A study of community knowledge, attitudes, practices, and health in Pakistan during the COVID-19 pandemic

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Abstract
The ongoing outbreak of novel Coronavirus originated from Wuhan, China, and vigorously spread throughout the globe causing serious concerns. This study aimed to appraise the community demographics, knowledge, attitudes, practices mental health, symptoms, and precautionary measures during the COVID-19 pandemic in Pakistan. This study was a cross-sectional and observational study. An online semi-structured questionnaire was designed by freely available Google Forms. A Referral Sampling technique was used, a total of 439 responses were recorded and analyzed by using Statistical Package for the Social Sciences. Regression analysis and multinomial logistic regression analysis were done to test the hypothesis. This study shows more than 63% of participants maintain social distancing at their workplaces, offices, markets, and so forth and 59% of participants stayed at their homes during the lockdown. Almost 75% of participants did not attend any gathering during COVID-19. Most participants (75.4%) wear masks and gloves, and 85.6% of participants wash their hands with soap and using hand sanitizer regularly. This study shows that 40.8% and 36.2% of participants felt anxiety and fear due to Coronavirus. This study shows that knowledge among the population in Pakistan about COVID-19 was low. Continued efforts are needed to address knowledge, attitudes, and practices to interrupt novel Coronavirus transmission.

KEYWORDS
attitudes, community knowledge, COVID-19, health, practices
INTRODUCTION

For the last 15 years, China has been facing several public health disasters and the cause of these devastations are disease outbreaks such as the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 and the influenza outbreak in 2013 caused by a family of viruses (W. Qiu et al., 2018). A recent disaster that emerged in China is that of a number of patients suffering from pneumonia of unidentified cause 2019 in Wuhan, the capital city of the Province Hubei in the People’s Republic of China (Y. Qiu et al., 2020). In December 31st 2019, the World Health Organization (WHO) came to know about the patients suffering from pneumonia in Wuhan, and emergency measures were put forth by WHO to become aware of the causes, diagnosis, treatment, safety measures against this devastating Coronavirus disease (WHO, 2020).

The first death proclaimed by China due to novel Coronavirus was that of a 61-year-old man who was exposed to a seafood market. A few weeks later, the virus spread dynamically in the world, and because of this rapid and fast spread, WHO announces it as an alarming situation and a Public Health Emergency of International concern on January 30, 2020. On February 11, 2020 Coronavirus disease was referred to by WHO as COVID-19, on March 11, 2020 COVID-19 was announced to be a pandemic, 114 countries become a victim of that health hazard (Roy et al., 2020) and now devastating impacts can be seen globally. More than 72,500 people were diagnosed with COVID-19 on February 18, 2020, in China, the deaths of more than 1800 patients were due to this new viral infection, which is pneumonia or respiratory tract infection (Xiao et al., 2020). Now, China has successfully controlled the situation and according to WHO, 90,890 cases and 4744 deaths were reported by September 22, 2020.

The novel Coronavirus was confirmed to have reached Pakistan on February 26, 2020, when a student in Karachi tested positive upon returning from Iran. On March 22, 2020, Prime Minister Imran Khan declared a nationwide lockdown and urged citizens to stay indoors and refrain from hoarding food. The Pakistan Army and Police were deployed at the roads in all cities to ensure the public stayed at home to reduce the spread of the pandemic (Geo News, 2020). Pakistan was on the edge of a major outbreak, with 916 confirmed cases as of March 24, 2020. COVID-19 had the most devastating outbreak of the virus on record with 76,398 confirmed cases and 1621 causalities reported in Pakistan until the morning of June 01, 2020. The figure reached out 306,304 confirmed cases and 6420 causalities by the end of September 22, 2020, but the situation is under control and just 7,070 cases are active in the country (Government of Pakistan, 2020).

The Government of Pakistan has been taken various significant steps to curb the widespread of COVID-19 in the country. Official websites were created, which contain information about precautions, symptoms, and mode of transmission. The National Coronavirus helpline has the number 1166, at this portal, any query regarding Coronavirus will be entertained, and a home page was generated for live trackers. The list of laboratories was issued across the country to get tested for Coronavirus (Hayder, 2020). The Prime Minister Relief Fund was initiated to address the miserable condition of the poor during COVID-19. Also, the Ehsaas Program was initiated in which 12,000 PKR would be distributed to the poor and needy to fulfill their requirements in the depressing conditions of lockdown in the country (The News, 2020). Teleschool Channel Pakistan was launched for children to fill the gap of education from class one to class twelve during the lockdown. For universities, the Government instructed the Higher Education Commission to launch a Learning Management System (LMS) for online classes of graduation and postgraduate students to deal with the lack of education during the period of lockdown in Pakistan. For Hospitals, a Telemedicine facility was introduced for patients 24/7 to get information about their disease on call from dedicated and experienced doctors. The Government launched an application having radius alert as well as other features, the radius alert gives a signal about any patient suspected to reside in the nearest area of a person’s locality within a radius of 300 m, it also has a self-assessment test related to Coronavirus only for Pakistani (Shehzad, 2020). The Government launched a Command and Control Centre for Coronavirus, which has started functioning as a centralized mechanism for regular sharing of information, latest updates, figures, and directions on this disease (Business Recorder, 2020).
To interrupt the transmission of this disease, a precautionary measure has been suggested known as social distancing, in which the contact between the infected and healthy person is prohibited (European Centre for Disease Prevention and Control, 2020). COVID-19 is a huge pandemic and global challenge that affects each and every aspect of human existence such as the political, religious, territorial, ideological cultural, academic, social, and economic. Health care workers are making their best efforts to contain the spread of this disease (Huang et al., 2020). This contagious disease creates manifestations of anxiety, fear, depression, suicide, and trauma among individuals (Dubey et al., 2020). Previous studies unveiled the enormous range of psychosocial impacts on individuals, communities, and nations to the international level during infectious diseases outbreak. People are fearful of being victimized by the disease and losing their lives (Gover et al., 2020). However, the eventual COVID-19 impact is uncertain, by enhancing cohesion with public health organizations, the following guidelines will make the health care system to conquer devastating disaster (WHO, 2020). Consequently, government and public health organizations have provided guidelines and applicable recommendations on public psychological involvement for the mental peace of the general public (WHO, 2020). SARS outbreaks in 2003 have had massive impacts on public psychological health, (Khan et al., 2020) the outbreak of contagious diseases such as MERS, cholera, tuberculosis, and so forth destroyed lives causing mental disturbances and financially disrupt countries (Dueby et al., 2020).

By taking into account the current situation during the lockdown in COVID-19, the following hypothesis has been put forth to get a better understanding regarding community knowledge, their attitude toward devastating conditions and practices to be followed.

**Hypothesis 1:** Participants with good knowledge of COVID-19 will think social distancing is a reasonable step to stop the spread of COVID.

**Hypothesis 2:** Participants with good practices regarding COVID-19 will maintain social distance at offices, health centers, and markets during the lockdown in Pakistan.

**Hypothesis 3:** Participants will be less likely to be well informed about Coronavirus, most would fall into horrible states of anxiety and distressful levels of poverty during COVID-19.

**Hypothesis 4:** Media coverage will be able to make the participants aware positively or distract and threaten them in these circumstances.

The study aimed to identify the association of the community demographics, knowledge, attitudes, practices mental health, symptoms, and precautionary measures during the COVID-19 pandemic in Pakistan. This study also highlighted the policy implications. In this study, Section 2 briefly describes the study area. Section 3 explains the methodology used in this study to address the research objectives. Section 4 presents the results of this study. The findings of the research are discussed in Section 5. Policy implications are presented in Section 6, followed by a conclusion in Section 7.

## 2 | DESCRIPTION OF CASE STUDY

Pakistan is a developing country located in South Asia, sharing its border with Afghanistan (North), Iran (West), India (South-East and East), China (North-East), and the Arabian Sea (South). This country has profound cultural and historical links with its neighboring nations. Pakistan has four provinces Punjab, Sindh, Balochistan, Khyber Pakhtunkhwa, and Islamabad as the capital. It entails the regions such as Azad Kashmir, Gilgit Baltistan, and Tribal
Areas. In the Federal Republic of Pakistan, three tiers of Government exist such as national, provincial, and local. In descending order, the Local Government System comprises a three-tier system of District, Tehsil, and Union Council, so-called blocks (Country Profile, 2018).

Pakistan is the most urbanized country in South Asia with an urban population growth rate of 2.52%. According to the population census of 2017, the total population of Pakistan was recorded at 207.77 million and was 132.35 million in 1998 and 84.25 million in 1981 (Pakistan Bureau of Statistics, 2019). The total area of the country is 796,095 km². It was estimated that the average density was 261 persons per km² in 2017 (Javed & Khan, 2018). The total number of households was about 32.2 million with an average household size of 6.45 persons. According to the population census of 2017, 36.40% of the population lives in urban areas of Pakistan, which was 32.5% in the year 1998 and 28.3 in 1981. It is determined that almost 47% of the urban population is living in ten major cities of Pakistan, each with a population of more than 1 million (Kedir et al., 2016). It is evaluated that almost half of the population of Pakistan would be able to live in urban areas by 2025 (United Nation Development Program Pakistan, 2018). According to UNDP Pakistan, the unprecedented increase in population, migration, and expansion of urban boundaries are the main factors which contribute toward urban growth in Pakistan. Urbanization is categorized by the speedy intensification of agriculture, socioeconomic change, and ecological fragmentation, which can have deep influences on the epidemiology of infectious diseases (Hassell et al., 2017).

3 | MATERIALS AND METHODS

This study was a cross-sectional and observational study, conducted in major cities of Pakistan such as Lahore, Karachi, Multan, Islamabad, Rawalpindi, Peshawar, Hyderabad, Quetta, and Shaiwal. The nature of this study is mixed methods with qualitative and quantitative aspects. For this study, an online semi-structured questionnaire was used by using freely available Google Forms. A Snowball Sampling technique (also known as the Referral Sampling technique or Chain Sampling technique) was used in this study. A link to the questionnaire was sent to the contacts by using WhatsApp, Messenger, and email among the people in Pakistan. The participants were encouraged to send the same link to their contacts and as much as possible to friends, colleagues, relatives, and family members. Hence, the link was forwarded to the participants as the initial point of contact and then to others and so on. On receiving and clicking the link of the Google Form, participants got access to the questionnaire which is a form of an online survey, displaying questions related to the community knowledge, attitudes, practices, and health effects in Pakistan during the devastating lockdown situation in COVID-19. Participants were requested to fill the questionnaire in the most appropriate way with their personal understanding and awareness regarding COVID-19, the level of personal interpretation was recorded through their answers, finally, the form was submitted by clicking the submit option on the provided Google Forms. All responses were automatically saved in the drive.

This study was designed with an online perspective, and limited to those participants having accessibility to android base cell phones and internet connection. The mode of this questionnaire was English, therefore the link was sent to those participants who were able to understand English, with thinking and interpreting abilities, willing to respond to the designed questionnaire. For this study, data collection was carried out for 72 h in all localities of Pakistan. The link of the questionnaire for participants was initiated on 16 April 2020 at 1:15 p.m. and stopped on 19 April 2020 at 1:15 p.m. and responses were collected. A total of 439 responses were recorded in the above-mentioned stipulated time. In this study, Statistical Package for the Social Sciences (SPSS) was used to perform the different statistical analyses. The number of participants and proportions have been taken directly from the google survey to evaluate the results of this study. In this study, descriptive statistics techniques in SPSS have been used to calculate the mean and standard deviation. Independent Samples t test was performed to calculate the p value for checking the significance level of variables. In this study, p value < .05 was considered statistically significant. Linear regression, multinomial logistic regression and χ² test were used for testing the hypothesis in this study. Reliability analysis was performed to estimate the internal consistency of various variables.
COVID-19 is a drastic pandemic and global issue, a lockdown was announced by the Government of Pakistan under the threat of novel Coronavirus to save people from becoming victims of this consequential COVID-19. Social distancing was created among people, all educational institutions, offices, recreational places, markets, import, export, transport, railways, and airlines were restricted in the country. In this study, to investigate the personal opinion of the community toward these circumstances, an online survey was initiated comprising four fundamental traits including community knowledge, attitudes, practices, and health effects in the Pakistan population.

4.1 | Demographic characteristics of the participants

In this study, during the circumstances of COVID-19, the demographic characteristics of the participants focus on the following variables such as gender, age, educational level, marital status, profession, type of family, number of households, monthly household income. A total of 439 participants responded to the questionnaire comprising of $n = 317$ males and $n = 122$ females, the other demographic characteristics are expressed in Table 1.

Table 1 summarizes the distribution of online survey males represents a proportion of more than $72\%$ and $27.3\%$ females. The mean age was recorded at $29.5 \pm 4.82$, and participants from all age groups including those below 18 years to more than 65 years actively participated. The findings represent that most of the participants ($63.1\%$) were between the ages of 18–30 and more than $22\%$ of participants were between the ages of 31–40. This means that the young generation is more dynamic due to having accessibility to an internet connection. The qualification profile of the participants reflects a good representation ranging from primary to postgraduation. This shows that $43.5\%$ of participants were graduates and $26.7\%$ of participants were postgraduates. A small percentage ($1.4\%$) of participants had not completed primary level education. In this study, most participants ($58.8\%$) were single and only $39.4\%$ of participants are married, while the remaining participants preferred not to say. This study shows that most of the participants were employed with a $47.4\%$ proportion of the total responses. The second-highest proportion for profession is students with a proportion of $28.0\%$. Almost $12\%$ of participants were unemployed and $3.9\%$ of participants were daily wage earners, both being the most vulnerable groups in society. This study represents that $44.4\%$ of participants were living in the joint family system and the remaining were living in a single or nuclear family system. The findings elucidated that more than $54\%$ of participants had a household size of 5–8, with $21.9\%$ participants having a household size of 2–4, and $6.8\%$ of participants had a household size greater than 12, and $17.1\%$ of participants with a household size of 9–12. The participants having a greater household size, should be recommended to adopt a social distancing of 3–4 feet at their homes. This study represents that most participants ($22.8\%$) have a household income ranging between 40,001 and 60,000 PKR and almost $17\%$ of participants have household income of more than 100,000 PKR. The average income was calculated as $42,500 \pm 1702.34$. Around $20\%$ of participants are under the poverty line having a monthly household income less than 18,000 PKR. In demographic characteristics, the $p$ value < .05 was considered as statistically significant.

4.2 | Community knowledge about COVID-19 pandemic

A significant number of respondents were adequately aware of the basic elements of the novel Coronavirus pandemic in the country. This study represents that $78.6\%$ of participants did not hear the word Coronavirus before the occurrence of COVID-19 ($1.79 \pm 0.411, p = .370$). More than $46\%$ of the participants used social media to get information about COVID-19. Television (TV) is contributed a share of $32.6\%$ of the participants ($2.125 \pm 1.194, p = .467$). During COVID-19, maintaining a social distance of 3–4 feet is indispensable for people at
their homes, offices, markets, and health centers. Around 53% of participants said that social distancing is a reasonable step to prohibit the spread of Coronavirus and 13.4% of participants denied this, while 33.7% of participants did not know about social distancing. Electronic media, social media, and print media can play a vital role to create awareness, enhance knowledge, and reduce the fear and anxiety among the community at the time of crisis. Around 43% of participants agreed with the awareness campaign delivered by the afore-mentioned media while 22.6% of participants disagreed and 19.1% of participants remained neutral. This study illustrates that 42.1% of participants said the media is fear-mongering about COVID-19, while 19.4% of participants respond by disagreeing and 17.3% of the participants remained neutral (refer to Figure 1). The overall knowledge of COVID-19

| TABLE 1 | Demographic characteristics of the participants |
|---------|-----------------------------------------------|
| Sr. no. | Characteristic | Response | No. of participant (%) | Mean ± SD | p Value |
| 1       | Age (years)    | <18      | 9 (2.1)               | 29.5 ± 4.82 | .001 |
|         |                | 18–30    | 277 (63.1)            |           | |
|         |                | 31–40    | 99 (22.6)             |           | |
|         |                | 41–50    | 40 (9.1)              |           | |
|         |                | 51–65    | 13 (3.0)              |           | |
|         |                | >65      | 1 (0.2)               |           | |
| 2       | Educational level | Unfinished primary | 6 (1.4) | 4.14 ± 2.958 | .329 |
|         |                | Elementary | 24 (5.5)            |           | |
|         |                | Secondary  | 90 (20.5)            |           | |
|         |                | Graduation | 191 (43.5)           |           | |
|         |                | Postgraduation | 117 (26.7)      |           | |
|         |                | Others    | 11 (2.5)             |           | |
| 3       | Marital status | Single    | 258 (58.8)           | 1.42 ± 0.531 | .209 |
|         |                | Married   | 173 (39.4)           |           | |
|         |                | Prefer not to say | 8 (1.8)   |           | |
| 4       | Profession     | Employed  | 208 (47.4)           | 2.91 ± 2.18 | .001 |
|         |                | Unemployed | 52 (11.8)           |           | |
|         |                | Retired   | 13 (3.0)             |           | |
|         |                | Businessman | 26 (5.9)         |           | |
|         |                | Daily wage earner | 17 (3.9)   |           | |
|         |                | Student   | 123 (28.0)           |           | |
| 5       | Type of family | Single    | 244 (55.6)           | 1.47 ± 0.67 | .081 |
|         |                | Joint     | 195 (44.4)           |           | |
| 6       | Number of household | 2–4 | 96 (21.9) | 6.7 ± 2.08 | .049 |
|         |                | 5–8       | 238 (54.2)           |           | |
|         |                | 9–12      | 75 (17.1)            |           | |
|         |                | Greater than 12 | 30 (6.8)       |           | |
| 7       | Household income | <10,000 | 22 (5.0) | 42,500 ± 1702.34 | .252 |
|         |                | 10,001–18,000 | 57 (13.0)     |           | |
|         |                | 18,001–40,000 | 92 (21.0)     |           | |
|         |                | 40,001–60,000 | 100 (22.8)   |           | |
|         |                | 60,001–100,000 | 94 (21.4)   |           | |
|         |                | >100,000  | 74 (16.9)            |           | |
in the population was low in the country. Although most participants were well aware of the spread of Coronavirus disease and showing negligence towards practicing lockdown and directed guidelines.

4.3 | Attitudes toward COVID-19 pandemic

This study shows that 33.9% of participants replied as being neutral with the condition of lockdown in the country (refer Figure 2). More than 27% and 13% of participants are satisfied and strongly satisfied respectively while 17.5% and 7.7% of participants are dissatisfied and strongly dissatisfied. This study represents that 57.4% of participants responded that there is no case of Coronavirus reported in their nearby locality but 23.5% of participants said that cases were reported near their locality ($1.956 \pm 0.652, p = .723$). Around 86% of participants did not have any travel history abroad, only 14% of participants have traveled out of the country after the occurrence of COVID-19 ($1.86 \pm 0.349, p = .026$). Also, 74.9% of the participants have not gone even to other cities of the country while 1/4th of the participants have traveled to other cities from their locality ($1.75 \pm 0.435$). Almost 51% of participants said that no one comes to our surroundings from another city and country, just 23% of participants replied that people come to our surroundings from other cities and abroad ($2.1 \pm 1.635, p = .253$). The Government of Pakistan imposed a ban on all types of gatherings to stop the spread of novel Coronavirus in the country. More than 3/4th of the participants did not attend any gathering during the lockdown period, while 1/4th of the participants have attended gatherings.

4.4 | Practices regarding COVID-19 pandemic

The disaster of COVID-19 and circumstances created by lockdown diminishing instantaneously a person’s individual income to the economy at the national level to international level. At the time of crisis, the income declines, unemployment becomes great, and the price of commodities is raised. The daily wage earners are suffering from the state of being dead, cannot even able to earn a rupee in a disastrous condition of lockdown to meet the needs of their family.

In this study, participants were asked regarding practicing/maintaining social distance, Table 2 summarized that more than 63% of participants maintain the social distance at their homes, offices, markets, and health centers while almost 37% of participants did not care about this ($1.36 \pm 0.481, p = .047$). More than 3/4th of the participants are wearing masks and gloves at the afore-mentioned places ($1.24 \pm 0.428, p = .355$) and 85.6% of participants wash their hands with soap.
and using a hand sanitizer regularly (1.14 ± 0.351, \( p = .107 \)). This means that most people are pursuing the guidelines of WHO and the Government of Pakistan to get rid of this pandemic disease.

During COVID-19, the socioeconomic status of the general public was badly affected in the country. This study shows that 59% of participants stayed in their homes from 16 to 30 days (23.5 ± 0.742, \( p = .132 \)) and almost 3/4th of the participants were not going to their offices and workplace. Only 1/4th of the participants are still going for their work to fulfill their needs (1.75 ± 0.435, \( p = .003 \)), which includes the daily wage earners, private office workers, and so forth. Most participants are not able to visit their families, relatives, and friends owing to the closure of public transport and limited use of private vehicles in the country. This study revealed that 59.5% of participants did not make visits, while 14.4%, 12.1%, 7.3%, and 6.8% participants visited their families, relatives, and friends on a monthly, weekly, twice in a week, and daily basis respectively (2.19 ± 1.83, \( p = .264 \)).

This disaster spread across the globe without giving any early warning. Therefore, people were not ready to face this type of hazard, only 36.7% of participants stored food and essential items for the days of lockdown while more than 63% have not stored essential items (1.63 ± 0.482, \( p = .015 \)). More than 28.2% and 22.6% of participants visited the market on a weekly basis and twice in a week respectively, while more than 23% of participants did not visit the market during COVID-19 (3.05 ± 1.99, \( p = .905 \)). This study figured out that only 11.6% of participants visited the markets on a daily basis. Most people are getting these essential items within an accessible distance from their residence. This study represents that almost 28% and 24% of participants are availing of these facilities within a distance of 3–5 km and 1–2 km, respectively, from their homes. Only 22.8% of participants are accessing these facilities within a walkable distance (<1 km) while more than 1/4th of the participants are getting these things by traveling a distance of 6–10 km and more than 10 km during the lockdown in COVID-19 in the country (4.2 ± 1.208, \( p = .108 \)). This study shows that just 30.3% of participants availing the online facility for obtaining foods, grocery items, and medicine, and the rest of the participants did not avail of the online delivery facility (1.69 ± 0.465, \( p = .456 \)).
To identify the presence of any patient having blood pressure, heart problem, and diabetes at the respondent’s home, Figure 3 represents that there are no patients with these above-mentioned chronic diseases, which contributed to 43.3% of the participants with the remaining proportions as 1 person (27.8%), 2 persons (20.7%), 3 persons (5.5%), and greater than 3 persons (2.7%). The symptoms of COVID-19 are fever, respiration problem,
dry cough, sore throat, and shortness of breath. Almost 73% of participants did not feel any above-mentioned symptoms and the remaining participants have felt some symptoms like fever (9.3%), respiration problem (2.7%), dry cough (8.7%), sore throat (7.3%), and shortness of breath (3.6%) it may be related to COVID-19 or other sensitivities related to health issues (5.1 ± 1.616, *p* = .404). This study inferred that 39.6% of participants have consulted the doctor for the above-mentioned felt symptoms by visiting their clinic/hospital, only 16.9% of participants have availed the Telemedicine facility and 43.5% did not respond about this facility (2.038 ± 0.912, *p* = .723). During the period of lockdown, 35.5% of responses recorded that they are feeling mentally ill by considering the COVID-19 as a pandemic, while 41.7% of participants did not feel mentally ill, meaning people were free from fear, this is a positive sign to combat with this disease (1.87 ± 0.754, *p* = .923). This study represents that 40.8% and 36.2% of participants have felt anxiety and fear respectively, while 14.4% and 8.7% of participants felt comfortable and have no concern, respectively.

4.6 | Hypothesis testing

**Hypothesis 1:** Participants with good knowledge of COVID-19 will think social distance is a reasonable step to prohibit the spread of COVID.

In this hypothesis, regression and analysis of variance test were performed, the model summary is given at Table 3, as a result showing that adjusted *R*² was .007 and *F* change was estimated 3.888. whereas Table 4 represents that level of significance was recorded as 0.049. which is less than 0.05 meaning the null hypothesis is rejected and this hypothesis is supported.

**Hypothesis 2:** Participants following good practices regarding COVID-19 will maintain the social distance at offices, health centers, and markets during the lockdown in Pakistan.

The residents of Pakistan with good knowledge of COVID-19 significantly maintained the social distance at the offices, health centers, and market during the lockdown. For this purpose, linear regression was performed at a 95% confidence interval, as a result, the value of *F* was 4.856, adjusted *R*² was .009, and *p* value was .028, which is less than .05, which shows the null hypothesis is rejected and this hypothesis is supported (refer Tables 5 and 6).

**Hypothesis 3:** Participants will be less likely to well informed about coronavirus, most will be made anxious with a distressful level of poverty during COVID-19.
| Model | $R$  | $R^2$ | Adjusted $R^2$ | Std. error of the estimate | Change statistics | Durbin–Watson |
|-------|------|-------|----------------|---------------------------|------------------|--------------|
|       |      |       |                |                           | $R^2$ change     | $F$ change   | $df_1$ | $df_2$ | Sig. $F$ change |               |
| 1     | .094 | .009  | .007           | 0.90854                   | .009             | 3.888        | 1      | 438    | 0.049          | 1.576          |

**TABLE 3** Model summary of regression analysis for hypothesis
The participant is not well informed about the coronavirus according to the results of the regression analysis. Tables 7 and 8 show that the significance value at 95% confidence interval was 0.600 which is greater than 0.05 meaning that the null hypothesis will be accepted in this case and this hypothesis is not supported.

Hypothesis 4: Media coverage would be able to make the participants aware or distract and threaten them in these circumstances.

For this hypothesis, multinomial logistic regression was performed by using SPSS. Table 9 illustrates that the significance level was calculated as 0.015 at a 95% confidence level, which is less than 0.05 ($p$-value). Hence, the null hypothesis is rejected.

### 4.7 | Reliability analysis

Cronbach’s $\alpha$ was developed by Lee Cronbach in 1951 used to provide a measure of the reliability of a test. It is expressed as a number between 0 and 1. In this test, if items are correlated to each other, then the value of $\alpha$ will be increased (Tavakol & Dennick, 2011). The ranges of Cronbach’s $\alpha$ are given in Table 10.

Reliability analysis was done by taking five variables into account such as the satisfaction of participants with lockdown conditions, steps taken by the Government of Pakistan, satisfaction with health facilities, satisfaction with media coverage, and facility of telemedicine during lockdown conditions. The result of Cronbach’s $\alpha$ concluded that reliability (0.595) had poor internal consistency (Table 11).

### 5 | DISCUSSION

COVID-19 is an emerging, rapidly changing global health challenge affecting all sectors in the world. It is vital to encourage the public to accept the precautionary measures, which are totally dependent on the correct knowledge of the pandemic and suitable response among the people. Several studies have been conducted to examine the level of knowledge, attitudes, and practices (KAP) about infectious disease outbreaks such as SARS, Influenza, Swine flu, and MERS. Recently, some researchers have conducted studies on KAP toward COVID-19 among residents in the countries like China, United States, Tanzanian, Kenya, Ethiopia, and Nepal (Abuya et al., 2020; Akulu & Ayelign, 2020; Asraf et al., 2020; Rugarabamu et al., 2020; Wolf et al., 2020; Zhong et al., 2020). Jilani et al. (2020) also conducted a study in Bangladesh on the influence of knowledge sharing on sustainable performance, which concluded that the influence of knowledge sharing on employees’ ambidexterity is not affected by knowledge hiding. But, through literature research, we have not found any study on KAP about COVID-19 among the Pakistan population till now. Therefore this study was conducted to investigate the community knowledge, attitudes, practices, and health toward COVID-19 in this country. Also, this study identified some demographic characteristics associated with KAP toward the COVID-19 pandemic. This study may help to provide findings to
| Model | $R$  | $R^2$ | Adjusted $R^2$ | Std. error of the estimate | Change statistics | Durbin–Watson |
|-------|------|-------|----------------|---------------------------|-------------------|---------------|
|       |      |       |                |                           | $R^2$ change | $F$ change | $df_1$ | $df_2$ | Sig. $F$ change |               |
| 1     | .105 | .011  | .009           | .47972                    | .011             | 4.856        | 1      | 438   | 0.028          | 1.683          |
assist the health sector authorities and public health policymakers in developing the strategies and health awareness campaigns to stop the transmission of the novel Coronavirus pandemic.

This study had more male participants (72.2%) which was similar to the study conducted by Asraf et al. (2020), Zhang et al. (2020), and Akalu and Ayelign (2020). Although female participants were more in a study done by Rugarabamu et al., (2020) and Zhong et al., (2020). In our study, most participants had not heard the word Coronavirus before the occurrence of COVID-19 which was dissimilar to the study which was conducted by Bharadva et al. (2017). In this study, social media was the most common source of information which was dissimilar to the studies conducted by Kaur et al. (2015) and Bharadva et al. (2017). In this study, the symptoms of the novel Coronavirus were probed like the study conducted by Asraf et al. (2020), Zhong et al., (2020), and Olum et al., (2020).

In our study, most participants did not attend any gathering during COVID-19, which was similar to the study conducted by Zhong et al. (2020), Akalu and Ayelign (2020), Al-Hanawi et al. (2020), and Olum et al., (2020). In our study, most participants wear masks and gloves at the time of the visit to the market, office, hospitals, which was similar to the study by Asraf et al. (2020) and Zhong et al., (2020) and most participants practice social distancing at the above-mentioned places, which was similar to the study by Asraf et al. (2020) and Akalu and Ayelign (2020). These precautionary measures could be mainly attributed to the very strict prevention and control measures imposed by the Government of Pakistan such as banning public gatherings. As a result, a strict lockdown was implemented by the Government to curb the spread of COVID-19. They also could be the outcome of the residents’ good knowledge about the high infectivity of the COVID-19 virus, which can be easily transmitted among people. Unfortunately, this current study showed that almost 1/4th of the participant did not wear masks and gloves when leaving their homes. Regrettably, almost 37% of participants did not maintain social distancing in their daily routine and 14.4% of participants did not wash their hands with soap, which was similar to the study conducted by Akalu and Ayelign (2020), and did not use hand sanitizer regularly. Similar findings were obtained among Nepalese residents in a study done on KAP toward COVID-19 (Asraf et al., 2020).

The triad of community knowledge, attitudes, and practices in amalgamation govern all aspects of life in human societies and all three pillars together make up the dynamic system of life itself. Therefore, they are correlated all together in a way so that, the demonstration of an increase in knowledge, changes in attitudes, and practices would be pinpointed towards the prevention of pandemic effects (Bharadva et al., 2017). As prevention is the best measure to minimize the effects of Coronavirus pandemic and awareness of this virus is ranked very high in the precautionary measures, the dissemination of the appropriate facts to the general public on the status of the COVID-19 is vital to spread awareness of the potential risks and the optimum code of behavior during COVID-19 in Pakistan.

Due to inadequate access to internet facilitates and online health information means, vulnerable populations of Pakistan under the COVID-19 outbreak like older adults and rural residents at the grass-root level are more likely to have poor knowledge, negative attitudes, and unsuitable precautionary measures during COVID-19. Thus, KAP toward COVID-19 in the vulnerable section of society deserves special research attention in Pakistan these days. Moreover, there was limited sample representativeness and another limitation of the study was the lack of detailed assessment of KAP toward COVID-19, which would be possible by conducting focus group discussions and in-depth interviews and made as multi-dimensional measures.

### Table 6: ANOVA for Hypothesis 2

| Model       | Sum of squares | df  | Mean square | F     | Sig.  |
|-------------|----------------|-----|-------------|-------|-------|
| Regression  | 1.118          | 1   | 1.118       | 4.856 | .028  |
| Residual    | 100.568        | 438 | .230        |       |       |
| Total       | 101.686        | 439 |             |       |       |

Abbreviation: ANOVA, analysis of variance.
### TABLE 7  Model summary of regression analysis for Hypothesis 3

| Model | $R$  | $R^2$ | Adjusted $R^2$ | Std. error of the estimate | Change statistics | Durbin–Watson |
|-------|------|-------|----------------|---------------------------|------------------|--------------|
|       |      |       |                |                           | $R^2$ change      |               |
|       |      |       |                |                           | $F$ change        | $df_1$       |
|       |      |       |                |                           | $df_2$           | Significance |
|       |      |       |                |                           |                  | $F$ change    |
|       |      |       |                |                           |                  |              |
| 1     | 0.025 | 0.001 | -0.002         | 0.75439                   | 0.001            | 0.275        |
|       |       |       |                |                           | 1                | 437          |
|       |       |       |                |                           | 0.600            |              |
|       |       |       |                |                           | 1.710            |              |
This study demonstrated panic fueled by poor understanding of COVID-19 associated facts and the need for the government to ensure more targeted awareness campaigns in a most transparent way to gain public confidence and ensure public engagement in mitigation measures. This study provides a KAP and health baseline about COVID-19 among the Pakistani population. This study indicated that most of the people are adopting the SOPs regarding prevention of COVID, the government should encourage them, and enforcement mechanism should be enhanced at all general public gathering places in the country to stop the spread of COVID-19.

**TABLE 8** ANOVA for Hypothesis 3

| Model     | Sum of squares | df | Mean square | F     | Sig. |
|-----------|----------------|----|-------------|-------|------|
| Regression| 0.157          | 1  | 0.157       | 0.275 | 0.600|
| Residual  | 248.700        | 437| 0.569       |       |      |
| Total     | 248.856        | 438|             |       |      |

Abbreviation: ANOVA, analysis of variance.

**TABLE 9** Multinomial logistic regression for Hypothesis 4

| Model                             | Model fitting criteria | Likelihood ratio tests | χ² | df | Sig. |
|-----------------------------------|------------------------|------------------------|----|----|------|
| Intercept only                    | -2 log likelihood      | χ²                      |    |    |      |
| Final                             | 224.967                | 24.921                 | 12 | .015|      |
| Final                             | 200.046                | 24.921                 | 12 | .015|      |

**TABLE 10** Ranges of Cronbach’s α

| Cronbach’s α | Internal consistency |
|--------------|---------------------|
| a ≥ .9       | Excellent           |
| .9 > a ≥ .8  | Good                |
| .8 > a ≥ .7  | Acceptable          |
| .7 > a ≥ .6  | Questionable        |
| .6 > a ≥ .5  | Poor                |
| .5 > a       | Unacceptable        |

**TABLE 11** Reliability statistics

| Cronbach’s α | Cronbach’s α based on standardized items | No. of items |
|--------------|-----------------------------------------|--------------|
| .596         | .595                                    | 5            |

6 | THEORETICAL AND POLICY IMPLICATIONS

This study demonstrated panic fueled by poor understanding of COVID-19 associated facts and the need for the government to ensure more targeted awareness campaigns in a most transparent way to gain public confidence and ensure public engagement in mitigation measures. This study provides a KAP and health baseline about COVID-19 among the Pakistani population. This study indicated that most of the people are adopting the SOPs regarding prevention of COVID, the government should encourage them, and enforcement mechanism should be enhanced at all general public gathering places in the country to stop the spread of COVID 19.

7 | CONCLUSION

Novel Coronavirus pandemic is spreading across the globe vigorously. This study represents that overall knowledge about COVID-19 among the participants was low. The attitudes of the participants were positive as 3/4th participants have not gone to any other city after the occurrence of COVID-19 and 3/4th participants did not attend any type of gathering
during the COVID-19 outbreak. This study concluded that practices regarding maintaining social distancing, wearing masks and gloves, washing hands with soap, and using hand sanitizer regularly were appreciated. Extensively, people are feeling mentally ill by the threat of being a victim to the COVID-19. This study concluded that 3/4th participants felt anxiety and fear because of this pandemic. However, electronic media, print media, and social media are playing the requisite role and providing a sense of awareness among the people in Pakistan. There is a need to create more awareness about the COVID-19 pandemic, though the afore-mentioned media is vital for limiting the transmission of the novel Coronavirus pandemic.

PEER REVIEW
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DATA AVAILABILITY STATEMENT
The authors declare that all data supporting the findings of this study are available within the article.

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