

Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Study from Nagpur

Dissertation Submitted to



2021

Master of Business Administration (MBA)

in

Hospital and Health Management

by

Dr. Ruchika Bhaurao Meshram

Roll No.-0979

Under the Supervision and Guidance of

Dr. Monika Chaudhary

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **“Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Study from Nagpur”** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Name of Student:
Dr. Ruchika Bhaurao Meshram

Date:24.06.2021

CERTIFICATE

This is to certify that dissertation titled “**Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Study from Nagpur**” is a record of the research work undertaken by **Dr. Ruchika Bhaurao Meshram** in partial fulfilment of the requirements for the award of the degree of **MBA (Hospital and Health Management)** from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide

IIHMR University, Jaipur

Date

School Dean

IIHMR University, Jaipur

Date

ABSTRACT

Healthcare workers (HCWs) are at the frontline defense against the coronavirus disease 2019 (COVID-19) pandemic. Inadequate knowledge and incorrect attitudes among HCWs can directly influence practices and lead to delayed diagnosis, poor infection control practice, and spread of disease. This study aimed to assess the knowledge, perception, and attitude of the Nagpur HCWs towards the COVID-19 disease. Across-sectional study was conducted in Nagpur, among 201 HCWs using a self-administered questionnaire. The mean correct answer rate was 88.92% with a mean knowledge score of 18.5 ± 2.7 out of 24. A positive correlation between knowledge and attitude scores was detected ($r = 0.215$, $p < 0.001$). About 83.1% of our participants reported that they were afraid of being infected with COVID-19, and 89.2% stated that they were more susceptible to COVID-19 infection as compared to others. Fear of transmitting the disease to their families, and social stigma were the most frequently reported reasons for increased risk perception. The overall knowledge level of HCWs was generally good especially among physicians. A positive attitude was detected among allied health professionals more than physicians. Risk perception was high among HCWs. Causes of increased risk perception need to be considered by the government.

ACKNOWLEDGEMENT

It has been a privileged to receive my Dissertation under the guidance of **Dr. Monica Chaudhary,IIHMR University, Jaipur**. These three months of my dissertation has helped me in gaining extensive knowledge.

I would like to thank **Dr. P.R. Sodani**, President of IIHMR University, Jaipur for his support during university placement and giving long period of time for research project.

Dr. Monica Chaudhary, mentor, and advisor, for her help, guidance, exhortation, direction, important remarks, recommendations of this study. Sharing her insight and aided in the analysis of information and its measurable statistics.

I am overpowered in all humbleness and appreciation to perceive my significance to every single one of the people who have helped me to put these contemplations, well over the level of straightforwardness and into something concrete. I am likewise grateful to the Respondents who partook in review for their participation. I might want to communicate my unique gratitude to my parents and friends for their consistent good help.

TABLE OF CONTENT

	Page no.
1 Introduction	7
2 Review of Literature	10
3 Methodology	12
4 Theoretical/Conceptual Framework	8
6 Research Objectives	13
7 Study Design	14
8 Results	15
9 Discussion	22
10 Conclusion	28
11 Recommendation	28
12 References	30

Introduction

The year 2020 is begins with an enormous challenge referred to as COVID19 in India too. the primary case of COVID19 in India was rumored on thirty Jan 2020, originating from China. once four months this sickness unfold in the majority components of the country. The COVID19 is increasing day by day in India and therefore the Maharashtra state has the very best variety of COVID19 infected cases within the initial week of could 2020. these days the full world is facing many sorts of problems that ar originated . Day by day the things have become important to regulate the COVID-19 cases by the native directors, state governments and central government additionally. the complete world isn't solely losing their economical strengths however additionally lost innumerable lives until date in many countries together with India

COVID19Ais associate degree communicable disease caused by a fresh discovered coronavirus. Most of the individuals infected with the COVID19 virus can expertise gentle to moderate respiratory disorder and recove while not requiring special treatment. adulthood (60+ years) individuals, and people with underlying medical issues like upset diabetes, chronic respiratory illness, and cancer area unit a lot of probably to develop serious sickness .

Coronaviruses flow into in some wild animals and have the potential to transmit from animals to humans. These viruses will cause metabolic process symptoms in humans, beside alternative symptoms of cold and fever.

There are not any specific treatments for coronaviruses up to now. However, one will avoid infection by maintaining basic personal hygiene and social distancing from infected persons .

Adopting the proper maintenances which are according to the said guidelines only can make us safe like “stay in home and stay safe”. No other mode of survival methods will save us from Corona virus. But another side, only sitting inside the home will not work to survive our-self and our family members as well.

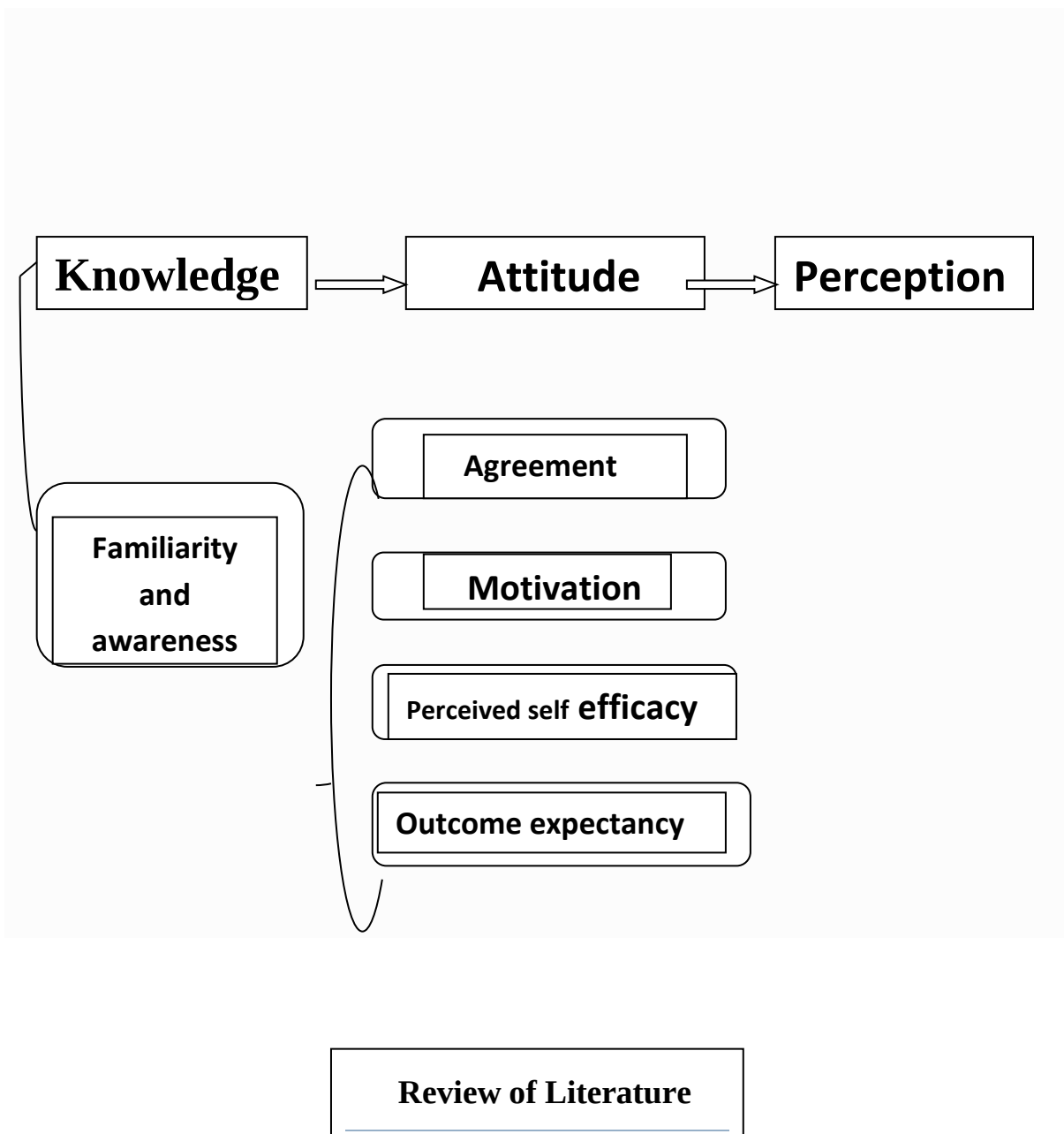
For some styles of essential home wants, goods, and probationary things we've got to travel out and get the specified materials from shops/market. whereas getting conjointly there are many tips that we'd like to be follow to avoid the Corona infection

Maharashtra is the highest Covid-19 burden state in India reporting quarter of overall cases. The city of Nagpur, in Maharashtra state, ranks 4th in terms of reported COVID-19 cases, with 2.5 lakh incidences and more than 4,000 deaths on March 2021 .

Nagpur is a tier 2 city and is one of the rapidly growing cities of Maharashtra and Central India. It is located at the eastern tip of Maharashtra and is located in the heart of India. Nagpur Municipal Corporation (NMC) is the major municipal body that administers the Nagpur region. NMC split Nagpur into 10 zones, which are also divided into 38 wards . In (basu, 2020)Nagpur, the first COVID-19 case was reported on March 12, 2020, a 45-year-old male who travelled from the United States. Till December 2020, the city had recorded a total of 98 thousand cases with 2600 deaths. As of May 2021, the city had recorded a total of 4.88 lakh cases incidences and more than 6,537 deaths

Theoretical and conceptual frame work

The mode of spread of COVID-19 is through the respiratory route. Ideally, designated isolation wards, emergency departments (ED) and intensive care units (ICUs) with negative pressure should be used to house these patients. In developed countries, intelligent hospitals with these facilities integrated during inception itself are incorporated to handle such exigencies.[10] Dedicated air handling units (AHUs) can convert positive or neutral pressure rooms to negative pressure rooms depending as the circumstances demand. In low and middle income countries, very few hospitals have stand-alone buildings or even wards with negative pressure ventilation settings to house infectious patients such as COVID-19.[11] Installing separate AHUs to support negative pressure rooms might be an expensive and not a very feasible option. Hence, enhancing natural ventilation with the help of exhausts and quickly converting buildings with ordinary ventilation to negative pressure settings may be the only alternative for EDs.[12] Planning should be done in ICUs for the upcoming surge in cases. The ICU facility should be expanded at least 20% from the baseline capacity.[13] The alternative method could be utilisation of the normal pressure ICU beds or existing monitored beds (e.g., operation theatres and high-dependency units). In addition, simple measures such as cohorting beds with physical barriers (e.g., curtains) in between patients and timely step-down of stable patients with deisolation protocol can be done



AN OVERVIEW OF COVID-19 AND THE ROLES OF HEALTH CARE WORKERS

The COVID 19 disease causes respiratory illness with symptoms including cough, fever, and, in more severe cases, difficulty breathing. COVID-19 can be

serious and even fatal. Older people and people with coexisting medical conditions could be more vulnerable to becoming severely ill. The outbreak of COVID-19 could be particularly risky for health care workers because of their ongoing professional exposure to the virus. At present, health care practitioners are the most valuable resource for every country to combat the disease, and we believe that health care workers need to be well protected first, especially anesthesiologists who play a vital role in emergency airway management, intensive care, and preoperative medicine. Here, we review the different stages of COVID-19 development, focusing on the personal protection of health care workers and the risk factors related to their infection

INADEQUATELY PROTECTED HEALTH CARE WORKERS DUE TO LACK OF SUPPLIES

Frontline healthcare workers (HCWs), including doctors, nurses, technicians, ward, and sanitation workers, are experiencing acute challenges in effectively managing patients while also protecting themselves and their families from COVID-19. Globally, tens of thousands of HCWs have been infected with the coronavirus (SARS-CoV-2), and hundreds have died in the line of duty.[4] In India, according to the Indian Council of Medicine Research, 5.2% of the COVID-19 infected patients are healthcare workers.[(HEBBAR, 2020)

Methodology

A descriptive cross-sectional study was done among a group of HCWs at different hospital types in Nagpur, city of Maharashtra

A self-administered form was used, it had been developed by the authors when reviewing antecedently conducted analysis [14–16], and visiting WHO websites for commonly asked queries [17]. queries were written in English and Marathi and were tailored to suit participants.. The form are pretested on twenty HCWs WHO were shortly excluded from analysis;. The form coated the following: (I) Demographic characters: age sex, hospital, department, education, and supply of data concerning COVID-19. (II) The data section: consisted of twenty four data queries covering the most general data, mode of transmission, and ways that of unwellness interference. every question was answered by either affirmative, no, or don't grasp. affirmative was the right answer to some queries and no for others. (III) The perspective section; enclosed 10 queries assessing HCWs' attitudes of COVID-19 as a preventable and governable unwellness (four items), and their attitudes towards directions and laws taken by the Nagpur Government to beat COVID-19 pandemic state of affairs (six items). Response to every item was recorded on the 5-point Likert scale as follows: powerfully agree (5-points), agree (4-points), undecided (3-points), disagree (2-points), and powerfully disagree. Risk perception: enclosed assessment of HCWs feelings towards COVID-19 infection by 2 statements: (1) i'm a lot of prone to infection with COVID19 as compared to others, (2) i'm terrified of being infected with COVID-19 virus. The response may be either affirmative, no, or undecided. Causes of risk perception of a lot of susceptibleness to COVID-19 or perception of concern from catching covid19 were encountered. Data assortment method thanks to the

internment in geographic area during this important state of affairs to attain social distance, we have a tendency to used the web information assortment technique. A Google type is` created, and participants were invited to complete and submit it. A form link are shared with teams for HCWs on Facebook and Whatsapp..

Research objective

1. To assess the knowledge, and attitude of the Nagpur HCWs towards the disease.
2. To access the Risk perception of Healthcare worker towards COVID 19.

Plan of Analysis

Statistical Analysis Once all necessary information were obtained and checked for completeness, they were coded and analyzed victimisation applied math Package for scientific discipline (SPSS) computer code version sixteen. straightforward descriptive analyses as suggests that and commonplace deviations (SD) were thought of for numerical information and variety and p.c for qualitative information. Chi-square take a look at was wont to compare qualitative variables between physicians and allied physicians. examination data scores between 2 teams are going to be doing victimisation student t-test, and ANOVA take a look at for quite 2 teams. Pearson correlation are going to be doing between data and angle scores. Multiple regression toward the mean analyses and supply regression analyses were performed to spot the factors related to favorable angle score and risk perception towards COVID-19 infection. $P \leq 0.05$ was thought of statistically signifcant. data score was calculated for the twenty four data questions; the right answer was scored one purpose and also the wrong answer or don't grasp was scored zero, with the utmost score to be twenty four. 2 angle scores were calculated: the primary one concerning HCWs' angle toward COVID-19 as a preventable malady (four things, with a most score of 20), the opposite angle score regarded their angle

toward governmental actions to combat COVID-19 (with a most score of 30). These scores were wont to be compared between participants in keeping with the characters studied.

Results

Table Table11 shows the socio-demographic characteristics of the studied participants. Nearly half of the participants (53%) were females.. More than one fourth (33%) were postgraduates, 27% are university graduates, and 15% had less than high school education. The majority (50%) of the study participants were working at the general hospital and the others were from university hospital (40%) or primary health care centers (10%). Those who worked in direct contact with patients represented 73% of the study group. All participants claimed that the main source of information about COVID-19 was physicians (20%), MOHP website (30%), social media (2%). Other sources included friends or family members (1%), courses (17%)

Basal characteristic of study group (N =201)

	N	Percentage
Sex		
Female	107	53%
Male	94	46%
Hospital type		
University hospital	81	40%
General hospital	100	50%
Primary health care	20	10%

Age (years)		
20–29	91	45%
30–39	53	27%
40–49	36	18%
≥50	21	10%
Education		
Postgraduate	66	33%
University	54	27%
Intermediate	30	15%
High school education	31	15%
Less than high school education	20	10%
Professions		
Physician	45	22.38%
Nurse	38	18.9%
Pharmacist	32	15.9%
Technician	24	11.9%
Employee	30	14.92%
House keepers	32	15.9%

Direct contact with patient		
Yes	146	73%
No	55	27%
Main source of knowledge on COVID-19		
MOHP and WHO website	20	10%
Social media	60	30%
Newspaper	4	2%
Television	40	20%
Physicians	40	20%
Friends/Family	2	1%
Courses	35	17%

Results of knowledge assessment of the participants regarding COVID-19 general information, ways of spread, common symptoms, and measures to prevent the spread of COVID-19 are shown in Table [Table2.2](#). The mean knowledge score of participants was 18.5 ± 2.7 ranged from 9 to 23, with the mean correct answer rate of questions was 80.4%. Correct answers were mostly identified for all items by more than half of participants with a significantly higher percent in physicians than in allied health professionals. The least correct answers were related to the following question: "COVID-19 is transmitted by dealing with domestic animals?" where only 36.83% correctly identified that COVID-19 cannot be transmitted by dealing with domestics animals, also 50% of participants correctly identified that antibiotic are not the drug of choice for treating COVID-19. About half the participants thought that COVID-19 is always fatal. The preventive measures of COVID-19 were correctly identified by the majority of participants except the faulty understanding about washing

nose with a salty solution as only 20% identified that it has no role in COVID-19 prevention. A knowledge gap was detected between physicians and allied health professionals in most items (Table [Table22](#)).

Knowledge about coronavirus disease (COVID-19) among healthcare workers

	Doctor (=92)	Allied health care (=109)	Total corrected answer	p value
COVID-19 isA (Anand, singh, & singh, 2020) (saqlain, muddarsir, & Rehman, 2020) (Kharche, Kharche, & Kharche, 2021)a viral disease	92(100%)	109(100%)	201(100%)	
COVID-19 is transmitted by direct contact with infected persons	92(100%)	102(93.5%)	194 (96.5%)	0.001
COVID-19 is transmitted by dealing with domestic animals	63(67.7%)	11(10.09%)	74 (36.81%)	<0.001
The incubation period of disease is from 2 to 14 days	91(99.00%)	73(66.9)%	164 (81.5%)	<0.001
There is an available vaccine for COVID-19	76(82.6%)	50(45.8%)	126 (62.68%)	<0.001
Antibiotics are the drug of choice in treating COVID-19	77(71.7%)	25(22.9%)	102(50.7%)	<0.001

The virus may be more dangerous in patients with chronic diseases	90(98.2%)	94(86%)	184 (91.5%)	<0.001
The virus may be more dangerous for the elderly	92(100%)	92(84.4%)	184 (91.5%)	<0.001
Health care workers are more prone to COVID-19	81(88%)	92(84.4%)	173 (86.06%)	0.911
COVID-19 always causes death	32(35%)	49(45%)	81 (40.29%)	<0.001
COVID-19 is transmitted by droplets	91(99.2%)	71(65%)	162 (80.5%)	<0.001
COVID-19 is transmitted through eating contaminated food	71(77%)	55(50.4%)	126 (62.6%)	<0.001
Headache, fever, cough, sore throat, and flu are symptoms of COVID-19	92(100%)	99(91.2%)	191 (95%)	<0.001
COVID-19 leads to pneumonia, respiratory failure, and death	89(97%)	85(78%)	174 (86.56%)	0.012
Preventive measures against COVID-19				
1.Wash hands with soap, water or alcohol	92(100%)	109(100%)	201 (100%)	0.001
2.Avoid touching eyes, nose and mouth	91(99.2%)	109(100%)	200 (99.5%)	0.312
3.Putting on facemask	91(99.2%)	106(97.5%)	197 (98%)	0.443

4. Covering the nose and mouth while coughing	92(100%)	105(96.3%)	197 (98%)	0.731
5. Avoiding crowdedness in public places	92(100%)	107(98.6%)	199 (99%)	0.315
6. Frequently cleaning and disinfecting surfaces	92(100%)	108(99.3%)	200 (99.5%)	1
7. Keep at least one meter distance between people	91(99.2%)	104(96.1%)	195 (97.01%)	0.114
8. Washing nose with a salty solution	38(41.3%)	16(16.5%)	54 (26.86%)	<0.001
9. Avoid direct contact with colleagues	92(100%)	101(93.2%)	193 (96.01%)	0.028

The relation between the socio-demographic characteristics and knowledge about COVID-19 is demonstrated in Table [Table3.3](#). Almost similar knowledge mean scores were observed for male and female participants (18.68 ± 2.89 and 18.24 ± 2.56 , respectively) with no statistically significant difference. The mean knowledge score was significantly higher in the younger HCWs at age groups (20–30) and (30–39) than those in the older age groups ($p = 0.014$). Physicians then pharmacists had the highest knowledge score than other professions. No difference in knowledge according to the place of work was noted. The knowledge mean scores were significantly related to the level of education as well as to the source of knowledge. Participants with university or higher education had significantly higher knowledge mean scores compared to those with lower levels of education. Additionally, significantly increased knowledge score was detected in those working in direct contact with patients than others ($p < 0.001$).

Relation between sociodemographic characteristics of study participants and their knowledge scores regarding COVID-19

	±Mean knowledge score	p value
Sex		

F	18.68+/- 2.89	0.106
M	18.24+/- 2.56	
Age		0.001
20–29	19.02+/- 2.73	
30–39	18.47+/- 2.68	
40–49	17.63+/-2.7	
≥50		
Profession		
Physician	21.0+/-1.4	
Nurse	17.82+/-2.27	
Pharmacist	19.14+/- 124	
Technician Employee	16.92+/- 1.99	
House Keepers	16.96 +/- 2.18	
Education		<0.001
Postgraduate	20.1+/- 1.18	
University	18.62+/- 21	
Intermediate	18.68+/- 2.7	
High School education	18.10+/-2.96	
Less than high School education	15.00+/-31	

Direct contact with patients		
Yes	18.9+/- 2.5	<0.001
No	17.9 +/- 2.9	
Work place		
University hospital	18.29+/- 2.6	0.114
General hospital	18.94+/- 2.6	
Primary health care	18.29+/- 3.38	
Source of knowledge		
MOHP and WHO website	19.3+/- 2.34	< 0.001*
Social media	19.09+/- 2,23	
Newspaper	17.0+/- 2.9	
TV	15.78 +/- 3.5	
Physicians	18.00+/- 3.97	
Friends/family	17.9+/- 1.8	
Courses		

Attitudes of healthcare workers regarding coronavirus disease 2019 (COVID-19)

	Doctors	Allied health care workers	Total	p value
COVID-19 is a severe disease	78 (85%)	95 (87.1%)	173(86%)	0.453

COVID-19 can be prevented	78(85%)	91 (83.9%)	169(84%)	0.635
Standard precaution can protect us against COVID-19	83 (90%)	106(97.5%)	189(94%)	0.005
COVID-19 cases will increase	84(92.1%)	83 (76.1%)	167(83%)	<0.001
I am confident that Nagpur can overcome COVID-19	28(30.6%)	59 (54.8%)	87 (43.2%)	<0.001
I am confident in the information disseminated by the MOPH about COVID-19	40(43.3%)	77(70.5%)	120.3(59.7%)	<0.001
There are cases recovered from disease	65(70.8%)	86 (79.6%)	151(75.1%)	<0.001
Regulation taken by the government are enough to combat disease	32(34.6%)	83(76%)	115(57.2%)	0.358
COVID-19 is accurately diagnosed	22(23.6%)	73(67.1%)	95(47.26%)	<0.001
I am confident in hospitals dealing with and treating COVID-19 patients	42(45.7%)	72 (66.4%)	114(56.7%)	<0.001

The mean attitude score regarding COVID-19 as a preventable disease was 13.7 ± 2.1 and was significantly higher in physicians than allied health workers (14.5 ± 1.9 versus 13.3 ± 2.1 , $p < 0.001$). The attitude score towards the governmental role in COVID-19 management was 20.9 ± 4.3 , which was lower for physicians than for allied health workers (19.0 ± 4.7 versus 21.9 ± 3.7 , $p = < 0.001$). Knowledge score was positively associated with attitude score towards COVID-19 as a preventable disease ($r = 0.215$, $p < 0.001$). High educational level and younger age were the factors

associated with the positive attitudes outlined towards COVID-19 as a preventable disease Table 5.

Table 5

Predictors of positive attitudes towards corona virus disease 2019 (COVID-19) as preventable disease by multiple linear regression analysis

Predictors	Unstandardized coefficients		Standardized coefficients	t	p value
	B	Standard error			
Constant	16.115	1.436			
Age	-0.023	0.011	-0.10	11.224	0.000
Gender	0.070	0.201	0.017	0.349	0.727
Health workers (Allied health personnel versus physicians)	-0.238	0.522	-0.053	-0.455	0.649
Knowledge score	0.028	0.048	0.037	0.588	0.557
Contact with patient	-0.118	0.208	-0.208	-0.566	0.572
Education	1.055	0.529	-0.224	-1.996	0.047

Table for Risk perception towards coronavirus disease 2019 (COVID-19) among healthcare workers

I am afraid of being infected with covid 19 virus		
	N	Percentage
1. The disease is highly transmissible	180	90%
2. The disease may be fatal	40.8	82%
3.I could transmit infection to my family	198	98.5%
4.High risk of infection	133	66.3%

I am more susceptible to be infected with covid 19 as compared to others		
	N	Percentage
1. We have direct Contact with patient without knowing that he /she is positive/negative.	97	48.6%
2. The circumstances (crowdedness) in the workplace is suitable for transmitting infection	123	61.4%
3. The public is not committed to the preventive measures	151	75.4%

Predictors of perception of higher susceptibility to infection were: younger age, OR (95%CI) 0.666(0.510–0.871); being from allied health workers, 4.970 (2.190–11.278); negative attitude toward disease as a controllable and preventable disease, 0.824(0.706–0.961); and working in contact with patients, 3.358(1.85–6.085). While predictors of fear perception from COVID-19 infections were; young age OR (95%CI) 0.782(0.566–1.079); female sex, 1.969(1.004–3.860); higher education level, 9.624(2.218–41.755); a

negative attitude toward disease as a controllable and preventable disease, 0.715(0.585–0.874); and working in contact with patients 2.991(1.485–6.024)

Discussion

The study was conducted during last week of May 2021. It aimed to assess the knowledge and attitude level of HCWs and to estimate the risk of infection perception among HCWs in health facilities in Nagpur, Maharashtra.

Maharashtra is the highest Covid-19 burden state in India reporting quarter of overall cases. The city of Nagpur, in Maharashtra state, ranks 4th in terms of reported COVID-19 cases, with 2.5 lakh incidences and more than 4,000 deaths on March 2021.

Nagpur is a tier 2 city and is one of the rapidly growing cities of Maharashtra and Central India. It is located at the eastern tip of Maharashtra and is located in the heart of India. Nagpur Municipal Corporation (NMC) is the major municipal body that administers the Nagpur region. NMC split Nagpur into 10 zones, which are also divided into 38 wards. In (basu, 2020) Nagpur, the first COVID-19 case was reported on March 12, 2020, a 45-year-old male who travelled from the United States. Till December 2020, the city had recorded a total of 98 thousand cases with 2600 deaths. As of May 2021, the city had recorded a total of 4.88 lakh cases incidences and more than 6,537 deaths.

.At the time of writing this manuscript, in the middle of June, Maharashtra confirmed over six million cases of the coronavirus (COVID-19)

as of June 27, 2021, with over 121 thousand fatalities and over 5.7 million recoveries. A state-wide lockdown was implemented in late April 2021 to attempt reducing infections and.

In the current study, the knowledge level of HCWs about COVID-19 was high. The mean correct answer rate was 80.4%. This comes in accordance with studies conducted in China, Vietnam, and Pakistan [14, 15, 21]. Similarly, a Ugandan study had reported about 70% of their respondents had sufficient level of knowledge [22] also in an Iranian study it was found that 99% of respondents had excellent knowledge level regarding the disease modes of transmission but regarding the disease symptoms only 86% had sufficient knowledge [23]. On the other hand in a study from the United Arab Emirates, poor knowledge about the disease transmission, and the symptom was found in a significant proportion of HCWs [24].

25

Physicians were the most often mentioned as a source of information about COVID-19 followed by the MOHP or WHO official web sites and social media with only small percent reported courses or training as their source of information. This was unlike other studies where social media, WHO and the government web sites , seminars and workshops were found to be the most common information sources .

The participants of this study had a reasonable level of knowledge irrespective of their job, especially regarding the disease preventive measures. Apart from the faulty belief that washing the nose with saline could prevent the infection that was significantly prevailing among physicians, almost all of the HCWs knew the proper disease preventive measures. Adequate knowledge about the disease preventive aspects was found in an Indian study despite the moderate overall knowledge about the COVID-19 infection .

Hand washing, refrain from touching eyes, mouth and nose, and putting surgical face mask were among the preventive measures frequently accepted by our participants. Inconsistent to our findings, Kumar et al. [28] found HCWs knowledge regarding the role of face mask in the prevention of the disease to

be moderate to poor. Also, Olum et al., [22] found about 17% of HCWs believed that wearing general medical masks was not protective against COVID-19. Outlined that surgical masks are similarly as effective as N95 respirators if used with hand wash and other infection prevention precautions. Lately, on the 30th of May, the Maharashtra Government has mandated wearing a face mask in public places and at public transportation.

Regarding the knowledge about modes of transmission, symptoms, and treatment of COVID-19, we found that physicians had a significantly higher level of knowledge followed by pharmacists and nurses.

Knowledge level about COVID-19 was significantly associated with younger age groups especially 20–30 years and with superior education levels. Several results found younger persons with higher levels of education had higher knowledge. Also, a higher knowledge level was found among HCWs who gained information about the disease from the internet either through social media or MOHP/WHO web site. This could be explained by the fact that younger highly educated persons tend to use the internet than older less educated persons. We also found that being in direct contact with COVID-19 patients significantly increases the knowledge level as direct dealing with patients make HCWs more motivated to know about the disease and to search for scientific materials and guidelines.

Our results revealed an overall positive attitude of HCWs towards COVID-19 as a preventable disease. We also found that good knowledge was significantly associated with this positive attitude. This parallels several studies that found an association between the knowledge level of HCWs about COVID-19 and their attitude. Even the studies that included the general population, reported that a higher knowledge level was associated with a positive attitude. It is well known that knowledge of HCWs is a very important prerequisite for prevention beliefs, positive attitudes, and to promote positive practices. It also affects their coping strategies to some extent. Inadequate knowledge with other factors, as type and frequency of exposure, could increase the risk

of infection . The attitude towards COVID-19 as a preventable disease was also higher among physicians than other HCWs.

As the health sector comes in the first place as regards the risk that entails its employees, reducing this risk is the first step in providing quality healthcare. The HCWs risk perception could strongly affect not only their mental health but also their exposition to this risk . It worth mentioning that, and despite their high knowledge score, the vast majority of our respondents were afraid and felt more susceptible to have COVID-19 infection (83.1% & 89.2%, respectively).

In our results, the first and the most frequently mentioned items that make HCWs afraid of getting infected is their fear to transmit the infection to their families followed by their belief that the disease is highly transmissible. The stigma associated with infection was mentioned by about two-thirds of the respondents..

27

In this study, the most commonly mentioned cause for feeling more susceptible followed by dealing with the public who are not committed to preventive measures together with ill ventilation and over crowdedness in the workplace. Likewise reported limited supplies of infection control materials and overcrowding in the emergency rooms were perceived as barriers in infection control practice that could set them at high risk of getting infected.

Even though the Nagpur population had a positive general attitude towards the disease preventive measures, as about three-quarters of respondents believed that the face mask can protect against infection, just about 35% were ready to wear it . This could explain our findings that more than three-quarters of our HCWs feel more prone to infection due to dealing with the public who are not committed to preventive measures. About two-thirds of our HCWs thought they were more susceptible as COVID-19 is a newly emerging disease and several reasons made them more afraid of being infected as; unavailability of specific treatment or vaccine, associated fatalities, and the perceived unsatisfactory response of health authorities. This was corresponding to the reasons outlined to increase the risk perception among emergency nurses .

Conclusion and Recommendations

HCW are the frontline defense in our war against COVID19. Despite the high knowledge score and the positive attitudes observed in this study, the number of infected and deceased . So, providing HCWs, especially physicians, with mental, psychological financial and administrative support is crucial. We recommend health education campaigns to the less educated HCWs and the public. Continuous provision of PPE and training of all HCWs on proper infection prevention measures are serious and substantial.

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