

Original Research Article

Awareness regarding covid 19 disease among healthcare workers in a Tertiary Care Hospital in Southern Bihar**Amit Kumar Singh¹, Avinash Kumar², Mukesh Kumar³, Soumya Singh⁴, Abhishek Kamendu^{5*}**¹*PG resident, Department of General Medicine, Narayan Medical College & Hospital, Jamuhar, Sasaram, Bihar, India*²*PG resident, Department of General Medicine, Narayan Medical College & Hospital, Jamuhar, Sasaram, Bihar, India*³*Professor, Department of Microbiology, Narayan Medical College & Hospital, Jamuhar, Sasaram, Bihar, India*⁴*Senior resident, Department of Anesthesiology, AIIMS, Patna, Bihar, India*⁵*Associate Professor, Department of General Medicine, Narayan Medical College & Hospital, Jamuhar, Sasaram, Bihar, India***Received: 16-08-2021 / Revised: 19-09-2021 / Accepted: 16-10-2021****Abstract**

Background: The SARS-COVID-19 virus is a highly infectious and life threatening which has taken the form of a global pandemic since march 2020. It presents with symptoms similar to common respiratory illness like sore throat, fever, cough, weakness, myalgia and dyspnoea. At present no definitive treatment is available for this deadly virus. Hence prevention is the most effective intervention. This global pandemic is causing severe burnout and exhaustion in health care workers. Hence, this study was conducted based on a questionnaire to assess the skills and attitude of the health care professionals. **Materials and methods:** A cross sectional study was conducted from October to December 2020 after approval by the ethics committee of Narayan Medical College and Hospital, Jamuhar, Bihar. A written and informed consent was obtained from the respondents before administering the questionnaire using WHO course materials on emerging respiratory viruses, including COVID-19, a 13-item based survey questionnaire was developed. Health care workers features, memory, information sources, skills, and attitudes were all addressed in the survey questionnaire. The data was coded, validated, and analysed using open source software that is static. To measure frequencies and proportions, descriptive analysis was used. The chi-square test was used to determine the degree of correlation between variables. Statistical significance was described as a P value of less than 0.05. **Results:** The majority of the sample population (50.8 percent) was between the ages of 21 and 30, with 67.7% males and 32.3 percent females. Non-clinical/administrative employees made up 51.5 percent of The workforce, while nursing made up 48.5 percent (students and faculty). Among the sample population, the most common source of knowledge was Family/ Peers (64.6%), followed by News and Blogs (43.8%) and Social Media (40.8%). Corona virus transmission and prevention were not well understood. Nursing (students and faculty) performed substantially better than Non-clinical/personnel in charge of administration. **Conclusion:** It is critical that the health care workers community members knowledge and preparedness be strengthened. For reaching out to staff, directed educational interventions are needed, as well as the evolution and evaluation of these interventions.

Keywords: COVID-19, Healthcare personnel, Psychological stress

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Introduction

The Severe acute respiratory syndrome corona virus 2 (SARS- CoV-2) infection originated initially in the city of Wuhan in China. This fatal disease has been constantly transforming itself into more lethal variations. The virus is a single stranded RNA virus and has spherical structure which shows pleomorphism. The virus shows constant changes in its physical structure which has posed serious difficulty in the development of specific medicine and anti viral agents. The viral genome has a peculiar feature of having spike proteins which give the virus an appearance like a solar corona.

*Correspondence

Dr. Abhishek Kamendu

Associate Professor, Department of General Medicine, Narayan Medical College & Hospital, Jamuhar, Sasaram, Bihar, India.

E-mail: abhishekkamendu1980@gmail.com

Since there is still a scarcity of reliable knowledge about COVID-19 disease, the entire clinical scope of COVID-19 has yet to be discovered based on the actual situation. According to the available literature, COVID-19 is a highly infectious disease with symptoms that are similar to those of common respiratory illness. Fever, dry cough, fatigue, myalgia, and dyspnea are all commonly manifested symptoms of corona virus infection along with lesser specific symptoms like malaise, diarrhea, conjunctivitis. Another significant symptom that has been rampant in patients of corona virus disease is anosmia and aguesia which take a quite significant time to return to pre infection state. Different people are impacted by this disease in different manners ranging from mild to moderate to severe. Among the infected cases a majority of them manifest mild to moderate features and improve without hospital admission. More lethal symptoms include labored breathing, inadequate and declining blood oxygen levels and severe pneumonia. Patients who have already debilitating diseases like diabetes mellitus, chronic hypertension, chronic obstructive airway disease, chronic

renal disease and other immunocompromised conditions develop more severe form of Covid-19 infection which can lead to death in a short span of infection. The main route of transmission is through droplets, feco oral route and fomites. The virus stays on surfaces for a long time and hence forms a major significant route of transmission. Hence the prevention includes various methods like avoiding close contact, regular hand washing, social distancing and use of proper mask. Also the safety measures include use of sanitizing solution on surfaces to avoid direct contact.

Coronavirus is spread primarily by respiratory droplets (5–10m in diameter) that are released from an infected person mouth or nose when they cough or sneeze. [1, 2] Human-to-human contact of this deadly virus can also be transmitted

by feco-oral and direct contact with patients. The incubation period is usually between two and fourteen days.

As of now, no definitive treatment (drugs or vaccine) for the COVID-19 disease spectrum has been prescribed. Currently, the only way to combat COVID-19 infection is to prevent it, and prevention is the most effective intervention in all government policies.

Primary health care staff (HCWs) come into close contact with patients and may become a significant source of infection for the population. These staff on the front lines are at a very high risk of being exposed. World health organization (WHO) and Centre for disease control (CDC) have provided prevention and control guidelines of COVID-19 for health care workers.

To improve preventive steps, including raising awareness and training of health care workers, WHO and governments have started virtual training sessions and are providing informative materials on COVID-19 in various vernacular languages. Wrong information circulating among health care workers has delayed appropriate treatment, [3], and has also resulted in infection spreading in hospitals, [4, 5], putting the lives of other health care workers in jeopardy.

This SARS-CoV-2 virus pandemic is putting an additional strain on our healthcare system by causing longer work hours, which can lead to physical and mental stress, burnout, and exhaustion. [6] As a result, health care workers prior experiences and beliefs may cause a delay in recognising and dealing with potential threats. During this global health-care crisis, the COVID-19 pandemic provides us with an opportunity to learn more about health care workers awareness and expectations. We are still trying to figure out where health care workers get their details about the COVID-19 pandemic. [7] Overcrowding, a lack of sanitation, and a lack of training are all factors that contribute to disease transmission among health care workers. This is complicated by the fact that some health care workers are unaware of infection prevention strategies [8], and incorrect behaviours and practices raise infection risk directly. [9] Understanding the roles of health care workers awareness, behaviours, and procedures (KAPs) aid in the prediction of expected outcomes. The aim of this study is to determine how well healthcare professionals in a tertiary care hospital in southern Bihar are aware of COVID-19 disease and infection management procedures. The survey was based on a questionnaire and was adapted from current interim guidelines data for medical professionals.

Materials and methods

A cross sectional study was conducted from October to December 2020 after approval by the ethics committee of Narayan Medical College and Hospital, Jamuhar, Bihar. A written and informed consent was obtained from the respondents before administering the questionnaire. The WHO course materials on emerging respiratory viruses, including COVID-19, were used to create a 13-item survey questionnaire. Health care workers features, comprehension, information sources, expertise, and opinions about COVID-related issues were all addressed in the survey questionnaire. Information was evaluated mainly on the questions based on COVID-19 source of transmission, clinical presentation and risk of acquiring infection. Furthermore, 10 randomly selected faculty members read the questionnaire for 15 minutes and graded its readability on a scale of 0 to 100 (0-30: confusing; 31-50: difficult; 51-70: standard; 70-90: easy; and 90-100 very easy).

Pilot study

The pilot survey was then administered to ten randomly chosen health care staff to determine its clarity, validity, and acceptability. The surveys feasibility and response time were taken into account. The participants in this group were not included in the main analysis. The sample size was calculated using a computer based software. The power of the study was taken to be 80 percent and confidence interval of 95 percentage was considered. The sample size calculation was done as per the article by Modi et al. It was decided that there would be 130 participants.

The 13-item questionnaire was divided into several sections: participant characteristics (3 items), understanding of COVID-19 (2 items), source of current information (4 items), knowledge of COVID-19- affected patients symptoms (2 items), and various modes of communication (2 items), propagation (2 items).

Questions on COVID-19 aetiology, signs, and symptoms were used to determine knowledge. Every answer was given a score between one and seven, with one being correct and zero being incorrect. A cut off level of two was considered inadequate knowledge of COVID-19, while a cut off level of four was considered as a sufficient knowledge.

Statistical analysis

The data that had been collected was comprehended and interpreted using SPSS version 24 (IBM) software. Using open source statistical tools, the collected data was coded, validated, and analysed. To measure frequencies and proportions, descriptive analysis was used. The chi-square test was used to determine the degree of correlation between variables. A P value of less than 0.05 was considered important and relevant in terms of statistics. The results that had been obtained were interpreted into tables for a pictorial description.

Results

The study population consisted of 50.8% subjects belonging to 21-30 years, 26.2% belonging to 31-40 years and 23.1% subjects belonging to above 40 years age group. The study population consisted of 67.7% males and 32.3% females. There were 51.5% Non-clinical/administrative staff and 48.5% Nursing (students and faculty). (Table 1)

Table 1: Demographic characteristics of the study population

		No.	%
Age group	21-30 years	66	50.8%
	31-40 years	34	26.2%
	Above 40 years	30	23.1%
Gender	Male	88	67.7%
	Female	42	32.3%
Type of job	Non-clinical/ admin staff	67	51.5%
	Nursing (students and faculty)	63	48.5%

Among study population, 91.5% had information about Novel Coronavirus and 51.5% attended lecture/discussion about Novel Coronavirus disease. (Table 2.)

Table 2: Information about COVID-19 among study population

	Non-clinical/ admin staff	Nursing (students and faculty)	Total
Have you heard of Novel Coronavirus	56	63	119
	83.6%	100.0%	91.5%
Had you attended any of the lectures/discussions about Novel Coronavirus disease	23	44	67
	34.3%	69.8%	51.5%

The most common source of information was Family/ Peers (64.6%) followed by News and websites (43.8% each) and Social media (40.8%) among study population. (Table 3)

Table 3: Source of COVID-19 information among study population

	Source of COVID-19 information			
	News	Social media	Websites	Family/ Peers
Less commonly used	34	37	42	14
	26.2%	28.5%	32.3%	10.8%
Sometimes	39	40	31	32
	30.0%	30.8%	23.8%	24.6%
Most commonly used	57	53	57	84
	43.8%	40.8%	43.8%	64.6%

The knowledge regarding the transmission and prevention of Coronavirus was significantly better among Nursing (students and faculty) compared to Non-clinical/ administrative staff. (Table 4)

Table 4: Knowledge regarding the COVID-19 among study population

	Non-clinical/ admin staff	Nursing (students and faculty)	Total	p-value
COVID-19 is transmitted through air, contact, fecal-oral routes	33	39	72	0.028*
	49.3%	61.9%	55.4%	
Headache, fever, cough, sore throat, and flu are symptoms of COVID-19	27	34	61	0.040*
	40.3%	54.0%	46.9%	
The incubation period of COVID-19 (2-14 days)	26	31	57	0.039*
	38.8%	49.2%	43.8%	
COVID-19 leads to pneumonia, respiratory failure, and death	35	36	71	0.031*
	52.2%	57.1%	54.6%	
Novel Coronavirus (SAR-COV-19) transmission occur through contact with infected person	34	38	72	0.034*
	50.7%	60.3%	55.4%	
Hand hygiene, covering nose and mouth while coughing, and avoiding sick contacts can help in the prevention of COVID-19 transmission	45	50	95	0.011*
	67.2%	79.4%	73.1%	

Discussion

The corona virus pandemic posed many challenges to the health care system particularly in infection control and disease treatment. On December 30, 2019, the first bronchoalveolar samples of a novel pneumonia causing virus were extracted from a patient in Wuhan Jinyintan hospital in China. This potentially fatal disease was declared as a pandemic on March 11 2020 all over the world. Corona virus is a large enveloped single stranded RNA virus. Corona virus is a member of a family of viruses which usually infect humans or animals. Different types of health care staff had different levels of knowledge and comprehension of COVID-19. There are new advances and constant changes in information regarding this deadly life threatening disease. Moreover this disease poses severe threat to patients who already have other diseases and have compromised levels of immunity or are debilitated. There is a lot of fear and misinformation regarding the spread and fatal nature of this virus but the most important strategy to combat this is by taking all necessary and specific precautions. The most problematic aspect of this mortal disease is the transmission which occurs via droplets expelled during face to face exposure. The viral load and viral shedding peaks a few days after the initial infection hence this is also a matter of concern and adds to the mortal nature of this disease. Our research found that health-care staff have a strong understanding of COVID-19 transmission and prevention methods. However anxiety, impaired ability to think clearly and overwhelming of emotions do add to the problems and fear associated with risk of transmission of this virus which has led to a huge number of mortality.

This suggests that official government health-related COVID-19 updates posted online are accurate. Collecting data from reliable sources is critical for disseminating unbiased and trustworthy information about the emerging COVID-19 outbreak, as well as for health-care workers preparation and response. However, one result that should be of grave concern is that more than 61 percent (n=278) of health-care staff used social media to learn new things. Currently, the internet provides a wealth of information, including unverified false information that can spread quickly and confuse health care workers. Health officials and scientists have specifically cautioned that there is widespread disinformation regarding COVID-19.

A major problem that is triggering xenophobia around the world. In this regard, health care staff should carefully review COVID-19-related information and collect information from empirical and reliable sources. According to Zhang et al, approximately 85% of the surveyed health care workers were afraid of being infected. Health care workers support patients with everyday activities such as medical consultation, injection, dressing adjustments, and surgery on the isolation ward and intensive care unit, where patients are critically ill and have trouble breathing. They will have to deal with a variety of emergency situations. If they are not careful, they may become infected with the virus.

This may explain why doctors felt more exhausted during the outbreak than paramedics (OR: 0.44), and why overworked health care workers felt more tired after the outbreak than those who were not overworked (0.66; 0.46e0.96).

Health care workers with five to nine years of experience were less exhausted than those with less experience (0.64; 0.43e0.95), demonstrating that this community has specialised knowledge and experience working with the public emergencies.

Non-frontline health care workers had lower faith in their ability to fight the virus than frontline health care workers (OR: 0.56; 95 percent CI: 0.38e0.84). The materials and policies of the Chinese are most likely to blame for the enthusiasm and excitement shown by frontline health care staff.

Since frontline medical staff in China receives strong support, the government is concerned about frontline support they have material assistance and treatment, and they are more confident in their efforts to defeat the virus.

The findings of this study indicate that there is a significant gap between the amount of information available on COVID-19 and the depth of knowledge among health care workers, especially regarding COVID-19 transmission mode and incubation time. In addition, there are many allied health professionals.

Staff had erroneous information about COVID-19 (for example, that it can be treated with antivirals and that it is contagious, there is a vaccine for it.) This is unfortunate, since the COVID-19 outbreak is wreaking havoc

and causing a large number of deaths around the world, and health-care officials have committed a significant amount of money to educating health-care staff and improving their awareness of COVID-19. One reason for these may be that Doctors are well-versed in infectious diseases, so they have a distinct advantage in terms of expertise because of their ongoing clinical engagement, update of recent guidelines and pharmacotherapy. As a result of our results, we believe that more support from health officials is required to spread COVID-19-related information to all types of health care workers. Usage of personal protective equipment (PPE) for suspected or confirmed cases.

COVID-19 cases and infections were more common in both groups of healthcare workers. Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings has been released by the Centers for Disease Control and Prevention (CDC). PPE stands for Personal Protective Equipment, [11] which is the most significant strategy to prevent risk of acquiring infection. Proper sequence of wearing a personal protective equipment kit is also known as 'donning' while the removal and correct sequence of removing and discarding the ppe known as 'doffing' is very important to prevent infection with COVID-19 virus.

When entering the patient room or ward, a facemask or N95 with respirator along with disposable gloves should be worn. The N95 mask is a form of respiratory protection to prevent spread of droplets. When conducting or presenting aerosol-generating procedures, a N95 face mask is favored over a normal face mask. Appropriate disposal of the used masks and hand hygiene should be carried out after every encounter with any infected patient. According to a previous analysis, the causes of higher infection risk

are linked to health care worker types and frequency of exposure their work-related exposure. According to Zhang et al., 89.7% of the surveyed health care workers complied with COVID-19 best practices, which is supported by evidence.

Non-frontline health care workers were less likely to maintain quarantine with family (OR: 0.75), which may result in the worker accidentally infecting family members; quarantine with family, on the other hand, was positively associated with a five-to-nine-year career history (1.54). Furthermore, nurses who obtain saliva samples from patients pharyngeal isthmus; if they fail to do so, the patients pharyngeal isthmus will be contaminated. They disregard their own safety and they are more vulnerable to infection if they do not wash their hands carefully and repeatedly after an attempt to obtain a sample from a patient who has been infected with COVID-19 or has been in close contact with an infected individual [9-11]

Overworked health care workers washed their hands less often than non-overworked health care workers to avoid virus transmission among themselves, hence overworked health care workers should keep proper working hours with breaks to allow them time for proper hand hygiene maintenance.

Paramedics were also discovered to be involved. They will be less likely to wash their hands as much. Participating in training on a regular basis had a negative effect on longevity in the workplace and front-line status.

The majority of participants had a good impression and knowledge of the methods for preventing and controlling COVID-19. However, there were differences in the views of different people.

Health care workers are divided into several groups. For example, only half of health care workers in the age group of 45-65 years old (n=32, 52%) were aware that COVID-19 symptoms could appear as early as 2 days or as late as 14 days (P.001). If these responses are really reflective of the population, this may have negative implications on the treatment of patients as well as the complexities of future COVID-19 outbreaks. This apparent lack of awareness may cause delays in implementing required confinement measures and personal protective equipment, potentially increasing COVID-19s burden. In our research, we discovered that more than a quarter of medical students felt it was risky to consume meat during the outbreak. This may be due to the fact that COVID-19 was connected to a Chinese wet market. As a result, many people suspect that eating undercooked meat increases the risk of viral transmission. According to Bhagavathula et al [7], about 20% of allied health workers believe the flu vaccine is sufficient for COVID-19 prevention. Finally, the vast majority of people believe that health care workers unanimously accepted that preserving hygiene proper hand washing, use of alcohol based hand rub, maintaining social distance and reporting recent travel history is important.

Conclusion

It is critical that the targeted community members knowledge and preparedness be improved, especially health care providers, who are the first line of defence. The aim of educational initiatives is to reach residents, and the evolution of these steps is needed. This research revealed an increasing need for new local strategies to improve awareness among the general population with respect to COVID-19 and also the preventive measures for protection against this disease. Hence simple methods like use of proper N95 mask along with maintaining social distance and regular hand washing with soap or alcohol based hand rub can be useful to curb the spread of this lethal disease. Awareness according to our survey, was found to be more in case of medical related staff as compared to non medical or administrative staff working in the hospital premises.

References

1. Wu HJ, Huang J, Casper JPZ, Zonglin H, Ming WK. Facemask shortage and the novel coronavirus disease (COVID-19) outbreak: reflections on public health measures. *Eclinical Medicine*. (2020) 21:100329.
2. World Health organization. Modes of Transmission of Virus Causing COVID-19: Implications for IPC Precaution Recommendations: Scientific Brief. World Health Organization, Geneva (2020). Available online at: WHO/2019-nCoV/ Sci_Brief/ Transmission_modes/2020.2 (accessed April 4, 2020).
3. Hoffman SJ, Silverberg SL. Delays in Global Disease Outbreak Responses: Lessons from H1N1, Ebola, and Zika. *Am J Public Health*. 2018;108(3):329-333.
4. Selvaraj S, Lee K, Harrell M, Ivanov I, Allegranzi B. Infection Rates and Risk Factors for Infection Among Health Workers During Ebola and Marburg Virus Outbreaks: A Systematic Review. *J Infect Dis*. 2018;218(5):S679-89.
5. McCloskey B, Heymann DL. SARS to novel coronavirus – old lessons and new lessons. *Epidemiol Infect*. 2020 Feb 05;148.

6. Modi PD, Nair G, Uppe A, Modi J, Tuppekar B, Gharpure AS, Langade D. COVID-19 Awareness Among Healthcare Students and Professionals in Mumbai Metropolitan Region: A Questionnaire-Based Survey. *Cureus*. 2020;12(4):e7514.
7. Bhagavathula AS, Aldhalei WA, Rahmani J, Mahabadi MA, Bandari DK. Knowledge and Perceptions of COVID-19 Among Health Care Workers: Cross-Sectional Study. *JMIR Public Health Surveill*. 2020;6(2):e19160.
8. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese Center for Disease Control and Prevention. *JAMA* 2020 Feb 24 [online ahead of print].
9. McEachan R, Taylor N, Harrison R, Lawton R, Gardner P, Conner M. Meta-analysis of the reasoned action approach (RAA) to understanding health behaviors. *Ann Behav Med* 2016;50:592-612.
10. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, et al. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020;7:e15-6.
11. Interim infection prevention and control recommendations for patients with suspected or confirmed coronavirus disease 2019 (COVID-19) in healthcare settings. (2020). Accessed: March 20, 2020: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/controlrecommendations.html>.

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