramamurthy and Srivastava, 2020) and in the absence of a vaccine or drug, citizens were ordered to wear a mask that helped to reduce disease spread.

Conclusion

From the study, it was concluded that community-based health campaigns are urgently needed in the current time to create awareness, remove misconceptions about coronavirus, and promote appropriate practices such as washing hands, social distancing, keeping away from shaking of hands besides wearing a mask. As such, covid—appropriate behavior as decided by the government from time to time needs to be followed by each and every individual irrespective of age, education, place of residence and socio-economic back ground to eradicate the inoculum and control the disease.

Acknowledgment

The author wishes to thank the Principal, RIE, Bhubaneswar, for his encouragement and Dr. S. K. Das for his support in preparing the figures.

References

Ananthanarayan, R. and C. K. J. Paniker. 2012. *Textbook of Microbiology.* University Press (India) Private Limited, Hyderabad, India, pp746.

Anonymous. 2020. *Not just you, masks can help protect the economy too. The Times of India* (Bhubaneswar Edn.) July 4, 2020, p6.

Azlan, A. A., M. R. Hamzah, T. J. Sern, S. H. Ayub and E. Mohamad. 2020. *Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. PloS one,* Vol.15(5), https://doi.org/10.1371/journal.pone.0233668

Emami, A., F. Javanmardi, N. Pirbonyeh and A. Akbari. 2020. *Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis. Archives of Academic Emergency Medicine,* e35 Vol. 8(1).

John, T. J. 2020. Will coronavirus pandemic eventually evolve as Pan-endemic? Current Science, Vol 118(6): pp :855-856.

Mondal, M., L. Ankita and S. Kumaravel. 2020. *Genomics of Indian SARS-Cov-2: Implications in genetic diversity, possible origin and spread of the virus. Current Science.* Vol. 118(11): pp. 1786-1791.

Mukharjee, S. 2020. *Dealing with COVID-19. SPAN* LXI (3): pp. 32–35.

Pandey, K. B. 2020. *Novel Corona virus-2019 prevention is the only cure. Science Reporter* March 2020, 30-31.

Puspitasari, I. M., L.Yusuf, R. K. Sinuraya, R. Abdulah and H. Koyama. 2020. *Knowledge, Attitude, and Practice During the COVID-19 Pandemic: A Review. Journal of multidisciplinary healthcare.* Vol. 13. pp. 727–733. https://doi.org/10.2147/JMDH.S265527

Ramamurthy, V. S. and D. K. Srivastava. 2020. *Communication and management of public risks (with specific reference to the COVID-19 global pandemic). Current Science.* Vol. 118(12). pp. 1878–1884. ISSN 0011-3891. 10.18520/cs/v118/i12/1878-1884

Rao, A. S. R., S. G. Krantz, T. Kurien, R. Bhat and S. Kurapati. 2020. *Model–based retrospective estimates for COVID-19 or coronavirus in India: Continued efforts required to contain the virus spread. Current Science*. Vol. 118(7). pp. 1024–1025.

Rueben, R. C., M. A. Danladi, D. A. Saleh and P. E. Ejembi. 2020. *Knowledge, Attitude and Practices towards COVID-19: An Epidemiological survey in North Central Nigeria. Journal of Community Health*. July 7, pp 1–9.

Wu, F. 2020. *A new Corona virus associated with respiratory disease in China. Nature*. Vol. 579. pp. 265–269.