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DEMOGRAPHIC ASSOCIATIONS OF POSITIVE AND NEGATIVE BELIEFS ASSOCIATED WITH COVID-19 VACCINATION AMONG PAKISTANI UNIVERSITY STUDENTS

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ABSTRACT

This study investigated demographic associations between positive and negative beliefs about COVID-19 vaccination among university students. A sample of 500 university students aged 18-29 (M= 22.05, SD =1.501) was selected through a convenient sampling technique from different public and private universities in Lahore, Pakistan. Participants responded to a demographic Information form and a self-developed survey questionnaire on beliefs about COVID-19 vaccination. The t-test analysis revealed significant differences on students' positive and negative beliefs about COVID-19 vaccination regarding their vaccination status, education level, marital status, and family system. Students' beliefs were important in knowing society's beliefs as they make up a future generation. It is significant to know how the attitudes and beliefs of students change and differ due to different demographic factors.

Keywords: *COVID-19, Vaccination, Positive Beliefs, Negative Beliefs, Students*

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INTRODUCTION

Coronavirus consists of two viruses directly impacting Human Beings' respiratory and gastrointestinal systems. Firstly, this Acute Virus has affected Human beings; then it started impacting Animals too (Mahase, 2020); it is explained as an illness brought about by Corona Virus, an Acute Respiratory disease. Chinese Doctors first identified it as a respiratory illness. Sars were issued and given formal names by the World Health Organization (WHO), Dated December 31, 2019, the most prominent health organization. Corona Virus includes a family of contagious diseases that can cause serious side effects on the human body system. They are known as Corona due to being similar to the crown and Spikes on the top of the Virus (WHO, 2019). Vaccines that prevent Covid-19 include Pfizer and Moderna and are applied in two administrations. A person is believed to get vaccination doses for protection and immunization from viruses. Pfizer COVID-19 vaccine doses are given with a gap of 21 days, and it is also issued to utilize in those aged five and older. Moderna vaccine doses are given with a gap of 28 days and are authorized and given for utilization in those aged 18 and older. Vaccination is being tested, and results are being checked; no Vaccine is 100% effective (WHO, 2020).

People's assumptions and perceptions about themselves and their world matter a lot. These assumptions are self-limiting sometimes because, in some way, they are holding people back from achieving and getting what they are capable of. Negative or positive beliefs were built on experiences, perceptions, and learning from the environment. As in the coronavirus pandemic, people's beliefs fluctuated. Some experienced illness from COVID-19 and got affected. Their beliefs were built negatively that it is a life-threatening and dangerous Virus. However, some people are unaffected by acute respiratory syndrome and have different beliefs than those of the infected person. It is the way people perceive things. One's belief systems may be positive or negative. Emotions, feelings, mental health, and behaviors significantly affect how people react to the illness (Magadmi, 2021).

The outburst of the coronavirus has been a major disturbing event for economies and beliefs worldwide. One of the primary key features of the classical representation of behavior under certainty is beliefs (Saeed et al., 2021). Vaccine Acceptance and vaccine refusal play a significant role in getting Vaccinated, depending on people's negative and positive beliefs about COVID-19. Some people may accept vaccination or refuse it. The most important indicator of acceptance of COVID-19 vaccination is people's beliefs. Negative factors and beliefs include that

Vaccination of COVID-19 is a Conspiracy, it causes infertility in women, is not safe for health, and is not practical. It is also believed that it has severe side effects on health, shortens the life span, or may cause death. This leads to a refusal to get vaccinated, and positive beliefs include that vaccination against COVID-19 is a safe, effective, and best protective measure against COVID-19. It has no severe side effects. The land can stop the pandemic, and these beliefs in people lead to Acceptance of COVID-19 Vaccination and positive belief towards it (Sherman et al., 2020).

University students play a condemning role and have significance in all communities as they serve the nation in the future. University students are referred to as informed, receptive, and responsible for Public Health Challenges. To ensure immunity by the maximum number of people and effective vaccination and healthcare for society, it is essential to recognize the elements and components that affect university students' behavior, intention, perceptions, and thoughts (particularized group) with feasible hesitancy and unwillingness. Studying university students' beliefs is crucial as they collectively comprise all societies. In Pakistan, students' beliefs and perceptions differ based on their family systems, education status, vaccination status, and marital status. Individuals form their beliefs about the COVID-19 vaccination based on positive or negative factors. Research indicates that it's essential to estimate university students' perceptions and beliefs, whether negative or positive, concerning the COVID-19 vaccination, leading to the distribution of knowledge in the widespread population (Dutta, 2020).

The purpose of this study is to understand better the critical role that university students play in influencing the attitudes and behaviors of society, especially concerning significant public health problems like COVID-19 immunization. Comprehending students' attitudes and ideas about vaccinations is crucial for several reasons. Firstly, distribution of Knowledge and Influence as studies have indicated that university students frequently act as intermediaries for exchanging knowledge within their local communities. Their opinions and ideas about vaccinations significantly impact their friends, family, and more extensive social networks. Secondly, Unfavorable attitudes about the COVID-19 vaccine are becoming more prevalent, which presents a severe obstacle to public health initiatives. Herd immunity and virus control can be hampered by false information, mistrust, and misconceptions, which can damage vaccination campaigns and cause vaccine hesitancy. Stakeholders can address particular issues and misconceptions more effectively by determining which negative views are most common among

university students. Third, university campuses offer the perfect environment for implementing instructional interventions and encouraging students to adopt healthy lifestyles. Psychologists, mental health counselors, and other medical experts can use universities' infrastructure and resources to hold lectures, run awareness campaigns, and lead conversations on the COVID-19 vaccine. These approaches, directly engaging students and addressing their concerns, can facilitate informed decision-making and advance vaccination acceptability. Hence, the objective of this study was to assess positive and negative beliefs associated with COVID-19 vaccination among students of Pakistan based on their vaccination status, educational level, marital status, and family structure.

METHOD

Participants

For this study, through purposive sampling, 500 University Students ages 18-29 (mean age=22.05, SD=1.501) were selected from private and government Universities in Lahore, Pakistan. Inclusion criteria include (a) Only Residents of Pakistan and (b) university-going students selected to participate in the study. Exclusion criteria include (a) participants with any psychological disorder and (b) students who could not get vaccinated due to medical conditions were excluded from the study.

Measures

Demographic Information Form

Participants' age, gender, education, religion, marital status, mother tongue, City/Province, family's monthly income, vaccination status (Vaccinated/ Not Vaccinated), and any diagnosed psychological disorder were added in Demographic form.

The Survey Questionnaire

The survey questionnaire was self-developed based on a literature review. Self-developed survey questionnaire consists of questions. For all questions, answers were scored on a 5-point Likert scale ranging from strongly disagree (1), Disagree (2), Neutral (3), Agree (4) and strongly agree (5). Three questions were on positive beliefs related to COVID-19 vaccination, and four were on negative

beliefs related to COVID-19 vaccination. The sample items include, 'Do you think that COVID-19 vaccination is effective?' and 'Do you think that COVID-19 vaccination is a conspiracy?

Procedure

Initially, the survey questionnaire was self-developed based on a literature review. First of all, it was decided what information should be sought. It was decided to administer the questionnaire face to face with the participants, and then the first draft of the questionnaire was written. The questionnaire was then re-examined, validated by five psychologists, and revised before being finalized. The pretesting of the questionnaire on 50 students was done. Finally, the questionnaire was edited, and the procedures for its use were specified.

Permission for data collection was obtained from higher authorities in the universities. Three questions were on positive beliefs related to COVID-19 vaccination, and four were on negative beliefs related to COVID-19 vaccination. The sample items include, 'Do you think that COVID-19 vaccination is effective?' and 'Do you think that COVID-19 vaccination is a conspiracy?'. For all questions, answers were scored on a 5-point Likert scale ranging from Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and (5) strongly agree. Participants were asked to complete the demographic information form and the survey questionnaire.

All ethical considerations were taken into account while preparing and distributing the questionnaires. The participants were assured of their confidentiality concerning the dissemination of their results. The researcher collected data anonymously without collecting information that could identify the respondents. The cost-benefit analysis was done before conducting the survey. No physical or emotional harm to participants was involved in the study, and participants had the right to withdraw.

Statistical Analysis

The analysis was performed on IBM SPSS for Windows, Version 24. The demographic characteristics of participants were analyzed through descriptive statistics. To determine the significant differences on positive and negative COVID-19 vaccination-related beliefs based on status of vaccination, education level, martial status and family system, *t*-test was used.

RESULTS

Table 1
Demographic Characteristics of Study Participants (N=500)

Variables	*f*	*%*
Education		
Intermediate	61	12.2
Graduate	439	87.8
Family System		
Nuclear	351	70.2
Joint	149	29.8
Marital Status		
Married	83	16.6
Unmarried	417	83.4
Status of Vaccination		
Vaccinated	357	71.4
Not Vaccinated	143	28.6

Table 2

Independent Sample t-test showing difference on Positive and Negative COVID-19 Vaccination Beliefs between Vaccinated and Non-vaccinated University Students (N=500)

	Vaccinated (*n*=357)		Non-vaccinated (*n*=143)			
Variables	*M*	*SD*	*M*	*SD*	*t*	*p*
Positive Beliefs						
Do you think that the COVID-19 vaccination is safe for health?	3.58	1.36	2.20	1.36	10.25	.00*
Do you think COVID-19 vaccination is effective?	3.78	1.04	2.79	1.23	8.48	.00*
Do you think COVID-19 vaccination is the best Protective measure against COVID 19?	3.30	1.18	2.43	1.09	7.82	.00*
Negative Beliefs						
Do you think that the COVID-19 vaccine has serious side effects?	2.66	0.89	3.12	0.96	-4.98	.00*
Do you think that COVID-19 vaccination can cause death?	1.93	0.90	2.24	1.00	-3.27	.00*
Do you think that COVID-19 vaccination is a Conspiracy?	3.07	1.17	3.62	1.23	-4.57	.00*
Do you think COVID-19 vaccination can cause infertility?	2.11	0.96	2.25	0.81	-1.70	.09

**p<.05, df = 498*

Table 3
Independent sample t-test difference on Positive and Negative COVID-19 Vaccination Beliefs between Undergraduate and Graduate University Students (N=500)

	Undergraduate (*n*=61)		Graduate (*n*=439)			
Variables	*M*	*SD*	*M*	*SD*	*t*	*P*
Positive Beliefs						
Do you think that the COVID-19 vaccination is safe for health?	3.11	1.46	3.20	1.50	-.416	.68
Do you think COVID-19 vaccination is effective?	3.15	1.29	3.55	1.17	2.29	.03*
Do you think COVID-19 vaccination is the best Protective measure against COVID 19?	2.74	1.24	3.10	1.21	2.12	.04*
Negative Beliefs						
Do you think that the COVID-19 vaccine has serious side effects?	3.11	.933	2.74	.926	2.92	.01*
Do you think that COVID-19 vaccination can cause death?	2.05	.990	2.02	.930	.247	.81
Do you think that COVID-19 vaccination is a Conspiracy?	3.25	1.287	3.22	1.20	.143	.89
Do you think COVID-19 vaccination can cause infertility?	2.30	.937	2.13	.923	1.311	.19

p<.05, df = 498

Table 4

Independent sample t-test difference on Positive and Negative COVID-19 Vaccination Beliefs between Students living in Nuclear and Joint Family Systems (N=500)

	Nuclear (*n*=351)		Joint (*n*=149)			
Variables	*M*	*SD*	*M*	*SD*	*t*	*P*
Positive Beliefs						
Do you think that the COVID-19 vaccination is safe for health?	3.26	1.48	3.01	1.52	1.75	.08
Do you think COVID-19 vaccination is effective?	3.57	1.19	3.57	1.19	2.17	.03*
Do you think COVID-19 vaccination is the best Protective measure against COVID 19?	3.11	1.25	2.92	1.15	1.63	.10
Negative Beliefs						
Do you think that the COVID-19 vaccine has serious side effects?	2.74	.93	2.90	.950	-1.72	.09
Do you think that COVID-19 vaccination can cause death?	2.01	.91	2.05	1.01	-.502	.62
Do you think that COVID-19 vaccination is a Conspiracy?	3.16	1.25	3.22	3.38	1.10	.05
Do you think COVID-19 vaccination can cause infertility?	2.11	.922	2.23	.931	-1.26	.21

p<.05, df = 498

Table 5
Independent sample t-test difference on Positive and Negative COVID-19 Vaccination Beliefs between Married and Unmarried Students (N=500)

	Married (*n*=83)		Unmarried (*n*=417)			
Variables	*M*	*SD*	*M*	*SD*	*t*	*P*
Positive Beliefs						
Do you think that the COVID-19 vaccination is safe for health?	2.89	1.59	3.25	1.47	-1.88	.06
Do you think COVID-19 vaccination is effective?	3.14	1.25	3.57	3.14	1.25	.00*
Do you think COVID-19 vaccination is the best Protective measure against COVID 19?	2.87	1.20	3.09	1.22	-1.52	.13
Negative Beliefs						
Do you think that the COVID-19 vaccine has serious side effects?	2.83	.960	2.78	.930	.425	.65
Do you think that COVID-19 vaccination can cause death?	1.88	.903	2.05	.942	-1.54	.13
Do you think that COVID-19 vaccination is a Conspiracy?	3.41	1.28	3.19	1.20	-1.46	.14
Do you think COVID-19 vaccination can cause infertility?	2.12	.817	2.15	.946	-.327	.74

p<.05, df = 498

DISCUSSION

Getting vaccinated or not is a choice that is made by people based on their belief systems. Belief systems are formed from individuals' experiences, exposure, and differences. Choosing whether to get vaccinated involves so many significant factors that are responsible for a person deciding to get the dose of vaccination or

not. Furthermore, interacting with people and the environment makes people's perceptions. Everyone has different perceptions of COVID-19; some have a high perceived Susceptivity to getting coronavirus, and some have a low Perceived Susceptibility to getting infected by it (Haley, 2019). These factors involved in making positive and negative beliefs about vaccination depend on whether an individual is educated or not educated, married or unmarried, living in a joint nuclear family, or is vaccinated or not vaccinated. All these factors play a significant role in people's decisions that result in choosing the positive or negative attitudes, beliefs, and perceptions about the vaccination of COVID-19. Hence, it can be said that it is very much influenced by their demographic characteristics (WHO, 2021).

Education has a significant role in students' willingness to get vaccinated. Knowing the factors that result in students' positive and negative beliefs about vaccination is essential. Being educated and literate plays an essential role in students getting vaccinated. Results of this study indicate that graduate students have a higher rate of getting vaccinated than undergraduates because the element of maturity matters here a lot. Graduate students are mature and have fewer negative beliefs about vaccination because they don't believe in the conspiracy theories related to COVID-19. Undergraduates have fewer positive beliefs about vaccination because they have less knowledge. The maturation of their thoughts and perceptions also caused graduates to have more positive beliefs about vaccination. Therefore, being educated or not is the factor that makes a difference in beliefs. University students play a significant role in every society. Research done in Pakistan in 2022 indicates that education is the main factor contributing to positive or negative attitudes and belief systems towards the COVID-19 vaccination (Hossain, 2022).

Being vaccinated against COVID-19 is another factor contributing to people having positive beliefs about the vaccination; it is evident that people who had already taken the vaccine had positive perceptions and thoughts about the vaccine, which is why they had taken it. They had positive attitudes about vaccination. Vaccination is a lifesaver, gives immunity that fights the deadly virus, is safe for health, has no side effects, and helps save the nation from the COVID-19 Pandemic. These were the positive attitudes of people who had already gotten the vaccination. In getting vaccinated and having positive or negative beliefs about the COVID-19 vaccination, perceived susceptibility to the coronavirus leads to self-care activities in human beings. The pandemic has also given rise to self-caring and health-engaging activities. The first, second, and subsequent waves differed

significantly; people reacted to them with different attitudes, beliefs, self-care activities, treatments, and perceptions. People's beliefs and perceptions about COVID-19 played a significant role in taking protective measures or not taking protective measures (Bolster & Pompilio, 2020).

Vaccinated students mostly had a belief that getting vaccinated would lessen their danger of getting infected by the coronavirus. They believed that if they became infected with the virus, their chances of developing acute complications would be less after vaccination. Unvaccinated students considered vaccination less essential and effective to protect themselves and the people around them (Martin, 2020). Health Belief Model (HBM) plays a significant role; belief systems about the perceived susceptibility, perceived severity, and other factors play a significant role in whether an individual will get vaccinated. Students who were not vaccinated had more negative attitudes about the COVID-19 vaccination. Their negative beliefs include that the vaccine is not safe for health, has serious side effects, has no effect, and is a conspiracy. So, these perceived barriers in the form of strong negative beliefs are responsible for limiting a student's willingness to get immunization against COVID-19 (Arshad et al., 2021).

Whether married or unmarried, marital status is also a significant factor in having positive and negative beliefs about vaccination; it shapes attitudes and behavior. Married university students have positive beliefs about vaccination. Positive beliefs include that COVID-19 vaccination is effective against the coronavirus and provides immunity against the deadly coronavirus. At the same time, unmarried university students are hesitant about getting vaccinated. WHO has defined vaccination hesitancy as a delay in refusing or accepting vaccines. Most married students have gotten the vaccine, and the purpose was to save themselves and their spouses from infection by the deadly virus. Somehow, married students also accepted that COVID-19 vaccination is safe for health. Married students were more responsible towards their spouses and family values than unmarried students. Hence, they have more perceived susceptibility to getting the virus and getting ill, so they engage in safety behaviors and self-care activities in the form of vaccination. Research also indicates that married individuals are more worried about themselves and their spouses' well-being, adopt more self-care activities, and have positive attitudes about vaccination (Cucinotta, 2021).

Nuclear families' children believe in vaccination acceptance and have more positive beliefs about COVID-19 vaccination. They believe COVID-19 vaccination is an effective and protective measure against the deadly Coronavirus pandemic.

Their beliefs were not influenced and become impaired by the beliefs of other family members, so they have positive intentions toward the vaccine (WHO, 2021). On the other hand, nuclear family systems also believe in the conspiracies about the COVID-19 vaccination. Results of this study indicate that students living in the nuclear family system have more acceptance and positive beliefs that vaccination is effective and gives immunity. Still, joint-family students have so much social influence on their families on them. If their authoritative figure believes vaccination is ineffective, they imitate those beliefs, being pessimistic or optimistic about it.

Bower's family system theory (1988) indicates that an individual's behavior is affected and influenced by the family social system, and family members' impacts strongly influence each other's behavior and perception. The findings of this study suggest that vaccination acceptance is higher in nuclear family systems than in joint family systems. A Nuclear family system is a two-generation family consisting of a mother, father, and children. A joint family system refers to three or more generations living together. Children are firmly inclined to believe what their parents believe. They might have formed beliefs about vaccination for Covid-19. It affects their attitudes, perceptions, and behaviors about covid 19. In this way, whether they get vaccinated depends on their family's Authoritative figures. Belief systems of an Authoritative house figure play a significant role in practicing health behaviors or having a negative or positive attitude towards it. Older people are disposed to trust the authorities. It's challenging to change people's admiring and enriched beliefs that they have learned from the home environment (Bowen, 1988). In Pakistan, families strongly influence children, which indicates their children's attitudes and behaviors towards outbreaks and their decisions. In Pakistan, many students commonly depend on their fathers and mothers, who shape their behaviors and attitudes. Joint family systems strongly influence the students' beliefs, perceptions, and attitudes toward COVID-19 (Martin et al., 2020).

This study clarifies the association between demographic factors and favorable and unfavorable attitudes about COVID-19 immunization among Pakistani university students in Lahore. Several significant conclusions were drawn from examining a sample of 500 students, ages 18 to 29, from both public and private universities. First, based on demographic variables, the investigation supported the significant disparities in favorable and unfavorable opinions about COVID-19 immunization that were hypothesized. Several factors, including family structure, education level, marital status, and vaccination status, influenced students' opinions of the COVID-19 vaccination.

Results point to the importance of demographic factors in influencing people's attitudes and perceptions about COVID-19 immunization. Comprehending these variables can aid in creating focused treatments and communication tactics meant to tackle vaccine reluctance and encourage vaccination adoption among college students and, consequently, the wider community. The study also emphasizes how critical it is to watch and comprehend how younger people's attitudes and beliefs change because college students are the next generation. Their views and actions will have a significant impact on public health outcomes.

In the future, initiatives to encourage acceptance of COVID-19 immunization should consider the target population's varied demographic profiles, adjusting interventions to target particular issues and obstacles within certain demographic groups. This study emphasizes the dynamic interaction between demographic factors and university students' beliefs about COVID-19 vaccination, underscoring the need for multimodal strategies to address vaccine hesitancy and encourage well-informed decision-making during public health emergencies.

The research was conducted in the best possible manner to uphold all necessary ethical and research guidelines. While conducting the research, a few hurdles were faced. The findings of this research cannot be generalized to all Pakistani students because the sample size was limited to Lahore. Moreover, it was challenging to collect data from the different universities of Lahore due to COVID-19. The sample size would have been increased and led to more generalized findings. As a future endeavor, the sample size should be increased, and the study should be expanded to different provinces of Pakistan. Another challenge was that some students behaved improperly and did not complete the questionnaire. Moreover, some of them were uncomfortable sharing their information that their data was collected for some secret purpose.

The research findings are exciting. As a future endeavor, other demographic characteristics like ethnicity, sexual orientation, etc., can be added, and other populations can also be added, like psychologists or other specialized doctors. This phenomenon is significant in creating awareness of how demographics like education and marital status can lead to differences in belief systems.

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