

RESEARCH ARTICLE

Received 23 Feb 2024 | Accepted 02 Mar 2024 | Published Online 02 Mar 2024

<https://doi.org/10.32948/ajpt.2024.02.27>

Exploring pharmacist role in dispelling myths regarding covid-19 vaccination

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Cite this article: Butt AR, Rehman HU, Bashir MB, Khan S et al. Exploring pharmacist role in dispelling myths regarding covid-19 vaccination. Asia-Pac J Pharmacother Toxicol 2024, 4: 1-8. <https://doi.org/10.32948/ajpt.2024.02.27>

Abstract

Background Vaccination against Coronavirus provides adequate adaptive immunity to combat the infection; however, lack of knowledge and misinformation regarding COVID-19 vaccines leads to “Vaccine hesitancy” among people and halts the immunization process. Aim of this study is dispelling myths and misinformation via a pharmacist counseling and optimizing the vaccine acceptance to withstand this pandemic.

Methods A prospective observational study was conducted in two phases at Quaid-i-Azam University (QAU), Islamabad and its peripheral rural area; 200 non-vaccinated individuals were recruited in the pre-intervention phase and 50 in the post-intervention phase. Interview based questionnaire filling was done in both the phases for highlighting the myths causing COVID-19 vaccine hesitancy, and major sources of spreading misinformation. Individuals were guided and counseled regarding misinformation about vaccination.

Results In our study most of the respondents were females (70%). In current study, we counseled 50 participants from pre-intervention phase and significant difference has been seen in percentages. As in the pre-intervention phase, 77% individuals believed the myth that COVID-19 vaccine was developed too fast, and in the post-intervention phase it was reduced to 12% via counseling. Similarly 50% participants believed that vaccine is associated with COVID-19 illness that was decreased to 20% Highly prevailed myths included; too fast development of COVID vaccine (77%), its association with COVID-19 illness (72%), and doubt regarding its efficacy (53%). Chi square analysis found significant association between highly prevailed myths and education level. Study participants with higher education level were more reluctant as they were relying more on the misconceptions regarding COVID-19 vaccine (p-value > 0.05).

Conclusion Awareness regarding misconception and myths via proper counseling played important role in eradicating vaccine hesitancy and optimizing its acceptance. Longer follow up studies on large sample size are required for convincing results.

Key words extra pulmonary TB, TB-high burden country, risk factors, Pakistan

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Introduction

The term Coronavirus is imitative of a Latin word ‘Corona’ meaning crown or wreath, as the virus surface has crown-like spikes. June Almeida and David Tyrrell, who first perceived and studied human corona virus, has coined its name [1]. Corona viruses that cause infection in human are: SARS (Severe Acute Respiratory Syndrome), MERS (Middle East Respiratory Syndrome), and the common cold [2]. Respiratory ailment caused by SARS-CoV-2 started in Wuhan (China) in December 2019 and became a pandemic in March 2020 [3]. Coronavirus caused more than six million mortalities and affected about 590 million people worldwide, as of August 2022 [4]. Pakistan, being the third world country, is also carrying the burden of COVID-19 with millions of affected individuals and thousands of deaths.

To combat the COVID-19 pandemic, a shielding vaccination is needed to accomplish adequate adaptive immunity against the infection. The significant measure of evolving vaccine is to warrant its safety, because SARS-CoV-2 infection could be

boosted by a vaccination if potential risks have been addressed: when infection happens after vaccination is one of the possible risks mentioned in the context of COVID-19 vaccine research [5]. In this COVID-19 pandemic, safe and effective vaccine strategies are of great significance, because vaccine ensures protection due to its capability of triggering a substantial, long-lasting immune response that includes both the neutralizing antibodies and T cells [6].

People’s refusal to receive nonviolent and suggested vaccines is called “vaccine hesitancy”. To increase the vaccine uptake, foremost step is to determine the reason behind the hesitation of people towards vaccination [7]. According to the studies conducted worldwide, people are vaccine hesitant because of their concern related to the side effects, and doubts regarding the safety and efficacy of vaccines. Extensive availability of smartphones have made easy access to the internet; and social media has pros and cons. In vaccine decision-making process, it might be valuable tool for self-education but significant disadvantages such as misinformation and myth about COVID-19 vaccine are not

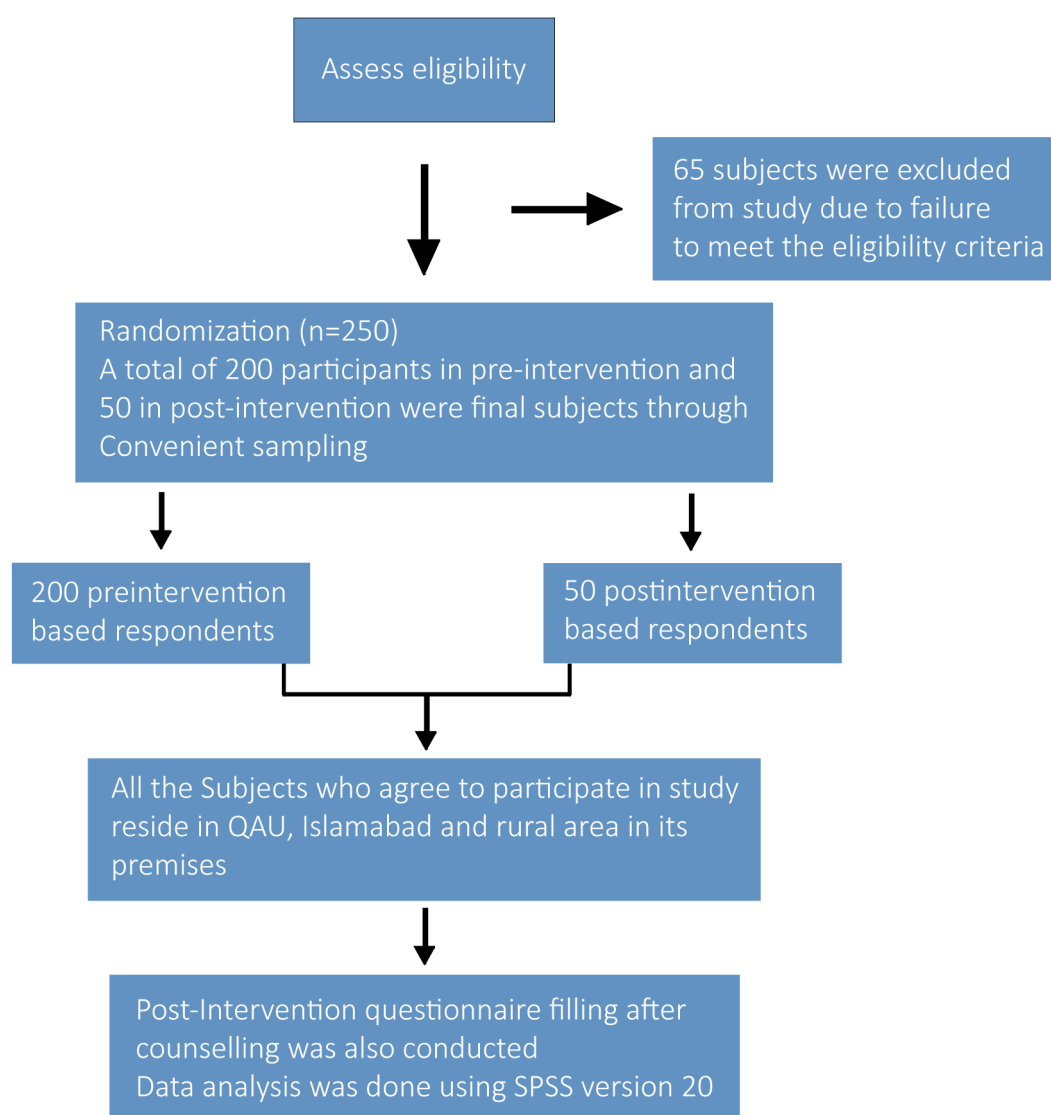


Figure 1. Study flow chart.

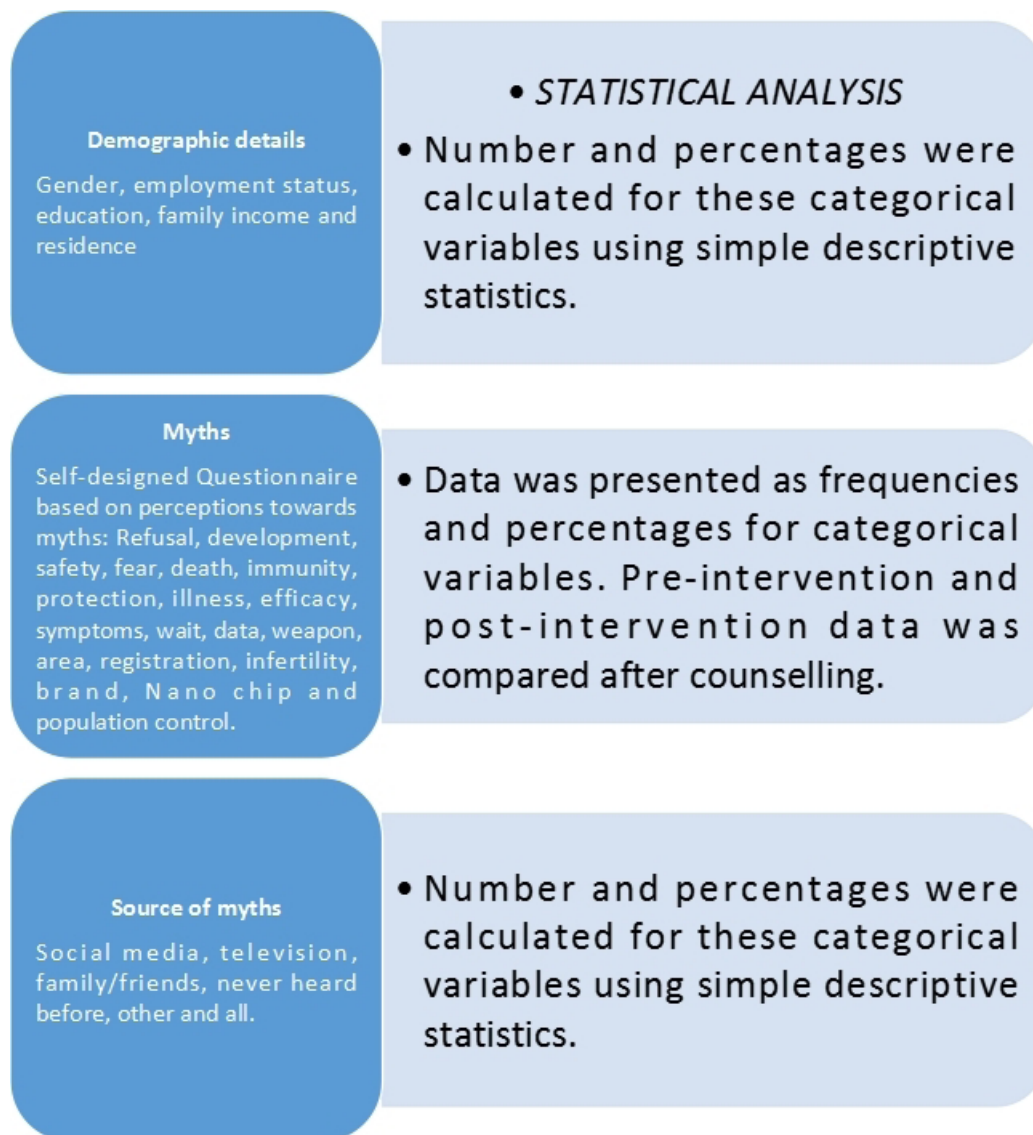


Figure 2. Study work flow.

comprehensible [7].

People who doubt the safety of COVID-19 vaccine are not willing to receive it; lack of the information regarding virus is the prime reason behind accepting the vaccine related myths [8]. To eradicate COVID-19, it is important that maximum number of people get vaccinated, but the fast spread of misinformation and myths regarding Corona vaccination are massive hurdles in the immunization process. Aim of this study is to dispel the misinformation and to optimize the vaccine acceptance by highlighting the myths that contribute to increase reluctance to the COVID-19 vaccination, and to educate and counsel the individuals breaking the shackles of misinformation.

Methods and Materials

Study design & study settings

A prospective observational study was conducted to observe the

misinformation causing COVID-19 vaccine hesitancy and to optimize the vaccine acceptance through counseling and educating individuals. The targeted study population included people who were non-vaccinated against COVID-19. The data was collected from the students of Quaid-i-Azam University, Islamabad, Pakistan and from the peripheral rural areas of University. The study duration was three months from Jun-Aug 2021.

Inclusion & exclusion criteria

The non-vaccinated individuals in the rural areas and university premises were included in the study, while all the people already vaccinated against COVID-19 were excluded.

Sample size

Non-probability convenience sampling technique was used for enrolment of the study population. All individuals meeting

inclusion/exclusion criteria during study duration in pre intervention were 200 and in post-intervention were 50.

Study tool

The questionnaire was self-designed and pre-validated by the 3 experts of relevant field before the start of original research. The questionnaire comprised of 2 parts, first part included demographics details (i.e., gender, employment status, education, family income and residence) and disease history. The second part of questionnaire included of two sections; one about the perception of people towards myth regarding COVID-19 vaccine i.e. refusal, development, safety, fear, death, immunity, protection, illness, efficacy, symptoms, wait, data, weapon, area, registration, infertility, brand, nano-chip and population control, and other section was to observe major sources of spreading myths i.e. social media, television, family/friends, never heard before, other and all. Interview based questionnaire filling has been done in both pre and post intervention phases and individuals were guided and counselled.

Data collection

One-to-one interview was conducted with non-vaccinated participants in pre-intervention phase and the response was noted on the questionnaire. Immediately after getting responses, individuals were counselled and guided regarding their queries and misconceptions while explicating their feedbacks. Later in couple of weeks, few of those individuals were indulged in post intervention phase to get reciprocated responses. However, sample size was finite due to limited time span of survey. **Figure 1** shows the study flowchart.

Statistical analysis

Statistical software package for social sciences (IBM SPSS Statistical version 20) has been used to analyze data. Percentages and frequencies were used for depicting categorical variables using simple descriptive statistics. Chi Square Independent test was used to analyze significant association between highly prevailed myths in study population and education level. P-value less than 0.05 was considered as statistically significant.

Study workflow

Table1. Demographics of non-vaccinated study participants (n=200).

Sr. No.	Demographic Variables	Categories	Number (percentage)
1	Gender	Male	60(30)
		Female	140(70)
		15-26	112 (56)
		27-38	45 (22.5)
2	Age	39-50	28 (14)
		51-62	12 (6)
		63-74	3 (1.5%)
		Govt. Employed	54 (24)
3	Employment Status	Private Employed	24 (12)
		Unemployed	122 (51)
		Primary	18 (9)
		Secondary	57 (28.5)
4	Education	Intermediate	26 (13)
		Above	99 (49)
		Low	21 (10.5)
		Moderate	146 (73)
5	Family Income	High	33 (16.5)
		Rural	57 (28.5)
6	Residence	Urban	143 (71.5)

Table 2. Myths regarding COVID-19 vaccine (pre-intervention phase and post-intervention).

Sr. No.	Myths about COVID 19 Vaccine	Categories	Frequencies (Pre-Intervention Phase (n=200)/Post-Intervention Phase (n=50))		Percentage (Pre-Intervention Phase/Post-Intervention Phase)	
1.	Do you think COVID-19 Vaccine was developed too fast?	Yes	154	6	77%	12%
		No	46	44	23%	88%
2.	Do you think it is not safe for your health?	Yes	92	12	46%	24%
		No	108	38	54%	76%
3.	Are you scared of post vaccination complications?	Yes	80	12	40%	40%
		No	120	38	60%	60%
4.	Do you think you would die after being vaccinated?	Yes	34	8	17%	16%
		No	166	42	83%	84%
5.	Do you think your physiological immunity is better?	Yes	151	16	75.5%	32%
		No	49	34	24.5%	68%
6.	Do you think it will not provide long-term protection?	Yes	100	9	50%	18%
		No	100	41	50%	82%
7.	Do you think it is associated with COVID 19 illness?	Yes	144	10	72%	20%
		No	56	40	28%	80%
8.	Do you Doubt regarding vaccine efficacy?	Yes	106	10	53%	20%
		No	94	40	47%	80%
9.	Do you think COVID 19 symptoms are mostly mild?	Yes	54	12	27%	24%
		No	146	38	73%	76%
10.	Are you waiting for others to vaccinate first?	Yes	77	4	38.5%	8%
		No	123	46	61.5%	92%
11.	Do you think it is not safe until we get more long-term data?	Yes	145	7	72.5%	14%
		No	55	43	27.5%	86%
12.	Do you think it is a political weapon to harm Muslim Nation?	Yes	55	5	27.5%	10%
		No	145	45	72.5%	90%
13.	You did not know where to be vaccinated?	Yes	93	9	46.5%	18%
		No	107	41	53.5%	82%
14.	You did not know the procedure of being registered?	Yes	90	10	45%	20%
		No	110	40	53.5%	80%
15.	Do you consider it unnecessary to fight against COVID 19?	Yes	59	11	29.5%	22%
		No	140	39	70%	78%

Table 2. Myths regarding COVID-19 vaccine (pre-intervention phase and post-intervention) (Continued).

Sr. No.	Myths about COVID 19 Vaccine	Categories	Frequencies(Pre-Intervention Phase (n=200)/Post-Intervention Phase (n=50))		Percentage(Pre-Intervention Phase/Post-Intervention Phase)	
16.	Do you think vaccine could lead to infertility?	Yes	39	4	19.5%	8%
		No	161	46	80.5%	92%
17.	Are you perplexing about different vaccine brands?	Yes	145	9	72.5%	18%
		No	55	41	27.5%	82%
18.	Do you think its installation of 5G Nano-Chips in human to control them?	Yes	35	3	17.5%	6%
		No	165	47	82.5%	94%
19.	Do you think it is created to control world population?	Yes	69	8	34.5%	16%
		No	131	42	65.5%	86%

After the inclusion of eligible respondents, we used the following workflow diagram during data collection is shown in **Figure 2**.

Results

Demographics of study population

Demographics of study population included gender, age, occupation, education, family income and residence status is presented in **Table 1**.

Myths contributing to COVID-19 vaccine hesitancy

Perception of study population toward the myths regarding COVID-19 vaccine were related to its safety, efficacy, post-vaccination complications, death, political conspiracy, infertility, insufficient information about vaccination center and lack of

knowledge associated with its registration. **Table 2** highlights the myths with frequency and percentage of the pre and post-intervention phase.

Association between highly prevailed myths and education level

Chi-Square analysis was performed to find association of highly prevailed myths in study population with their education level. Study participants with higher education level was found abundant in number who were more hesitant to vaccine because of their strong believe on misinformation and myths related to COVID-19 vaccine. Variables having p-value less than 0.05 were assessed as shown in **Table 3**.

Major source of spreading misinformation

Summary statistics of major source of spreading misinformation. In study group was social media (46%), television (8%), family/

Table 3. Association between myths and education level.

Myths about COVID-19 Vaccine	Categories	Primary Education level (n=18)	Secondary Education level (n=57)	Inter-mediate Education level (n=26)	Above (n=99)	P-value (p<0.05)
Do you think COVID 19 Vaccine was developed too fast?	Yes	9	44	21	80	0.038
	No	9	13	5	19	
Do you think it is associated with COVID-19 illness?	Yes	9	49	23	63	0.001
	No	9	8	3	36	
Do you Doubt regarding vaccine efficacy?	Yes	8	27	9	62	0.037
	No	10	30	17	37	
You did not know the procedure of being registered?	Yes	8	38	11	33	0.001
	No	10	19	15	66	

friends (12%), all three (31%), other (2%) and never heard before (1%).

Discussion

To combat the COVID-19 pandemic, a shielding vaccination is desirable to accomplish adequate adaptive immunity to SARS-CoV-2 septicity. The influence of vaccines in precluding ill health and expiry of individuals from other infective ailments has encouraged the expectation that prevention vaccines can check COVID-19 as well [5, 9]. In the global COVID-19 pandemic there is great significance of safe and effective vaccine strategies, because it ensures protection due to the capability of triggering a substantial, long-lasting immune response that includes both neutralizing antibodies and T cells [10]. People's unwillingness to accept nonviolent and suggested vaccines is called "Vaccine Hesitancy". In May 2020, the 73rd World Health Assembly endorsed a resolution distinguishing universal immunization as a global public-health priority for avoiding and dismissing SARS-CoV-2 transmission. People were, however, hesitant to get COVID-19 vaccine, and the first step in encouraging vaccine uptake is to identify the causes for people's reluctance [11, 12].

In 2021, national survey was conducted in USA regarding COVID-19 vaccine acceptance which concluded that doubts related to safety and lack of knowledge about virus are the main reasons of vaccine hesitancy and trusting myths. People more hesitant to vaccine were those having less education and lower income and those belonging to rural areas; and study found that better communication with them can eradicate the knowledge gap in different socioeconomic and educational background [13, 14]. Our study highlighted the myths among students of QAU and in its rural premises (n=200). Highly prevailed myths included; too fast development of COVID vaccine (77%), its association with COVID-19 illness (72%), and doubt regarding its efficacy (53%). Significant association was found between these myths and education level, as study participants with higher education level were more reluctant to vaccine due to trusting myths ($p < 0.05$).

According to the other studies conducted worldwide, people are vaccine hesitant because of their concerns related to side effects, and doubts regarding safety and efficacy of vaccines. Extensive availability of smartphones have made easy access to the internet and social media have pros and cons. In vaccine decision-making process it might be a valuable tool for self-education, but significant disadvantage; such as, misinformation and myths about COVID-19 vaccine are not comprehensible [15-17]. Our results concluded that social media (46%) is the major source of spreading misinformation.

A study related to COVID vaccine hesitancy showed that the novelty of vaccine (82%) and fear of side effects (80%) are the main reasons of declining rate of COVID-19 vaccination. Not only the effective vaccine is required but also the effective strategies for implementation; and policymakers may reduce vaccine hesitancy through campaigns to increase the public awareness and to raise confidence in the safety and efficacy of vaccine [18, 19]. In current study, we counseled 50 participants from pre-intervention phase and significant difference has been seen in percentages. As in the pre-intervention phase, 77% individuals believed the myth that COVID-19 vaccine was developed too fast, and in the post-intervention phase it was reduced to 12% via counseling. Similarly 50% participants believed that vaccine is associated with COVID-19 illness that was decreased to 20%. Frequent decline has been seen in believing myths in the post-intervention phase. Hence, education and guidance plays a vital role in eradicating hurdles regarding vaccine acceptance and increases NO. of vaccinated people which indirectly is a useful tool to combat COVID-19 pandemic.

Study Limitations: In limited period, no long-term follow up study has been managed. Hence, longitudinal method to evaluate changed perceptions related to time and different analysis methods to find association with misinformation is needed as convincing evidence.

Conclusion

Results suggested that non-vaccinated people of the target population are reluctant to COVID-19 vaccine because of incomplete knowledge and misinformation. Our study concluded that there is a significant association between highly prevailed myths and education level. Study participants with higher education level are more reluctant as they are more relying on misconceptions regarding COVID-19 vaccine. Social media is the major source of spreading misinformation. Awareness regarding misconception and myths via proper counseling played an important role in eradicating vaccine hesitancy and optimizing its acceptance.

Acknowledgments

We are grateful to the Department of Pharmacy, Quaid-i-Azam University for the support rendered to ensure the success of this study.

Ethics approval

The ethical approval was obtained from ERB of Department of Pharmacy Quaid I Azam University, Islamabad for being a project of post-graduation. Additionally, informed consent from the respondents was also obtained.

Data availability

All relevant data are within the paper.

Funding

The author(s) received no specific funding for this work.

Authors' contribution

Ayesha Raza Butt collected the data, conceptualized, supervised the study. Hafeez Ur Rehman analyzed the data and proofread manuscript, Sandal Khan entered data. Musa Bin Bashir wrote the manuscript.

Competing interests

The authors have declared that no competing interest exist.

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