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Research Article

A SURVEY ON COVID-19 VACCINE ACCEPTANCE AND CONCERN AMONG PAKISTANIS

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Abstract

The current study aims to assess the beliefs of the general public in Pakistan towards conspiracy theories, acceptance, concern, and preference for the COVID-19 vaccine availability and efficacy (Especially our targeted population was from southern Punjab) as this can help planning preventive actions against COVID-19. A cross-sectional study was conducted through an online self-administered questionnaire from February 2022 till May 2022 in which 605 people from southern Punjab participated.

Keywords: *Vaccine hesitancy, Public perception, Public health survey, Pakistan.*

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1. INTRODUCTION

Coronavirus is a zoonotic, RNA virus in the family *Coronaviridae* of the order *Nidovirales*. It is a family of viruses that cause respiratory infections, which were first isolated in 1937 and designated coronaviruses, because they have a crown-like appearance under microscopy in 1965 (Claudio Márcio Amaral de Oliveira Lima, 2020). Previous outbreaks of coronaviruses (CoVs) include the severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV which have been previously characterized as agents that are a great public health threat (Hussin, 2020). The types of coronavirus known to date are as follows: the alpha coronaviruses HCoV-229E and HCoV-NL63; the beta coronaviruses HCoV-OC43 and HCoV-HKU1; SARS-CoV, which causes severe acute respiratory syndrome (SARS); MERS-CoV, which causes Middle East respiratory syndrome (MERS); and SARS-CoV-2, a new coronavirus described in late 2019 after cases were reported in China, which causes the disease known as coronavirus disease 2019 (COVID-19) (Lima, 2020).

In late December 2019, a cluster of patients was admitted to hospitals with an initial diagnosis of pneumonia of an unknown etiology. These patients were epidemiologically linked to a seafood and wet animal wholesale market in Wuhan, Hubei Province, China. Early reports predicted the onset of a potential coronavirus outbreak given the estimate of a reproduction number for the 2019 Novel (New) coronavirus (COVID-19, named by WHO on Feb 11, 2020) which was deemed to be significantly larger than 1 (ranges from 2.24

to 3.58) (Rothan and Byrareddy, 2020). A number of studies in various settings determined the basic reproductive number R0 to be within the range of 2–3; the incubation period was determined as ranging from 1 to 14 days with an average of 5–6 days; transmission through droplets was established as the main mode of transmission; the clinical picture that emerged included a wide range from mild symptoms with fever, sore throat and cough to severe pneumonias with characteristic features on computed tomography scans; in Hubei, China, up to 13.8% of laboratory-confirmed patients had severe disease, 6.1% were critically ill and the case fatality rate among all COVID-19 cases was 2.3%.

Patients with SARS-CoV-2 infection may present symptoms ranging from mild to severe with a large portion of the population being asymptomatic carriers. The most common reported symptoms include fever (83%), cough (82%) and shortness of breath (31%). In patients with pneumonia, chest X-ray usually shows multiple mottling and ground-glass opacity. Gastrointestinal symptoms such as vomiting, diarrhea, and abdominal pain are described in 2–10% of the patients with COVID-19.and in 10% of patients, diarrhea and nausea precede the development of fever and respiratory symptoms (Ciotti *et al.*, 2020).

The current recommendations for laboratory diagnosis of COVID-19 from the CDC are that clinicians coordinate this testing with local public health authorities and/or the CDC. The preferred testing method is the real-time reverse transcription-PCR (RT-PCR) test similar to that developed for the diagnosis of SARS-CoV. Viral cultures are not recommended (Tang *et al.*, 2020). This commentary addresses current issues for the laboratory diagnosis of COVID-19 that must be understood by clinicians, clinical microbiology laboratories, and public health authorities (Tang *et al.*, 2020: Yi-Wei Tang, 2020). A systematic review has outlined a severe form of the disease in 20% of the affected individuals with a mortality rate of 3%. As of February 2021, COVID-19 has affected 108 million people worldwide, leading to 2.38 million deaths while Pakistan has reported 560,000 cases and 12,218 deaths. Hence, in addition to social distancing measures and personal protective equipment, there is a vital need to be vaccinated for COVID-19 to curb community transmission in Pakistan (Malik *et al.*, 2021). To cope with this situation, countries around the globe have adopted stringent measures and restrictions to limit the spread of the virus, which include but are not limited to social isolation, obligatory use of face masks, and travel restrictions. Such stop-and-go strategies are expected to continue until herd immunity has been achieved. However, the most promising strategy to control the pandemic is a vaccine with an established track record of efficacy and a successful vaccination rollout (Güner *et al.*, 2021).

1.1. COVID-19 vaccine landscape

As of 8 April 2020, 115 vaccine candidates are known to be engaged in research and development for COVID-19, of which 78 have been confirmed to be active and 37 have not been confirmed (due to lack of information in public or proprietary information sources). There are 78 confirmed active projects, of which 73 are exploratory or preclinical. The most advanced candidates have recently entered into clinical development, such as mRNA-1273 from Moderna, Ad5-nCoV from CanSino Biologicals, INO-4800 from Inovio, and LV-SMENP-DC and pathogen-specific aAPC from Shenzhen Geno-Immune Medical Institute (Tung Thanh Le, 2020). Many other vaccine makers have said they will start clinical trials in human volunteers in 2020. Variety of technology formats. One interesting thing to note about the vaccine development scenario for COVID-19 is that

it is being evaluated across a variety of technology platforms such as nucleic acid (DNA and RNA), virus- like particle, peptide, viral vector (replicating and non-replicating), live attenuated virus and inactivated virus approaches (Kalinke *et al.*, 2022).

Safety is a primary goal for vaccines that are given to otherwise healthy people, and there is a risk that vaccination could make subsequent SARS-CoV-2 infection more severe. This has happened before with vaccines based on whole-inactivated virus formulated in alum for a coronavirus of cats and for another unrelated respiratory virus in children (Graham, 2020). The attitudes of the population are still a crucial variable in the successful implementation of countries' COVID-19 vaccination plans. Coronavirus disease 2019 (COVID-19) vaccine is available in different countries around the world, and the vaccine is being made available to everyone according to a staged introduction, with public-private partnerships. Regardless of geographical distribution, a number of myths around the COVID-19 vaccine have emerged, which has hindered national vaccine administration and rollouts. The reluctance of people to receive safe and recommended available vaccines, known as 'vaccine hesitancy', was already a growing concern before the COVID-19 pandemic. The 5C model of drivers of vaccine hesitancy was developed based on research in high-income countries, and identifies the following five main individual level determinants of vaccine hesitancy: confidence, complacency, convenience (or constraints), risk calculation and collective responsibility (Liu *et al.*, 2020). To increase vaccine uptake (including COVID-19 vaccines), it will be important to learn if someone wants a vaccine, why they do or don't, and what they trust that they listen to when they make a decision. In diverse countries all over the world, the coronavirus disease 2019 (COVID-19) vaccine has been introduced and public-private partnerships have been established for all people to be vaccinated in a phased manner.

Table. 1: Baseline Characteristics of Index Patients with COVID-19.

	n (%)
Age, median (25th–75th), years	47 (40–56)
Gender	
Male	60 (57.1)
Female	45 (43.9)
Exposure history within 14 days	
Physically in Wuhan before	65 (61.9)
Contact with people from Wuhan	13 (12.4)
Previously in local high-risk sites	27 (25.7)
Symptoms at onset of illness	
Fever	56 (53.3)
Cough	31 (29.5)
Fatigue	20 (19)
Chill	12 (11.4)
Dyspnea or anorexia	6 (5.7)
Dizziness or myalgia	5 (4.8)
Vomit or nausea	3 (2.9)
Diarrhea or nasal congestion	2 (1.9)
Headache or palpitations	1 (0.95)
Time from onset of illness to hospitalization	
0–1 days	12 (11.4)
2–5 days	34 (32.4)
>5 days	59 (56.2)
Quarantine at home immediately after onset of symptoms	
Yes	14 (13.3)
No	91 (86.7)

Regardless of the geographical region, a number of myths around the COVID-19 vaccine have proliferated, which has hindered national administration of vaccines and rollouts. The general public in Pakistan showed a high level of acceptance for the COVID-19 vaccine in this study. The study aimed to evaluate the acceptance of COVID-19 vaccine among the general population in Pakistan (Ahmed *et al.*, 2021).

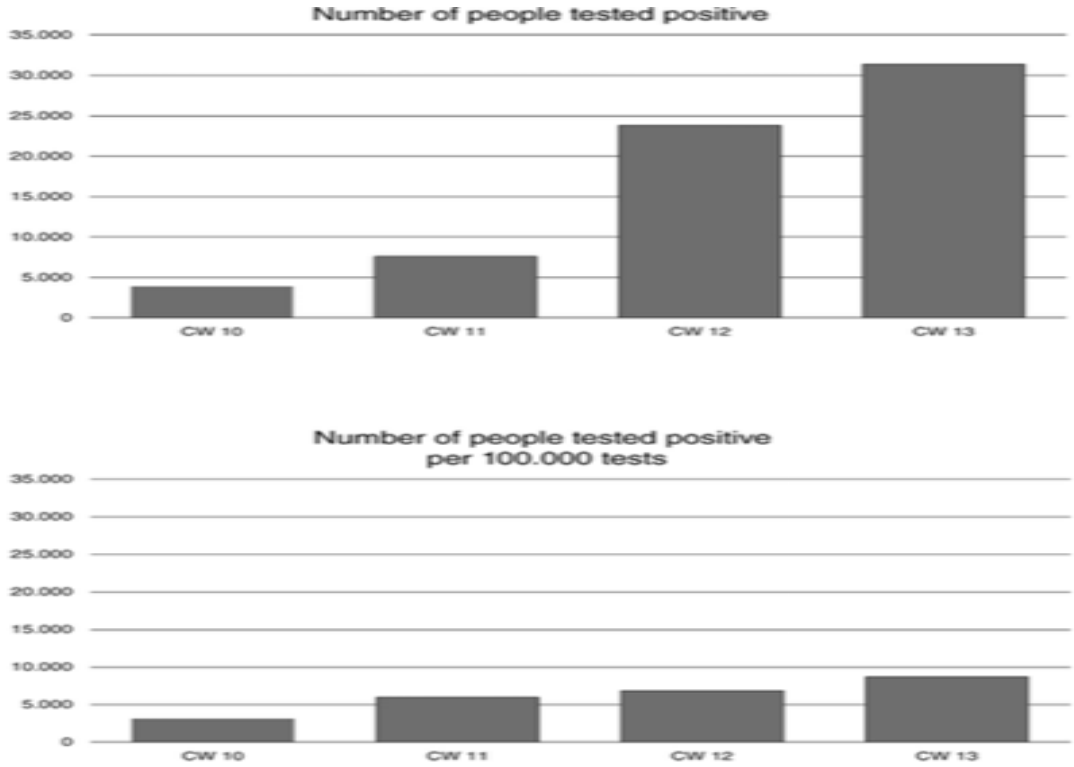

Figure. 1: COVID-19 disease penetrance rate across the globe

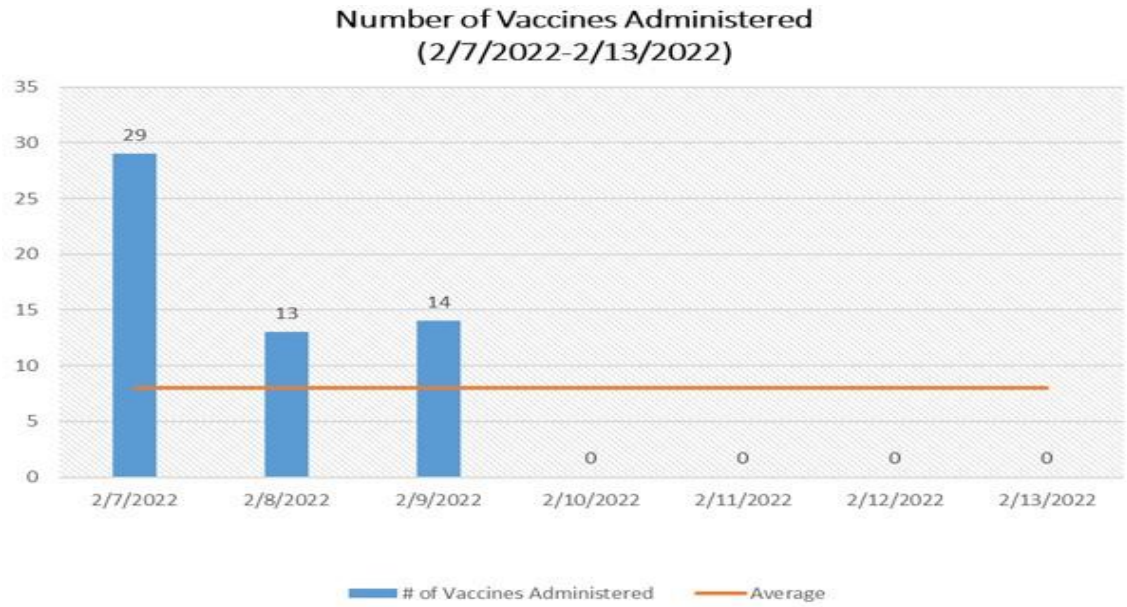

Figure. 2: Number of vaccines administered (an average overview)

2. MATERIALS AND METHODS

2.1. Study Design, Sampling, and Study Participants

Cross-sectional study was conducted online using a self-administered questionnaire from January 2022 to May 2022. A convenient sampling technique was utilized to get maximum responses from the general population of Pakistan. Our aim was to study COVID-19 vaccine acceptance rate and concern among Pakistanis (especially targeted population was from southern Punjab) as this can help planning preventive actions against COVID-19.

2.2. Survey Tool

The formulated self-administered questionnaire was based on the previous studies and following the aim of the study. For the ease of public, the questionnaire was also translated in the national language of Pakistan "Urdu". The Urdu version of the study instrument was also developed based on the face validity of the study instrument by experts in the field and their suggestions were incorporated in the last version of the study instrument. Then, the improved and finalized questionnaire was used for the final data collection (Arshad *et al*., 2021). The final questionnaire comprised of six sections with a total of 29 items. The first section was based on demographic information such as gender, age, education and residential area. The second part consisted of five questions on the acceptance of COVID-19 vaccine. The third section was comprised of four items assessing COVID-19 vaccine availability to general public, social pressure of being vaccinated and their concerns regarding it. The fourth section consisted of 4 questions related to the side effects and the durations of the COVID-19 vaccination. The fifth section was comprised of eight items assessing the public opinions, beliefs about myths or conspiracy theories and preference regarding the COVID-19 vaccine efficacy. The last section consisted of two items concerning the public opinion regarding effect of booster dose against omicron variant. The COVID-19 vaccines that were approved by the DRAP at the time of the study, were included in the study instrument for assessing participants' vaccine preference. The brands of the included vaccines were Pfizer-BioNTech, Oxford/AstraZeneca and Sinopharm.

2.3. Data Collection

Google Forms (Google LLC, Mountain View, CA, USA) was used to design the online questionnaire. The link of the pre-validated questionnaire was designed and made public on social media platforms (Facebook, WhatsApp, E-mail) using the author's approach to assess the attitude and acceptance of the public towards the COVID-19 vaccine from 20 January 2022. The questionnaire has been sent online through social media following a methodology of the author. All authors were sent a link to the online survey. The authors had to distribute the online survey in an assigned geographical region. To prevent incomplete answers, the answer to each question was required for advancing to the next section of the survey. The items in the specific section were randomized to avoid any bias. A check was applied to obtain a single response from an IP address, to avoid duplicate entries. Questionnaires that were not completed were not used in the study.

2.4. Statistical Analysis

The statistical package for the social sciences (SPSS) version 21.0 (IBM SPSS Statistics, New York, NY, USA) was used for the statistical analysis. After data collection, layer variables (as control) were added in the chi square test to control the potential confounders. The demographic data of the participants were presented using descriptive statistics. For categorical variables, the frequencies and percentages were used and for continuous variables, the mean and standard deviation were used. The chi-squared ($\chi 2$) test or Fisher exact test was used

to analyze the association between categorical variables as per need.

3. RESULTS

3.1. Demographic characteristics of study participants

A total of 605 respondents with 100% rate were included in this survey out of which 175 (29.2%) were male, 417 (69.5%) were female, and 8 (1.3%) were transgender. Majority 409 (68.2%) were in the age group of 15 – 25. Regarding their educational status, majority 325(54%) were graduated and 145 (24.2%) were post graduated. Majority of participants (70.9%) are from urban area. Almost three-quarters of the participants were students (68.3%) with no monthly income. The detail of the demographics of participants can be seen in Table 2.

Table. 2: Demographic characteristics of study participants (n = 605).

Characteristics	Frequency or Mean	Percentage or ± SD
Gender		
Male	175	29.2
Female	417	69.5
Transgender	8	1.3
Age		
15-25	409	68.2
25-40	124	20.7
40-60	45	7.5
>60	22	3.7
Educational status		
Null	17	2.8
Matric/inter	114	19
Graduate	324	54
Post-graduate	145	24.2
Residence		
Rural area	173	29.1
Urban area	422	70.9
Employment Status		
Student	400	68.3
government employee	53	9
private employee/business	115	19.6
Retired or pensioner	18	3.1

Table 3: Acceptance of COVID-19 vaccine

Variables	Frequency or Mean	Percentage or ± SD
People suffered from COVID-19		
Yes	147	24.5
No	454	75.5
People got vaccination against COVID-19		
Yes	562	93.8
No	37	6.2

People completed their both doses		
Yes	518	86.8
No	79	13.2
Brand of preference (COVID-19 vaccination)		
Pfizer	97	16.8
Sinovac / Sinopharm	376	65.3
AstraZeneca	18	3.1
Johnson	4	0.7
Moderna	40	6.9
CanSino	26	4.5
How many brands of COVID-19 vaccines in Pakistan?		
More than 5	263	44.3
5	169	28.5
<5	180	26

3.2. Acceptance of COVID-19 vaccine

Among total respondents only 147 (24.5%) suffered from COVID-19. Almost 93.8 % were vaccinated against COVID-19 and only 13.2 % were those who didn't complete their vaccination as they got only single dose. More than half of the respondents (65.3%) had Sinovac or Sinopharm, 16.8% had Pfizer,16.9% had Moderna,4.5% had CanSino ,3.1% had AstraZeneca as their preference for COVID-19 vaccine. Almost Half of the participants (44.3%) thought that there are more than 5 brands of vaccines available in Pakistan while 28.5% thought only 5 brands and according to remaining ones there are 3 or less than 3 brands of vaccines available in Pakistan.

3.3. COVID-19 vaccine availability and concerns

The COVID-19 vaccine was readily available to majority (93.1%) of the respondents almost three quarters of respondents (69.7%) got their vaccines from civil hospital. 17.5% got from door-to-door vaccination and only 12.8 % got from private clinic. Furthermore, majority (85.8%) of participants preferred getting vaccinated from government vaccination center. Almost 68% among them get vaccinated unwillingly or due to any social or government pressure.

Fig 3.1: Map showing five major districts shaded of South Punjab Pakistan covered for our survey (source: Download Scientific Diagram).

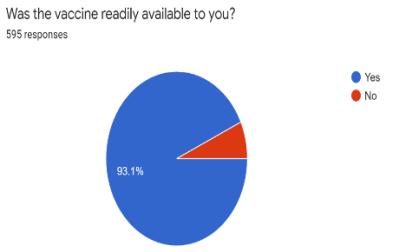

Figure. 3.2: Vaccine availability status of respondents.

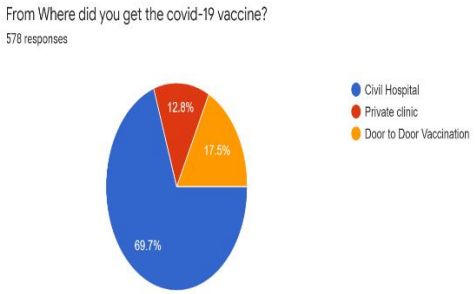

Figure. 3.3(a): Preference of respondents for their Vaccination center.

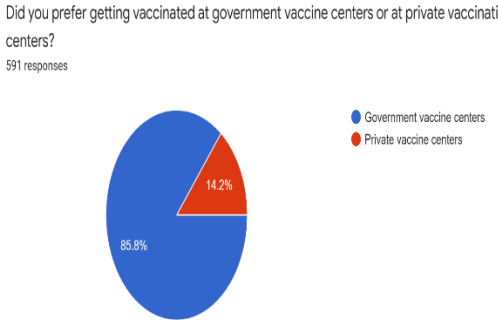

Figure. 3.3(b): Preference of respondents for their Vaccination center.

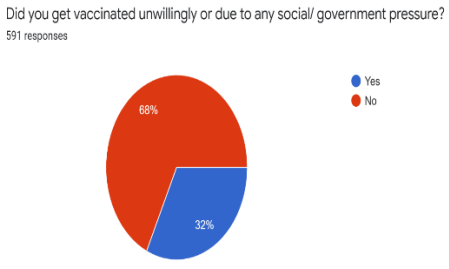

Figure. 3.4: Rate of COVID-19 vaccination affecting by social pressure.

3.4. COVID-19 vaccine dose duration and side effects

Among the total respondents 33.1% did not have any side effect while 20.9% experience fatigue/pain ,10.6% experience fever, 6.4% suffer from headache and 29% were those who experience all these side effects right after their COVID-19 vaccination. Majority of respondents did not suffer from COVID-19 after their 1st dose only 13.3%) suffer from COVID-19 even after their 1st dose. Almost half of the participants got their 2nd dose right after 28 days, 24.3% were those who got after 2 months and 11.6% were those who never got their 2nd dose of vaccination. according to our survey only 10.1% of participants suffer from COVID-19 even after their 2nd dose of COVID-19 vaccination.

3.5. Public opinion regarding COVID-19 vaccine

As far as public opinion concerns 78.9% of the respondents don't have any sort of hesitation regarding COVID-19 vaccine. 1.7% of females were hesitant due to their pregnancy, 28.2% among them were hesitant due to diabetes melilites, 1.1% due to hyper-cholesterolemia and only 2.4% were hesitant due to religious beliefs and fear for being infertile. furthermore 69.8% of participants mentioned social media as the major source of information related to COVID-19 vaccination almost half of the respondents (47.1%) thought that Pfizer is more effective than other brands of vaccines while 31.7% consider Sinovac/Sinopharm as most effective brand of vaccine among the total respondents. 52.6% believe that COVID-19 vaccine is not safe for pregnant women, lactating women, and patient suffering from diseases like diabetes and hypertension etc.

Majority of respondents (80.2%) thought that COVID-19 vaccine is not safe for children and 76.6% thought that COVID-19 vaccine is safe for people above age of 60. among the total respondents only 27.2% thought that COVID-19 vaccines are safe even though

that develop in a short time while 12.4% did not agree to it, 60.4% were still confused about the safety and efficacy of COVID-19 vaccine. Almost half of the people (53.3%) consider antiviral drugs and vaccines as a possible treatment of COVID-19 while 23.5% rely on herbal remedies like joshanda, garlic, green tea and 23.2% preferred only paracetamol and antibiotics as the possible treatment of COVID-19.

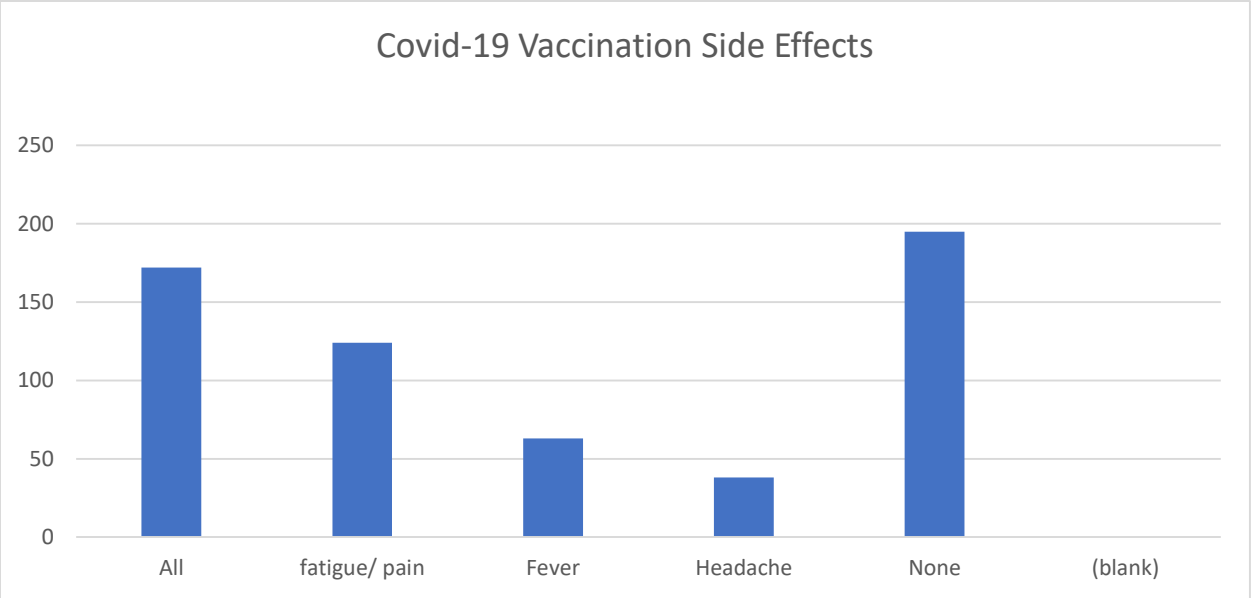

Figure. 3.5: Side Effects of COVID-19 Vaccination.

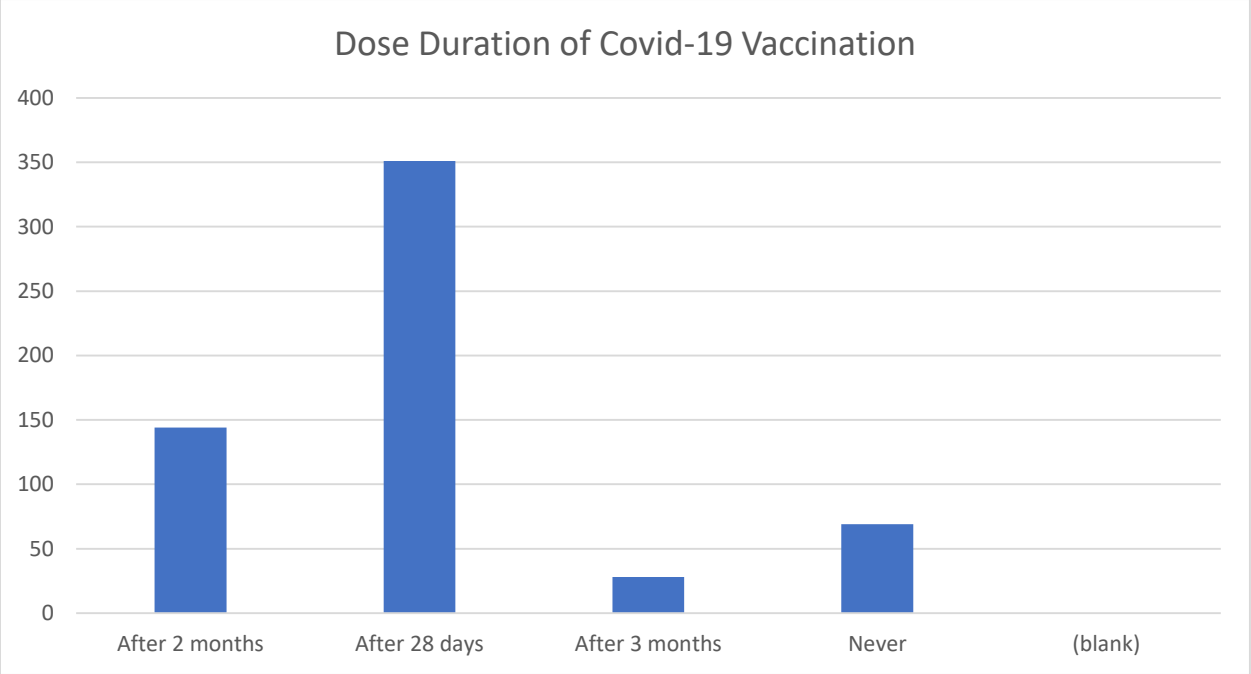

Figure. 3.6: Dose duration for COVID-19 Vaccination.

Table 4: Questionnaire used for recording the data

Queries	Frequency or Mean	Percentage or ± SD
If you are still not vaccinated what is the cause of hesitation?		
Religious beliefs	147	24.5
Pregnancy	454	75.5
Diabetes mellitus		
Lack of information		
Disease history		
Hypercholesterolemia,		
Any other		
What was the primary source of information related to COVID-19 vaccine?		
	562	93.8
	37	6.2
Which brand of vaccine is more effective in your opinion?		
Yes	518	86.8
No	79	13.2
Do you think that COVID-19 vaccine is safe for pregnant women, lactating women and patients suffering from diseases like diabetes, hypertension etc.?		
Pfizer	97	16.8
Sinovac / Sinopharm	376	65.3
AstraZeneca	18	3.1
Johnson	4	0.7
Moderna	40	6.9
CanSino	26	4.5
What do you think is COVID-19 vaccine is safe for children under age of 5?		
More than 5	263	44.3
5	169	28.5
<5	180	26

3.6. Effect of booster dose against omicron variant

As far as omicron variant concern more than half of the respondents (57.8%) were in doubt that their previous vaccination can protect them against omicron variant too or not while 66.7% believe that they should get booster dose against omicron variant for their protection.

4. DISCUSSION

The findings of this study indicate a high level of COVID-19 vaccine acceptance among the surveyed population, with most respondents completing their vaccination schedule. Easy access to vaccines through government health facilities contributed significantly to the high vaccination rate. Although vaccine uptake was encouraging,

concerns regarding vaccine safety, particularly for pregnant women, individuals with chronic diseases, and young children, were still evident. Social media was the major source of vaccine-related information, which may have influenced public perceptions and contributed to uncertainty about vaccine safety and efficacy. Most participants reported no or only mild side effects following vaccination, supporting the overall safety of COVID-19 vaccines. Furthermore, the majority of respondents favored booster doses to enhance protection against emerging variants such as Omicron. This study demonstrated a high acceptance and uptake of COVID-19 vaccines among the Pakistani population. Vaccines were generally accessible, well tolerated, and perceived as an important measure for protection against COVID-19. However, concerns regarding vaccine safety, effectiveness, and protection against new variants still exist. Therefore, continuous public awareness campaigns and dissemination of accurate scientific information are necessary to improve vaccine confidence and support future vaccination programs.

5. REFERENCES

Ahmed, T.F., A. Ahmed, S. Ahmed and H.U. Ahmed. 2021. Understanding COVID-19 vaccine acceptance in Pakistan: an echo of previous immunizations or prospect of change? Expert Review of Vaccines 20:1185–1193.

Ciotti, M., M. Ciccozzi, A. Terrinoni, W.-C. Jiang, C.-B. Wang and S. Bernardini. 2020. The COVID-19 pandemic. Critical Reviews in Clinical Laboratory Sciences 57:365-388.

Güner, H. R., I. Hasanoğlu and F. Aktaş. 2021. Evaluating the efficiency of public policy measures against COVID-19. Turkish journal of medical sciences 51:3229–3237.

Kalinke, U., D. H. Barouch, R. Rizzi, E. Lagkadinou, Ö. Türeci, S. Pather and P. Neels. 2022. Clinical development and approval of COVID-19 vaccines. Expert Review of Vaccines 21:609-619.

Lima, C. M. A. de O. 2020. Informações sobre o novo coronavírus (COVID-19).

Liu, Y., K. Wang, T. F. Massoud and R. Paulmurugan. 2020. SARS-CoV-2 Vaccine Development: An Overview and Perspectives. ACS Pharmacol. Transl. Sci. 3:844-858.

Malik, A., J. Malik and U. Ishaq. 2021. Acceptance of COVID-19 vaccine in Pakistan among health care workers. PloS one 16:0257237.

Map showing five major districts (shaded) of South Punjab-Pakistan|Download Scientific Diagram. n.d. Available at https://www.researchgate.net/figure/Map-showing-five-major-districts-shaded-of-South-Punjab-Pakistan-covered-for_fig1_347065133.

Rothan, H.A. and S.N. Byrareddy. 2020. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. Journal of autoimmunity 109:102433.

Tang, Y.-W., J.E. Schmitz, D.H. Persing and C.W. Stratton. 2020. Laboratory Diagnosis of COVID-19: Current Issues and Challenges. J Clin Microbiol 58:00512-20.

Yi-Wei Tang, J. E. S. 2020. Laboratory Diagnosis of COVID-19: Current Issues and Challenges.