

COVID-19; from knowledge to clinical practice of health care providers

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Abstract:

There is currently an ongoing worldwide pandemic COVID-19. It is associated with a respiratory illness that may cause severe pneumonia and acute respiratory distress syndrome (ARDS). Pakistan has more than 255,769 confirmed cases including health care providers who acquired COVID-19 infection. Therefore, the aim of study is to assess knowledge, and practice of infection control measures among HCPs in Pakistan regarding COVID-19.

Material and Methods: An online survey-based study was conducted during the month of JUNE among healthcare professionals including doctors, dentists and paramedical staff. A self-administered questionnaire comprised of three sections (Demographics, Knowledge and practice) were used for data collection. Descriptive analysis was applied to calculate frequencies and proportions. The chi-square test was used to investigate the level of association among variables using SPSS version 24.

Results: Out of 508 respondents 65.7% doctors, 22.4% dentists and 11.8% paramedical staff contributed in this study. Most of them have good knowledge of COVID-19 regarding its origin, symptoms, complications, treatment and how to reduce its spread. Many of them were practising infection control measures to limit the spread of this highly communicable disease.

Conclusion: Health care providers in Pakistan have good knowledge about COVID 19 and practice all infection control measures to prevent this disease to be transmitted to other HCPs, their families and to other people.

Keywords: Health care providers (HCPs), Covid-19, knowledge, practise, infection control measures, acute respiratory distress

Introduction:

Today the world is facing a pandemic "COVID-19" which emerged in Wuhan City, Hubei Province, China in December 2019 as a case of Pneumonia of unknown origin.¹ Later it emerged as a global outbreak and World Health Organization (WHO) declared COVID-19 a public health emergency of international concern.² Globally, as of 15 July 2020, there have been 13,150,645 confirmed cases of COVID-19, including 574,464 deaths, reported to WHO.³

Coronavirus (CoV) infections are emerging respiratory viruses which cause illness ranging in severity from the common cold to severe and fatal illness.⁴ COVID-19 is spread by human-to-human transmission through droplets, feco-

oral, and direct contact and has an incubation period of 2-14 days.⁵ Till date there is no available vaccine although many attempts are under clinical trials. Several anti-viral, anti-malarials and immuno-modulators that have shown activity against SARS-CoV and Middle East coronavirus respiratory syndromes are being evaluated.⁶ Therefore, applying preventive measures to control COVID-19 infection is the most critical intervention.

Healthcare providers (HCPs) of all levels and groups are involved in caring for patients with this highly transmittable pathogen. COVID-19 has posed serious occupational health risks to HCPs due to their frequent exposure to infected individuals.⁷ Preventing intra-hospital transmis-

Table 1: Sociodemographics characteristics of health care providers N(508)

Characteristics	Participants n(%)
Gender	
Males	305 (60)
Females	203 (40)
Age range (in years)	
25-40	324(63.8)
41-55	161(31.7)
56-70	23(4.5)
Profession	
Doctors	334(65.7)
Dentists	114(22.4)
Paramedical staff	60(11.8)

sion of this communicable disease is therefore a priority.

In Pakistan, from February 26 to 15 July 2020, there have been 255,769 confirmed cases of COVID-19 with 5,386 deaths as per WHO.³ The Ministry of Health, Pakistan has declared new guidelines for infection control which are based on the WHO recommendations.⁸ However, the implementation of the basic infection control protocols is possible only when HCPs are made aware of the introduced policies by giving them clear guidelines. Awareness level and compliance of the healthcare providers are of utmost importance in the effective and timely prevention and control of this public health crisis.^{9,10}

So the aim of this study is to evaluate the knowledge of HCPs towards COVID 19 and application of infection control measures at their workplace to prevent this highly communicable disease to be transmitted to other HCPs, their families and to other people by avoiding occupational exposure.

Materials and Methods:

A web-based, cross-sectional study was conducted using a survey instrument to obtain responses from HCPs in Pakistan in June 2020. HCPs including doctors, dentists and paramedical staff participated in this study. A questionnaire was designed on Google forms, and a link was shared to WhatsApp groups of HCPs. The

link was also shared personally to HCPs in the contact lists of the investigators. Electronic informed consent was taken as it was written on the initial page of the survey. Participation in this survey was completely voluntary. Confidentiality of personal information was maintained throughout the study by making participants information anonymous.

The survey questionnaire consist of 20 questions which evaluate HCPs demographics (gender, age, profession), source of information, knowledge of Covid 19’s origin, symptoms, transmission, complications, treatment , prevention and the infection control measures taken at their workplace for the prevention of spreading this disease.

Data analysis: The obtained data were coded, validated, and analyzed using SPSS version 24 (IBM). Descriptive analysis was applied to calculate frequencies and proportions. The chi-square test was used to investigate the level of association among variables. A P value of less than 0.05 was considered statistically significant.

Results:

Google form questionnaire was sent to 550 HCPs out of which 508 completed the questionnaire (93% response rate). Out of 508 respondents 305 are males (60%) and 203 are females (40%). Most participants were below 40 years of age (n=324, 63.8%) and majority of participants were doctors (n=334, 65.7%) as shown in Table 1.

Knowledge about coronovirus: 97% (n=493) of total respondents heard about coronavirus from which 46.9% (n=238) heard about coronavirus from social media, 35.2% (n=179) from news, 16.5% (n=84) from official websites and only 1.4% (n=7) from family members. 67.3% (n=342) had attended the lecture on novel Covid-19. 87.4% (N=444) HCPs thought skin rash is not a symptoms of coronavirus. About the incubation period of coronavirus 53.3% (n=271) of respondents thought it was 2-14 days and 32% (n=163) considered incubation period of 7-14 days. 80.3% (n=408) HCPs considered bat

Table 2: Knowledge of health care professionals about Covid-19 N(508)

Knowledge	Doctors	Dentists	Paramedical staff	p-value
Have you heard of Novel Coronavirus?				.000
yes	329(64.8)	111(21.9)	53(10.4)	
no	5(1)	3(0.6)	7(1.4)	
maybe	0(0)	0(0)	0(0)	
Source of information?				.000
News	101(19.9)	49(9.6)	29(5.7)	
Social media	184(36.2)	30(5.9)	24(4.7)	
Official website	45(8.9)	33(6.5)	6(1.2)	
Family	4(0.8)	2(0.4)	1(0.2)	
Attended lectures?				.003
Yes	237(46.7)	75(14.8)	30(5.9)	
No	84(16.5)	38(7.5)	29(5.7)	
Maybe	13(2.6)	1(0.2)	1(0.2)	
Incubation period of covid-19(days)?				.000
2-7	43(8.5)	3(0.6)	6(1.2)	
2-14	154(30.3)	83(16.3)	34(6.7)	
7-14	121(23.8)	26(5.1)	16(3.1)	
7-21	16(3.1)	2(0.4)	2(0.2)	
None of the above	0(0)	0(0)	2(0.2)	
Symptoms of Covid-19 are all except?				.019
Headache	12(2.4)	1(0.2)	0(0)	
Fever	18(3.5)	2(0.4)	2(0.4)	
Cough	3(0.6)	0(0)	2(0.4)	
sore throat	18(3.5)	1(0.2)	5(1)	
skin rash	283(55.7)	110(21.7)	51(10)	
Origin of covid 19?				.000
Bats	290(57.1)	84(16.5)	34(6.7)	
Snakes	0(0)	0(0)	0(0)	
Fish	0(0)	0(0)	0(0)	
camel	0(0)	0(0)	0(0)	
Unknown	44(8.7)	30(5.9)	26(5.1)	
Transmission of covid 19?				.717
Air	10(2)	1(0.2)	2(0.4)	
Direct contact	40(7.9)	12(2.4)	8(1.6)	
Indirect contact	0(0)	0(0)	0(0)	
All of above	284(55.9)	101(19.9)	50(9.8)	
Complications of covid 19?				.008
Pneumonia	5(1)	1(0.2)	2(0.4)	
Respiratory failure	18(3.5)	0(0)	8(1.6)	
Death	2(0.4)	0(0)	0(0)	
All of above	309(60.8)	112(22.2)	50(9.8)	
Treatment of Covid -19?				.000
Supportive	289(56.9)	95(18.7)	40(7.9)	
Antiviral	17(3.3)	16(3.1)	13(2.6)	
Vaccination	11(2.2)	1(0.2)	0(0)	
None of above	17(3.3)	2(0.4)	7(1.4)	

Reduce risk of transmission?				.022
Hand hygiene	12(2.4)	390(6)	1(0.2)	
Covering nose	17(3.3)	1(0.2)	8(1.6)	
Avoid sick contacts	3(0.6)	0(0)	0(0)	
Well cooked meats	0(0)	0(0)	0(0)	
All of above	302(59.4)	110(21.7)	51(10)	

to be the origin of covid-19 but 19.7%(n=100) thought it was of unknown origin. Majority 85.6% (N=435) of HCPs thought transmission of covid-19 was through air by directly contact with infected person and also indirectly by touching the surfaces. Death, pneumonia and respiratory failures were the complications of covid-19 agreed by 92.94% (N=472) HCPs. Supportive therapy should be used to treat corona virus patients by 83.5% (N=425) while 9.1% (N=46) HCPs were of view that anti-viral would help in treatment of such cases. 91.1% (N=463) respondents believed that transmission of Covid 19 can be reduced by hand hygiene, covering the nose while coughing, avoiding sick contacts and by eating well cooked meat and eggs as shown in table 2.

Application of infection control measures at work place: Results showed that 61.2% HCPs (n=311) educate the patients about covid-19. 90% (n=457) respondents wash and disinfect their hands after contact with every patient. 98.4%(n=500) health care providers were using surgical masks and filtered masks were also be worn by 90.9% (n=462) HCPs. Gloves are used by all HCPs (100%). 90.6% (n=460) respondents kept the distance of 1-meter atleast with the patients and 79.7% (n=405) HCPs were also wearing either the gown or PPE while treating the patients as shown by table 3.

Discussions:

COVID-19 is an emerging, rapidly changing global health challenge affecting all sectors. HCPs are not only at the fore-front of the fight

Table 3: Health care professionals: Application of infection control measures at workplace to reduce Covid-19 N(508)

Application of SOPs	Doctors	Dentists	Paramedical staff	p-value
Education of patients?				.803
yes	202(39.8)	70(13.8)	39(7.7)	
no	132(26)	44(8.7)	21(4.1)	
maybe	0(0)	0(0)	0(0)	
Wash and disinfect hand with each patient?				.442
yes	303(59.6)	99(19.5)	55(10.8)	
no	31(6.1)	15(3)	5(1)	
maybe	0(0)	0(0)	0(0)	
Use of surgical masks?				.299
Yes	327(64.4)	114(22.4)	59(11.6)	
No	7(1.4)	0(0)	1(0.2)	
Maybe	0(0)	0(0)	0(0)	
Use of filtered mask (N95)?				.687
Yes	302(59.4)	106(20.9)	54(10.6)	
No	32(6.3)	8(1.6)	6(1.2)	
Maybe	0(0)	0(0)	0(0)	
Use of gloves?				*
Yes	334(65.7)	114(22.4)	60(11.8)	
No	0(0)	0(0)	0(0)	
Maybe	0(0)	0(0)	0(0)	
Keep distance of 1-meter with patients?				.029
Yes	295(58.1)	106(20.9)	59(11.6)	
No	7(1.4)	4(0.8)	1(0.2)	
Maybe	32(6.3)	4(0.8)	0(0)	
Use of PPE or gown?				.5
Yes	264(52)	95(18.7)	46(9.1)	
No	70(13.8)	19(3.7)	14(2.8)	
Maybe	0(0)	0(0)	0(0)	

against this highly contagious infectious disease but are also directly or indirectly affected by it and the likelihood of acquiring this disease more as compared to the general population. It is therefore of paramount importance that HCPs across the world have adequate knowledge about all aspects of the disease from clinical manifestation, diagnosis, proposed treatment, and established prevention strategies.¹¹

In this study 305 are males (60%) and 203 are females (40%). Most participants were below 40 years of age (n=324, 63.8%) and majority of participants were doctors (n=334, 65.7%). According to this study all health care providers have good knowledge of Covid-19 (97%) which is in

accordance with other study (93.2%) in Pakistan.⁷ Increase in knowledge has been shown in this study because the previous study mentioned was done in March which was the start of pandemic in Pakistan and this study has been done in June in the middle of pandemic. This study shows that 64.8% doctors, 21.9% dentists and 10.4% paramedical staff heard of coronavirus. P value .000 shows there is significant difference between profession and knowledge. This may be the reason that sample size is not equal in all professions who are contributing in this study. The main source of information for doctors, dentists and paramedics is social media. P-value of .000 also reflects that social media is the most important information source in our study. This finding is in accordance with study done by Huynh G¹² but not with Albarrak I's study¹³ in which he found highest main source being seminars and workshops (48%) and Abdel Wahed found physicians (29%), MOHP website (27%), and social media (20.6%) as their main source of informations.¹⁴ Our findings show that HCPs are more interested in social media to gather knowledge on an emerging infectious disease like COVID-19 than the official website. So it is needed that official websites should update knowledge and learning materials about this epidemic to encourage HCPs to access this channel for all health-related issues and information. Most doctors (46.7%) and dentists (14.8%) have attended the lectures. Nearly half of paramedical staff (5.9%) have also attended the lectures so lectures are helpful in knowing about this pandemic Covid-19 in detail. The incubation period of Covid-19 thought be 2-14 days by most respondents in this study 53.3% but 32% also believed to be 7-14 days. P value is significant (.000) and it may be explained by the fact that doctors contributing in this study is more than other profession. Most HCPs considered that skin rash is not the symptom of Covid-19. Initially it was not considered by WHO but now it is well established symptom of Covid-19. All HCPs have good in knowledge about origin, transmission, complications, treatment and how to reduce the risk of transmission of covid- 19 which is in accordance with other

studies.¹⁵ Although there is slight difference present as shown by P value. One possible explanation is difference in sample size and other reason for these differences in knowledge is that doctors are more educated in infectious diseases and pharmacotherapy because of their continuous professional development. Therefore, our findings suggest that greater encouragement from health authorities is needed to distribute COVID-19-related knowledge to all categories of HCPs.⁵

Practice of infection control measures at hospitals and clinics are very important to reduce the risk of transmission of this transmittable disease. WHO has given the guidance for HCPs to follow at hospital to avoid Covid-19's transmission.¹⁶ In the present study 61.8% of HCPs were educating their patients about covid-19. 90% were washing their hands before and after contacting with each patient as shown by other studies also^{11,17}. 98% HCPs used surgical masks and 90% were used filtered masks N95 also at their work place to protect themselves and others from spreading this disease. Other study also found that masks especially use of N95 masks while usual take care of patients had protective roles against COVID-19 among the physicians.¹⁸ Almost all the HCPs of this study were wearing gloves and 80% were wearing gown and PPE while treating the patients. PPE is a precious commodity for health personnel to protect them against infections 19.90% was able to maintain the distance of 1-meter with the patients for their safety but the rest of HCPs were not able because of their professional or procedural requirement. This study shows that overall knowledge of covid-19 and practice to control its spread is good in Pakistan as shown by other studies as well.²⁰

Conclusion:

Proper knowledge of Covid-19 is very important in handling the pandemics by health care providers. By assessing awareness and knowledge about the corona virus, deeper insights into practices can be gained which help HCPs in adopting healthy practices and responsive behaviour at their workplaces. This study shows that health care providers have good knowledge

of corona virus and practising every measure to prevent the spread of this pandemic.

Limitation: The limitation of study is small sample size and the responses of HCPs are self adopted at their workplaces. This study should be carried out at national levels with the help of government institutes so as to know the exact situation in all hospitals.

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Role and contribution of authors:

Dr Ghazala Suleman, collected the data, references and did the initial writeup.

Dr Kiran Suleman, critically review the article and made useful changes in the article

Dr Zahid Sarfraz, collected the data and helped in introduction writing.

Dr Zehra Iqtidar, collected the references and helped in discussion writing.

Dr Bilal Murtaza, collected the data, references and compiling the results.

Dr Nazish Gul, collected the data, references and helped in discussion writing.

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