Proceedings of the Pakistan Academy of Sciences:
B. Life and Environmental Sciences 58(3): 65-73 (2021)

ISSN (Print): 2518-4261; ISSN (Online): 2518-427X
http://doi.org/10.53560/PPASB(58-3)668

Pakistan Academy of Sciences

Research Article

Assessing Public Opinion Regarding COVID-19 Vaccinations in Pakistan: Knowledge, and Perceptions of General Public

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Abstract: The COVID-19 infodemic can be counteracted by clear and consistent communication of scientific evidence and improved health literacy between the public and informants. For complete eradication of COVID-19, several vaccines are approved in various countries for public use by regulatory authorities. Assessing public perception regarding COVID-19 vaccination is an important area of research. In the current study, we aim to evaluate the opinions of individuals from multiple localities about COVID-19 and its vaccination through an online survey. Participants of the study were divided into different groups based on age, profession, demography, and income, and their opinions were calculated in percentage. In age group analysis we reported the highest willingness, 62.8 % (n=22) in age group 30-40, followed by 60 % (n=3) in age group >50, 58.6 % (n=244) in age group 20-30, 57.95 % (n=51) was in age group 15-20 and the least willingness, 33.33 % (n=4) in age group 40-50. The highest disagreement regarding vaccination of 60 % was found in age group >50, followed by 33.3 % in the age group 40-50, 14.7 % in the age group 20-30, 11.4 % in the age group 15-20 and 30-40. Similarly based on profession, maximum acceptability, 59.1 % (n=262) was reported in students, followed by a businessman (68.7 %, n=11), professional workers (3.5 %, n=20). Likewise, in demographic analysis, individuals from Khyber Pakhtunkhwa (KP) (61.3 %, n=200) were found more enthusiastic for vaccination, followed by AJK (58.33 %, n=7) and Islamabad (58.1 %, n=32). In the same way, people with income range $435 - $621/month showed the highest willingness (65.7 %, n=69) regarding vaccination, followed by income group ($621 or more $s/month). Surprisingly, individuals from the low-income group were found more interested in vaccination as compared to the higher-income group. Comparatively low interest of high-income group individuals may be due to more exposure to conspiracy theories shared on social media.

Keywords: COVID-19, vaccination, survey, perception, demography, willingness, infodemics

1. INTRODUCTION

Coronavirus belongs to the family of zoonotic viruses that cause illnesses ranging from the common cold to severe respiratory conditions like breathing difficulties, dry cough, high fever, etc [1]. In some serious cases, it can cause pneumonia, severe respiratory syndrome, kidney or lungs failure, or even death [2]. It can transmit from one person to another by respiratory droplets and personal contact [3]. It may take 2-14 days for a normal person to show its symptoms or it can be asymptomatic altogether [4].

The first case was documented in Wuhan, China in December 2019, COVID-19 was declared as a global pandemic in March 2020 by WHO. The early form of the virus has symptoms similar to the influenza virus and common cold but the death rate is much higher in covid-19 [5]. Soon this viral infection gained attention globally due to the high rate of transmission in humans and it crossed the borders of China and take over the whole world in a few days [6]. Research centers around the world started to find anti-viral treatments to cure the infection and the priority was to make a vaccine against this deadly virus. So phylogenetic studies showed COVID-19's relation with SARS, severe acute respiratory syndrome-like viruses [7]. But the origin of SARS-CoV-2 is still unknown [8].

Received: May 2021; Accepted: September 2021
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After primary researches on the virus genetics and structural biology, pharmaceutical and biotech companies started producing vaccines, and after production, clinical trials began [9]. Now talking about human attitudes towards this disastrous biological calamity, the behavior which was dominated all over the world that was taking no serious measure to overcome the viral transmission [10]. A part of the population attributed this virus to race and blamed their eating habits [11].

According to WHO the novel coronavirus has infected more than 209 countries around the globe. The first coronavirus case in Pakistan was reported in Karachi on February 26, 2020, and confirmed by the Pakistan ministry of health, Islamabad [12, 13]. The government of Pakistan took all the necessary measures to control the spread of SARS-CoV-2 and ensure the health and safety of its people [12]. The SOP's were followed according to the WHO standards and the complete lockdown was imposed by the government. But Pakistan, being a 3rd world country and facing economic instabilities, this pandemic proved to be causing a more alarming condition and have a huge negative impact on the economy and people [14]. So the government has to make the difficult decision to ease the restrictions of lockdown to keep the economic wheel of the country running, that's why it is very necessary to vaccinate the people as soon as possible [15].

The pandemic situation and the imposed lockdown appeared to have a role in the uncertainty, substantial public anxiety, and distrust in the people and most of them started blaming the government. [16]. Half of the population wanted to get rid of this lockdown due to poverty as the majority Pakistani population works on daily wages [17]. All the reasons for the population's insensitivity towards government measures come due to underestimating the danger of COVID-19 [18].

Many companies around the globe have launched the vaccine for the common public after 3rd phase of the clinical trial and a few companies are still in clinical trials [19]. But unfortunately, people have lots of concerns about the long-term effects of the vaccine. There is a lack of trust in vaccination from humans [20]. Illiteracy in Pakistan can be the reason but response towards vaccination is also the same in the educated population [18]. Now people are more concerned about the coronavirus rather than vaccination. The main reason for such concerns is overthinking due to the infodemics and misconceptions about COVID-19 being shared without any investigation on social media [21]. Also, the reason for this type of attitude is the elevated death rate in the last few months [22]. As this natural calamity proved to be disastrous for more than a year, it affected mentally everyone and made them confused about the vaccination [20]. The purpose of our current survey is to evaluate the perception and acceptance of the COVID-19 vaccine among people in Pakistan. The results of our study may help the government policymakers and health care professionals to formulate the best possible approaches to implement the mass immunization programs against COVID-19 in Pakistan.

2. METHODOLOGY

2.1 Study design

This was an online study that was conducted from 15th November 2020 to 10th December 2020 after the ease of lockdown in the country. We choose the online platform to survey because it was difficult to perform a community-based survey at that time, as nowadays almost every individual has internet access.

2.2 Survey instrument

The survey instrument or questionnaire was designed in an online Google forum in such a way that the people of any community and age group can easily understand it, a thorough literature survey of other vaccine-based studies was done. Once the survey conceptualization was done it was rechecked and reviewed by senior experts with a background in biotechnology. Some changes were made as suggested by the experts for a better understanding of the participants.

The questionnaire had 31 questions that had the demographic information of the participants, such as gender, age, marital status, education, occupation, and current residence. To investigate the knowledge of the participants, the questions were asked in the second part with three options: "yes", "no", and "maybe". These knowledge-based

questions were based on the presence of the virus, family individuals being infected, and strategies to prevent the transmission of COVID-19. The third part had questions focused on the attitude toward the COVID-19 vaccine and the perception of the people towards the SOPs after the COVID vaccine intake. The last part mainly focused on the misconceptions and infodemic-related views of the participants. The answers to the question of the third and fourth part comprised of five options: "strongly agree", "agree", "disagree", "strongly disagree", "don't know".

The questionnaire was shared through social media platforms like WhatsApp groups, Facebook, Twitter, Instagram, and through emails with friends, family, and colleagues. The participants were requested to share the questionnaire with their friends and family and they were requested to fill the form honestly by clicking the options on the link. Moreover, the main objective of the study was mentioned on the first page, and the sharing of individual data, confidentiality, and consent was also provided. Participants above the age of 15 years old living in Pakistan were added to the study and no incentives were provided to the participants.

2.3 Data analysis

The data was collected from 580 participants of which 556 participants' data was considered correct and the exclusion was made based on incomplete information and it was analyzed and arranged through Microsoft excel and was distributed among different age groups, financial status, province, education level, and professions.

3. RESULTS AND DISCUSSION

Assessing public perception regarding COVID-19 vaccination is an important area of research. In the current study, we had evaluated the opinions of individuals from multiple localities about multiple aspects including vaccination. Participants consisted of males and females comprising 46.2 % (n=257) males and 53.8 % (n=299) were females (Figure 1) belonging to multiple localities throughout Pakistan, 60.3 % (n=335) were from rural areas and 39.7 % (n=221) from urban areas (Figure 2). The majority of the participants that took part in this survey were of graduation level that was 53.6 % (n=298) followed by postgraduate level 34 % (n=34) and high school level were 12.4 % (n= 69) (Figure 3). They were further divided into different age groups and their opinions were calculated in percentage.

In the age group 15-20, 57.9 % (n=51) individuals were willing to be vaccinated, 11.4 % (n=10) individuals were not keen to be vaccinated and 30.7 % (n=27) individuals were not sure about being vaccinated. In age group 20-30, 58.6 % (n=244) people want to get vaccinated, 26.7 % (n=111) might get vaccinated and 14.7 % (n=61) people will not get the vaccines for COVID-19. Overall the highest percentage (62.8 %, n=22) of individuals who agree to be vaccinated lies in the age group 30 to 40, and the lowest lies both in individuals aged from 15-20 as well as 30-40. The data for all three perceptions in the age group 40-50 remain the same at 33.3 % (n=4 for each perception) and people above 50 who agree to be vaccinated and those who are not sure about being vaccinated are 20 % (n=1 each) with a high percentage of 60 % (n=3) who disagree to getting shots for COVID-19 (Figure 4). The results show that most people are not sure but will most like to get vaccinated because they want to wait before others get vaccinated and not try new vaccines on themselves right away.

People that agreed to get COVID-19 shots per different professional and educational sectors among which the overall highest number is that of students (59.1 %, n=262) and people with less education were less likely to say they would get vaccinated because they were less aware of its importance. The businessmen (68.7 %, n=11) fall next in line to students followed by professional workers (3.5 %, n=20). In the group of individuals that are not willing to get vaccinated most are professional workers (35 %, n=7) and the lowest number is that of administrative professionals (12.5 %, n=1). Professional workers (40 %, n=8) also show the highest peak among individuals that are not sure if they will get vaccinated for COVID-19 with the least doubtful individuals from the business sector (12.5 %, n=2).

Figure 6 demonstrates the attitude of the public regarding COVID-19 vaccination throughout different Pakistani provinces and their capital. The most elevated peak shows that the highest number

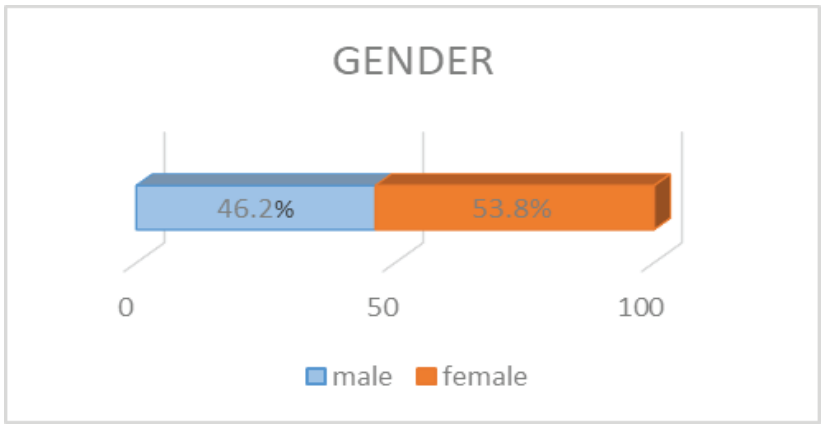

Fig. 1. No. of Male and Female individuals.

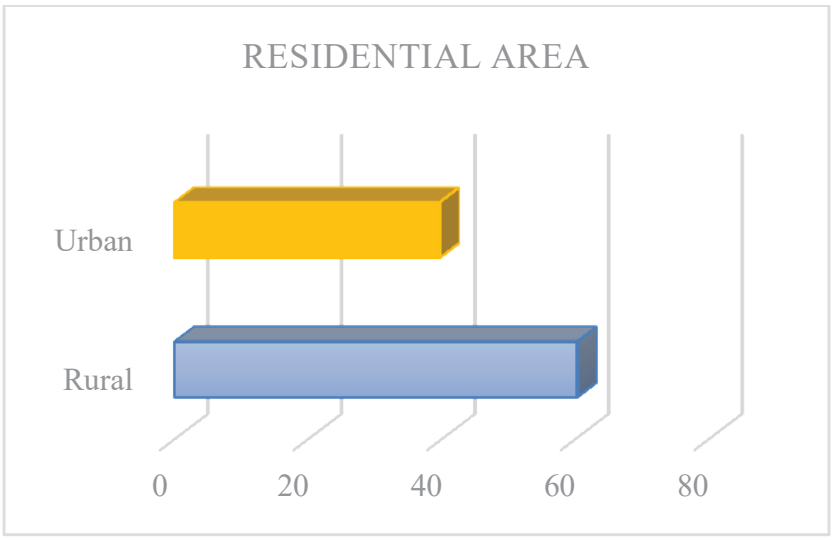

Fig. 2. Residential area wise count of participants.

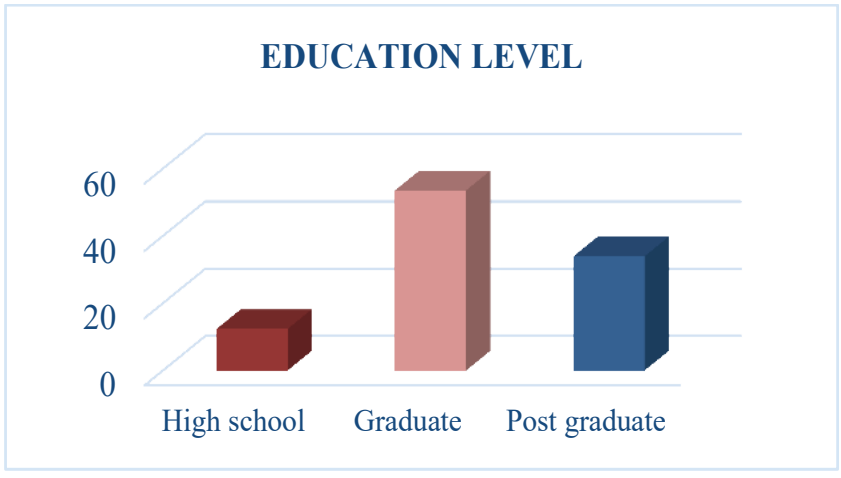

Fig. 3. Education level of the participants.

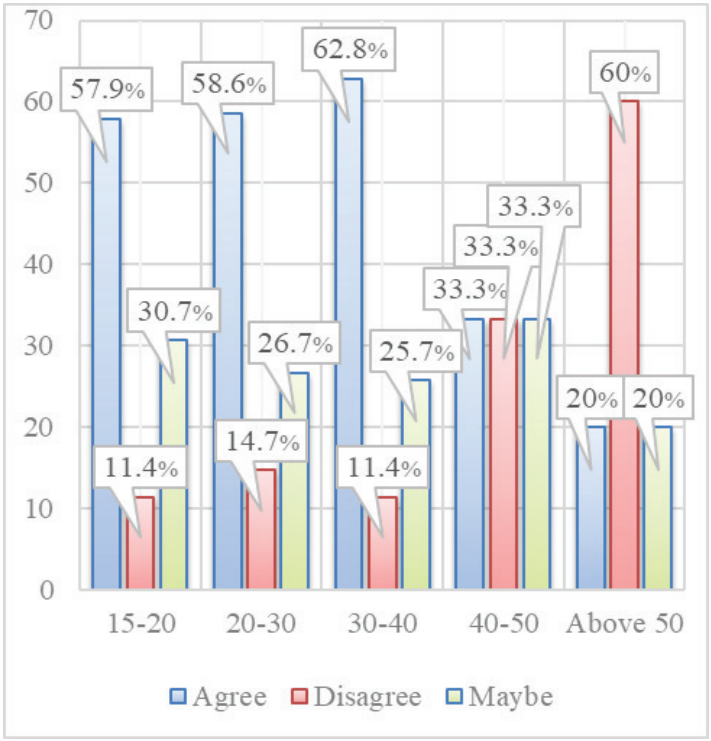

Fig. 4. Age group-wise perception about COVID-19 vaccination.

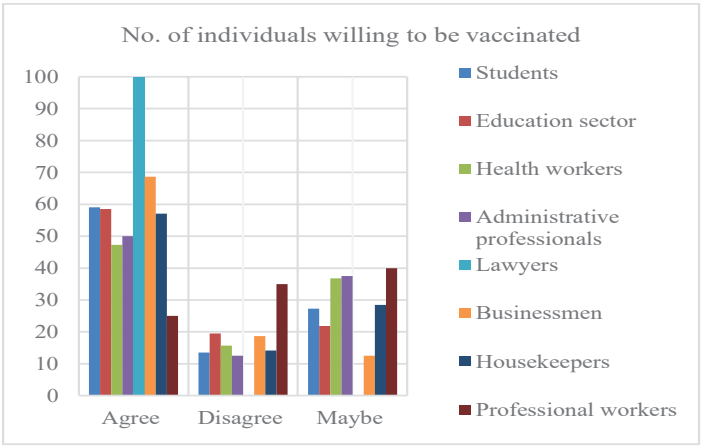

Fig. 5. No. of individuals willing to be vaccinated.

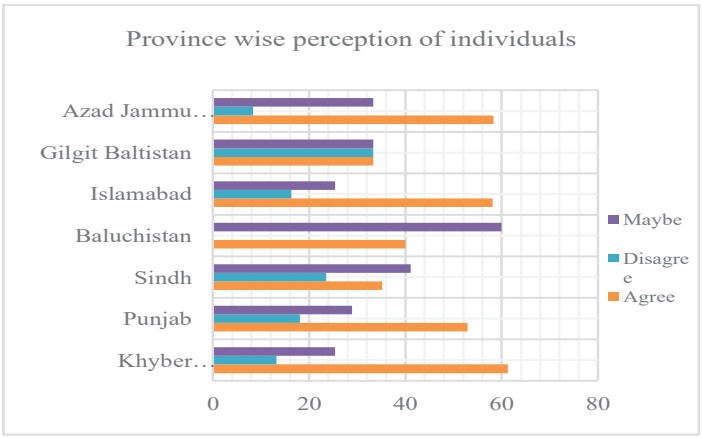

Fig. 6. Province wise perception of individuals.

of people that agree to be vaccinated belongs to KP (61.3 %, n=200) followed by the people of AJK (58.33 %, n=7) and Islamabad (58.1 %, n=32). The peak in KP can be explained as the most affected cases were from that province and the public is more aware of the severity of the disease. Most people who disagree with getting the shots are from Gilgit Baltistan with the same number of people from the area agreeing to be vaccinated and those who are not sure if they want to get vaccinated (33.33 %, n=1). The most uncertain group of people regarding the vaccines belongs to Baluchistan (60 %, n=3).

Figure 7 displays results about COVID-19 vaccine perception as per different wages of people across Pakistan. The people with income ranging between $435 - $621 (65.7 %, n=69) show the most interest in being vaccinated followed by the richest class (income more than $621). People with less income are less interested in buying expensive vaccines and choose to remain unvaccinated. Similar but the opposite trend is seen in the figure that the least people who disagree with being vaccinated for COVID-19 also belong to the group of people with stable wages of $435-$621 as they would be able to afford vaccines. The people with income between $310-$435 are most unsure if they want to spend on vaccines for COVID-19. A detailed overview of the above-said data is mentioned in (Table 1).

Unfortunately, due to the infodemics and misconceptions caused due to social media and different thoughts of people, 3.8 % of the people still think that covid-19 does not exist and there is no need of making the vaccine, while 10.4 % of people don't know whether the covid-19 a deadly virus exists or not and 85.8 % people are aware of this deadly virus and they think that a vaccine is necessary. Of the total participants 84.3 % people think that COVID-19 trials should conduct in Pakistan of which 57.7 % people are willing to participate in the trials and they will accept the vaccine shots, the remaining people are in doubt that is 6.7 % and some disagree with the trials in Pakistan 8.9 % and they would not accept the COVID-19 vaccine shots. There are 67.3 % of people who think that the COVID-19 vaccine will be effective, moreover, 4.3 % of people think that the vaccine will not be effective, 28.4 % people think that this vaccine can be effective or it can cause adverse effects and can have future complications. As initially there were myths against the COVID-19 virus that it doesn't exist and it's propaganda by the superpower countries to control people activities and to implement the new world order, same is with COVID-19 vaccine 51.8 % of people think that these vaccines can cause genetic manipulation in people while some think that these vaccines can be used to control people through 5g technology that were 26 % and 35.2 % people disagree with this myth to control people's mind with vaccines. On the other side, there are a total of 25 % of people who think that these vaccines can control the minds of people through advanced microchip technology and 20.7 % people think that this vaccine can cause a serious threat to their religious concepts and it can have the ability to control and change their religious beliefs by controlling their minds, while 51.4 % people don't accept this myth of the harm to their minds, genetics and religious concept by the COVID-19 vaccine.

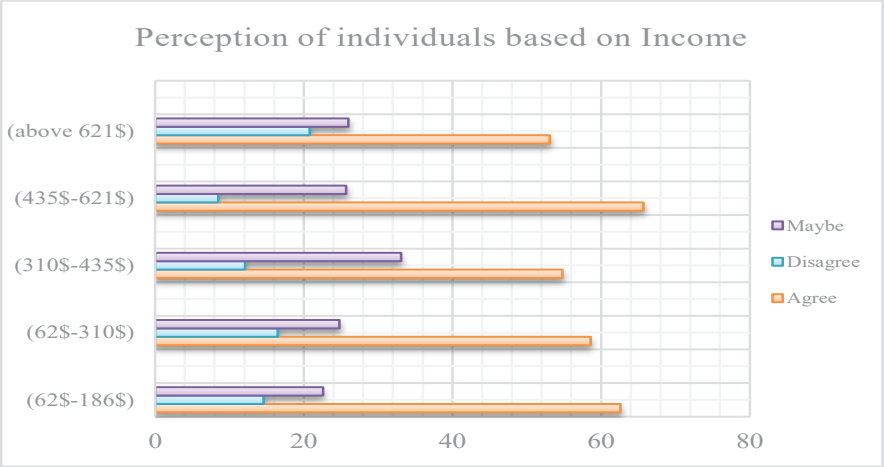

Fig. 7. Perception of individuals based on income.

Table 1. A detailed overview of the opinions of individuals from multiple localities about multiple aspects including vaccination

Age groups	**Total no, % value**	**No. of individuals willing to be vaccinated**		
		Agree	Disagree	Maybe
15-20	88 (15.8 %)	51 (57.9 %)	10 (11.4 %)	27 (30.7 %)
20-30	416 (74.8 %)	244 (58.6 %)	61 (14.7 %)	111 (26.7 %)
30-40	35 (6.3 %)	22 (62.8 %)	4 (11.4 %)	9 (25.7 %)
40-50	12 (2.2 %)	4 (33.33 %)	4 (33.33 %)	4 (33.33 %)
Above 50	5 (0.9 %)	1 (20 %)	3 (60 %)	1 (20 %)
Profession	**Total no, % value**	**Agree**	**Disagree**	**Maybe**
Students	443 (79.7 %)	262 (59.1 %)	60 (13.5 %)	121 (27.3 %)
Education sector	41(7.3 %)	24 (58.5 %)	8 (19.5 %)	9 (21.9 %)
Health professionals	19 (3.4 %)	9 (47.3 %)	3 (15.7 %)	7 (36.8 %)
Administrative professionals	8 (1.4 %)	4 (50 %)	1 (12.5 %)	3 (37.5 %)
Lawyers	2 (0.3 %)	2 (100 %)	-	-
Businessmen	16 (2.9 %)	11 (68.7 %)	3 (18.7 %)	2 (12.5 %)
Housewives	7 (1.2 %)	4 (57.1 %)	1 (14.2 %)	2 (28.5 %)
Professional jobs	20 (3.5 %)	5 (25 %)	7 (35 %)	8 (40 %)
Province	**Total no, % value**	**Agree**	**Disagree**	**Maybe**
KP	326 (58.6 %)	200 (61.3 %)	43 (13.2 %)	83 (25.4 %)
Punjab	138(24.8 %)	73 (52.9 %)	25 (18.1 %)	40 (28.9 %)
Sindh	17 (3.1 %)	6 (35.2 %)	4 (23.5 %)	7 (41.1 %)
Baluchistan	5 (0.9 %)	2 (40 %)	-	3 (60 %)
Islamabad (Capital territory)	55 (9.9 %)	32 (58.1 %)	9 (16.3 %)	14 (25.4 %)
Gilgit Baltistan	3 (0.5 %)	1 (33.33 %)	1 (33.33 %)	1 (33.33 %)
AJK	12 (2.2 %)	7 (58.33 %)	1 (8.33 %)	4 (33.33 %)
Income Groups (Monthly)	**Total no, % value**	**Agree**	**Disagree**	**Maybe**
10k-30k ($62-$186)	75 (14.1 %)	47 (62.6 %)	11 (14.6 %)	17 (22.6 %)
30k-50k ($62-$310)	133 (25 %)	78 (58.6 %)	22 (16.5 %)	33 (24.8 %)
50k-70k ($310-$435)	124 (23.3 %)	68 (54.8 %)	15 (12.1 %)	41 (33.1 %)
70k-100k ($435-$621)	105 (19.7 %)	69 (65.7 %)	9 (8.5 %)	27 (25.7 %)
Above 100k (above $621)	96 (18 %)	51 (53.1 %)	20 (20.8 %)	25 (26 %)

The majority of the people think that govt. and media are playing a sufficient role in awareness against this virus and they are trying their best for the acceptance of the COVID-19 vaccine among people.

To the best of our knowledge, this is one of the first kinds of study conducted in Pakistan. Moreover, in terms of age group and profession, similar findings have been reported in several international studies [4, 23-27].

The study has a few limitations that need to be considered, the samples count is more enough to represent the surveyed areas but the results could not be generalized over areas where the number

of participants was very low. In addition, due to lockdown and pandemic situations, the study was conducted online through a questionnaire and no personal interviews were conducted. This is the first survey conducted in Pakistan that highlights the knowledge and behavior of the individuals regarding COVID-19 vaccination.

4. CONCLUSION

This survey assessed the perceptions of the individuals of different ages, regions, and income groups of Pakistan regarding the acceptance of COVID-19 vaccination. It has been concluded that the major number of individuals who were willing to get vaccinated were teenagers and students. Senior citizens were found more hesitant of vaccination due to negative perception of side effects or mythical effects. Based on geographic distribution, the highest number of individuals willing for vaccination were from Khyber Pakhtunkhwa. Moreover, based on income, the highest willingness for COVID-19 vaccination was found in middle-income group individuals. To recapitulate, we suggest that only authentic sources such as WHO, CDC, and NIH website should be followed for seeking information regarding COVID-19. Exposure to malicious and disinformation could lead to infodemics that negatively influence people's perceptions regarding COVID-19 vaccination.

5. ACKNOWLEDGMENTS

We would like to thank all the participants who voluntarily took part in this survey.

6. CONFLICT OF INTEREST

The authors declared that they do not have any conflict of interest.

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