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Original Article

Knowledge, Attitude and Perceptions Towards COVID-19 Vaccination Among The Pakistani Population

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ABSTRACT

The Corona virus disease of 2019 (COVID-19) is a very infectious lung illness that is instigated by Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2). **Objective:** To assess the knowledge, attitude and perceptions towards COVID-19 vaccination among the Pakistani population. **Methods:** This cross-sectional study was conducted for about 02 months in COVID-19 clinic of Qazi Hussain Ahmad Medical Complex, Nowshera, Pakistan. Data was collected through nonprobability convenient sampling after obtaining ethical approval from Institutional Ethical Review Board (IERB), NMC. A sample of 385 was calculated. All those who presented to COVID-19 clinic and were 18 years or above and were suspected of having COVID-19irrespective of gender were included whereas those who were below 18 years and presented for other medical problems were excluded from this study. **Results:** In the current study male participation was observed more than females (Male=271, 64.8%) and (Females=147, 35.2%). Out of whole sample (n=221, 52.9%) were previously vaccinated. More than half of the study participants were between 18-25 years of age (n=240, 57.4%). Among the whole sample (n=148, 35.4%) participants were married while (n=270, 64.6%) were unmarried and also most the participants were living with joint family system (n=279, 66.7%). Most of the study participants were educated. **Conclusion:** The present investigation has found high acquaintance but low favorable attitudes toward COVID-19 vaccine among the Pakistani population.

INTRODUCTION

The Corona virus disease of 2019 (COVID-19) is a very infectious lung illness that is instigated by Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2). World Health Organization (WHO) declared the term "COVID-19" for this novel ailment on 11th February, 2020 [1]. The illness was initially spotted in Wuhan, China in the late part of 2019 and it was on 30th January, 2020 that the outbreak was stated a Public Health Emergency of International Concern and subsequently at that time blowout worldwide, ensuing in the current 2019-21 Corona virus disease [1]. In the previous two eras, corona virus has instigated three wide-ranging illnesses, that is SARS, MERS, and COVID-19 in 2003, 2012 and 2020 correspondingly [2]. Temperature, coughing and fatigue are the utmost common warning sign of COVID-19 infection whereas some of the affected people may have body pains, sickness, gooey nose, aching throat or looseness of the bowels [3]. Most of the COVID-19 infected people don't progress to severe infection and get well without requiring slight treatment, nevertheless 1 out of every single 6 persons who suffer from COVID-19 progress to develop a severe infection, necessitating hospital admission [3]. In Pakistan, the initial COVID-19 case was established in February 26, 2020 who came from Iran [4]. Keeping in sight the current COVID-19 disease, the Government of Pakistan has adopted matchless steps in Khyber Pakhtunkhwa and also in the rest of the provinces of Pakistan, together with imposing lockdowns in many other areas throughout Pakistan [5]. In all four provinces of Pakistan together with Khyber Pakhtunkhwa, the government and health care staff are working vigorously to tackle this outbreak. To limit the spread of this disease, general public needs to follow certain standard operating

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procedures (SOPs) approved by the concerned quarters [6]. COVID-19 has swiftly spread throughout the world. In the span very short time, the death and disease ratio has surpassed the unanticipated stages. The researchers are at work to discover treatments and vaccines to stop the spread of this disease [7]. Likewise, vaccines are the utmost vital precautionary measure and active approach to guard the people from COVID-19 infection [8]. However, there are numerous studies that which have shown that population is reluctant to do such vaccination [9,10]. Additionally, some studies have shown different factors which are involved in such reluctance [11]. Similarly, in spite of thorough literature search, literature is deficient with such kind of studies. There is a dire need to identify population's knowledge, attitude and perception regarding COVID-19 vaccination. Thus, this study was intended to apprehend the practical suggestion to advise policy devisers and experts in our country in relation of how to implement COVID-19 vaccination in our setup.

METHODS

A cross-sectional study was conducted. This investigation was permitted by the Institutional Ethical Review Board (IERB), Nowshera Medical College, Nowshera vide letter No: 18/NMC/IERB/Sec. This study was conducted in COVID-19 clinic of Qazi Hussain Ahmad Medical Complex, Nowshera, Pakistan for 02 Months (June, 2021 till August, 2021). The number of participants required to optimally represent the residents of district Nowshera, Pakistan of approximately 100,000 people was determined. The sample size was calculated through Raosoft®[12], an online sample size calculator was 385, using a margin error of 05%, a confidence interval (CI) of 95%, and population size of 1.5 million and a response distribution of 50% in the general population. Data was gathered through non-probability convenient sampling. Inclusion criteria was all people having the age of 18 years or above who were suspected of having COVID-19 and presented to COVID-19 clinic irrespective of gender and exclusion criteria was people who were below 18 years of age and presented to the COVID-19 clinic for other medical problems, injuries or other outpatient departments. After ethical approval, data was collected by a semi-structured pre-validated questionnaire [13]. The tool comprised of 4 sections, initial part contained queries regarding the participant's age, consent, gender, residence. Second part comprised of five (5) questions regarding evaluation of participants' knowledge about COVID-19 vaccine. Similarly, 3rd section was having six (6) questions about attitude. Last section consisted of six (6) questions about their perception regarding COVID-19 vaccine. Collected data was entered in Microsoft Excel 2019. Similarly, analysis was done through SPSS version 25. Categorical data was expressed percentage and continuous variables as average and standard deviation (SD). Furthermore, the Chi-square test was used to determine the relationship between demographic variables and the indicated factors. Likewise, one-way ANOVA test was done to identify the important relationship of the mean knowledge and attitudes outcome along with social and demographic data. Lastly, multivariate linear regression analysis was done for acquaintance and attitudes, correspondingly as the reliant on variables. Entirely the tests were measured noteworthy at 95% CI and p-value ≤0.05.

RESULTS

In the current study male participation was observed more than females (Male=271, 64.8%) and (Females=147, 35.2%). Out of whole sample (N=221, 52.9%) were previously vaccinated. Results in table No. 01 showed that more than half of the study participants were among 18-25 years of age (n=240, 57.4%). Among the whole sample (n=148, 35.4%) participants were married while (n=270, 64.6%) were unmarried and also most the participants were living with joint family system (n=279, 66.7%). Most of the study participants were educated. (n=135, 32.3%) were having Bachelor education, (n=125, 29.9%) were having higher secondary education while only 11.2% were illiterate (Table 1).

Variables	n (418)	% (100)
Gender		
Male	271	64.8
Female	147	35.2
Age		
18-25 Years	240	57.4
26-32 Years	100	23.9
33-39 Years	30	7.2
40-46 Years	20	4.8
47-53 Years	14	3.3
54-60 Years	14	3.3
Marital Status		
Married	148	35.4
Unmarried	270	64.6
Vaccine History		
Yes	221	52.9
No	197	47.1
Family Type		
Nuclear	139	33.3
Joint	279	66.7
Education		
Illiterate	47	11.2
Primary	19	4.5
Middle	32	7.7
Secondary	40	9.6
Higher Secondary	125	29.9
Bachelor	135	32.3
Master	20	4.8

Table 1: Demographics of participants

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Item wise distribution of acquaintance and sex difference: The item wise association of knowledge with gender was found in Table No. 02, and the association was found significant with item no.1 ("Do you have any knowledge of the COVID-19 vaccine?") having a p-value=0.000, df=2, and X2=19.07; with item no. 2 ("Do you know about the effectiveness of COVID-19 vaccine?") it was also found significant (p-value=0.000, X2=15.83, df=2).The results in table no. 02 also revealed that the association of knowledge (an outcome variable) with item no. 3 ("Is it dangerous to use overdose vaccines?") regarding gender of the participants was found significant (p-value=0.000, X2=20.79, df=2). Signification association was observed regarding knowledge (item no. 4 "Does vaccination increase allergic reactions?") in male and female participants with having p-value (0.021), X2 (7.73), and df (2). Results in Table No. 02 showed insignificant association among gender of the participants regarding knowledge item no. 5 "Does vaccination increase autoimmune diseases?" with having p-value=0.414, df (2), and X2 (1.76).

Variables	Total		Male		Female		X^2	df	P-value
	n	%	n	%	n	%			
Do you know about the COVID-19 vaccine?									
Yes	363	86.8	221	81.5	142	96.6	19.07	2	0.000
No	36	8.7	32	11.8	4	2.7			
Don't know	19	4.5	18	6.6	1	0.7			
Do you know about the success of COVID-19 vaccine?									
Yes	306	73.2	190	70.1	116	78.9	15.83	2	0.000
No	55	13.2	31	11.4	24	16.3			
Don't know	57	13.6	50	18.5	7	4.8			
Is it hazardous to use overdose vaccines?									
Yes	210	50.2	115	42.4	95	64.6	20.79	2	0.000
No	79	18.9	64	23.6	15	10.2			
Don't know	129	30.9	92	33.9	37	25.2			
Does vaccination increase allergic reactions?									
Yes	97	23.2	54	19.9	43	29.3	7.73	2	0.021
No	162	38.8	102	37.6	60	40.8			
Don't know	159	38.0	115	42.4	44	29.9			
Does vaccination increase autoimmune diseases?									
Yes	52	12.4	37	13.7	15	10.2	1.76	2	0.414
No	175	41.9	108	19.9	67	45.6			
Don't know	191	45.7	126	46.5	65	44.2			

Table 2: Item wise distribution of acquaintance and sex difference

Item wise distribution of attitude and sex difference: Results in table 3 showed that the association of different items related to attitude with gender and was found insignificant having p-value>0.05. Also, approximately equal no. of males and females participants were agreed upon that "The newly revealed COVID-19 vaccine is harmless"; nearly equal no. of male and female participant were found agreed upon that "the COVID-19 vaccine is indispensable for us"; agreement of males and females was also found equal about taking the "COVID-19 vaccine deprived of any hesitancy, if it is accessible in Pakistan"; nearly equal number of males and females were agreed upon that they will also reassure their family/friends/relatives to get vaccinated. About equal replies from both males and females regarding the "COVID-19 vaccine should be circulated fairly to all of them" were reported.

Variables	Total		Male		Female		X^2	df	P-value
	n	%	n	%	n	%			
The newly discovered COVID-19 vaccine is safe.									
Disagree	40	9.6	21	7.7	19	7.7	3.68	2	0.159
Undecided	107	25.1	73	26.9	32	26.9			
Agree	273	65.3	177	65.3	96	65.3			
The COVID-19 vaccine is essential for us.									
Disagree	30	7.2	21	7.7	9	6.1	0.38	2	0.823
Undecided	33	7.9	21	7.7	12	8.2			
Agree	355	84.9	229	84.5	126	85.7			
I will take the COVID-19 vaccine deprived of any hesitation, if it is available in Pakistan									
Disagree	36	8.6	29	10.7	7	4.8	5.63	2	0.60
Undecided	45	10.8	25	9.2	20	13.6			
Agree	337	80.6	217	80.1	120	81.6			
I will also reassure my family/friends/relatives to get vaccinated.									
Disagree	16	7.9	24	8.9	9	6.1	1.88	2	0.389
Undecided	45	10.8	26	9.6	19	12.9			
Agree	340	81.3	221	81.5	119	81.0			
It is not conceivable to decrease the incidence of COVID-19 without vaccination.									
Disagree	84	20.1	59	21.8	25	17.0	2.67	2	0.262
Undecided	48	11.5	34	12.5	14	9.5			
Agree	286	68.4	178	65.7	108	73.5			
The COVID-19 vaccine should be distributed fairly to all of us.									
Disagree	33	7.9	24	8.9	9	6.1	1.02	2	0.600
Undecided	32	7.7	20	7.4	12	8.2			
Agree	353	84.4	227	83.8	126	85.7			

Table 3: Item wise distribution of attitude and sex difference

Item wise distribution of perception and sex difference: Results in table 4 showed that the association of different items related to the perception of participants with gender and p-value<0.05 was considered significant. The connotation in male and female participants about the perception regarding their "thinking that the recently revealed COVID-19 vaccine may have harmful effects" was found significant with having X2 (5.62), and a p-value (0.018). The association among male and female participants about the perception regarding their "that if everyone in society continues to take preventative steps, the COVID-19 pandemic may be eliminated without vaccine" was found insignificant. Also, the association in males and females participants regarding the perception regarding their thinking "that who should have been vaccinated" was found insignificant and most of the participants (n=295, 70.6%) referred that everyone should have been vaccinated. Similarly, the association in male and female participants perception regarding their thinking "that who's supposed to be vaccinated first" was found insignificant and most of the participants (n=332, 77%) referred that healthcare workers should have been vaccinated first. Results further raveled the association in males and females participants regarding the perception of their thinking "that the vaccine is provided free of charge in Pakistan" was found insignificant and most of the

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participants (n=385, 92.1%) referred it should be administered free, while the association in males and females participants regarding the perception of their thinking about "obtaining the vaccine on their own dime if it was not offered for free by the government" was found significant with having p-value(0.007) and most of the male participants (n=245, 90.4%) replied that they can afford it.

Variables	Total		Male		Female		X^2	df	P-value
	n	%	n	%	n	%			
Do you believe the recently found COVID-19 vaccination will have any adverse effects?									
Yes	261	62.4	158	58.3	103	70.1	5.62	1	0.018
No	157	37.6	113	41.7	44	29.9			
Do you believe if everyone in community continues to take precautions, the COVID-19 pandemic can be eliminated without vaccination?									
Yes	265	63.4	169	62.4	96	65.3	0.35	1	0.551
No	153	36.6	102	37.6	51	34.7			
Do you believe who should have been vaccinated?									
Those that haven't been infected yet.	86	20.6	52	19.2	34	23.1	4.81	3	0.186
People infected with COVID-19	25	6.0	15	5.5	10	6.8			
Newly recovered from COVID-19	12	2.9	11	4.1	1	0.7			
Everyone	295	70.6	193	71.2	102	69.4			
Do you believe should be vaccinated first?									
General Public	46	11.0	37	13.7	9	6.1	9.64	5	0.086
Health workers	332	77.0	204	75.3	118	80.3			
Public/private employee	24	5.7	17	6.3	7	4.8			
Teacher/ Student	20	4.8	9	3.3	11	7.5			
Garment worker	1	0.2	1	0.4	0	0.0			
Bussinessman	5	1.2	3	1.1	2	1.4			
Do you believe the vaccination should be made availabe for free in pakistan?									
Yes	385	92.1	245	90.4	140	95.2	3.06	1	0.80
No	33	7.9	26	9.6	7	4.8			
Do you believe you could afford the vaccination on your own if it wasn't offered free by the government?									
Yes	133	31.8	74	27.3	59	40.1	7.23	1	0.007
No	285	68.2	197	72.7	88	59.9			

Table 4 : Item wise distribution of perception and sex difference

Group difference analysis of acquaintance scores and attitudes scores: Results in table no. 05 &06 showed the group difference analysis of knowledge mean scores with attitude mean scores. Gender wise the associations regarding both knowledge and attitude were found significant with p-value=0.000. Age-wise the association regarding knowledge was found significant p-value=0.000 while with attitude, it was found inconsequential with p-value=0.815. Marital status wise association regarding knowledge was noteworthy (p=value=0.001) while attitude was found inconsequential. Age-wise the association regarding knowledge was found significant (p-value=0.000) while and with attitude, it was found insignificant with p-value=0.815. In family type, the associations regarding both knowledge and attitude were found significant with p-value> 0.05. The association of vaccine history with knowledge was found significant (p-value=0.004) while and with attitude, it was found insignificant with p-value=0.423, and also the association of education with knowledge was found insignificant (p-value=0.053) and with attitude, it was also found inconsequential with p-value=0.131.

Variables	Knowledge			Attitudes		
	Mean (SD)	t/F	p-value	Mean (SD)	t/F	p-value
Gender						
Male	1.84 (0.473)	-4.101	0.000	2.60 (0.440)	0.234	0.000
Female	1.65 (0.356)			2.69 (0.409)		
Age						
18-25 Years	1.73 (0.373)	3.953	0.000	2.71 (0.417)	-2.957	0.815
26-32 Years	1.68 (0.428)			2.64 (0.787)		
33-39 Years	1.96 (0.420)			2.80 (0.283)		
40-46 Years	2.07 (0.570)			2.56 (0.409)		
47-53 Years	1.78 (0.624)			2.47 (0.736)		
54-60 Years	2.20 (0.792)			2.23 (0.521)		
Marital Status						
Married	1.78 (0.537)	3.406	0.001	2.59 (0.469)	0.898	0.370
Unmarried	1.76 (0.385)			2.71 (0.400)		
Family Type						
Nuclear	1.77 (0.453)	-0.710	0.478	2.70 (0.453)	-0.710	0.478
Joint	1.77 (0.441)			2.65 (0.427)		
Vaccine History						
Yes	1.81 (0.485)	-2.876	0.004	2.68 (0.400)	-	0.423
No	1.72 (0.89)			2.65 (0.461)	0.802	
Education						
Illiterate	1.88 (0.656)	-1.938	0.053	2.54 (0.483)	-1.512	0.131
Primary	1.94 (0.415)			2.61 (0.474)		
Middle	1.78 (0.517)			2.71 (0.440)		
Secondary	1.88 (0.445)			2.70 (0.298)		
Higher Secondary	1.76 (0.370)			2.72 (0.379)		
Bachelor	1.73 (0.380)			2.69 (0.429)		
Master	1.42 (0.383)			2.38 (0.612)		

Table 5: Group difference analysis of knowledge with attitudes scores

Variables	Knowledge			
	B (un-standardized regression coefficient	SE (Standard error of mean	B (standardized regression coefficient)	P-value
Gender	-0.186	0.045	-0.200	0.000
Age	0.088	0.022	0.253	0.000
Marital Status	0.186	0.055	0.200	0.001
Family Type	-0.033	0.046	-0.035	0.478
Vaccine History	-0.121	0.042	-0.136	0.004
Education	-0.028	0.015	-0.109	0.053
Variables	**Attitudes**			
	B (un-standardized regression coefficient	SE (Standard error of mean	B (standardized regression coefficient)	P-value
Gender	0.011	0.046	0.012	0.815
Age	-0.066	0.022	-0.198	0.003
Marital Status	0.049	0.055	0.055	0.370
Family Type	-0.033	0.047	-0.036	0.478
Vaccine History	-0.034	0.043	-0.040	0.423
Education	-0.022	0.015	-0.089	0.131

Table 6: Multivariate regression analysis predicting acquaintance and attitudes towards the COVID-19 vaccine

DISCUSSION

The COVID-19 vaccination has been portrayed as the best answer for stumbling the current epidemic. In Pakistan, COVID-19 vaccinations have already begun to be distributed by the government. Whereas some transgender fears the stigma of COVID-19 vaccine which has slowed down the vaccine drive in the country as part of a pandemic solution, providing optimism [14]. Contempt the detail that Pakistan

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offers a variety of vaccination facilities, the COVID-19 immunization roll newness out increases worry about inoculation supply and acceptance in the state. It also raises concerns about the general public's understanding, attitude, and discernments about the COVID-19 vaccination and its distribution. The outcomes of this education were used to evaluate individuals' knowledge, attitude, and perceptions about COVID-19 vaccines among the Pakistani population. The discoveries signify an extensive range of socio-demographic variables that affect COVID-19 vaccination knowledge, attitudes, and perceptions, and so our conclusions will be critical in designing COVID-19 infection-associated responsiveness and wellbeing teaching initiatives. More than half of the public had little or no awareness of COVID-19 vaccines. Knowledge was shown to be strongly related to education, family type, and gender in this study, as well as prior vaccination uptake experience. Only gender and prior vaccination delivery experience were shown to be substantially related to views. Importantly, the majority of participants (78%) had a favorable opinion of the COVID-19 vaccination. In terms of gender, participants' knowledge of COVID-19 vaccines was not relevant. This conclusion is consistent with earlier research performed in Pakistan and adjacent countries, which found no significant gender differences in COVID-19 information [14,15]. This conclusion is consistent with studies performed in Pakistan and other neighboring countries on COVID-19 information, which found that men had slightly more advanced notches in COVID-19 information than girls [16,17]. Yet, this conclusion contradicts research performed in Pakistan and other neighboring countries on COVID-19, which found that men had slightly more advanced notches in COVID-19 data than girls [16,17]. The data gaps discovered in the present training on COVID-19 vaccines might be due to incomplete administration exposure to COVID-19 vaccination evidence or promotional since the vaccine's distribution began. Furthermore, broadcasting or misrepresentation of statistics on the importance of COVID-19 occurrence and death may diminish vaccination safety concerns or make the population of Pakistan's Nowshera district wary of seeking statistics on COVID-19 [18]. As a result, it's critical to provide public associates with informal admittance to reliable, indication-based inoculation statistics. Furthermore, a study of Bangladeshi women's awareness of cervical cancer and the HPV vaccination confirms the present SES relationship [19]. In this study, those who had previously conventional any inoculation were shown to have higher information about COVID-19 inoculations. Individuals who had beforehand been inoculated in contradiction of infection were extra inclined to receive the COVID-19 vaccine, according to a recent study conducted in China and Hong Kong [20,21]. This propensity among people might be linked to past favorable vaccination experiences. When compared to those living in rural regions, people in urban areas had considerably more awareness of COVID-19 infections. In multiple regressions, however, this relationship did not hold. This is confirmed by a previous study in Bangladesh, which found a strong link between COVID-19 familiarity and urban position [16]. However, our findings contradict a recent study that indicated that persons in rural regions have a higher accurate understanding of COVID-19 [14]. In this study, 78% of individuals had further optimistic opinions regarding the COVID-19 vaccination, and being female was substantially linked with this. This discovery is consistent with a current Indonesian study on attitudes about dengue inoculation [22]. In Bangladesh, as well as opinions about COVID-19 The public's perception of COVID-19 vaccines [14]. A study discovered that females had more reservations about COVID-19 vaccines than males [23]. Male volunteers in Chinese research, on the other hand, were more inclined to accept the COVID-19 vaccination [20]. Similarly, in Oman, a cross-sectional study was undertaken to assess COVID-19 vaccination knowledge, attitudes, and practice (KAP). It involved 3000 people who were chosen at random and were asked to complete a standardized questionnaire over the phone. Sixty-eight percent of the participants were Omani, 76% were male, and 83.7% had no comorbidities. They were 38.27 years old on average (SD ±10.45). COVID-19 indications, mechanism of spread, and insolences to the illness were all well-understood; 88.4% had heard of the vaccine, 59.3% would recommend it to others, 56.8% would take it themselves, and 47.5 percent would take a second dosage. Males were more eager to get vaccinated (CI = 2.37, OR = (2.00–2.81), as were Omanis (CI = 1.956, OR = (4.595–2.397)). The readiness to receive the vaccination was influenced by the past of chronic sickness, the basis of inoculation information, and the degree of teaching. Using communal broadcasting and municipal influencers to promote knowledge about the COVID-19 inoculation's care and effectiveness can increase the Omani group's inclination to receipts it [24].

CONCLUSION

The COVID-19 disease is still wreaking havoc on people's lives and livelihoods all across the world, but the COVID-19 vaccination offers a ray of hope for the future. The current study discovered that the Pakistani community has high awareness but low favorable sentiments for COVID-19 vaccines.

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