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ORIGINAL ARTICLE

Knowledge, Attitude and Practices of Healthcare Providers about Covid-19 in Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

Objective: Healthcare providers (HCPs) are at the forefront and are at risk of being exposed to suspected cases of COVID-19. The objective of our study was to evaluate knowledge, attitude and practices of HCPs about COVID-19 in Khyber Pakhtunkhwa (KPK) province of Pakistan.

Methods: A cross-sectional survey was conducted online among HCPs that included physicians, dentists, pharmacists, nurses and technicians in KPK province. The validated questionnaire (Cronbach alpha= 0.61 & 0.69 respectively for knowledge & practice sections) related to COVID-19 including socio-demographics was asked. Data was analyzed using SPSS version 22.0.

Result: Out of 480 HCPs, 83.8% (n=402) were physicians & dentist, while 12.5% (n= 60) were pharmacist, nurses and technicians. We found that 86% of the HCPs had adequate knowledge. Most common reason for being worried about COVID-19 was risk to members of family and friends (98%), followed by dangers of disease itself (93%). Fear of infection and carrying it home was as high as 93% and 97% respectively. Around 75% of the HCPs had adequate score about practices.

Conclusion: HCPs in Pakistan has good knowledge and attitude related to COVID-19. However, one-fourth of the HCPs did not report good practices, which is alarming. There is a need to reinforce knowledge and monitor practices of HCPs regarding standard infection control practice.

Keywords: COVID-19; Healthcare providers; Knowledge; Attitudes; Practices; Pakistan

INTRODUCTION

2019's coronavirus disease epidemic (COVID-19) round the globe has affected almost all countries and the whole medical fraternity has been on the frontline to respond to this situation. This was called "severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)" due to its resemblances with SARS, the World Health Organization (WHO) named it "COVID-19" on 11th February, 2020 [1]. The epidemic was first classified by WHO as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020, and then on March 11 as a pandemic. To date (27 July, 2020), there are 16,264,048 confirmed cases of COVID-19 globally, including 274,288 cases from Pakistan. There has been 648,966 fatalities globally inclusive of 5,842 deaths in Pakistan [3]. According to the latest figures from the Government of Pakistan, 33,397 cases has been reported in Khyber Pakhtunkhwa (KPK) province till date (27 July, 2020) [4].

WHO recommends contact and droplet precautions for COVID-19. Airborne transmission is possible in aerosol-generating settings [5]. Healthcare providers (HCP) have a high risk of acquiring and spreading infections. Literature shows that not only do HCPs have a major role in the spread of the infection, there is also a significant percentage that ends up with notable morbidity and mortality [6]. In China, by early March, 2020, 3300 medical personnel have been infected with COVID-19 and around 22 died. In Italy, 20% of attending HCPs were infected and some have died [7]. To ensure an early end of this pandemic, medical staff should have a thorough understanding of the disease. Misinformed HCPs can delay the provision of treatment, can accelerate the spread of the disease and may end up jeopardizing the patient's health as well as their own [8].

A Chinese study regarding COVID-19 revealed that medical staff were well informed about the disease, and the large proportion among them was already trained in hospitals [9]. This high level of awareness was one of the many factors contributing to the exemplary control of COVID-19 in China [10]. There is limited evidence available globally and especially in Pakistan about knowledge, attitude and practices of HCPs about COVID-19. There is an immediate and dire need for such a survey amidst the COVID-19 crisis, as it will help us to assess and then devise an effective strategy to educate and train our frontline health workforce. This will also alleviate their personal fears, increase their confidence in providing guidance to patients and general public and make them better equipped to fight the war against COVID-19. Therefore we aimed to assess the knowledge, attitude, and practices of HCPs of KPK regarding COVID-19.

METHODS

Survey design and sampling strategy: Online cross-sectional research among HCPs was done in Khyber Pakhtunkhwa (KPK) province. Currently, 50,528 HCPs are working in the Department of Health (DOH) in KPK province which included 6531 physicians followed by 4672 nurses. Similarly, the private sector has 5,075 medical practitioners registered in the province [11].

HCPs included in our study were doctors, dentists, pharmacists, nurses, technicians, homeopaths and other paramedics as well. Between March 25 and April 8, 2020, a web-based self-administered questionnaire created on Google Forms was distributed to all HCPs through email, WhatsApp, Facebook and personal contacts of the research project team. It was unable to conduct one-on-one interviews with HCPs since the province was under a rigorous lockdown for the implementation of social distancing to prevent the spread of the pandemic, so the investigators decided to conduct the survey online using all possible means of contacting the HCPs to participate in our study. HCPs were enrolled based on convenience and the snowball sampling approach.

Sample size calculation: The purpose of our study was to estimate the proportion of appropriate knowledge and practises. Adequacy refers to knowledge of and adherence to important criteria. We chose 50% as the predicted percentage of acceptable knowledge and practise since it would result in the biggest sample size, and a minimum sample size of 377 was needed with a 95% confidence interval and a 5% margin of error.

Data collection instruments, measures and variables: The questionnaire was created by talking with and studying the most recent recommendations of international health organisations, such as the WHO and the US Center for Disease Control (CDC-US). There were a total of 25 questions in the questionnaire, which was split into 4 sections. The first component included sociodemographic data (age, gender, city of residence, type of

HCPs, professional qualification, and place of employment), whereas the second, third, and fourth sections evaluated HCPs' knowledge, attitudes, and practises in relation to COVID-19.

The following parts of knowledge about COVID-19 were evaluated: the causative organism, the incubation time and length of symptoms, the most typical signs and symptoms, the high-risk population, the mechanism of transmission, the therapy, and the preventative measures. A person was considered to have appropriate awareness of COVID-19 signs and symptoms if they cited four out of the six major signs and symptoms. We identified the mechanism of transmission for COVID-19, and participants were deemed to have appropriate knowledge if they could name at least four significant routes out of the possible seven. We also identified how frequently people have the wrong ideas about therapy, such as the use of antibiotics, antivirals, flu shots, and herbal remedies.

Those who had at least three accurate answers were considered to have sufficient understanding of COVID-19 treatment methods. Age 65 years, age 5 years, the existence of chronic diseases (diabetes, hypertension, asthma, and chronic obstructive pulmonary disease), pregnancy, individuals in crowded areas, having skin disorders, and seasonal flu were used to determine the level of knowledge about high-risk populations. HCPs were deemed to have sufficient knowledge of the high-risk population if they could identify at least four high-risk groups out of seven.

People were deemed to have appropriate knowledge of prevention if they properly identified the two preventative methods against COVID-19 that were asked for in the survey. There were 10 major categories in all, and participants were deemed to have "sufficient knowledge" if they could answer the questions correctly on seven out of ten of them.

A set of four attitude-related items were used to measure attitude toward the COVID-19, and responses were given on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." These are connected to disease transmission and prevention through limiting travel, employment, and general individual COVID-19 readiness. The 5-point Likert scale was reduced to 3-point replies, with "strongly disagree" and "disagree" being combined to become "disagree," "strongly agree" and "agree," and "don't know" serving as the middle option.

Practices regarding COVID-19 prevention: This part included four items regarding hand-washing, respiratory hygiene (coughing and sneezing etiquette and disposing of tissue) and wearing surgical masks. These items were recorded on a 3-point Likert scale ('never', 'sometimes', and 'always'). Participants' response "always" on three or more items was labeled as good practice. Cronbach's alpha coefficients of knowledge and practice sections were 0.61 & 0.69 respectively, while for attitude section it was found to be low (0.43). Attitude questions were referring towards different direction, as two questions were directing towards positive attitude while two were referring to negative attitude.

We circulated our online questionnaire to 10 HCPs from other provinces for checking the language and understanding level of the questions. We received minor feedback for some questions which were revised and corrected before circulating for the actual conduct of the survey.

Statistical Analysis: Analysis was done on IBM SPSS for Windows, v. 22.0 (IBM Corp., Armonk, USA). Mean and standard deviations were used to summarize quantitative variables. Qualitative variables e.g. gender, city of residence, type of HCPs, professional qualification and place of work were summarized percentage and frequencies. We reported frequencies and percentages for each item of knowledge, attitude and practices related to COVID-19 pandemic. Moreover, prevalence of adequate knowledge and practices were calculated based on individual items and pre-defines cut-off.

Ethical Approval: This study was approved by local medical college Scientific Research Ethical Committee (ref. no. WMC/ERC/1415). Participants provided informed consent before proceeding to fill the survey form.

RESULTS

Characteristics of participants: The survey questionnaire was completed by 480 individuals in total. Among them, 402 (83.8%) were doctors and dentists, while 60 (12.5%) were pharmacists, nurses and technicians. The mean age was 31.3 ± 7.7 years. Around 59.8% of the participants were between the ages of 18 and 30. Around 51.2 % were men and 51.9% were graduates. About 69.2% HCPs were working in government hospitals. (Table 1).

Knowledge about common signs and symptoms: About three-fourth of the participants knew the causative agent SARS-COV-2. About, 98.5% of the participants believed in close interaction with an infected person as the most significant risk factor, whereas 76.0% accurately knew about the appearance of symptoms after exposure. A good proportion (92-95.5%) had correct knowledge of COVID-19 sign and symptoms; fever, cough, and shortness of breath.

Knowledge about mode of transmission: Around 69-93% participants knew that touching contaminated objects, coughing and sneezing and shaking hands are modes of transmission. Furthermore, 67-97% participants knew that sexual contact with an infected person, dust, blood transfusion and mosquito bite had no role in transmission.

Knowledge about treatment of COVID-19: Around two thirds of the respondents (67-70%) believed that antibiotics and flu vaccine are not effective in treatment against COVID-19, however, 66% and 58% believed that antivirals and use of onion, lemon or garlic respectively are potential treatments of COVID-19.

Table 1: Socio-demographic characteristics of healthcare providers of KPK enrolled in the study (n=480)

Characteristics		
	n = 480	%
Gender		
Male	246	51.2
Female	234	48.8
Age(Years) Mean (SD)	31.35±7.77	
18-30 years	287	59.8
31-39 years	127	26.5
≥ 40 years	66	13.8
City of Residence		
Abbottabad–Manshera-Haripur	294	61.3
Peshawar	104	21.7
Other cities	82	17.1
Health Care Providers		
Doctors & Dentist	402	83.8
Pharmacist, nurse & technician	60	12.5
Others	18	3.8
Type of Facility		
Public	356	74.2
Private	124	25.8
Professional Qualification		
Graduate (MBBS, BDS, PharmD, BScN)	249	51.9
Postgraduate (any degree after graduation)	185	38.5
Diploma & others	46	9.6
Place of work		
Govt. hospital	332	69.2
Private hospital	63	13.1
Others	85	17.7

Knowledge of high-risk segment of the population: Around 95% of participants considered age more than 65 years as a high-risk segment of the population, 94% believed people suffering from some chronic diseases and 85 % labeled crowded places as high risk.

Knowledge about duration of symptoms, quarantine and preventive measures: The majority of the respondents 97% agreed that in case of contact with corona patient one should observe isolation. Furthermore, 68% of the participants knew that 11-14 days of isolation are required in case of exposure. All the respondents agreed that hand washing can decrease the risk of disease spread. However, only 45% of the respondents believed that simple surgical masks are effective in reducing the risk.

Regarding overall knowledge of COVID-19 infection among HCPs in KPK, 86% HCPs had adequate knowledge (Table 2).

Table 2: Knowledge and attitude towards COVID-19 infection among health care providers in KPK (n=480)

Knowledge items	n = 480	%
Corona Virus Disease is caused by SARS-CoV-2 (Correct Response)	357	74.4
Close contact with infected person is most important risk factor (Correct Response)	473	98.5
How many days for corona virus symptoms to appear after person gets exposed (2-14 days) (Correct Response)	365	76.0
Knowledge of signs and symptoms of COVID-19 (Correct Response)		
Fever (Yes)	459	95.6
Cough (Yes)	456	95.0
Shortness of breath (Yes)	436	90.8
Hemoptysis (No)	443	92.3
Sore throat (No)	155	32.3
Joint/muscle pain (Yes)	293	61.0
Knowledge about mode of transmission of COVID-19 (Correct Response)		
Touching soiled (contaminated) objects (Yes)	332	69.2
Coughing and sneezing (Yes)	446	92.9
Dust (No)	420	87.9
Blood transfusion (No)	425	88.9
Shaking hands (Yes)	419	87.7
Mosquito bite(No)	463	96.9
Having sexual contact with an infected person (No)	331	69.0
Knowledge about treatment of COVID-19 (Correct Response)		
Antibiotics are effective in treatment of COVID-19 (No)	324	67.5
Antivirals are effective in treatment of COVID-19 (No)	164	34.2
Flu vaccine is effective in prevention of COVID-19 (No)	337	70.2
Using onion, lemon or garlic is protective against COVID-19 (No)	202	42.1
Knowledge of high risk segment of population (Correct Response)		
Age more than 65 years (Yes)	458	95.4
Age less than 5 years (No)	186	38.8
Chronic diseases (Diabetes, hypertension, Asthma, COPD (Yes)	450	93.8
Pregnancy (No)	243	49.2
Those in crowded places (Yes)	409	85.4
Skin disorders (No)	413	86.4
Seasonal flu (No)	365	76.4
Knowledge of needed for isolation/quarantine after exposed with suspected COVID 19 (Correct Response)		
If a person comes in contact with corona virus patient, does he/she require isolation? (Yes)	466	97.1
Knowledge of duration of symptoms after COVID 19 (Correct Response)		
In case of exposure or infection, the isolation required for 11-14 days. (Yes)	326	67.9
Knowledge about preventive measures of COVID 19 (Correct response)		
In routine practice in health care settings, simple surgical mask is effective in reducing the risk. (Yes)	216	45.0
Washing hands with soap or alcohol based rub can decrease the risk of diseases transmission. (Yes)	480	100
Composite Knowledge		
Adequate	86.5 %	
Inadequate	13.5 %	
Attitude items		
My worriedness about Corona Virus Disease is:	n = 480	%
Dangers of disease		
Yes	448	93.3
No	32	6.7
Risk to family and friends		
Yes	470	97.9
No	10	2.1
Social isolation		
Yes	436	90.8
No	44	9.2
I am afraid of getting disease during my work.		
Agree	446	93.1
Disagree	23	4.8
Don't know	10	2.1
I am afraid of carrying infection from my workplace to my home		
Agree	468	97.5
Disagree	4	0.8
Don't know	8	1.7
I feel that someone who has flu-like illness should cover his mouth and nose with a hand kerchief when coughing or sneezing		
Agree	464	97.1
Disagree	13	2.7
Don't know	1	0.2
If I develop flu like symptoms, I must avoid normal activities such as going to work, travel, shopping etc.		
Agree	439	92.4
Disagree	29	6.1
Don't know	7	1.5
I find it difficult to obtain protective equipment (masks, gloves, etc) in sufficient quantity at my work place.		
Agree	432	90.1
Disagree	36	7.5
Don't know	9	1.9
My workplace is well prepared for COVID-19 pandemic.		
Agree	103	21.5
Disagree	327	68.1
Don't know	49	10.2

Table 3: Practices regarding prevention of COVID-19 among health care providers in KPK (n=480)

Variables	Always n (%)	Sometimes n (%)	Never n (%)
I clean my hands with soap or alcohol based rub before and after exposure with patient or any other care related material.	467 (97.3)	13 (2.7)	0.0
I cover my nose and mouth with the bend of elbow or tissue during sneezing or coughing.	467 (97.3)	13 (2.7)	0.0
I throw the used tissue in the trash.	464 (96.7)	11 (2.3)	5 (1.0)
I wear surgical mask during my work	448 (93.3)	17 (3.5)	15 (3.1)
I feel confident enough to educate my patients about COVID-19 (%)			
Yes	355 (74.0)		
To some extent	7 (1.5)		
No	118 (24.6)		
Composite Practice			
Adequate	74.6 %		
Inadequate	25.4 %		

Attitude towards COVID-19 infection: Large number of participants 93% and 98% had worries about disease risk to their family and friends respectively. Furthermore, 91% of the participants were worried about isolation. Majority of the respondents 93%% and 97 % agreed that they are afraid of contracting infection at work and transfer it to their home respectively. A higher percentage of participants 97% agreed that a person should cover his mouth and nose with a handkerchief when coughing or sneezing. Furthermore, 92% participants agreed to restrict activities should flu-like symptoms appears.

About 90% of participants agreed that it was difficult to obtain personal protective equipment PPEs (masks, gloves, etc.) in sufficient quantity at their workplace, furthermore, only 21% agreed that their organization is well prepared for COVID-19 (Table 2).

Practices regarding COVID-19: Nearly all of the study participants 97% always practice to clean hands before and after exposure with the patient and practicing sneezing or coughing etiquette. Moreover, 97% participants reported throwing used tissue in the trash and 93% participants wore surgical masks during work. Higher proportion of study participants (74%) had confidence that they can educate their patients about COVID-19. The overall adequate practice of COVID-19 infection among HCPs in KPK was 75 % in survey population (Table 3).

We also performed multivariate analysis showing the association of socio-demographic variables with adequate knowledge and adequate practices towards COVID-19. We only found that significantly higher proportion of doctors had adequate knowledge as compared to other HCPs. Hence, we decided not to present this table in our main manuscript and attached it in supplementary files.

DISCUSSION

This study is one of the few studies conducted to assess the knowledge, attitude and practices of HCPs about COVID-19 globally and among first studies in Pakistan. We found that 86% of the HCPs had adequate knowledge. Most common reason for being worried about COVID-19 was risk to friends and family members, followed by dangers of the disease itself. Fear of contracting the infection and transmitting it home was high 93% and 97% respectively. Majority 90% reported difficulty in getting PPEs and only small proportion (21%) agreed that their organization was well equipped for the COVID-19 pandemic. Three fourth of the HCPs had adequate score about practices.

In order to prevent and control an epidemic, proper knowledge of HCPs about the disease is an important factor [12]. This will not only help them protect themselves from the infection during their practice, but also provide proper health education to the community. Our study found that 86% of the HCPs had adequate knowledge about the disease. This proportion is comparable to 89% reported in a recent study among Chinese healthcare workers (HCWs) at the beginning of COVID-19 outbreak [13]. Even higher proportion (93%) HCWs were reported to have good knowledge from Pakistan [14].

One study from Pakistan by Saqlain M et al. also studied knowledge, attitude and practices of (HCWs) [14]. In our study, 98.5% of the participants assumed close interaction with an infected person is an important risk factor which is similar to this study where 99% of the (HCWs) reported close contact as an important risk factor. However, knowledge about incubation period was lower in our study 76% as compared to 96%. Knowledge about the common symptoms of COVID-19 in our study was similar to Saqlain M et al.[14] Proportion of HCPs considering antibiotics effective against COVID-19 was higher in our study 33% compared to 18%. Similarly, correct knowledge about flu vaccine as being effective against COVID-19 was lower in our study 70% versus 77%. However, knowledge about high-risk groups was higher in our study 94% versus 79% in Saqlain M et al.[14] Another study among dentists globally reported that 97% of the participants reported that they were aware of the mode of transmission of COVID-19,[15] which is higher than our study. However, this may be overestimation due to social desirability bias because the authors did not ask about specific modes of transmission.

In our study, 93% of the respondents were worried about the dangers of the disease. A study from Saudi Arabia during MERS-CoV epidemic reported about 70% of HCWs were worried about the dangers of disease [16]. Another study from Greece reported this proportion to be 55% about H1N1 disease [17]. In our study, 93% of the respondents were afraid of contracting infection at work. This is higher than Chinese HCWs (85%) [13] and dentists globally (87%) [15]. These higher levels of worriedness and fears in our study could be attributed to large scale spread of disease globally as compared to MERS-CoV and H1N1 and earlier study from China about COVID-19 when the disease was mainly restricted to China only.

Knowledge about the disease and positive attitudes are not sufficient to prevent and control a disease unless coupled with adequate practices. We found that about 75% of our HCPs had adequate practices. This proportion is lower than reported by Saqlain M. et al. [14] where about 89% of the workers were reported to have good practices. Study from China also reported higher proportion (90%) of HCWs to have good practices [13]. This finding has important policy implications as quarter of the health workforce does not practice adequate. This is not only harmful for them as this may prone workers to COVID-19 infection but also a risk of spread of disease to other patients, colleagues and family members.

Majority (97%) of our participants mentioned using soap or alcohol-based rub for cleaning hands after patient encounter which is comparable to 96% reported elsewhere [14]. Another study from Saudi Arabia during MERS-CoV outbreak reported even lower proportion (86%) of HCWs always or very often cleaning their hands after patient encounters [18]. Covering mouth and nose while sneezing or coughing was high (97%) in our study compared to about 92% in Saqlain el al. study [14]. These differences in knowledge, attitude and practices across different studies could be due to differences in tools used for measurement of knowledge, operational definition of adequacy of KAP and study settings in which studies were conducted.

This study comprehensively assessed KAP of HCPs about COVID-19. We assume that our estimates are precise as participation in our study was higher and we recruited a larger sample than required as per priory sample size calculation. However, there are certain limitations that need consideration. Firstly, because of lockdown, since face-to-face interviews were not possible, we used an online survey; the response rate cannot thus be determined. Secondly, this study included HCPs from one province only. However, we assume that, this may not limit the generalizability of our study to the whole country, as currently there is uniform national response to the COVID-19 pandemic across the country. National guidelines and protocols are shared with HCPs in all provinces uniformly. Another limitation was low Cronbach alpha

value for attitude section in our questionnaire; this was because of different direction questions in this domain.

CONCLUSION

In summary, there was good knowledge and attitude of HCPs regarding COVID-19. However, one-fourth of the HCPs did not report good practices, which is alarming. There is a need to reinforce knowledge and monitor practices of HCPs regarding standard infection control practices. Provision of adequate amount of protective supplies such as masks, gowns, gloves, face shields, soaps and other disinfectant is essential for a conducive environment to ensure good practices among HCPs.

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