

Evaluation of COVID-19 Vaccination Status among University's Students, Academic and Nonacademic Staff in Mosul, Iraq

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Abstract

Background: The future frontline combatants in the fight against pandemics will be academic and nonacademic employees and health science students. A successful vaccination program requires an understanding of the factors that influence coronavirus disease 2019 (COVID-19) vaccine acceptance. **Objective:** The purpose of this study was to examine the influences on COVID-19 vaccination among the health sciences faculty and staff at Al-Noor University College, Mosul, Iraq. **Materials and Methods:** The study was a self-administered cross-sectional online survey that included employers and Al-Noor University College health sciences students. The individuals' important information was gathered through the survey, which covered sociodemographic traits, COVID-19 infection, and vaccinations. To identify the COVID-19 vaccination variables, Statistical Package for the Social Sciences version 26 was used. **Results:** Most of the participants 77%, however, are single. More than 75% of participants were between the ages of 18 and 25 years; the majority were university students. Only 6% of participants held a doctor of philosophy, whereas 91% of participants were healthy. More than 80% of participants had vaccinations, with the Pfizer vaccine being the most common. Age groups and COVID-19 infection, immunizations, vaccine types, infection after vaccination, vaccination frequencies, COVID-19 infection frequencies, and period of infection were found to be significantly correlated. **Conclusion:** The health department may spread information about the COVID-19 vaccination to raise people's impressions of their knowledge in light of the study's findings. People could use anxiety-reduction strategies like mindfulness during the lockdown to assist them in maintaining composure and to help them analyze their coping skills concerning their vaccine confidence.

Keywords: Academic staff, COVID-19, Mosul, university students, vaccination

INTRODUCTION

Since its initial epidemic in Hubei, Wuhan, China, the novel coronavirus disease 2019 (COVID-19), which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has become a significant public health issue.^[1]

Global health systems and economies have suffered serious effects from the pandemic.^[2-4]

The pandemic is one of the deadly coronavirus outbreaks, along with the Middle East respiratory syndrome in 2012^[5] and the severe acute respiratory syndrome in 2003.^[6] COVID-19 was expected to have catastrophic effects on nations with weaker health systems, notably those in Africa.^[7]

A coordinated regional response that prioritizes protecting all susceptible populations is therefore required. The development of COVID-19 vaccine candidates has accelerated since the SARS-CoV-2 genome was sequenced. Currently, various vaccinations are going through various stages of clinical testing. Additionally, some of the vaccines have since received Emergency Use Authorization from the World Health Organization (WHO) and other pertinent authorities;^[8,9] in particular, BioNTech/Pfizer's vaccine, AstraZeneca's vaccine, and Sinopharm vaccine. It is important to

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investigate the factors that influence COVID-19 vaccine uptake, as vaccination coverage is a key component of herd immunity.

The COVID-19 vaccine is widely available, but prior research has indicated that immunization uptake is severely constrained.^[10,11] There are times when the COVID-19 information that is, readily available is inaccurate, which causes overload and confusion.^[12] The regrettable lessons learned from past pandemics (such as the influenza virus), particularly the low acceptance in many nations, point to the need for a better understanding of the vaccine's uptake and reluctance.^[13] Vaccine hesitancy is defined as "the delay in acceptance or refusal of vaccination despite the availability of vaccination services" by the WHO's Strategic Advisory Group of Experts on Immunization.^[14] Due to regional and population variation, there is a need to investigate local data to supplement the worldwide data pool on COVID-19 vaccine acceptance and reluctance. Vaccine hesitancy is regarded as a threat to global health.

The adoption of the COVID-19 vaccination in a crucial population of young adults, such as students in higher institutions and those working in the medical field, has been explored in several international studies.^[15,16] Participation in the COVID-19 response by students varies across nations and is largely done for educational reasons.^[17] However, because there is a global shortage of healthcare workers, the role of healthcare students and staff—particularly medical students and staff—in COVID-19 response initiatives is increasingly changing.^[18]

It is advised that medical students participate in the COVID-19 response as volunteers, acquire the necessary training, only engage in tasks that are within their scope of expertise, and remain under constant supervision.^[18] Additionally, they advocate for the public and offer suggestions about disease education and prevention. Numerous socioeconomic factors, such as gender, age, household income, the area and level of study, and a history of chronic disease, may have an impact on the health literacy of health sciences students.^[19]

The current study's objective was to assess the level of COVID-19 vaccination acceptance and usage among students, faculty, and other staff members at the Iraqi University.

MATERIALS AND METHODS

Study design

The study used Google Forms (www.google.com/forms) to conduct a cross-sectional study with a self-administered survey. The survey's link was shared in emails, groups, and social media pages, such as Facebook and WhatsApp, to welcome participation. To increase response rates, occasional reminders were given. Data for the poll were gathered between January 15, 2023, and March 14, 2023.

The participants in this study were chosen by convenience sampling. The invited participants were required to share the study invites on their social media accounts and groups. The Google Form was pre-configured to only allow users to submit one email address-based response. The final analysis included participants whose responses were accurate, comprehensive, and valid.

The survey's completion rate was calculated by dividing the number of respondents who finished the survey by the total number of respondents. Participants who provided careless responses were identified and removed from the study.

Study setting and participants

Students, faculty, and staff from Al-Noor University in Mosul (Northern Iraq) participated in the study. Students who were at least 18 years old and majoring in pharmacy, dentistry, and health-related fields, such as optometry, radiology, anesthesia, medical laboratories, and dentistry technicians, were included in the study.

Survey tool and outcome measures

The study survey form was created based on a validated vaccine scale provided by the WHO, other studies regarding immunization,^[20-25] a search of pertinent literature, and consultations with experts, the study survey form was created. Three impartial specialists examined and approved the content of the final survey tool.

Three key elements make up the research survey instrument. Sociodemographic information, such as gender, age, marital status, family income, field of study, degree of education, and history of chronic disease, was gathered in the first part. Information on the COVID-19 vaccine was gathered in the second section. All of the inquiries had closed-ended categorical variables. Due to the pupils' familiarity with Arabic and English, the tool was made available in those languages.

Data preparation and analysis

Data analysis was performed using IBM Statistical Package for the Social Sciences Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA) after the survey responses from Google Forms were downloaded into a Microsoft Excel spreadsheet. Multiple imputation techniques were used to manage missing data.^[26]

Ethical considerations

Al-Noor University Research Ethics Committee reference number 169 was used to secure ethical approval. All actions taken throughout this investigation that involved using people comply with institutional and/or national research committee ethical guidelines. The goals of the study, the survey, and the researchers were all thoroughly explained to the participants. Before participating in

the study, each subject provided their digitally signed informed consent. Throughout the study, anonymity, confidentiality, and privacy of the study's data were all assured and preserved.

RESULTS

Demographic characteristics

As shown in Table 1, about 77% of participants are single. More than 75% are aged between 18 and 25 years, whereas most of the participants are students in university. Only 6% of participants have a Doctor of Philosophy (PhD) degree, and about 91% did not have chronic diseases.

Data regarding COVID-19 virus and vaccination

As shown in Table 2, about 58% of participants were infected with COVID-19 before vaccination. More than 80% of participants were vaccinated, with most of the participants vaccinated with the Pfizer vaccine. Only 4.5% of participants had three doses of vaccinations, and about 42% of participants underwent a swab test during the infection.

COVID-19 treatments, prevention, and symptoms data

As shown in Table 3, about 96% of participants did not require oxygen treatments. More than 45% of participants took treatment for 1 week, whereas most of

the participants took supplements or vitamins during the infection. More than 60% of patients had used all types of prevention before, during, and after infections.

Age groups and COVID-19 infection and vaccination data

Significant associations were found in age groups with COVID-19 infection, vaccinations, vaccine types, infection after vaccination, vaccination times, COVID-19 infection times, and period of infection ($P < 0.05$) as shown in Table 4.

Education groups and COVID-19 infection and vaccination data

Significant associations were found between education level groups and vaccinations, vaccine types, infection after vaccination, and vaccination times ($P < 0.05$) as shown in Table 5.

Living groups and COVID-19 infection and vaccination data

Significant associations were found between living groups with the infection before vaccination and vaccination times ($P < 0.05$) as shown in Table 6.

Table 1: Demographic characteristics of participants

Demographics	Frequency	%
Gender		
Male	166	49.8
Female	167	50.2
Marital status		
Single	258	77.5
Married	70	21
Divorced or widowed	5	1.5
Age (years)		
18–25	255	76.6
26–35	44	14.1
35–45	9	2.7
>45	22	6.6
Where do you live?		
Urban	277	83.2
Rural	56	16.8
Education level		
Bachelors/bachelors student	282	84.7
Master	31	9.3
PhD	20	6
Do you have other chronic diseases?		
Yes	28	8.4
No	305	91.6

Table 2: COVID-19 virus and vaccination data

Vaccination data	Frequency	%
Did you get the coronavirus before the vaccine?		
Yes	194	58.3
No	139	41.7
Did you catch the virus after the vaccine?		
Yes	78	23.4
No	255	76.6
How many times have I been infected with a virus?		
Once	131	39.3
Twice	57	17.1
More than twice	23	6.9
I'm not infected before	122	36.6
Did you take the vaccine?		
Yes	292	87.7
No	41	12.3
Vaccine type		
Pfizer	252	75.7
AstraZeneca	19	5.7
Sinopharm	16	4.8
Compo	5	1.5
Nothing	41	12.3
How many doses did you take?		
1	72	21.3
2	206	61.9
3	15	4.5
Non	41	12.3
Did you take a swab during the infection?		
Yes	140	42.0
No	193	58.0

Table 3: COVID-19 treatments and duration data

Duration data	Frequency	%
Do you need oxygen therapy?		
Yes	36	10.8
No	297	89.2
How long did the treatment take?		
7 days	113	33.9
14 days	81	24.3
21 days	51	15.3
Non	88	26.4
Did you take supplements or vitamins during the infection?		
Yes	220	66.1
No	113	33.9
What are the prevention methods taken by you?		
Hand and body sterilization	234	69.3
Avoid gatherings	202	59.9
Wear mask	222	65.7
Not to be in places infected with the virus	240	71.1
What are the symptoms associated with virus infection?		
Fever	185	54.8
Fatigue	205	60.7
Headache	175	51.8
Loss of sense of smell or taste	146	43.3
Difficulty or shortness of breath	84	24.9
No symptoms	86	26.2

DISCUSSION

All study participants had COVID-19 infection before vaccination, except those over 45 years old who had received the vaccine during the first wave of infection and thus had a better level of protection. These findings are consistent with those of other studies conducted in 40 different countries.^[27-29] The majority of individuals received the same vaccination brand because Pfizer vaccines were readily available.

As seen by results from related research,^[11,13,19] the majority of individuals had not contracted an infection following all doses of immunization. Additionally, the majority of study participants received two doses of the vaccine following vaccination guidelines. The majority of persons over the age of 45 years had COVID-19 infection for 2 weeks or more, which is similar to the findings of earlier research.^[12,15,19,26] This is because immunity declines with age.

Due to a decline in immunization in younger age, a highly significant connection between infection times (two times of COVID-19 infection) and academic degree (BSc) has been demonstrated, and it is similar to other studies.^[13] According to other research studies,^[3,5,8,16,21] over 60% of participants who lived in urban areas had infections before vaccination due to the impact of congested cities on rural participants.

Table 4: Association of age groups with COVID-19 infection and vaccination data

COVID-19 infection vaccination data		Age (years)				P value
		18-25	26-35	36-45	>45	
COVID-19 before vaccination	Yes	144	35	6	9	0.038*
	No	111	12	3	13	
Vaccine received	Yes	220	41	9	22	0.18
	No	35	6	0	0	
Vaccine types	Pfizer	194	37	5	18	0.003*
	Astra Zeneca	12	3	1	3	
	Sinopharm	12	0	3	2	
	Compo	2	2	0	1	
	Non	35	5	0	0	
Infection after vaccination	Yes	47	20	5	6	<0.001*
	No	208	27	4	16	
COVID-19 times	One	106	18	2	5	<0.001*
	2 times	42	10	2	3	
	>2 times	9	9	3	2	
	Non	98	10	2	12	
Vaccination times	One	61	9	2	0	<0.001*
	2	155	31	7	13	
	3	4	2	0	9	
	Non	35	5	0	0	
COVID-19 long times	1 week	97	13	1	2	0.003*
	2 weeks	60	12	3	6	
	3 weeks	33	12	4	2	
	Non	65	10	1	12	

Chi-square test,

* $P < 0.05$

Table 5: Association of education groups with COVID-19 infection and vaccination data

COVID-19 infection vaccination data		Education levels			P value
		Student/BSc	MSc	PhD	
Vaccine received	Yes	242	30	20	0.04*
	No	40	1	0	
Vaccine types	Pfizer	213	26	13	0.006*
	Astra Zeneca	14	3	2	
	Sinopharm	12	1	4	
	Compo	3	1	1	
	Non	40	0	0	
Infection after vaccination	Yes	58	12	8	0.015*
	No	224	19	12	
Vaccination times	One	66	5	1	<0.001*
	2	171	22	13	
	3	6	3	6	
	Non	39	1	0	

Chi-square test,

*P < 0.05

Table 6: Association of living groups with COVID-19 infection and vaccination data

COVID-19 infection vaccination data		Living area		P value
		Urban	Rural	
COVID-19 before vaccination	Yes	170	24	0.01*
	No	107	32	
COVID-19 times	One	111	20	0.035*
	Two times	51	6	
	>Two times	22	1	
	Non	93	29	

Chi-square test,

*P < 0.05

The current study contains several drawbacks. Data from the participants was first gathered using a convenience sample technique. More specifically, with the help of university faculties, departments, and colleagues, the present researchers administered an online survey.

As a result, the geographical effect may have a similar pattern on the data collected because only participants who share similar settings and characteristics were included in the survey. Thus, the current study's representativeness is limited. Due to the lack of a temporal component in the data collection, the study's cross-sectional design may be criticized for its weak support for causal inferences. More particularly, the latent variables' data collection times were not in an ordered sequence, indicating that the suggested model could include distinct latent variables in different orders.

Third, all the information was self-reported using perceived evaluation. This suggests that certain biases and misrepresentations may have occurred. Fourth, even though many measures were taken to ensure the participants were students and academic and nonacademic staff, it is still possible that some of them

gained access to the online survey through channels that the study team was not aware of. Additionally, there might be some distinctions between respondents and non-respondents. More specifically, study participants who responded might be more interested in COVID-19 than study participants who did not. The findings of the current study cannot be generalized to non-responders as a result.

Fifth, there were roughly 8000 participants who were deemed eligible. As a result, the current study only included 4.1% of those who were eligible, which is a low participation rate. Sixth, there were more students majoring in medical departments in the sample for the current study compared to the total number of university students. The current findings, however, nonetheless showed a clear path for how a sample of Al-Noor University students formed their intention to receive the COVID-19 immunization. The results of the current study could offer government health policymakers additional guidance and understanding on how to increase COVID-19 vaccination uptake and ultimately meet immunization target rates.

CONCLUSION

The findings demonstrated a clear relationship between perceived knowledge and coping evaluation, which was further connected to intention. Based on the study's findings, the health department might disseminate information about the COVID-19 vaccine to enhance people's perceptions of their knowledge. During the lockdown, people could practice anxiety-reduction techniques like mindfulness to help them maintain self-control and to help make a coping assessment of their vaccine confidence. In any case, people may benefit by lowering vaccine reluctance and increasing vaccination uptake. Future research should concentrate on examining the relative factors that may influence intention formation among various population groups to raise the vaccination rate, it is also recommended.

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Conflicts of interest

There are no conflicts of interest.

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