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Covid-19 Vaccine Hesitancy in Pakistan: A Cross-Sectional Study to Assess Resistance and Related Fears and Misconceptions

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ABSTRACT

Objective: The purpose of this study was to assess willingness to receive COVID-19 vaccine in Pakistan and to understand the reasons causing hesitation towards vaccine administration.

Study Design: A cross-sectional study was done through an online survey that was created using google forms.

Place and Duration of Study: The study was conducted online from Mar to Aug 2021 in different cities of Pakistan employing nonprobability convenience sampling technique. The link to the questionnaire was shared on different social media platforms such as WhatsApp and Facebook.

Methodology: Any individual over the age of 16 and willing to fill the questionnaire was enrolled. Questionnaire used were standardized Oxford COVID-19 vaccine hesitancy scale to assess intent and Oxford general vaccine hesitancy scale to assess attitude towards vaccinations in general. SPSS v25 was used for data analysis.

Results: A total of 589 valid responses were finally analyzed. Among the respondents, 24%(141) showed at least some hesitancy regarding COIVD-19 vaccination and 9%(53) of the respondents showed extreme hesitancy. The Pearson correlation coefficient indicated a significant positive correlation (p<0.000) between hesitancy to childhood vaccines and COVID vaccine hesitancy. There was also a significant correlation (p<0.000) between belief in conspiracy's related to COVID-19 virus and refusal to get vaccinated.

Conclusion: Vaccine hesitancy is present in roughly 1/4th of the study population. Conspiracy theories and low vaccine acceptance among the general public pose a severe danger to COVID-19 vaccination success. Public vaccine education programs should be started to educate the public regarding their fear of vaccination.

Keywords: COVID-19, Vaccination, Vaccine Hesitancy.

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INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) epidemic has wreaked havoc on people all over the world in the last year.[1] COVID-19 was recorded in 102 million cases worldwide till January 2021, with 2.2 million deaths.[2] Pakistan has so far reported 1,080,360 positive cases and 24,085 deaths.[3] The spread of this contagious sickness has brought the entire planet to a standstill. An effective vaccine(s), which can lower illness incidence, prevalence, new hospitalizations, and intensive care need, can help to alleviate the ongoing pandemic.[4] In December 2020, the WHO approved Pfizer-BioNTech's (BNT162b2) and Moderna's (mRNA-1273) mRNA vaccines for emergency use, bringing hope for a return to normalcy.[5] However, the magnitude of resistance that the COVID-19 vaccine will face was not predicted.

Despite the reported success of available COVID-19 vaccines, the immunization efforts still face considerable backlash. The public's acceptance of the vaccination is the most critical aspect in any effective immunization campaign, as the public is the final determinant of a vaccination program's success or failure. In comparison to affluent countries, developing countries such as Pakistan have a higher rate of refusal and unwillingness to receive vaccination, which can be seen by the prevalence of avoidable diseases such as polio.[6] Previous studies have shown that up to 40% of the population in Pakistan is reluctant in getting the COVID-19 vaccine.[7] This number is very drastic especially when compared to developed countries like USA where refusal to get the COVID-19 vaccine is present in 7%-15% of the population.[8] Myths such as the vaccine causes death and the vaccine is more harmful than the virus because it causes autism and infertility are excessively present in the Pakistani community.[7] Furthermore, despite knowing the risks of the virus to human health, beliefs in conspiracy theories that have very rapidly developed lead to vaccine hesitancy by weakening trust in government agencies, healthcare personnel, and pharmaceutical companies.[9]

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The public's trust and confidence in immunizations is highly changeable. Understanding a group's perceptions of vaccines and vaccine-related risks or side effects, as well as their socioeconomic status, political stance, and religious affiliation, is necessary for building vaccine confidence.[10] It's critical to figure out where myths and conspiracies come from. Such tales may sow seeds of resistance against the COVID-19 vaccination effort in Pakistan, where vaccine apprehension is a key obstacle to preventing vaccine-preventable diseases.

The goal of this study was to assess the degree of aversion to COVID-19 vaccine and identify clusters within the population where resistance is excessively prevalent. The study tried to determine the severity of the problem, identify groups expressing increased reluctance, and understand the substance of essential beliefs underpinning antibody aversion. These objectives, taken together, provide a better understanding of how public health officials can tailor health campaigns to align with the psychological profiles of vaccine hesitant individuals.

METHODOLOGY

A cross-sectional study was conducted on the general population of Pakistan in various cities from March to June 2021. Sampling was done by WHO sample size calculator keeping the confidence interval as 95% and margin of error of 5%. A total of 700 individuals from different cities of Pakistan were asked questions about demography, experience with COVID-19, and belief in vaccine related myths and probable cause of their hesitancy. Out of the 700, 615 responded. Some responses were rejected due to incomplete forms and finally 589 valid responses were analyzed.

Inclusion Criteria: Any individual above the age of 16.

Exclusion Criteria: Unwilling to fill the forms.

The data was collected using a questionnaire that was distributed as a google form link. It was made available in both Urdu and English. The questionnaire was divide into 5 sections. Vaccine attitudes, awareness, and reluctance of study participants were assessed using a composite questionnaire that included a validated vaccine hesitancy measurement tool-the Oxford COVID-19 vaccine hesitancy scale. The questionnaire included nine Questions regarding demographic variables such as age, gender, educational status, occupation, current employment status, employment status before COVID-19 epidemic, economic status, marital status, presence of child in school. Two questions were asked about experience with COVID-19. Seven questions were asked about COVID-19 vaccine hesitancy, 14 were questions about Oxford COVID-19 vaccine confidence and complacency & nine questions about belief vaccine conspiracy were asked.

Analysis was done using SPSS v25. Descriptive statistics such as frequency and percentages were calculated. The responses were graded based on a 5 point likert scale, with 1 showing willingness and 5 showing extreme unwillingness. The total score was calculated by adding individual scores of Oxford COVID-19 Vaccine Hesitancy Scale and Oxford COVID-19 Confidence and Complacency Scale. Pearson's correlation was applied to find out association between the dependent and independent variables.

RESULTS

The survey received 615 responses. 26 responses were eliminated based on missing information in forms. 589 valid responses were considered. Out of the total responses, 237(40.2%) respondents were male and 351(59.7) respondents were female. Majority (82%) of the respondents were in the 18-23-year age bracket, with only 2.7% being above 40 years. A total of 81 respondents (13.8%) had tested positive for COVID in the past whereas 292(49.6%) have had a relative or family member test positive for COVID.

The mean total score for vaccine hesitancy was 39.09(SD=20.73). The highest possible score was 105. A score above 70%(63) was considered to be indicative of high level of vaccine hesitancy. About 45(7.6%) out of the 589 respondents had a score of 63 or higher. This group can be considered a very extreme group.

The majority 358(60.8%) of the total study participants (589) were willing to receive the vaccine. Most 228(38.7%) of participants who showed interest in getting the vaccine wanted to get it as soon as it is available to them. About 45(7.6%) people remain unsure while 55(9.3%) refuse to receive the vaccine for COVID-19. A minority group of participants held general vaccine conspiracy views 45(7.6%) while a larger number of participants were neutral on the subject. Those who have tested positive for COVID-19, 81(13.8%) or those who had a relative or family member who tested positive for COVID-19 in the past showed more willingness to accept the vaccine.

COVID-19 Vaccine Hesitancy

Oxford COVID-19 Vaccine Hesitancy Scale was used to assess vaccine hesitancy in the sample population. The mean score on the scale was

13.09±14.82. Out of the 589 respondents, 14124% respondents endorsed at least one of the seven items with a hesitant response (4 or 5) showing that a quarter of the population have at least some reservations with COVID-19 vaccine.

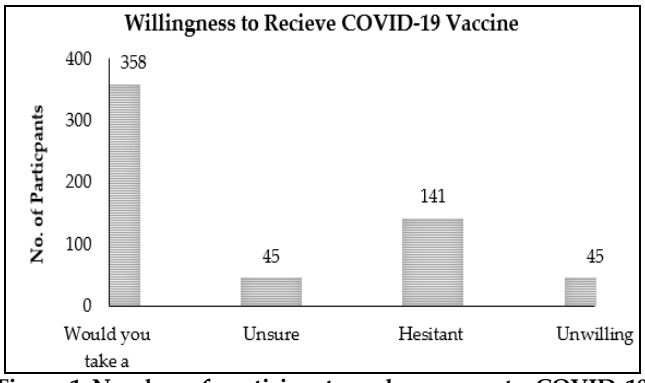

Figure-1 Number of participants and response to COVID 19 vaccine

Table: Oxford COVID-19 Vaccine Hesitancy Scale Results

Item	n	%
Would you take a COVID-19 vaccine if offered?		
Definitely	358	60.8%
Definitely not	49	8.3%
If there is a COVID-19 vaccine available		
Want to get it as soon as possible	228	38.7%
Refuse to get it	55	9.3%
I would describe my attitude towards receiving a COVID-19 vaccine as:		
Very keen	139	23.6%
Against it	47	8.0%
If a COVID-19 vaccine was available at my local pharmacy, I would:		
Get it as soon as possible	294	49.9%
Never get it	80	13.6%
If my family or friends were thinking of getting a COVID-19 vaccination, I would:		
Definitely get it	273	46.3%
Tell them they're wrong	29	4.9%
I would describe myself as:		
Eager to get a COVID-19 vaccine	190	32.3%
Anti-vaccination for COVID-19	37	6.3%
Taking a COVID-19 vaccination is:		
Really important	270	45.8%
Really unimportant	34	5.8%

COVID-19 Vaccine Confidence & Complacency

Oxford COVID-19 Vaccine Confidence & Complacency Scale was used to assess four factors surrounding COVID vaccine: the need to get COVID vaccine, confidence in COVID vaccine efficacy, the speed at which vaccine was developed, and fear of potential side effects. The mean score on the scale was 25.99±12.17. Out of the 589 respondents, 158(26.8%) respondents endorsed at least one of the 14 items with a hesitant response, showing that a quarter of the population lacks confidence in the COVID vaccine

The Pearson correlation test indicated a significant positive correlation between general vaccine hesitancy and COVID vaccine hesitancy. The 2-tailed significance *p*-value is <.000, which means that the correlation is highly significant.

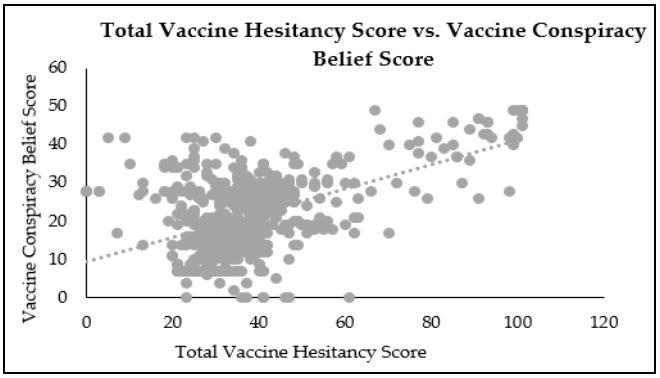

Figure-2: Correlation between total vaccine hesitancy score vs. beliefs in vaccine conspiracy

This indicates that people who oppose all kinds of vaccines due to various beliefs are once again in the forefront for opposing COVID-19 vaccine and spreading irrational fears.

The correlation between vaccine hesitancy and belief that the novel coronavirus is a conspiracy with underlying ulterior motives also showed a significant correlation.

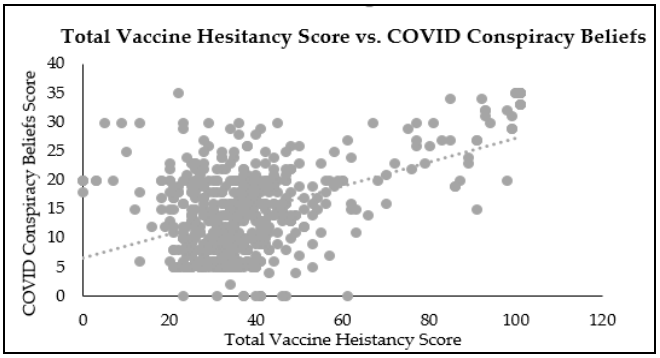

Figure-3: Correlation between total vaccine hesitancy score vs. beliefs that SARS COV-2 is a conspiracy

This shows the need to counter the conspiracy's surrounding SARS-COV-2 and COVID vaccine. The common conspiracies include fears that the virus was created artificially in a lab and getting vaccinated will cause long term problems such as infertility, personality control or autism.

DISCUSSION

This study revealed that roughly 25% of the population is hesitant in receiving the COVID-19 vaccine and lacks confidence in its safety and efficacy, while roughly 7% show extreme unwillingness and distrust. It is true that a majority of people in Pakistan consider COVID-19 a very serious health problem and many think vaccine is a way out and is something they are willing to accept if offered,[11] but the number is still lower than what it should be. A similar study done in Pakistan on acceptance of COVID-19 vaccine among health care providers showed that roughly 30% of the respondents were hesitant in receiving the vaccine. The results align with what this study found.[12] Another study assessing hesitancy to COVID vaccine among the general population in Pakistan by Ansar *et al.* found prevalence of vaccine refusal to be 40%, which is higher than our study.[7] Part of the reason can be geographical differences, our study was primarily conducted in Punjab while the study by Ansar *et al.* was primarily conducted in KPK.

Vaccine acceptance rate in Pakistan is less than some other developed countries like China, Korea and Singapore where some surveys show more than 85% population is willing to accept COVID-19 vaccine.[13] However, study shows that in USA to reluctance to COVID vaccine is 28% in the general population, which is very similar to Pakistan.[14] USA faces similar problems of conspiracy theories and misinformation surrounding the COVID vaccine. The statistics suggest that vaccination acceptance is mostly driven by a desire to protect oneself against COVID-19, with concerns about side effects being the most common cause for apprehension.[15]

Convincing those who are unsure about COVID vaccine safety will be a defining point in making vaccine campaigns a success. Belief in conspiracy's, annoyance, a lack of confidence in the government and health care system, can all lead to vaccine refusal. As a result, interventions should be carefully tailored to address the causes leading to vaccine hesitancy.[16] Efforts to improve vaccine testing transparency and thoroughness are likely to succeed in increasing confidence in the vaccine safety. These findings are especially pertinent today because of the speed at which COVID vaccine was rolled out. The efforts to quickly develop a COVID vaccine appear to anti-vaxxers as a politically motivated move and an instrument to intentionally cause major adverse effects. Unclear vaccine development process may undermine public trust in vaccines in general.[17]

Distrust and misunderstandings may bias vaccine acceptance decisions. This study showed that belief in conspiracy theories greatly undermines vaccination efforts. Studies have suggested that vaccine resistance is caused by a higher level of skepticism.[18] In contrast to previous surveys conducted around the world, there is an increase in the prevalence of COVID-19 conspiracy theories.[18] Mistrust is exacerbated by negative perceptions of vaccine developers and healthcare experiences. Anger aimed towards established structures played a role in vaccine hesitancy. Vaccine sceptics also see themselves as lower on the social ladder, showing a sense of vulnerability in relation to others. Positive healthcare experiences are linked to less vaccine reluctance in the face of mistrust and vulnerability.[19] A lack of faith in government officials to provide the vaccination and the impact of social media posts on their decision-making.[19]

This study also suggests that correlation between general vaccine hesitancy and COVID-19 vaccine hesitancy is significant. Individuals who consider themselves to be anti-vaxxers are more hesitant to accept COVID-19 vaccine. Public health education may help to convince more people to vaccinate themselves. It is critical to combat 'infodemic' with timely, evidencebased communication to ensure that disinformation does not sabotage national immunization efforts.[18] More efforts are needed to revamp trust in the health sector, the government, pharmaceutical companies and other institutions. Better immunization strategies are required to prevent vaccine hesitancy.

LIMITATIONS OF STUDY

The sample population was mostly young 18 to 23yrs of age (82%) and educated. Because data is collected using an online questionnaire, there is a limitation towards who was recruited to participate in the study. It is also not possible to establish to what degree willingness shown to accept vaccine correlates with accepting vaccine in reality. Despite these restrictions, a positive overall reaction to vaccination acceptance is a positive indicator on the road to global herd immunity, and improving information and health communication from healthcare personnel to the general public will reduce aversion to COVID-19 vaccines.[16]

CONCLUSION

There is generally a positive attitude towards accepting COVID vaccine. However, the minority strongly opposing vaccination will impair country-wide vaccination efforts. It is important to combat the fear and stigma associated with

COVID vaccine at both national and international level in order to fight SARS COVID-19.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

MAR: Data analysis plan, Manuscript Review & approval for the final version to be published.

SFM: Conception, Study design, Data analysis, & approval for the final version to be published.

FH:, HA: Conception od Idea, Study design, Data analysis Literature review & approval for the final version to be published.

AH:, JA: Data collection and statistical support & approval for the final version to be published.

TS: Data collection and Literature review & approval for the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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