

## THE KNOWLEDGE AND PERCEPTION OF COVID-19 AND ITS PREVENTIVE MEASURES, IN PUBLIC OF PAKISTAN

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### ABSTRACT

**Objective:** To study the perception of COVID-19 and its prevention in the general public.

**Study Design:** Cross-sectional study conducted using convenient sampling technique.

**Place and Duration of Study:** In Islamic Republic of Pakistan, from 1<sup>st</sup> Apr to 12<sup>th</sup> Apr 2020.

**Methodology:** An online questionnaire was made on Google Forms Inc. It was modified from an online questionnaire available free on the internet. The sample size was 1042. Frequencies and percentages were calculated for categorical variables. Mean and standard deviation was calculated for continuous data and chi-square and t-test were applied for statistical significance between healthcare providers and non-healthcare providers.

**Results:** A total of 97% people thought that older adults were more likely to develop complications. Most of the participants thought that use of face mask (91%), washing hands (99.4%), avoiding close contact with sick people (97.8%) and not touching the face with unwashed hands (98.7%) should be used as a preventive measure. Majority were aware of the common symptoms of the disease. Statistically significant difference between some perceptions of healthcare providers and non-health care providers was observed with myths prevailing more in the health care providers, these are; rinsing mouth and nose with saline for prevention (59.9%) and skin rash (8.9%) and watery diarrhea (47.8%) as common symptoms. 85.2% of the participants believed that "kalonji" and 81.6% believed that antimalarials may be effective in prevention or treatment of the disease.

**Conclusions:** The participants showed a high level of knowledge regarding the pandemic but certain myths are also prevalent.

**Keywords:** Complications, COVID-19, Health care providers, Myths, Preventions.

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### INTRODUCTION

The novel corona virus disease 2019 also known as nCov-19 or simply COVID-19 is a viral disease that first appeared in Wuhan, China and has now involved more than 200 countries. As of 10<sup>th</sup> April 2020 10:00 CET, the total number of reported cases was 1,521,252 with more than 92,000 deaths, thereby indicating its potential for global spread into a pandemic beyond imagination<sup>1</sup>. It is caused by Severe Acute Respiratory Distress Syndrome Coronavirus-2 (SARS-CoV-2). The virus belongs to the beta-corona virus cluster and is a type of zoonotic virus. It is homologous to SARS-CoV which was responsible for causing severe acute respiratory syndrome (SARS) in 2002. In contrast to SARS, COVID-19 has a lower

morbidity and mortality rate but a higher transmissibility than SARS<sup>2</sup>. Another member of this family is MERS-CoV, responsible for the Middle East respiratory syndrome outbreak in 2012 which was also responsible for significant health concerns<sup>3</sup>.

The spread of this novel coronavirus was initially associated with a live seafood market in Wuhan<sup>4</sup>. Later, the virus spread between humans by various means including droplet transmission, airborne transmission and with some evidence indicating possible feco-oral routes as well<sup>5</sup>. Novel coronavirus uses angiotensin converting enzyme-2 receptors to gain entry into the cells. These receptors are widely expressed at multiple sites in the human body but are more specifically present in type II alveolar cells of lungs<sup>6</sup>. On average, the incubation period is less than 14 days with the median being 4 days<sup>7</sup>. The presenting symptoms include fever, fatigue, dry cough,

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myalgias, dyspnea, and occasionally watery diarrhea<sup>8</sup>. The course of this illness is variable, with different degrees of severity. It ranges from asymptomatic or mild symptoms to severe ARDS (Acute Respiratory Distress Syndrome) requiring mechanical ventilation<sup>9</sup>. Although multiple drug trials are underway all over the world, currently, there are no specific approved treatments and patients are being managed symptomatically<sup>10</sup>. As it is caused by a zoonotic virus, the entire human population has no preformed immunity to it, and considering the limited treatment options, the best approach available to the health care organizations is to promote preventive strategies to combat this novel virus and the disease it causes.

The disaster of COVID-19 is unprecedented and the media all over the world is flooded with varying information regarding this novel virus and its related disease. However, the unanimous opinion is that it is very contagious and people all over the world are resorting to prevention as probably the most effective tool. Amidst this torrent of media information, a lot of false concepts are also being conveyed to the public. As human behavior is immensely affected by a person’s knowledge, perception and awareness<sup>11</sup>, clarifying the perceptions of the general public may prove to be crucial in determining the outcome of COVID-19.

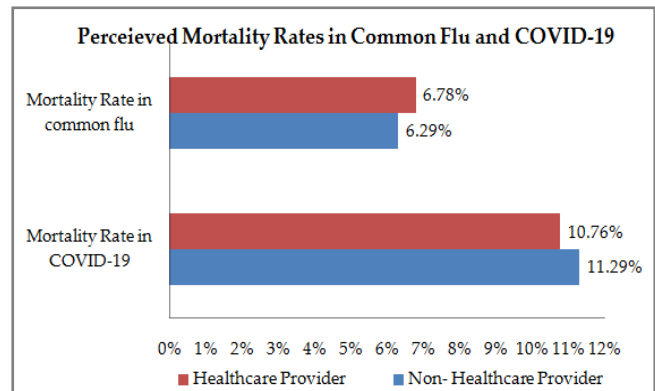
With this background in mind, the present project has been designed to study the knowledge and perception of COVID-19 and its preventive measures, in the public of Pakistan. It is hoped that this will help the health policy makers to plan awareness programs and clarify the existing myths surrounding it.

**METHODOLOGY**

After obtaining ethical approval (FF/FUMC /215 Phy/20), a cross sectional study was conducted on the public of Pakistan from 1<sup>st</sup> April to 12<sup>th</sup> April 2020. Convenient sampling technique was used to send an online questionnaire made on Google Forms Inc. via social mediato accessible contacts. The questionnaire

was modified and adapted from an online questionnaire available free on the internet for unrestricted reuse for the purpose of research<sup>12</sup>. The sample size was calculated using a cross sectional study sample size calculator from openepi.com, an open source calculator, recommended by Center of Disease Control, America. The confidence level was taken as 95% and the margin of error acceptable was taken as 5%, whereas the anticipated percentage frequency was taken as 50%. The calculator computed the sample size as 385. The submission of data was permitted for two days and the number was not restricted to 385, so as to increase the statistical power of the study. Consequently, the number was inflated to a sample size of 1042 as these were the number of responses received. Inclusion criteria included; individuals with access to cell phones and internet and residents of Pakistan. Exclusion criteria was ages below 16 and above 85 year of age.

Consent was taken before the initiating the filling of questionnaire. The questionnaire consis-



**Figure: The Perception of mortality rate in COVID 19 and common flu in the healthcare providers and non-healthcare providers.**

ted of questions regarding the knowledge and perception of COVID-19, including specific questions regarding common myths, listed on the WHO website under the section “Myth Busters”<sup>13</sup>.

Data was entered into SPSS-26. Frequencies and percentages were calculated for categoric variables. To summarize the survey findings, a few variables were dichotomized. Mean and

standard deviation was calculated for continuous data. Additionally, chi-square and t-test were also applied to calculate the statistical significance between incidentally emerging occupational

**RESULTS**

One thousand and forty-two people responded and submitted the questionnaire out of which 647/1042 (62.1%) were females and 395/

**Table-I: Responses of various questions from Questionnaire.**

Questions from Questionnaire	Responses	Total Frequency (%) N=1042	Non-Health Care Providers Frequency (%) N=649	Healthcare Providers Frequency (%) N=393
"Do you think it would be sensible for you to not eat out from a restaurant for the next few weeks to reduce the risk of getting infected with the new coronavirus?"	No	458 (44.0%)	325 (50.1%)	133 (33.8%)
	Yes	584 (56.0%)	324 (49.9%)	260 (66.2%)
	Statistical Significance	<i>p</i> <0.001*		
"Are those with other health problems more likely to develop complications from an infection with the new coronavirus disease than those without any other health problems?"	No	39 (3.7%)	31 (4.8%)	8 (2.0%)
	Yes	1003 (96.3%)	618 (95.2%)	385 (98%)
	Statistical Significance	<i>p</i> =0.024*		
"Is there currently a vaccine available that protects against infection with the new coronavirus?"	No	1014 (97.3%)	630 (97.1%)	384 (97.7%)
	Yes	28 (2.7%)	19 (2.9%)	9 (2.3%)
	Statistical Significance	<i>p</i> =0.537		
"Are there any specific approved clinically tested medicines to prevent or treat COVID-19?"	No	926 (88.9%)	586 (90.3%)	340 (86.5%)
	Yes	116 (11.1%)	63 (9.7%)	53 (13.5%)
	Statistical Significance	<i>p</i> =0.060		
"Are antibiotics effective in treating and preventing the new corona virus?"	No	940 (90.2%)	580 (89.4%)	360 (91.6%)
	Yes	102 (9.8%)	69 (10.6%)	33 (8.4%)
	Statistical Significance	<i>p</i> =0.239		
"In your opinion, should congregational prayers be temporarily restricted to only 5 people as per government orders?"	No	85 (8.2%)	61 (9.4%)	24 (6.1%)
	Yes	957 (91.8%)	588 (90.6%)	369 (93.9%)
	Statistical Significance	<i>p</i> =0.060		
"Will limiting congregational prayers help control and contain the spread of coronavirus?"	No	51 (4.9%)	38 (5.9%)	13 (3.3%)
	Yes	991 (95.1%)	611 (94.1%)	380 (96.7%)
	Statistical Significance	<i>p</i> =0.065		
"Do you think it is likely that the new coronavirus is a bioweapon developed by a government or terrorist organization?"	Unlikely	576 (55.3%)	320 (49.3%)	146 (37.2%)
	Likely	466 (44.7%)	329 (50.7%)	247 (62.8%)
	Statistical Significance	<i>p</i> <0.001*		
"How many people do you think will die in Pakistan from the new corona virus by the end of 2020?"	≤10,000	774 (74.3%)	457 (70.4%)	317 (80.7%)
	>10,000	268 (25.7%)	192 (29.6%)	76 (19.3%)
	Statistical Significance	<i>p</i> <0.001*		
"If you were an Uber driver, would you try to reject ride requests from people with foreign sounding names (or profile photo) to reduce your risk of getting infected with the new coronavirus?" Other**: Always, Often, Sometimes	Never	390 (37.4%)	287 (44.2%)	103 (26.2%)
	Other**	652 (62.6%)	362 (55.8%)	290 (73.8%)
	Statistical Significance	<i>p</i> <0.001*		
"Consistently wearing a facemask is 95% effective in protecting you from getting infected from corona."	False	519 (49.8%)	329 (50.7%)	190 (48.3%)
	True	523 (50.2%)	320 (49.3%)	203 (51.7%)
	Statistical Significance	<i>p</i> =0.463		
"If you have a fever or cough or spent time with someone who did, what would be the best course of action?" *Option 1: Stay at home and call your primary care doctor/corona helpline.	Option 1*	334 (32.1%)	202 (31.1%)	132 (33.6%)
	Other	708 (67.9%)	447 (68.9%)	261 (66.4%)
	Statistical Significance	<i>p</i> =0.409		

\*Statistically Significant

groups (healthcare providers and non-healthcare providers). The *p*-value ≤0.05 was taken as statistically significant.

1042 (37.9%) were males. 43% of the participants were from Islamabad, 37% from Punjab, while the remaining responses were from other pro-

vinces of Pakistan. Seventy seven percent of the respondents had completed more than 12 years of education.

Seventy four point three percent thought that by the end of 2020, less than 10,000 people

adults were more likely to develop complications, whereas 19.1% (199/1042) thought children, and only 12% (127/1042) thought that young adults were more susceptible to complications of the disease.

**Table-II: Responses regarding perceptions about preventing Infection by coronavirus.**

**Q. "Which of the following actions help prevent catching an infection with the new virus?"**

Variable	Responses	Total Frequency (%) N=1042	Non-Healthcare Providers Frequency (%) N=649	Healthcare Providers Frequency (%) N=393
Wearing a facemask	False	94 (9%)	75 (11.6%)	19 (4.8%)
	True	948 (91%)	574 (88.4%)	374 (95.2%)
	Statistical Significance		$p < 0.001^*$	
Getting vaccination against pneumonia	False	902 (86.6%)	564 (86.9%)	338 (86%)
	True	140 (13.4%)	85 (13.1%)	55 (14%)
	Statistical Significance		$p = 0.680$	
Gargling mouth wash	False	436 (41.8%)	285 (43.9%)	151 (38.4%)
	True	606 (58.2%)	364 (56.1%)	242 (61.6%)
	Statistical Significance		$p = 0.082$	
Washing your hands	False	6 (0.6%)	3 (0.5%)	3 (0.8%)
	True	1036 (99.4%)	646 (99.5%)	390 (99.2%)
	Statistical Significance		$p = 0.534$	
Eating Garlic	False	844 (81.0%)	531 (81.8%)	313 (79.6%)
	True	198 (19.0%)	118 (18.2%)	80 (20.4%)
	Statistical Significance		$p = 0.386$	
Avoid close contact with people who are sick	False	23 (2.2%)	14 (2.2%)	9 (2.3%)
	True	1019 (97.8%)	635 (97.8%)	384 (97.7%)
	Statistical Significance		$p = 0.887$	
Taking antibiotics	False	976 (93.7%)	605 (93.2%)	371 (94.4%)
	True	66 (6.3%)	44 (6.8%)	22 (5.6%)
	Statistical Significance		$p = 0.448$	
Using a hand dryer	False	845 (81.1%)	519 (80%)	326 (83%)
	True	197 (18.9%)	130 (20%)	67 (17%)
	Statistical Significance		$p = 0.233$	
Putting sesame oil on your skin	False	969 (93.0%)	603 (92.9%)	366 (93.1%)
	True	73 (7.0%)	46 (7.1%)	27 (6.9%)
	Statistical Significance		$p = 0.894$	
Avoiding touching your eyes, nose and mouth with unwashed hands.	False	14 (1.3%)	9 (1.4%)	5 (1.3%)
	True	1028 (98.7%)	640 (98.6%)	388 (98.7%)
	Statistical Significance		$p = 0.876$	
Regularly rinsing your nose with saline	False	570 (54.7%)	389 (59.9%)	181 (46.1%)
	True	472 (45.3%)	260 (40.1%)	212 (53.9%)
	Statistical Significance		$p < 0.001^*$	
Corona virus can be transmitted in hot and humid climates.	False	393 (37.7%)	252 (38.8%)	141 (35.9%)
	True	649 (62.3%)	397 (61.2%)	252 (64.1%)
	Statistical Significance		$p = 0.341$	
A hot bath can prevent the virus transmission	False	662 (63.5%)	413 (63.6%)	249 (63.4%)
	True	380 (36.5%)	236 (36.4%)	144 (36.6%)
	Statistical Significance		$p = 0.928$	

\*Statistically Significant

would have died of COVID-19. Ninety seven percent (1008/1042) people thought that older

Majority of participants thought that use of face mask (91%), washing hands (99.4%),

avoiding close contact with sick people (97.8%), and not touching the face with unwashed hands (98.7%) are effective preventive measures (table-II). Regarding the symptoms of COVID-19, majority of the participants claimed that the most common symptoms were cough (99.1%), fever (99%), shortness of breath (98.9%) (table-III). Regarding the preventive measures taken by the government most of the respondents agreed that quarantine of everyone from abroad (97.7%),

significant difference between the perceptions of these two groups. These perceptions were; about eating out, the number of people dying from corona virus, use of mask for prevention and that people should be home bound unless necessary with health care provider being significantly better informed. Statistically significant difference in these two groups was also found in false perceptions related to rinsing mouth and nose with saline for prevention, skin rash and watery

**Table-III: Perceptions regarding Symptoms of COVID 19.**

**Q. "What are common signs or symptoms of an infection with the new coronavirus?"**

Variable	Responses	Total frequency (%) N=1042	Non-Healthcare Professional, Frequency (%) N=649	Healthcare Professional Frequency (%) N=393
Nose bleeds	False	982 (94.2%)	609 (93.8%)	373 (94.9%)
	True	60 (5.8%)	40 (6.2%)	20 (5.1%)
	Statistical Significance		$p=0.471$	
Cough	False	9 (0.9%)	5 (0.8%)	4 (1.0%)
	True	1033 (99.1%)	644 (99.2%)	389 (99.0%)
	Statistical Significance		$p=0.676$	
Fever	False	10 (1.0%)	4 (0.6%)	6 (1.5%)
	True	1032 (99.0%)	645 (99.4%)	387 (98.5%)
	Statistical Significance		$p=0.144$	
Skin Rash	False	972 (93.3%)	614 (94.6%)	358 (91.1%)
	True	70 (6.7%)	35 (5.4%)	35 (8.9%)
	Statistical Significance		$p=0.028^*$	
Constipation	False	980 (94.0%)	605 (93.2%)	375 (95.4%)
	True	62 (6.0%)	44 (6.8%)	18 (4.6%)
	Statistical Significance		$p=0.146$	
Shortness of breath	False	11 (1.1%)	6 (0.9%)	5 (1.3%)
	True	1031 (98.9%)	643 (99.1%)	388 (98.7%)
	Statistical Significance		$p=0.594$	
Frequent Urination	False	1018 (97.7%)	633 (97.5%)	385 (98.0%)
	True	24 (2.3%)	16 (2.5%)	8 (2.0%)
	Statistical Significance		$p=0.654$	
Watery Diarrhea	False	625 (60.0%)	420 (64.7%)	205 (52.2%)
	True	417 (40.0%)	229 (35.3%)	188 (47.8%)
	Statistical Significance		$p<0.001^*$	

\*Statistically Significant

closing schools (97.4%), forbidding mass gathering (97.6%) and limiting congregational prayers (95.1%) were positive steps taken by the government (table-IV).

About 38% of all the participants were healthcare providers, therefore incidentally two occupational groups emerged from the data; healthcare providers and non-health care providers. Analysis of results revealed statistically

diarrhea as symptom. In these variables a greater percentage of non- health care providers were holding a false impression. The percentages and  $p$ -value are given in table-I-IV. Regarding the likelihood of coronavirus being developed as a bioweapon, only 49.3% of non-healthcare providers and 37.2% of healthcare providers considered it unlikely to be so. This difference in opinion was statistically significant with a  $p$ -

value of  $p < 0.001$ . The mean perception regarding the distance travelled by corona virus was 5.1 feet.

Regarding unapproved treatment of the disease, 85.2% of the participants believed that "kalonji" (*Nigella sativa* L. seed) and 81.6% believed that antimalarials are or may be effective in prevention or treatment of the disease.

Regarding the personal preventive measures, majority of the participants were well aware about the use of facial masks, avoiding close contact with sick people and avoiding touching hands to the face. All these have been recommended as important preventive measures<sup>2</sup>. There has been a wide debate and confusion regarding the use of facemasks by the general public with the governments and WHO changing statements

**Table-IV: Responses regarding Preventive Measures against Corona Virus.**

**Q. "At this point in the pandemic, do you think your government should implement the following measures to prevent the spread of the virus?"**

Variable	Responses	Total Frequency (%) N=1042	Non-Healthcare Provider Frequency (%) N=649	Healthcare Provider Frequency (%) N=393
Quarantine everyone coming in from abroad for 14 days	No	24 (2.3%)	19 (2.9%)	5 (1.3%)
	Yes	1018 (97.7%)	630 (97.1%)	388 (98.7%)
	Statistical Significance		$p=0.084$	
Suspend all air travel to and from the country	No	101 (9.7%)	69 (10.6%)	32 (8.1%)
	Yes	941 (90.3%)	580 (89.4%)	361 (91.9%)
	Statistical Significance		$p=0.188$	
Go door to door to measure everyone's temperature	No	781 (75.0%)	481 (74.1%)	300 (76.3%)
	Yes	261 (25.0%)	168 (25.9%)	93 (23.7%)
	Statistical Significance		$p=0.422$	
Close all schools	No	27 (2.6%)	22 (3.4%)	5 (1.35)
	Yes	1015 (97.4%)	627 (96.6%)	388 (98.7%)
	Statistical Significance		$p=0.037$	
Forbid any mass gathering	No	25 (2.4%)	17 (2.6%)	8 (2.0%)
	Yes	1017 (97.6%)	632 (97.4%)	385 (98.0%)
	Statistical Significance		$p=0.551$	
Make it mandatory for adults to wear a face mask when out doors	No	204 (19.6%)	125 (19.3%)	79 (20.1%)
	Yes	838 (80.4%)	524 (80.7%)	314 (79.9%)
	Statistical Significance		$p=0.740$	
Require everyone to stay at home except to seek medical care and obtain food	No	62 (6.0%)	51 (7.9%)	11 (2.8%)
	Yes	980 (94.0%)	598 (92.1%)	382 (97.2%)
	Statistical Significance		$p=0.001^*$	

\*Statistically Significant

**DISCUSSION**

The responses from the questionnaire reflect that the general public is well aware about the general concepts of the disease. Analysis of the responses show that 97% people thought that older adults were more likely to develop complications due to this disease. This is accordance with published studies which have reported increased progression of disease in the elderly and have advised greater caution for protecting the elderly<sup>14,15</sup>.

with time. However, most experts have identified the use of face mask as a proven way to halt the spread of aerosol borne diseases involved in acute respiratory infections<sup>16</sup>. In the present study, the participants thought that the mean distance travelled by the corona virus was 5.15 feet. This was in accordance with the opinion of experts who believe that droplets of oral secretions laden with viruses may travel more than 6 feet, and may stay in air for long periods of up to 3 hours<sup>17</sup>.



In response to the common symptoms, a vast majority of the participants, were aware of fever, cough and shortness of breath as the most common symptoms. This is in harmony with studies that claim fever to be present in 88.7%, cough in 67.8%, fatigue in 38.1%, sputum production in 33.4% and sore throat in 13.9% of the cases<sup>18</sup>. As the signs and symptoms of infection by coronavirus were correctly identified by a vast majority of the participants, therefore we can assume that they would know when to seek medical advice.

Regarding the therapeutic options available, the respondents were of the opinion that the use of antibiotics (81%) and chloroquine (18.44%) had no role in prevention or treatment of this disease. Presently the drugs being considered for use include lopinavir/ritonavir (protease inhibitors), penciclovir/acyclovir, ribavirin and oseltamivir, all of which are antiviral drugs. The use of chloroquine has been approved but presently is under investigation<sup>15</sup>. Majority participants (85.25%) of the present study thought that the use of "kalonji" (*Nigella sativa* L. seed) might have a preventive role. Literature is available regarding the antioxidant and other multisystem beneficial role of these seeds<sup>19</sup>. Presently, it is being explored as an alternative option or as an adjunct to other conventional drugs for the treatment of this pandemic. However, its role has neither been confirmed nor approved<sup>20</sup>. Moreover, studies claim that the use of traditional Chinese Medicines such as gansu, ningxia and hunan may have a beneficial role<sup>20</sup>.

The participants were also strongly in support of all the preventive measures at government level suggested in the questionnaire to reduce the transmission of COVID-19; Quarantining everyone coming in from abroad, suspending all air travel, closing all schools, forbidding mass gatherings, restricting congregational prayers and requiring everyone to stay at home unless necessary. These are in line with China's response to COVID-19 which focused on isolation, quarantine, social distancing and community containment<sup>21</sup>.

Majority of participants believed that by the end of 2020, less than 10,000 people would have died in Pakistan. The perception of the public regarding the mortality rate of coronavirus is crucial for public health efforts. Underestimating the mortality rate will decrease public acceptance to protective and preventive measures whereas an exaggeration of the mortality rate will lead to undue panic and disorder.

Religious congregations are under intense debate in Pakistan as the government is restricting congregational prayers in masjids. Among the participants of the survey, a large proportion believed that congregational prayers should be withheld temporarily. This reflects the inhibition to conduct mass gatherings of any form to prevent transmission of COVID-19 as advised by the health experts<sup>22</sup>.

The participants also had mixed views regarding whether they thought that this pandemic was a bioweapon developed by a government or a terrorist organization. 55.3% of the people felt that it was likely. However, scientific evidence to date suggests that it is unlikely that the virus was developed in a laboratory<sup>23</sup>. If the public considers this as a bioweapon, they will be reluctant as well as resentful to any foreign help, and for a matter of fact, in the future, any foreign vaccines or medicines.

A considerable proportion of responses reflected false perception. For example, preventive measures such as; rinsing the nose with saline water, taking a hot bath, exposure to hot, humid climate and use of hand dryer. None of these is backed by scientific evidence and are considered as myths<sup>13,2</sup>.

Keeping in mind the myths that the participants believed to be true, the findings of this research can help to identify the false beliefs present in the general public and health campaigns by the government and media outlets can be planned accordingly.

The study has a number of limitations. The demographics of this study were not representative of the demographics of Pakistan.

Additionally, having internet access and a basic command over English language was a prerequisite, thus omitting a large chunk of illiterate and less knowledgeable population.

**CONCLUSION**

The participants showed a high level of knowledge regarding the pandemic but certain myths are also prevalent.

**CONFLICT OF INTEREST**

This study has no conflict of interest to be declared by any author.

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