


## Original Research

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# Awareness of COVID-19 among Illiterate Population in Pakistan: A Cross-Sectional Analysis

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## Abstract

**Background** COVID-19 outbreak has been accompanied by a massive infodemic, however, many vulnerable individuals such as illiterate or low-literate, older adults and rural populations have limited access to health information. In this context, these individuals are more likely to have poor knowledge, attitudes, and preventive practices related to COVID-19. The current study was aimed to investigate COVID-19's awareness of the illiterate population of Pakistan.

**Methods** A cross-sectional survey was conducted among illiterate Pakistanis of ages  $\geq 18$  years through a convenient sampling approach. The study participants were interviewed face to face by respecting the defined precautionary measures and all data were entered and analyzed using SPSS version 22 (IBM, Armonk, NY).

**Results** The mean age of the study participants' (N = 394) was  $37.2 \pm 9.60$  years, with the majority being males (80.7%). All participants were aware of the COVID-19 outbreak and television news channels (75.1%) were the primary source of information. The mean knowledge score was  $5.33 \pm 1.88$ , and about 27% of participants had a good knowledge score (score  $\geq 7$ ) followed by moderate (score 4 - 6) and poor (score  $\leq 3$ ) knowledge in 41.6%, and 31.5% of respondents, respectively. The attitude score was  $4.42 \pm 1.22$  with good (score  $\geq 6$ ), average (score 4 - 5), and poor attitude (score  $\leq 3$ ) in 19%, 66%, and 15% of the participants, respectively. The average practice-related score was  $12.80 \pm 3.34$ , with the majority of participants having inadequate practices.

**Conclusion** COVID-19 knowledge, attitude, and preventive practices of the illiterate population in Pakistan are unsatisfactory. This study highlights the gaps in specific aspects of knowledge and practice that should be addressed through awareness campaigns targeting this specific population.

## Introduction

In December 2019, China became the center of global attention due to the emergence of a pneumonia-like outbreak of unknown etiology.<sup>1</sup> The causative pathogen among the affected patients was identified as a novel Coronavirus, SARS-CoV-2, and the disease named COVID-19.<sup>2</sup> The disease rapidly spread across the globe resulting in a pandemic declaration by the World Health Organization (WHO). Globally, more than 60 million individuals have been infected and approximately 1.5 million have lost their lives as at November 26, 2020.<sup>3</sup>

The first case of COVID-19 in Pakistan appeared on February 26, 2020.<sup>4</sup> The situation started deteriorating resulting in a complete lockdown across the country. After a partial relaxation of the lockdown (May 9, 2020), then followed by complete relaxation near the holy festival of Eid-ul-Fitr (May 22, 2020), the rate of COVID-19 spread increased alarmingly from around 1000 to more than 4000 cases per day.<sup>5</sup> The WHO stated that Pakistan was not in any condition for opening the lockdown due to a high positivity rate, weak surveillance system to trace contacts, and the public who were unwilling to adapt to change its behavior and adopt standard operating procedures (SOPs). The WHO recommended a 2-week total lockdown followed by a 2-week partial lockdown strategy.<sup>5,6</sup> However, a selective lockdown was imposed—trace and seal hotspots of COVID-19—in the middle of June 2020. This lockdown strategy worked

and COVID-19 cases started to decrease significantly (August 10, 2020 estimates: confirmed cases = 539, deaths = 15).<sup>7</sup> The authorities ended the lockdown in mid-August, however, non-compliance to COVID-19 SOPs by the public led to a surge in the positive cases and the Government announced the second spell of COVID-19 in Pakistan on October 28, 2020. At that time, a daily increase in cases reached 750 as compared to 400-500 a few weeks ago.<sup>8</sup>

The best line of defense against the disease is to adopt protection measures (physical distancing, hand hygiene, use of a face mask, and respiratory etiquette). Our earlier study conducted among the educated Pakistanis revealed that although the knowledge and attitude were adequate, preventive practices related to COVID-19 were unsatisfactory.<sup>9</sup> Moreover, it was suspected that due to a limited access to health information resources, vulnerable Pakistani populations such as illiterate or low-literate, older adults and rural residents would be more likely to have inadequate knowledge, attitudes, and practices. Since COVID-19 is primarily confined to the urban areas of the country, health authorities also have the primary focus to utilize the energy and resources in these vicinities. In this context, the present study was aimed to investigate the awareness and knowledge of COVID-19 among the illiterate population of Pakistan.

## Methodology

### Study design, subjects, and location

A cross-sectional survey was conducted among the adult (age  $\geq 18$  years) illiterate individuals, they were recruited using a convenient sampling approach at major markets/bazars in Lahore and Sahiwal divisions of the Punjab Province, between May - June 2020. A person was considered illiterate if he/she had no formal schooling or if they attended school but did not complete the primary school level.<sup>10</sup>

### Ethical considerations

Permission to conduct the study was acquired from the Research Ethics Committee of the Department of Pharmacy Practice, Faculty of Pharmacy, The University of Lahore. Verbal informed consent was obtained from each participant. There was no identifying information on the questionnaire. The participants were given a clear explanation regarding the confidentiality of their responses. Moreover, they were educated/counseled at the end of data collection about safety and preventive measures regarding COVID-19 by the trained researchers. All the current preventive measures were used during the data collection.

### Sample size

The sample size for the present study was determined by using the proportional formula of OpenEpi<sup>11</sup> by maintaining the population size of 1000000 and anticipated frequency of 50%. The required sample size was 384 individuals at a 95% confidence interval.

### Outcome measures

A questionnaire was designed from the published studies related to COVID-19.<sup>9,12-18</sup> The initial draft of the questionnaire was reviewed by an expert panel (1 lecturer, 2 assistant professors, 1 associate professor, and a professor from the health discipline). Minor corrections were suggested by the panel. Following the modification based on suggestion, the questionnaire was subjected

to data collection, and the final questionnaire had 5 sections (Supplementary File 1);

- **Section-1:** Demographic details of the study participants to be collected by 4 items.
- **Section-2:** Respondents' knowledge of COVID-19 being investigated through 11 questions. The first 2 questions were 'Are you aware of the ongoing COVID-19 outbreak?' and 'If yes, what is your source of information?' Those responding 'Yes' to the first question were asked 9 subsequent questions. A point was given for each correct answer and 0 for incorrect and 'do not know' answers, participants with scores  $\leq 4$ , 5-6, and  $\geq 7$  were considered to have poor, moderate/average, and good COVID-19 knowledge, respectively.
- **Section-3:** Respondents' perception of COVID-19 to be evaluated through 9 questions.
- **Section-4:** Respondents' attitudes towards COVID-19 assessed through 7 questions. A total score for this section was 7 points, with 1 point given for each positive attitude (Positive attitude means participants accepting COVID-19 and following recommended SOPs) and 0 for a negative attitude. Participants with scores  $\leq 3$ , 4-5, and  $\geq 6$  were considered to have poor, moderate/average, and good attitude towards COVID-19, respectively.
- **Section-5:** Evaluation of preventive practices related to COVID-19 through 6 questions. Responses were recorded using a 4-point Likert scale, with 0 indicating 'never' and 3 indicating 'always.' The total practices score range between 0 - 18, participants' achieving a score  $< 9$ , 9-12, and  $> 12$  were considered to have poor, moderate/average, and good preventive practices.

### Statistical analysis

Continuous data were presented as means with standard deviation (SD), categorical variables were expressed as frequencies and percentages. Continuous data were compared between the dichotomous variable using the independent student t-test, and between trichotomous or multinomial variables using the 1-way ANOVA. All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 22 for Windows. A p-value  $< 0.05$  was considered statistically significant.

## Results

A total of 394 individuals provided consent and were being interviewed face to face, maintaining a 6-feet physical distance, and using all the other COVID-19 precautionary measures by the trained investigators (response rate:  $394/448 = 87.8\%$ ). Characteristics of the study participants are shown in [Table 1](#). The mean age of the study participants' was  $37.2 \pm 9.60$  years, with male preponderance (80.7%).

### Participants' knowledge of COVID-19

All the study participants reported that they were aware of the ongoing COVID-19 outbreak and news channels (75.1%) were the major source of the information. Only 31.5% knew COVID-19 was caused by a virus, 43.1% knew it is not an air-borne disease and 81.2% were aware that the disease is transmitted by close contact with infected individuals. Majority of the participants knew that hand hygiene (72.3%) and wearing a face mask (70.3%) were effective preventive measures for COVID-19. Around 63% and 54% of respondents gave correct responses to questions related

**Table 1.** Characteristics of the study sample (N = 394)

| Characteristics                                                 | N (%)           |
|-----------------------------------------------------------------|-----------------|
| <b>Age (years; mean <math>\pm</math> SD)</b>                    | 37.2 $\pm$ 9.60 |
| $\leq$ 30                                                       | 116 (29.4)      |
| 31-40                                                           | 141 (35.8)      |
| 41-50                                                           | 103 (26.1)      |
| > 50                                                            | 34 (8.6)        |
| <b>Gender</b>                                                   |                 |
| Male                                                            | 318 (80.7)      |
| Female                                                          | 76 (19.3)       |
| <b>Disease</b>                                                  |                 |
| None                                                            | 328 (83.2)      |
| Respiratory disorders                                           | 23 (5.8)        |
| Diabetes Mellitus                                               | 14 (3.6)        |
| Cardiovascular diseases                                         | 29 (7.4)        |
| <b>Are you aware of the ongoing corona (COVID-19) outbreak?</b> |                 |
| Yes                                                             | 394 (100.0)     |
| No                                                              | -               |
| <b>Source of information</b>                                    |                 |
| Friends/family/relatives/neighbors                              | 48 (12.2)       |
| YouTube/WhatsApp/Facebook                                       | 28 (7.1)        |
| Television                                                      | 296 (75.1)      |
| COVID-19 caller tunes                                           | 22 (5.6)        |

to the cure and vaccine for COVID-19, respectively. The mean knowledge score was  $5.33 \pm 1.88$  (range 0 - 9). The frequency of participants having good/excellent (score  $\geq$  7), moderate/average (score 4 - 6) and poor (score  $\leq$  3) knowledge was 26.9%, 41.6%, and 31.5%, respectively. There was no significant difference ( $P > 0.05$ ) in knowledge scores among different age and gender categories (Table 2). The responses of participants towards knowledge items are described in Supplementary file 2 (Supplementary Table 1).

### Participants' perception of COVID-19

As shown in Table 3, 65% of participants believed the media were exaggerating COVID-19. The majority of the participants' (62.2%) reported that 'lack of public awareness' was the main reason COVID-19 had not been curtailed, however, a small fraction (6.1%) believed that 'health authorities were exaggerating the disease status to get financial aid from national and international donors,' and 'incompetence of health authorities.' Around 54% reported that there are foods and herbs ('Qehwa/Joshanda [herbal decoction], 'Honey lemon tea,' 'Mutton broth/soup,' 'Meethay [Sweet lime/Citrus limettioides Tan], 'Kalonji [nigella seeds], and 'Sana Makki [Senna]') that can effectively cure or prevent COVID-19. Nearly 30% of participants believed that people suspected of COVID-19 should not be isolated/quarantined. Additionally, about 34% of participants believed it was safe to roam freely in the country.

### Participants' attitude towards COVID-19

The mean attitude score was  $4.42 \pm 1.22$  and the frequency of participants having a positive, average, and negative attitude was 19%, 66%, and 15%, respectively. There was no statistically significant difference ( $p > 0.05$ ) of attitude scores between demographics

**Table 2.** Differences of knowledge, attitude and practices score among various demographics

| Variables                     | Subgroup  | Mean score $\pm$ SD |                 |                  |
|-------------------------------|-----------|---------------------|-----------------|------------------|
|                               |           | Knowledge           | Attitude        | Practices        |
| <b>Age<sup>†</sup>, years</b> | $\leq$ 30 | 5.12 $\pm$ 2.07     | 4.28 $\pm$ 1.42 | 12.81 $\pm$ 3.09 |
|                               | 31-40     | 5.57 $\pm$ 1.79     | 4.42 $\pm$ 1.17 | 13.02 $\pm$ 3.42 |
|                               | 41-50     | 5.28 $\pm$ 1.75     | 4.64 $\pm$ 1.02 | 12.54 $\pm$ 3.06 |
|                               | > 50      | 5.09 $\pm$ 1.98     | 4.21 $\pm$ 1.07 | 12.71 $\pm$ 3.67 |
|                               | P-value   | 0.266               | 0.115           | 0.726            |
| <b>Gender*</b>                | Male      | 5.28 $\pm$ 1.92     | 4.36 $\pm$ 1.21 | 12.61 $\pm$ 3.37 |
|                               | Female    | 5.53 $\pm$ 1.71     | 4.64 $\pm$ 1.17 | 13.64 $\pm$ 2.56 |
|                               | P-value   | 0.306               | 0.071           | 0.003            |
| <b>Chronic disease*</b>       | Yes       | 5.58 $\pm$ 1.82     | 4.42 $\pm$ 1.08 | 11.94 $\pm$ 3.94 |
|                               | No        | 5.28 $\pm$ 1.89     | 4.42 $\pm$ 1.24 | 12.98 $\pm$ 3.07 |
|                               | P-value   | 0.241               | 0.968           | 0.048            |

<sup>†</sup>1-way ANOVA; \*Independent t Test

(Table 2). The responses of participants towards attitude items are described in Supplementary file 2 (Supplementary Table 2).

### Preventive practice related to COVID-19

The mean practices-related score was  $12.80 \pm 3.34$ , with the majority of participants having average/moderate practices (66.8%). None of the study participants achieved a practice score  $> 75\%$ . Subgroup analysis revealed that females had significantly better scores than males ( $p = 0.003$ ). Moreover, chronic disease sufferers had significantly lower scores than healthy individuals ( $p = 0.048$ ). The responses of participants towards preventive practice items are described in Supplementary file 2 (Supplementary Table 3).

### Discussion

This study is the first of its kind ascertaining the awareness of COVID-19 among the illiterate population of Pakistan. Since this population is quite vulnerable to contract the virus due to limited health resources, financial constraints, and authentic information, the spread of COVID-19 in this population can be devastating. Major findings of the current study revealed that knowledge, attitude, and preventive practices of illiterate Pakistanis were unsatisfactory and alarming. Although the majority of the study participants (68.5%) were not aware of the etiology of COVID-19, around 81% were aware that the disease gets transmitted by close contact with the infected individuals. More than 70% of the participants knew that hand hygiene and wearing a face mask were effective prevention measures. A possible explanation of a higher rate of awareness of preventive practices could be attributable to the campaigns launched by the government describing causes, symptoms, and routes, but these awareness campaigns primarily focused on highlighting precautionary measures such as wearing a facemask, social distancing, and hand hygiene practices.

Overall, the majority of the study participants had intermediate knowledge (41.6%). This rate is lower as reported in previous studies conducted in Pakistan (51.81%<sup>19</sup>, 64.8%<sup>20</sup>), Malaysia (80.5%<sup>21</sup> and China (90%).<sup>22</sup> However, these findings corroborate the results of Abdelhafiz *et al.*, where the mean knowledge scores among participants with lower educational and monthly income levels were significantly lower.<sup>23</sup> These findings necessitate the focused efforts or the use of multiple methods to interact with these financial

**Table 3.** Perception of study participants about COVID-19

| Items                                                                                              | N (%)      |
|----------------------------------------------------------------------------------------------------|------------|
| <b>Are you afraid of COVID-19?</b>                                                                 |            |
| Yes                                                                                                | 213 (54.1) |
| No                                                                                                 | 181 (45.9) |
| <b>If yes, why are you afraid of COVID-19?</b>                                                     |            |
| No cure                                                                                            | 92 (43.2)  |
| Is highly contagious                                                                               | 72 (33.8)  |
| Is a new disease                                                                                   | 37 (17.4)  |
| No preventive methods                                                                              | 12 (5.6)   |
| <b>Do you believe the media is exaggerating COVID-19?</b>                                          |            |
| Yes                                                                                                | 256 (65.0) |
| No                                                                                                 | 138 (35.0) |
| <b>Why has it been difficult to halt the spread of COVID-19?</b>                                   |            |
| Lack of awareness                                                                                  | 245 (62.2) |
| Inadequate health personnel                                                                        | 44 (11.2)  |
| No effective preventive methods                                                                    | 75 (19.0)  |
| Miscellaneous                                                                                      | 24 (6.1)   |
| Unanswered                                                                                         | 6 (1.5)    |
| <b>Do you think COVID-19 can be brought under control in 2020?</b>                                 |            |
| Yes                                                                                                | 299 (75.9) |
| No                                                                                                 | 93 (23.6)  |
| Unanswered                                                                                         | 2 (0.5)    |
| <b>Do you think that people suspected to have COVID-19 should be quarantined/isolated?</b>         |            |
| Yes                                                                                                | 279 (70.8) |
| No                                                                                                 | 115 (29.6) |
| <b>Do you believe there are some foods or herbs that can effectively cure or prevent COVID-19?</b> |            |
| Yes                                                                                                | 214 (54.3) |
| No                                                                                                 | 176 (44.7) |
| Unanswered                                                                                         | 4 (1.0)    |
| <b>Do you think thermal surveillance/screening can prevent the spread of COVID-19?</b>             |            |
| Yes                                                                                                | 254 (64.5) |
| No                                                                                                 | 140 (35.5) |
| <b>Do you think it is safe to travel freely in the country nowadays?</b>                           |            |
| Yes                                                                                                | 132 (33.5) |
| No                                                                                                 | 261 (66.2) |
| Unanswered                                                                                         | 3 (1.0)    |

classes. The COVID-19 infodemic has demonstrated that low health literacy within a population is a globally overlooked public health issue.<sup>24</sup>

We observed that television was the key source of COVID-19 related information. Earlier research in Pakistan revealed that social media was the primary source of information (66.6%) to gain knowledge of COVID-19. This may be explained by the fact that the majority of their research participants were under the age of 30 and had a university education, while the participants in our sample were analphabets' with minimal information and access to social media.<sup>19</sup>

The majority of our study participants had average attitude scores. Approximately 52% believed that COVID-19 is not a severe disease, 46.2% thought it could be treated without consulting

health professionals, 23.4% reported they would not take COVID-19 vaccine even if it was available, 45.2% reported that health education had nothing to do with disease prevention and 67.5% believed that handling COVID-19 patients would not put them at the risk of getting the infection. On contrary, studies from Pakistan, Egypt, China, and Malaysia reported that a large number of participants had a positive attitude towards COVID-19.<sup>20–23</sup> The negative attitude in our study participants can be attributed to their low educational background.

Upon assessing participants' perceptions regarding COVID-19, more than half of the participants reported that they were afraid of COVID-19 and most participants believed that the media is exaggerating about COVID-19. This reflects the effectiveness of the message provided by the different media platforms, which was confirmed by the negative assumptions that media platforms were exaggerating the risk and spreading the fear of COVID-19.<sup>23–25</sup> A large proportion of participants reported that 'lack of public awareness' is the main reason due to which COVID-19 had not been curtailed, however, a small fraction believed that 'health authorities are exaggerating the disease status to get financial aid from national and international donors and 'incompetence of health authorities.' It must be noted that various false and misleading theories against COVID-19 are floating in Pakistan which could hinder the anti-COVID-19 efforts in the country.<sup>26</sup> Moreover, 1 out of 3 study participants believed that people suspected of COVID-19 need not be isolated. Additionally, around 1 out of 3 of the participants believed it was safe to travel freely in the country. These findings underscore the dire need for aggressive measures to improve the awareness of COVID-19 among illiterate and low-literate Pakistanis. Pakistan's National Institute of Health (NIH) has played a pivotal role in devising and circulating protocols regarding COVID-19 prevention, transmission, and defecation, as well as launching public awareness campaigns. However, health literacy might help people to grasp the reasons behind the recommendations and reflect on the outcomes of their various possible actions. Taking social responsibility, thinking beyond personal interests, and understanding how people make choices of aspects such as ethical viewpoints and behavioral insights should also be considered within the toolbox of health literacy.<sup>27</sup>

More than 50% of the study participants reported that there were foods and traditional herbs that could effectively cure or prevent COVID-19. This reflects the enormous belief in complementary and alternative medicines (CAM) among Pakistanis, especially among those with low educational background. Earlier studies conducted in Pakistan among patients with different chronic disorders had reported a higher prevalence of CAM usage where a lower level of education was associated with increased usage of CAM.<sup>28–30</sup>

Despite the vigorous broadcast of precautionary measures, insufficient COVID-19 related preventive practices found in our study which can be attributed to the low educational level and poor economic conditions of the study participants, shortage of face masks in different parts of the country due to their high demand, as well as price hike affects the affordability of the less income stratum. It has been encouraging to see that the Government has taken hard lines to ensure the availability of all personal protective equipment (PPE).<sup>25</sup> Authors believe that improving health literacy might help people to grasp the reasons behind the recommendations of the authorities and reflect on the outcomes of their risky actions on society. Along with system preparedness, individual preparedness is key for solving complex real-life problems. In this pandemic, it is difficult, yet possible to take the time to enhance

health literacy because immediate action is required by governments and citizens.

The current study is accompanied by few shortcomings which should be considered while interpreting the results. Firstly, the findings of this study are, however, limited to the 2 divisions of Punjab, Pakistan represented in the sample and cannot be generalized to the broader context. However, the findings can be implicated to all 4 provinces of Pakistan to initiate targeted measures as Lahore is the major metropolis of the most populated province (Punjab) and second-largest city of the country. Secondly, study participants contain almost 80% of males which urges the need of a countrywide cross-sectional study including equal representation of males and females. Last but not least, information bias amid self-reporting cannot be disregarded in the current study and possible measures should be taken to minimize such bias in future studies. Nevertheless, the current study is strengthened by the first of its kind including a large pool of an uneducated population. The findings of the present study will serve to design and implement disease knowledge initiatives by the health authorities in the existing COVID-19 control programs.

## Conclusion

The knowledge, attitude, and preventive practices of illiterate Pakistanis are inadequate. Since there is an impending danger of the second wave of COVID-19 in Pakistan, there is a dire need to focus the efforts on this target population to increase awareness and to enforce COVID-19 preventive practices.

**Author Contributions.** Muhammad Salman, Tahir Mehmood Khan, Naureen Shehzadi, and Khalid Hussain conceived and designed the study. Muhammad Salman, Noman Asif, Zia Ul Mustafa, Muhammad Junaid Farrukh and Muhammad Hammad Butt conducted the literature review. Muhammad Salman, Tahir Mehmood Khan, Tauqeer Hussain Mallhi, Noman Asif, and Yusra Habib Khan designed the questionnaire. Zia Ul Mustafa and Noman Asif collected the data. Muhammad Salman, Tauqeer Hussain Mallhi, Fahad Saleem and Tahir Mehmood Khan analyzed and interpreted data. Muhammad Salman, Naureen Shehzadi, Yusra Habib Khan and Muhammad Hammad Butt drafted the manuscript. Tahir Mehmood Khan, Khalid Hussain, Fahad Saleem, and Tauqeer Hussain Mallhi critically revised the manuscript. All authors approved the manuscript for submission.

**Supplementary material.** To view supplementary material for this article, please visit <https://doi.org/10.1017/dmp.2021.261>

**Conflict(s) of interest.** The authors declare no conflicts of interest.

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