



Knowledge, Awareness, and Practice of Preventive Measures Against COVID-19: A Prospective Observational Study from Pakistan

Kiran Abbas^{1,*}, Moiz Ahmed¹, Sadia Asad Ali², Shamas Ghazanfar³, Ali Aahil Noorali⁴ and Tularam Yadav⁵

¹Jinnah Postgraduate Medical Center, Karachi, Pakistan

²MCPS Dow University of Health Sciences, Karachi, Pakistan

³Dow University of Health Sciences, Karachi, Pakistan

⁴Aga Khan University, Karachi, Pakistan

⁵Jinnah Sindh Medical Univer, Karachi, Pakistan

*Corresponding author: Jinnah Postgraduate Medical Center, Karachi, Pakistan. Email: kiranabbas2020@gmail.com

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Abstract

Background: Coronavirus disease 2019 (COVID-19) is a rapidly spreading global emergency, causing significant damage to the global economy and health care. Knowledge and awareness are crucial elements in stimulating self-imposed preventive measures.

Objectives: We evaluated the knowledge and awareness about COVID-19 and the practice of hygiene measures to prevent the spread of coronavirus disease.

Methods: A prospective observational study was conducted in Karachi, Pakistan, between March 01 and March 25, 2020, using a non-probability consecutive sampling technique. All individuals aged 18 years or above were included in the study. The individuals who had no formal education were excluded from the study. A self-reported questionnaire assessing knowledge, awareness, and practices was distributed among the participants.

Results: The mean age \pm SD of the study population was 29.11 ± 7.8 years. In our study, 424 (98.6%) participants knew that a virus causes COVID-19, and most were knowledgeable about the disease's transmission mode. Higher education status and the medical profession were associated with the better practice of preventive measures.

Conclusions: We recommend that knowledge about COVID-19 and preventive measures be spread across the country via electronic media.

Keywords: COVID-19, Disease Control, Handwashing, Mask, Knowledge, Pandemic, Practice, Physical Distancing, Primary Prevention, Control, SARS-CoV-2

1. Background

Coronavirus disease 2019 (COVID-19) is an infectious disease affecting the respiratory system caused by a novel coronavirus (1, 2). In Pakistan, COVID-19 has infected over 1.17 million individuals and caused an estimated 26,000 deaths (3). Over 219 million individuals across the globe have been infected with the virus, which continues to rise exponentially every day. Having a high mortality index, COVID-19 has been declared a worldwide emergency due to its high burden of deaths across the globe (3, 4).

Since it is a viral disease, most patients are given palliative treatment, including pain relievers, antipyretics, cough medication, and fluid intake. Although COVID-19 is a self-limiting disease, it can cause severe respiratory

illness, especially among children and the elderly (5, 6). Researchers suggest that other preventive interventions may also be required apart from proactive measures to contain COVID-19 (7). The strongest and most effective strategy we can employ as a society is preventive measures against COVID-19 infection. Evidence suggests that by raising awareness and educating the masses about COVID-19, self-imposed preventive measures like mask-wearing and social distancing can be stimulated (8). To date, there have been only limited studies conducted to evaluate the knowledge and awareness about COVID-19 and the practice of hygiene measures to prevent the spread of coronavirus disease in a developing country like Pakistan.

2. Objectives

The present study assessed the knowledge, awareness, and general hygiene practices among the Pakistani population.

3. Methods

A prospective observational study was conducted in Sindh, Pakistan, from March 01 to March 25, 2020. A non-probability consecutive sampling technique was used to enroll the participants. Using the Select Statistics sample size calculator, a confidence interval of 99.9%, a margin of error of 1.57%, and a COVID-19 prevalence in Pakistani population to be 2.3%, a sample size of 978 was obtained (9). The following formula was used for sample size calculation: $n = \frac{N \times X}{X + N - 1}$. All individuals aged 18 years or older were included in the study. The individuals who had no formal education were excluded from the study. The ethics committee of the institutional review board approved the study (Reference number JSMU/2020/IRB-56889, dated: 15 February 2020). After obtaining consent electronically, participants were directed to a self-reported questionnaire.

The authors used previous literature and developed a questionnaire to determine the knowledge and prevention measures against COVID-19. The consultants of infectious diseases and public health approved the questionnaire. Moreover, a pilot study was performed to test the reliability and consistency of the questionnaire. The questionnaire was developed using Google Forms. The questionnaire was developed using the updated guidelines on COVID-19 by the National Health Service (NHS) (10). The data were analyzed with Statistical Package for Social Sciences (SPSS) version 24. All results were presented in tabular forms.

4. Results

The mean age \pm SD of the study population was 29.11 \pm 7.8. Of 980 participants, 198 (34.2%) were males, and 382 (65.8%) were females. The demographic characteristics of the study population are given in Table 1.

4.1. Knowledge about Coronavirus Disease (COVID-19)

The study participants were well-informed about COVID-19; nevertheless, most participants did not know that patients with COVID-19 can also manifest gastrointestinal and neurological diseases. Table 2 shows details.

Table 1. Demographics of Study Population (n = 980)

Variables	No. (%)
Age (y)	
18 to 24	602 (61.4)
25 to 29	245 (25.0)
30 to 44	51 (8.8)
45 or older	47 (4.8)
Gender	
Male	333 (34.2)
Female	647 (65.8)
Marital status	
Unmarried	578 (59.0)
Married	390 (39.8)
Divorced/separated	12 (1.2)
Educational status	
Grade tenth or lower	29 (3.0)
Higher secondary school or grade twelfth	186 (19.0)
University level	735 (75.0)
Postgraduate level or higher	30 (3.1)
Profession	
Medicine	470 (47.9)
Engineering	284 (29.0)
Business/commerce	176 (18.0)
Other	50 (5.1)
Employment status	
Government sector	411 (38.1)
Private sector	306 (31.3)
Business owner or self-employed	78 (8.0)
Student	146 (14.9)
Unemployed or retired	75 (7.7)

4.2. Awareness about Coronavirus Disease (COVID-19)

4.2.1. Route of Transmission

Only about half the study population, i.e., 562 (57.4%), were aware of the airborne transmission associated with COVID-19. Other sources of transmission, as claimed by the participants, included feces of an infected person with 245 (25.1%), animal sources with 615 (62.8%), and mosquito bites with 12 (1.2%) (Table 2).

4.2.2. Measures Effective Against Prevention of the Spread of COVID-19

Most participants knew the virus could survive in both hot and cold temperatures (Table 2).

4.2.3. General Awareness

Of the participants, 875 (89.3%) responded that the elderly, 857 (87.2%) claimed that individuals with pre-existing conditions like diabetes, and 629 (64.2%) replied that infants and young children were at risk of developing a critical illness.

4.3. Practice Measures to Prevent the Spread of Coronavirus Disease

The study participants observed apt practices of hygienic and self-imposed preventive measures. Also, 670 (68.4%) participants claimed that they maintained social distance, while 94.1% practiced proper respiratory etiquette. Higher education status and the medical profession were associated with the better practice of preventive measures (Tables 3 and 4).

5. Discussion

The sheer volume of emerging information coinciding with sensationalized media tends to render much of the general populace unable to delineate between actual data and conjecture, especially in developing regions, which can ultimately lead to misconceptions that may have a drastic impact on the health crisis. Knowledge of these perceptions may help institutions take better measures to inform the local public (11).

The findings of this study convey that the participants were well-informed of the modes of transmission and general awareness but also expressed a large degree of uncertainty in the measures effective against the spread of COVID-19. This seems to coincide with a recent Stanford University survey conducted by Dr. Pascal Geldsetzer. In Dr. Geldsetzer's study, 43.5% of US participants and 36% of UK participants answered that at least one of the following would help prevent an infection with the novel virus: "using a hand dryer, regularly rinsing your nose with saline, taking antibiotics, and gargling mouthwash" (12). In a similar survey conducted in the UAE, discrepancies were found even among the knowledge of healthcare workers, approximately 20% of whom believed that the flu vaccine would suffice as protection from COVID-19 or that washing hands with soap and water would not help in the prevention (13). Zhong et al. revealed that most residents of high socioeconomic status had a fair amount of knowledge regarding COVID-19 (14).

In a survey published by Saqlain et al., healthcare workers had good knowledge regarding COVID-19 (15). Similarly, another study from Pakistan revealed that about one-half of the study participants had adequate awareness while the majority that is 72%, were following preventive measures against COVID-19 infection (16).

In these instances, the insufficiency of prevention knowledge may be attributable to widespread rhetoric from non-professionals and media misinformation. It is also interesting to note that, in previous studies, increased general knowledge about the virus was associated with a better outlook or a more "positive attitude" towards the pandemic (17). This may have interesting implications for the psychological well-being of individuals, particularly those experiencing adverse effects of prolonged quarantine.

When proposing certain practices for infection prevention, it is also important to highlight the demographic differences that may serve as factors limiting the frequency of these preventative measures. As illustrated in Table 4, there were many statistically significant instances where demographic factors influenced the practice of a specified preventative measure. Individuals from other professions were significantly less likely to maintain social distancing and wash their hands with soap and water. Although it is intuitive to infer that the latter result may simply be due to the lack of familiarity of other disciplines with standard medical practices, the factors contributing to the difference between practices by gender may be more challenging to quantify. A study from Saudi Arabia on the MERS epidemic showed that gender significantly affected the concern for the epidemic, whereas knowledge was the only factor predicting precaution and concern (17). The earlier surveys from China, by Zhong et al., demonstrated a similar trend of statistical deviation regarding preventative practices of different demographics on the basis of gender, marital status, and education level. For instance, it was shown that the male gender, occupation of "student," and marital status of "other" were all significantly associated with "riskier" practices such as visitation of crowded places as well as decreased likelihood for mask-wearing (14). Thus, there seem to be inherent characteristics within each demographic which ultimately affect the preventative measures that are subsequently taken within that group. The previous studies suggest that targeting different demographic strata through alternative means geared towards those specific strata may be more effective in optimizing preventative measures.

One of the strengths of the study is that it is one of the earliest studies conducted in the region and so will act as the baseline against which all future studies will be compared. Since most of the participants were educated, the results cannot be generalized to a population of a lower socioeconomic status.

Table 3. Practice Measures to Prevent the Spread of Coronavirus Disease (n = 430)

Practice of Self-imposed Preventive Measures	No. (%)
Wash your hands frequently.	
Yes	951 (97.1)
No	29 (2.9)
Maintain social distancing.	
Yes	670 (68.4)
No	310 (31.6)
Maintain at least one meter or three feet distance between yourself and anyone who is coughing or sneezing	
Yes	791 (80.7)
No	189 (19.3)
Avoid touching eyes, nose, and mouth	
Yes	893 (91.1)
No	87 (8.9)
Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze	
Yes	922 (94.1)
No	58 (5.9)
Stay home when you are sick, except to get medical care.	
Yes	882 (90.0)
No	98 (10.0)
Clean frequently touched surfaces and objects regularly.	
Yes	914 (93.3)
No	66 (6.7)
Wash your hands often with soap and water for at least 20 seconds.	
Yes	884 (90.2)
No	96 (9.8)
Have a room in your home that is being used to separate sick household members from those who are healthy.	
Yes	776 (79.2)
No	204 (20.8)
If soap and water are not available, use a hand sanitizer to cleanse your hand.	
Yes	897 (91.6)
No	83 (8.4)
Use the separate room and bathroom you prepared for sick household members.	
Yes	743 (75.9)
No	237 (24.1)
Do not share utensils, towels, or toiletries with a sick person.	
Yes	822 (83.9)
No	158 (16.1)
Discourage children and teens from gathering in other public places.	
Yes	893 (91.1)
No	87 (8.9)
Take care of the emotional health of your household members.	
Yes	828 (84.5)
No	152 (15.5)
Comply with the lockdown/quarantine.	
Yes	526 (53.7)
No	454 (45.3)

Table 4. Practices Towards COVID-19 by Demographic Variables

Demographic Characteristics	Self-imposed Preventive Measures Taken by Study Participants		
	Maintain Social Distancing	Maintain at Least One Meter or Three Feet Distance Between Yourself and Anyone Who Is Coughing or Sneezing	Wash Your Hands Often with Soap and Water for at Least 20 Seconds
Age group			
18 - 24	514 (80.6)	490 (76.9)	618 (97.6)
25 - 29	77 (31.4)	208 (84.8)	189 (77.1)
30 - 44	39 (76.4)	46 (90.2)	41 (80.3)
45 and older	40 (85)	47 (100.0)	38 (79)
Gender			
Male	244 (73.2)	291 (87.3)	301 (90.3)
Female	426 (65.8)	500 (77.2)	585 (90.4)
Profession			
Medicine	345 (73.4)	427 (90.9)	448 (95.5)
Engineering	184 (64.8)	174 (61.3)	232 (81.8)
Business/commerce	101 (57.4)	148 (84.4)	166 (94.3)
Other	40 (90)	42 (84.0)	40 (80)

5.1. Limitations

Despite efforts to generalize the data, this study still poses many limitations regarding representing most of the Pakistani populace. This arises from the fact that the primary demographic of the sample came to be those who held a university-level education or higher and were thus more likely to be familiar with hygienic practices and modes of disease transmission as they are exposed to health education promotion programs on social media.

It is hoped that this study can catalyze more rigorous and prolonged assessments of knowledge of COVID-19 across diverse demographics so that each respective community can take a pragmatic course of action.

5.2. Conclusions

The present study indicated that the Pakistani population was well-informed of the modes of transmission and general awareness about the COVID-19 infection but also expressed a large degree of uncertainty in the measures effective against the spread of COVID-19. It is necessary to promote awareness about the pandemic and the effective ways to prevent the spread of the virus.

Footnotes

Authors' Contribution: Study concept and design: A. K. and A. M.; Analysis and interpretation of data: G. S. and A. K.; Drafting of the manuscript: A. S.; Critical revision of the manuscript for important intellectual content: A. S. N. A.

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Informed Consent: Informed consent was obtained from study participants electronically prior to data collection.

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Table 2. Knowledge and Awareness of COVID-19 Among Study Population

Item	No. (%)
Knowledge about COVID-19	
Coronavirus disease is caused by?	
Virus	933 (95.2)
Immunodeficiency	33 (3.4)
Inherited	11 (1.1)
Bacteria	3 (0.3)
The disease is transmitted through?	
Droplets after sneezing	866 (88.4)
Touching and shaking hands with an infected person	816 (83.3)
The use of objects used by an infected person	642 (65.6)
Sexual route	99 (10.1)
Signs and symptoms of the disease?	
Same as seasonal flu	934 (95.8)
Diarrhea	277 (28.3)
Shortness of breath	780 (79.6)
Nausea and Vomiting	194 (19.8)
Inability to smell	265 (27.0)
How is the disease diagnosed?	
Blood test	274 (28.0)
Nasopharyngeal swab test	575 (58.7)
Polymerase chain reaction	585 (59.7)
Treatment of COVID-19?	
No treatment; the disease is self-limiting	819 (83.6)
Paracetamol	223 (22.8)
Broad spectrum antibiotics	44 (4.5)
Anti-malarial; Hydroxychloroquine	260 (26.5)
Awareness about COVID-19	
Route of Transmission and Spread	
Airborne route	
Yes	564 (57.4)
No	232 (23.7)
Not sure	185 (18.9)

Can COVID-19 be caught from a person who has no symptoms?

Yes	835 (85.3)
No	69 (7.0)
Not sure	76 (7.7)
Can I catch COVID-19 from the feces of someone with the disease?	
Yes	247 (25.2)
No	380 (38.8)
Not sure	353 (36.0)
Can humans become infected with COVID-19 from an animal source?	
Yes	615 (62.8)
No	223 (22.8)
Not sure	142 (14.4)
Can the new coronavirus be transmitted through mosquito bites?	
Yes	21 (2.1)
No	830 (84.7)
Not sure	139 (14.2)
Measures Effective Against the Spread of COVID-19	
Are antibiotics effective in preventing or treating COVID-19?	
Yes	60 (6.1)
No	730 (74.4)
Not sure	191 (19.5)
Are there any medicines or therapies that can prevent or cure COVID-19?	
Yes	137 (14.0)
No	628 (64.1)
Not sure	215 (21.9)
Is there a medicine that can treat COVID-19?	
Yes	362 (36.9)
No	567 (57.9)
Not sure	51 (5.2)
Does smoking help in preventing the disease?	
Yes	106 (2.1)
No	819 (83.6)
Not sure	140 (14.3)
Can cold weather and snow kill the new coronavirus?	
Yes	161 (16.4)
No	600 (61.2)
Not sure	220 (22.4)

Can hot weather kill the new coronavirus?	
Yes	228 (23.3)
No	488 (49.8)
Not sure	264 (26.9)
Can "taking a hot bath" prevent the new coronavirus disease?	
Yes	417 (42.6)
No	543 (55.3)
Not sure	246 (25.1)
Are hand dryers effective in killing the new coronavirus?	
Yes	77 (7.9)
No	618 (63.0)
Not sure	285 (29.1)
Can an ultraviolet disinfection lamp kill the new coronavirus?	
Yes	116 (11.9)
No	365 (37.2)
Not sure	499 (50.9)
Can spraying alcohol or chlorine all over your body kill the new coronavirus (that has already entered your body)?	
Yes	77 (7.9)
No	807 (82.3)
Not sure	96 (9.8)
Do vaccines against pneumonia protect you against the new coronavirus?	
Yes	29 (3.0)
No	716 (73.0)
Not sure	235 (24.0)
Can regularly rinsing your nose with saline help prevent infection with the new coronavirus?	
Yes	352 (35.8)
No	346 (35.3)
Not sure	283 (28.9)
Can "eating garlic" help prevent infection with the new coronavirus?	
Yes	96 (9.8)
No	738 (75.3)
Not sure	146 (14.9)
General Awareness	
Who is at risk of developing severe illness?	
Older persons	875 (89.3)
Persons with pre-existing medical conditions (such as high blood pressure, heart disease, lung disease, cancer, or diabetes)	854 (87.2)

Infants or children under the age of 10 years	629 (64.2)
Not sure	41 (4.2)
Should I travel during the current pandemic?	
Yes	25 (2.6)
No, not unless absolutely necessary	882 (90.0)
Not sure	73 (7.4)
Should I wear a mask to protect myself?	
Yes, all the time.	404 (41.2)
No, because I am healthy.	158 (16.3)
No, because I am not taking care of a patient who has COVID-19.	265 (27)
No, because I am not in close contact with anyone who has COVID-19.	356 (36.3)
Not unless I have COVID-19, because there is a global shortage of masks.	368 (37.6)
Does wearing multiple masks give more protection?	
Yes	134 (13.7)
No	702 (71.6)
Not sure	144 (14.7)
How long does the virus survive on surfaces?	
10 to 60 minutes	215 (22.1)
Several hours to several days	720 (73.5)
It does not survive on surfaces.	43 (4.4)
How long is the incubation period for COVID-19?	
1 day	9 (0.9)
2 -14 days	873 (89.1)
Not sure	98 (10.0)