ISSN: 1607-8322, e-ISSN: 2220-5799 Anaesthesia, Pain & Intensive Care
Vol 26(6); December 2022 DOI: 10.35975/apic.v26i6.2056

ORIGINAL RESEARCH CORONA EXPERIENCE

Vaccine hesitancy and distrust: concerns of healthcare workers of Pakistani origin-a survey

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Abstract

Background: Vaccine acceptance can play a pivotal role towards control of COVID-19. Many healthcare workers (HCWs) have articulated safety and effectiveness concerns despite being the frontline takers of vaccination. This survey was aimed to investigate the causes of COVID-19 vaccine hesitancy and distrust among HCWs of Pakistani origin.

Methodology: This internet-based survey was conducted on 138 HCWs of Pakistani origin from January 2021 to April 2021.

Results: Out of a total of 138 subjects, 137 (99.3%) HCWs responded to the survey. COVID-19 vaccinations had already been administered to 101 (74%) of the respondents. Out of 36 (26.2%) unvaccinated individuals, 19 (14%) completely declined the vaccination. The prevalence of participants who distrust vaccination effectiveness and safety was 110 (80.3%), while 94 (68.6%) believed vaccine safety was compromised due to rapid development. The prevalence of HCWs who believed long-term adverse effects and that the manufacturers falsified the data was 36 (26.3%) and 22 (16%) respectively.

Conclusion: Our survey found that fears and concerns about the efficacy of the vaccine can impasse struggles to disease transmission and vaccine distribution. Healthcare workers in Pakistan had a higher prevalence of vaccine acceptance compared to other surveys.

Key words: Acceptance; COVID-19; COVID-19 vaccine; Healthcare workers; HCWs; Vaccine hesitancy

Citation: Zaki MMA, Siddiqui SW, Zafar M. Vaccine hesitancy and distrust: concerns of healthcare workers of Pakistani origin-a survey. Anaesth. pain intensive care 2022;26(6):768−773; DOI: 10.35975/apic.v26i6.2056

Received: December 31, 2021; **Reviewed:** September 17, 2022; **Accepted:** September 18, 2022

1. Introduction

COVID-19 pandemic has been propagated with resurgent third wave and delta variants across the globe. Vaccination is among the various measures taken to control this widespread pandemic threat.[1,2] Affluent countries have already secured adequate vaccine supplies, while impoverished countries had to wait for their turn. COVID-19 vaccines are being distributed worldwide. However, vaccine hesitancy among the population is the major challenge for policymakers.[3] Various studies have discovered the COVID-19 vaccine acceptance rate and factors that influence it.[4-6] Nicola et al. compared the acceptance rate of COVID-19 vaccine among Chinese healthcare workers (HCWs) versus the general population.[7] A USA based study found that about 20% population intended to refuse COVID-19 vaccination.[8] The pandemic news began to spread in Pakistan in early 2020, whereas some COVID-19 infected cases were reported in pilgrims returning from the Iranian shrines. SARS-Cov-2 has currently affected 120 million people worldwide and a staggering number of deaths was reported to be about 2.65 million.[9] The statistics of mortality and infected people in Pakistan were 21,022 and 926,695 respectively.[10] Pakistan began its coronavirus vaccination campaign in first quarter of

2021 when the first batch of the vaccines arrived from China. The vaccine was first given to HCWs who were treating COVID-19 patients. It was then made available to people over the age of 60 through a nationwide campaign, and it is now available to everyone aged 19 and above.[11]

Quarantines and social isolation or distancing like unstipulated measures can slow the virus spread, gaining epidemic flattened curve, but without establishing the herd immunity among the population through vaccination, the COVID-19 epidemic will not end.[12] More than 40 academic institutes and pharmaceutical companies had started their vaccine development process against infectious coronavirus while some started clinical trials before launching the vaccine to the real world.[13] However, healthcare authorities failed to communicate efficacy and safety of vaccine to the population convincingly. Lack of trust in vaccines efficacy and success, vaccination systems, as well as the ease of gaining service and higher costs, may all have reduced the vaccination acceptance.[14] Furthermore, HCWs can play a key role in spreading awareness regarding vaccinating and increasing acceptance rates among the general population irrespective of their exposure to high-risk pathogen infectious diseases such as COVID-19 and influenza viruses.[15,16]

A study conducted in Pakistan found that the major barriers to vaccination are myths and conspiracies which apply to most vaccination campaign outcomes, affecting people's reservations regarding vaccine efficacy and safety.[17] Vaccine hesitancy was found in a significant proportion of the population. Concerns about vaccine safety are central to the majority of these anti-vaccine movements. Yang et al.[18] investigated the reasons for vaccine refusal and discovered them to be quite complex.

The purpose of this study was to determine the prevalence and predictors of COVID-19 vaccine hesitancy (VH) among Pakistani-origin HCWs.

2. Methodology

This internet-based survey was conducted on 138 HCWs of Pakistani origin in January 2021. The questionnaire contained queries regarding HCWs' hesitancy and safety concerns of the COVID-19 vaccine. Also, the prevalence of hesitant HCWs was identified. The questionnaire was approved and revised by all the researchers and was pilot tested on 138 participants, out of which 137 responded and one declined.

The completed questionnaire comprised of different sections: demographic details, details about COVID-19 vaccination, contracting COVID-19 during the current pandemic, beliefs, and information about COVID-19 vaccination, and hesitancy and barriers to COVID-19 vaccination. All the participants (HCWs) were grouped into six categories according to age: 18 to 25 y, 26 to 30 y, 31 to 35 y, 36 to 40 y, 40 to 50 y, and > 50 y. Individuals who intended to refuse vaccination were defined as vaccine-hesitant. The social media platforms like e-mail were used for distributing the questionnaire to potential HCWs (participants) either living in Pakistan or other countries having Pakistani origin. Participants were encouraged to give details about their family and friends who were infected with coronavirus. The title, purpose, inclusive, and exclusive criteria of the study were clarified to the contributors following written informed consent taken prior to conducting the survey.

The second section evaluated acceptance and hesitance toward the COVID-19 vaccination by asking, 'Do you intend to get the COVID-19 vaccine when it becomes available?' Based on the responses 'Yes' and 'No/Unknown,' participants were divided into two groups: 'vaccine acceptant' and 'vaccine hesitant'. The second section also evaluated participants' COVID-19 vaccine perceived beliefs and knowledge.

The third section looked at the perceptions about the COVID-19 vaccine concerns, risks, and safety.

Finally, the fourth section inquired about the sources from which the participants obtained information on COVID-19 vaccines, as well as their level of trust in these sources.

Statistical analysis

SPSS version 20 was used for data analysis. Chi-square test was used to investigate the relationship between socio-demographic characteristics and attitudes toward COVID-19 vaccination at a 5% significance level.

3. Results

Of the total 138 HCWs approached, 137 (99.3%) responded to the questionnaire-based survey and 1 (0.7%) declined. COVID-19 vaccination had already been done in 101 (74%) respondents. A good number of 127 (93%) participants found that contacting infected patients could cause COVID-19, while the prevalence of positive PCR and raised antibodies were 36 (26.3%) and 14 (10%) respectively. Out of the 36 (26.2%) unvaccinated individuals, 19 (14%) completely declined the vaccination. The number of participants who expressed distrust towards vaccination effectiveness and safety was 110 (80.3%), while 94 (68.6%) believed vaccine safety was compromised due to rapid development and lack of evidence. The prevalence of HCWs who believed long-term adverse effects and manufacturer falsified data was in 36 (26.3%) and 22 (16%) respectively.

The participants overall mean age was 35.26 ±1.01 y with an age range from 18 y to 59 y. The frequency of participants in different age groups were as follows: 18-

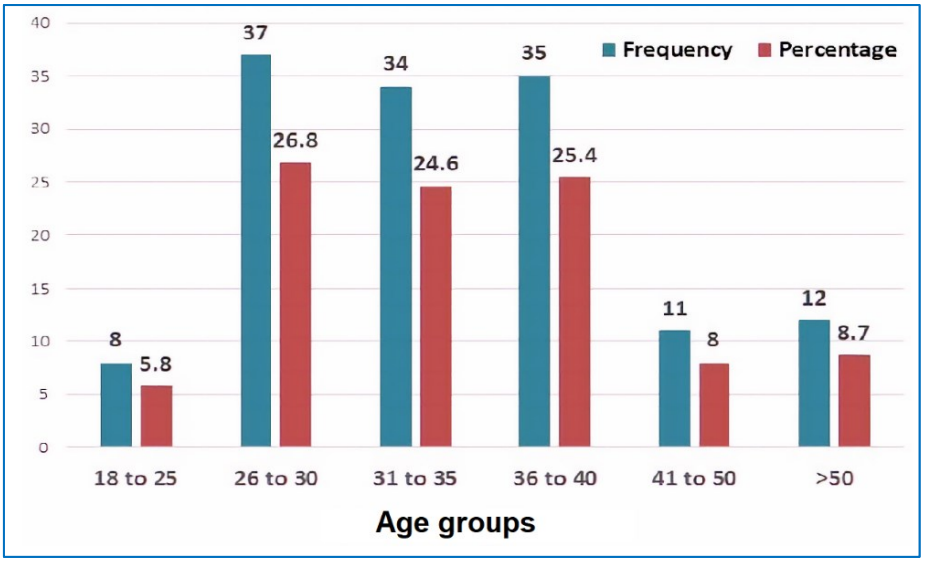

Figure 1: Age-wise distribution of the participants (n = 137)

25 y 8 (5.8%), 26-30 y 37 (26.8%), 31-35 y 34 (24.6%), 36-40 y 35 (25.4%), 40-50 y 11 (8%), and > 50 y 12 (8.7%) as shown in Figure 1.

The vaccine hesitance group had lower understanding, knowledge, and confidence regarding the COVID-19 vaccine compared to the acceptance group. The odds of knowing which vaccine to get, believing that the vaccine will effectively stop the pandemic, vaccines work understanding and believing that the immune system improved with vaccination were prevalent in acceptance group HCWs. Demographic details of participants are shown in Table 1.

Table 1: Demographic details of health worker (n=138)

Demographic Factors		N (%)
Age (y)	18-25	8 (5.8)
	26-30	37 (26.8)
	31-35	34 (24.6)
	36-40	35 (25.4)
	41-50	11 (8)
	> 50	12 (8.7)
Residency	Pakistan	110 (79.7)
	KSA	8 (5.9)
	USA	2 (1.45)
	UK	14 (10.1)
	Other	4 (2.85)
Clinical Specialty	Medical Specialty	128 (92.8)
	Family Physician	1 (0.7)
	Medical Students	3 (2.2)
	Public Health	3 (2.2)
	Businessman	1 (0.7)
	Administrator	1 (0.7)

Most of the HCWs agreed to coronavirus vaccination's safety, effectiveness, comfort, and efficacy as shown in Table 2. The participant's response regarding hesitancy and distrust of COVID-19 vaccine is also shown in Table 2.

Overall, HCWs have a more comprehensive knowledge of the infectious disease compared to over-all population. Mostly HCWs agreed that the corona virus is dangerous to people of all ages, and that infected people who are elderly or have chronic diseases face an increased risk of death. Of the total 137 HCWs who responded, 92% related COVID-19 high risk from possible contact with infected patients whereas polymerase chain reaction (PCR) was either tested positive in 26.3% or antibodies level raised in 9.4%. A great majority of HCWs showed concerns over vaccine safety and efficacy and 68.1% believed that vaccination was rapidly developed without considering their safety. About15.9% believed that vaccination manufacturer falsified their data while 26.1% responded to vaccination's long-term adverse effects. The COVID-19 vaccine, which is currently being developed, was deemed necessary by 90% of HCWs. The future vaccine was tolerated better by the HCWs. In comparison to the general population, about 68.1% of HCWs assumed that additional time was required before vaccine introduction, that they could accept severe effects like allergic reactions, and that they could accept more severe reactions.

4. Discussion

The present Pakistani region-stratified study surveyed the HCWs knowledge of COVID-19 and their approach toward forthcoming vaccination in Pakistan using an internet-based questionnaire. In comparison to the general population, HCWs demonstrated greater

Table 2: Participant's knowledge, beliefs, and hesitancy about the COVID-19 vaccine (n = 137)

Parameters	Response	n	%
COVID-19 vaccination done	Yes	101	73.7
	No	36	26.3
Have you ever had symptoms of COVID-19 disease?	Yes	35	26.3
	No	102	73.7
Have you ever tested PCR positive for COVID-19?	Yes	36	26.3
	No	69	50.4
	Never Tested	32	23.3
Have you ever had positive antibodies to COVID-19?	Yes	13	9.4
	No	50	36.5
	Never Tested	74	54.1
Due to your job are you at high risk for contracting COVID-19 from direct patient contact?	Yes	127	92.7
	No	10	7.3
Has anyone in your household been diagnosed with COVID-19?	Yes	48	35
	No	89	65
Has anyone in your family members or friends been diagnosed with COVID-19?	Yes	121	88.3
	No	16	11.7
Have you ever come across anyone (in clinical practice or otherwise) who has had severe side effects of COVID-19 vaccine?	Yes	44	32.1
	No	88	64.2
	Not Sure	5	3.6
If not would you like to get vaccinated against COVID-19?	Yes	28	20.4
	No	9	6.7
	No response	100	72.9
Have you ever refused to be vaccinated against COVID-19?	Yes	19	13.9
	No	115	83.9
	No Response	3	2.2
Do you think COVID-19 vaccines safe?	Yes	125	91.2
	No	12	8.8
Do you think benefits of COVID-19 vaccine outweigh its risks?	Yes	120	87.6
	No	14	10.2
	Not Sure	3	2.2
Do you think COVID-19 vaccines will reduce infection rate and help prevent disease?	Yes	127	92.6
	No	7	5.1
	Not Sure	3	2.2

tolerance for adverse effects and vaccine effectiveness. The epidemic may also provide additional potential benefits, such as influenza or pneumonia vaccination. Disease trends, communal acquaintances' decisions, and infectious disease-related high risks, are all related with an elevated likelihood of selecting vaccination among HCWs. Most HCWs agreed to get the vaccination for coronavirus post-introduction, which is mainly due to the risk assessment of infectious disease and assurance in the vaccine's efficacy and safety. HCWs were much more likely to become infected with the corona virus. In our study, 92% of HCWs considered that they got coronavirus as a result of close contact with infected patients. Uncertainty about how the epidemic will unfold also plays a role in risk assessment.

While the COVID-19 pandemic has globally overwhelmed healthcare systems, Pakistan has escaped the worst of the disease's high mortality. Pakistani caseload has been lower than in the developed countries due to its younger population and early adherence to facemask and social distancing mandates. Other South Asian countries with comparable socioeconomic and demographic characteristics to Pakistan fared worse in terms of COVID-19-related morbidity and mortality.[19] In contrast, Pakistan has a difficult history of polio eradication due to vaccine aversion in many of its

endemic regions.[20,21] A US-based study conducted on HCWs reported a higher vaccine acceptance rate in male HCWs compared to female HCWs.[22] Our study contradicts these findings due to higher female HCWs acceptance compared to male HCWs in our study. Additionally, HCWs involved in indirect patientcare had higher hesitancy of vaccine acceptance compared to direct patientcare HCWs, which was in agreement to their study. Also, HCWs of the age range 51 to 60 y had a higher rate of vaccine acceptance.

HCWs had a favorable attitude toward the vaccine. HCWs play an important role in the public willingness to get vaccinated, which can lead to an increase in vaccine coverage. It was discovered that knowledge and acceptance increased with HCWs readiness to recommend immunization. According to a United Kingdom based study, highly educated HCWs (nurses) preferred influenza vaccination to their families and recommended it for the future.[23] Concerned about the poor quality of local based vaccine production, vaccine hesitancy developed in certain HCWs, which may influence their own decisions and the public advocacy regarding vaccination. In the present study, about 22.7% of HCWs trusted vaccines produced by domestic manufacturers.[24]

Another potential advantage of the COVID-19 pandemic is that it serves as a virtuous health education against contagious diseases. In our study, we observed health protection such as wearing masks and receiving more vaccinations. The difference in getting a vaccination for COVID-19 in HCWs from the general population might be explained by their risk evaluation and knowledge level. The increased perception of coronavirus disease as enhanced influenza may increase the vaccine acceptance rate among HCWs.[25] The social status of both HCWs and the general population influence their knowledge and perception regarding COVID-19 vaccination. The attitude and behavior of friends, relatives, and neighbors also play a key role in HCWs' decisions regarding vaccinations. The acceptance and uptake of the coronavirus vaccine by others significantly influence the vaccine intent in terms of weakness or strength.[26] The coronavirus vaccine's social acceptance and clear choice increase the vaccination rate among HCWs and the public.

Currently, vaccine acceptance has been a major challenge, raising public and HCWs concern about trust in the COVID-19 immunization process even in developed countries; similar conspiracies and myths were also encountered for rubella, polio, mumps, and measles resulting in a reduction of vaccination acceptance.[27] In Pakistan, similar to polio vaccination, the COVID-19 vaccination is facing certain issues regarding its safety and efficacy.[28] Many researchers from the US and Canada studied the possible association of education level with beliefs in vaccination and found that a significant proportion of the educated population had similar concerns regarding the efficacy and safety of the coronavirus vaccine.[29,30] Educated participants like HCWs in our case had doubts about vaccine safety but mostly agreed to the vaccine immunity and were against the myths.

We need to provide data regarding vaccine composition, working, side effects and risks, effectiveness, testing, and safety. Unfortunately, no strict stance was taken by the government against false claims, myths, and disinformation about coronavirus vaccines. Putting all efforts into implementing the actions towards reducing the spread of misinformation will result in control and mitigation of the coronavirus pandemic.

5. Conclusion

Our study found that fears about the efficacy and the consequence of the COVID-19 vaccine can impasse struggles to control the disease spread. The safety and efficacy issues influenced the coronavirus vaccine acceptance. Healthcare workers in Pakistan had a higher prevalence of vaccine acceptance compared to other surveys. Healthcare workers advocacy and official effective communication can ensure success of the national vaccine strategy.

6. Conflict of interest

No author had any conflict of interest.

7. Data availability

The numerical data generated during this research is available with the authors.

8. Authors' contribution

All authors contributed in concept of the study, conduct of the study, data collection, data analysis, manuscript writing, editing and final approval.

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