

## ORIGINAL ARTICLE

# Covid-19 Vaccine Hesitancy: Frequency and causes among Population of Lahore

NAJMA SHOAB<sup>1</sup>, MUHAMMAD ATIF QURESHI<sup>2</sup>, MUHAMMAD ZAHID LATIF<sup>3</sup><sup>1</sup>Associate Professor Forensic Medicine and Toxicology, Azra Naheed Medical College, Lahore<sup>2</sup>Professor of Medicine Azra Naheed Medical College, Lahore<sup>3</sup>Director Medical Education, Azra Naheed Medical College, Lahore

Correspondence to Dr. Najma Shoaib, Email: najmashoaib60@gmail.com

## ABSTRACT

**Background:** Covid-19 vaccine hesitancy is prime hurdle in control and eradication of Covid-19 pandemic. The rapid Procedure of development of new vaccines resulted in a lot of false information and rumors leading to decrease trust of the public in the safety and effectiveness of the vaccine.**Aim:** To study the frequency and causes of Covid-19 vaccine hesitancy amid population of Lahore.**Methods:** This cross sectional study design was done on a sample of 385 participants from Lahore were included in the study. Frequency and causes were recorded on the prescribed questionnaire.**Results:** Frequency of hesitancy was found to be 41.7%. 12.8% had doubts related to efficacy and safety of the vaccine. 9.9% were of the view that the risks of the vaccine are greater than its benefits. 5.7% assumed that vaccines were promoted for gains of pharmaceutical companies. 4.4% were concerned about the immediate side effects of the vaccine. 2.6% responded by saying that vaccine was not recommended by health professionals. 2.3% had myths related to vaccine. And lastly, 1.63% said vaccine was not available free of cost.**Conclusion:** Hesitancy of covid-19 vaccine is seen more in illiterate people and the main cause of hesitancy is uncertainty related to protection and efficacy of covid-19 vaccine.**Keywords:** Covid-19 vaccine, hesitancy, myths, safety and efficacy, uncertainty, doubt, well being, protection

## INTRODUCTION

Covid-19 started in December 2019. According to WHO Covid-19 dash board upto April 2022 there have been 505, 817,953 established cases of covid-19 including 6,213, 876 deaths<sup>1</sup>. In Pakistan up till 14<sup>th</sup> April 2022 there are total 1.53 million confirmed cases including 30,369 deaths<sup>2</sup>. Vaccination is the most important pillar in road to recuperation from covid-19 pandemic<sup>3</sup>.

Vaccine hesitancy is defined as "delay in acceptance or refusal of vaccination despite availability of vaccination services" by strategy Advisory Group of Experts on immunization and involves a complex association of time, place, context, and vaccine specific factors<sup>4</sup>. Vaccine hesitancy among general population is one of the top ten global health hazards.

Upto 23<sup>rd</sup> August 2022, 59.46% (130,818,798) of the population is recorded to fully vaccinated<sup>5</sup> in Pakistan. In time of deep uncertainty, Covid-19 vaccination is offering a way to come out of this phase of the pandemic. Unlike the natural infection method, vaccines create immunity without causing illness or resulting complications. Using the concept of herd immunity, vaccines have successfully controlled contagious diseases such as smallpox, polio, diphtheria, rubella and many others<sup>6</sup>. Pfizer vaccine became the pioneer to receive emergency use authorization from the Food and Drug Authority (FDA) in December 2020 for Covid-19. In November 2021, in an article "how did we develop a Covid-19 vaccine so quickly" by Jocelyn and her colleagues was mentioned that Covid-19 vaccines are developed, manufactured and delivered in less than a year which is a great scientific feat<sup>7</sup>. The rapid procedure of development of new vaccines resulted in a lot of false information and rumors leading to decrease faith of the public in the protection and efficacy of the vaccine. Side effect like anaphylaxis and blood clots in people getting Astra Zeneca vaccine in Europe may be causing apprehension that vaccine development was rapid and protection may have been compromised<sup>8-9</sup>.

The general populations are still hesitant to receive the vaccination which leads to a relative low vaccination coverage<sup>10</sup>. Misinformation and conspiracy theories are main causes of hesitancy of vaccination. Majority of population assume that not enough information regarding Covid-19 vaccination is provided.

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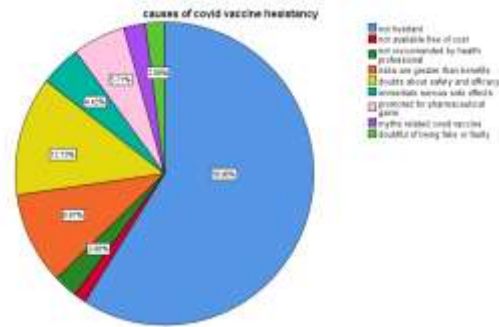
They are not familiar with their adverse effects. Moreover, many people in Pakistan think that Covid-19 is a myth and they assume that it is a bio-chemical war. Many people believe that vaccine is not effective due to increase in number of deaths around the globe. Lastly, according to majority of people no one really knows for how much time Covid-19 vaccine will provide immunity.

## METHODOLOGY

Before the start of the study, ethical approval was granted by institutional ethical review board of Azra Naheed Medical College. The study is a cross sectional survey conducted on general population of Lahore, the duration of study is 6 months that started in Nov 2021 and ended in April 2022. Participation in survey was voluntarily and anonymous. Inclusion criteria was male and female between 18 to 65 years, exclusion criteria included immunocompromised, lactating or pregnant women and people living in cities other than Lahore. A structured questionnaire consisting of 4 sections was constructed on Google form and shared with the participants through social media. The first section contained the basic information including age, sex, level of education and residence. The second section focused on exclusion criteria. Third section was framed to assess whether the participants received covid-19 vaccine or not. Last section was designed to evaluate the causes of covid-19 vaccine hesitancy. The questionnaire was pilot tested on 40 participants and the final version of questionnaire was revised and approved by all authors. It was observed after pilot study that participants living in slums had no access to Google form and were unable to understand the language so the questionnaire was translated in Urdu. Participants who could not read Urdu language were interviewed. The sample size is 385 subjects based on the fact that Lahore population is 13.5 million with 95% confidence level and 5% margin of error. The sampling technique is non-probability convenience sampling. All the data is analyzed by SPSS 25 version. Relevant statistical tests have also been applied.

## RESULTS

A total of 385 participants fulfilling the criterion were included in the study and the hesitancy of Covid-19 vaccine was found to be



Total	382	100.0	100.0
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41.7% (158 participants) among the population of Lahore. 158 participants who were hesitant in taking Covid-19 vaccine, it was found that 12.8% of the participants had doubts related to the efficacy and safety of the vaccine, 9.9% were of the view that risks of vaccine are greater than its benefits, 5.7% assumed that vaccines were promoted for the gains of pharmaceutical companies, 4.4% were concerned about the immediate side effects of the vaccine, 2.6% responded by saying that vaccine was not recommended by health professional, 2.3% had myths related to vaccine, according to 1.3% of the participants, vaccine was not available free of cost and lastly, remaining non-vaccinated participants had doubts of vaccine being fake or faulty. The findings regarding causes of Covid-19 vaccine hesitancy are presented in figure 1.

Figure 1: Causes of Covid-19 vaccine hesitancy

### DISCUSSION

According to this cross-sectional survey the most frequent cause of Covid-19 vaccine hesitancy is doubts about efficacy and safety of the vaccine (12.8%). Previously, in March 2022 Shama Parveen and her colleagues published an article in which they mentioned that people are hesitant to get vaccinated due to conspiracy theories and faith space believes. There is a need to educate public about Covid-19 vaccine through social media and mobilization of influential people including religious leaders can play a pivotal role in reducing the Covid-19 vaccine hesitancy<sup>11</sup>. Among conspiracy theories, most popular are: Virus being bio engineered and introduction of surveillance microchips dominate human beings via vaccine infiltrated social sites<sup>12</sup>. Secondly, unauthentic content regarding vaccine safety, inefficacy. Thirdly, stories about consequent reduced fertility and other inaccurate beliefs. Lastly, some religious scholars argue that vaccines are not “Halal” and this is western conspiracy to eradicate Muslims<sup>13</sup>.

All these contribute to anti-vaccine behavior in general population. This also led to defying the very existence of the virus or seriousness of condition.

Similarly, in the past many researches were done to know the causes of hesitancy of covid-19 vaccine. However, there are certain causes which remained unrecognized and were not addressed, amongst them are the availability of covid-19 vaccine free of cost and its recommendation by the health professionals. Moreover, previous research articles mainly focused on the general population of Pakistan. Whereas, this article is particularly emphasizing on the population of Lahore including the slums and nearby villages. Lastly, this study is also focusing on relationship between the levels of education with vaccine hesitancy.

According to this study, 158 participants were hesitant in taking Covid-19 vaccine. And the study has consistently shown greater Covid-19 vaccine hesitancy in illiterate adults than literate adults. Moreover, according to this particular research, the most frequent cause of vaccine hesitancy is people concern about safety and efficacy of the vaccine available.

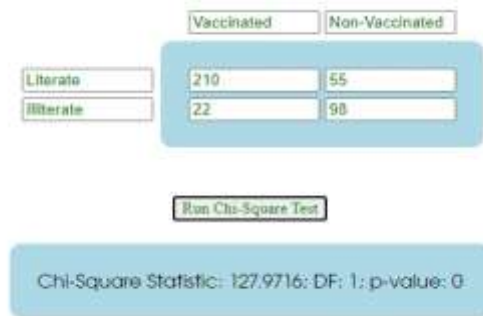
Misconceptions, myths and a decrease of public knowledge on the safety and efficacy of covid-19 vaccine is a big hurdle for public health experts in providing vaccine and developing herd immunity. Different scientists have proposed for diverse percentages of people to be immune before touching the status of herd immunity for covid-19 which ranges from 50-67% or even higher<sup>14-17</sup>.

During the study, it is discovered that a large number of people had different reservations against safety and efficacy of the vaccine available. Firstly, many believe that if they get vaccinated, they will die within two years as the vaccine will slowly and gradually target different organs resulting in multiple organ failure. Secondly, many assume that getting a vaccine can have immediate side effects like acute renal failure or sudden cardiac arrest. Moreover, many participants are of the view that it will result in infertility in males and females. Lastly, a lot of participants had no knowledge about the safety and efficiency, they only believe in false accusations made by random people. It was also seen that a lot of participants had doubts about formulating the vaccine in a short period of time and were uncertain of efficacy of the vaccine.

### CONCLUSION

The study concludes that a significant number of literate populations of Lahore is vaccinated. The main cause of hesitancy seen in people is uncertainty related to safety and efficacy of

This article is also focusing on the relationship of education with vaccine hesitancy among the general people of Lahore. Out of the vaccinated population, the results show that literate people were less hesitant towards the vaccine. The results are presented in table 1.



p-value is 0.01 which is less than 0.05, hence a significant correlation exists between status of vaccination and degree of education.

Table 1: Correlation between education and vaccine hesitancy.

Gender				
Valid	Frequency	%age	Valid%	Cumulative%
Male	154	40.3	40.3	40.3
Female	228	59.7	59.7	100.0
Total	382	100.0	100.0	

Age				
Valid	Frequency	%age	Valid%	Cumulative%
18	14	3.7	3.7	3.7
19	29	7.6	7.6	11.3
20	74	19.4	19.4	30.6
21	110	28.8	28.8	59.4
22	77	20.2	20.2	79.6
23	51	13.4	13.4	92.9
24	13	3.4	3.4	96.3
25	14	3.7	3.7	100.0

Covid-19 vaccine and is seen mainly in people living in slums and villages of Lahore.

**Conflict of interest:** Nil

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