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ORIGINAL STUDY

Public Acceptance, Attitude and Perception Toward Covid-19 Vaccination in Mosul City; Iraq

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ABSTRACT

Background: No doubt the recent coronavirus disease (COVID-19) pandemic represents the most serious health and life threats globally. Vaccination against the disease is considered the cornerstone for controlling the disease.

Aim of the study is to explore public attitudes, perception toward vaccination against COVID-19 infection.

Material and methods: A cross-sectional study was conducted by using a modified questionnaire form which was translated into Arabic language and transformed into a Google form. The form was disseminated to the population online using different platforms in Mosul City over a period of one month during November 2021 and the participants were volunteered for every individual above 18 years old.

Results: The number of respondents was 816. At time of data collection it was found that more than half of participants (54.29%) had been infected by covid-19-virus. About two third (63.85%) were vaccinated against covid-19-virus. The majority of participants (83.33%) were suspicious about the vaccine's side effect. On other hand, half of them (50.25%) thought that COVID-19 pandemic cannot be eradicated even if everyone in the society maintains the preventive measures without vaccination. More than half (56.37%) thought that the vaccines may contain heavy metals or odd materials. While, 25.37% of them believed that it may cause autism, 44.36% assumed that it may cause infertility and 41.30% expected that the vaccine may make genetic changes among humans.

Conclusions: The participants of this study had fears about the safety of the vaccine although about half of them realized that the disease cannot be eradicated with preventive measures only. Also considerable proportions of participants believed the myths that related to the presence of heavy metals in the vaccine or it may cause autism or infertility.

It is recommended to improve health literacy of the general public by developing a health education programs.

Keywords: Acceptance, Attitude, Covid-19 vaccination, Perception

1. Introduction

The novel coronavirus disease (COVID-19) first appeared in Wuhan, China, in December 2019 which later on has infected millions globally and on 30th of January 2020, it was decelerated by the World Health Organization (WHO) that the outbreak of COVD-19 constituted a Public Health Emergency of International Concern (Lee et al., 2021). Since the evolution of covid-19 pandemic a serious threat on health and wellbeing of human was evolved (Karlsson et al., 2021). According to WHO reports in 2022 there were 566 million people get covid-19 virus infection with more than 6 million deaths worldwide (Ahmad et al., 2023). Although the initial preventive measures against coivid-19 infection have flattened the epidemic curve, but they hold a lot of serous economic, and social sequels and the lockdown measures were eased later on (Alqudeimat et al., 2021; Bellato, 2020). Consequently, for the elimination of the viral infection, vaccination is the most successful and cost-effective methods of achieving individual and herd immunity in addition to hygienic and behavioral control procedures

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(Pogue et al., 2020; Greenwood, 2014). However, population hesitancy and refusal of vaccination, despite the availability of vaccination services was a great barrier for its implementation and achievement (Al-Qerem and Jarab, 2021; Abay et al., 2022). Actually, this represents a real challenge for disease prevention and control, according to WHO report the vaccine hesitancy represent one of the top ten global health threat in 2019 (WHO, 2019). It was found that vaccine hesitancy is related to attitude in general (Cordina et al., 2021). Therefore, it is important to identified public attitude and realized their hesitation toward covid-19 vaccination in order to deal with their fears and worries together with enhancing health literacy and modifying specific interventions to increase vaccine acceptance among public (Karlsson et al., 2021; Biasio et al., 2020). The aim of this study is to identify public acceptance, perception and attitude toward Covid-19 vaccination in Mosul City.

2. Material and methods

Initial approval was obtained from Department of Family and Community Medicine at College of medicine/University of Mosul and from Medical Research Ethics Committee (Ref. no.: UOM/COM/MREC/23-24/MAY2) prior to study conduction. The target population was informed that participation is voluntary.

A cross-sectional study design was adopted to identify public attitude and perception toward COVID-19 vaccine. The inclusion criteria were all individuals of both sexes above 18 years who residency was in Mosul City. A convenient sample size according to public response was assumed.

By the mean of a modified standardized questionnaire form the required information was collected. The questionnaire form initially includes questions related to socio-demographic characteristics. The second group of questions was about history of chronic illnesses, covid-19 infection, whether the participant had received covid-19 vaccine and their acceptance to receive the vaccine if available. Participants' attitude about covid-19 vaccine was obtained in the third part of the questionnaire. The attitude statements were answered by either agree, borderline or disagree. The last part of the form was related to the public perception toward the vaccine which encloses 7 items with their answers options by yes or no accordingly. The questionnaire was translated into Arabic language and transformed into an electronic Google Form and disseminated to the population online using platforms of Messenger, Telegram and Facebook groups in Mosul City. The link of electronic Google form was opened for a period of one month from 1st of November 2021 to the 1st of December 2021 and the participation was voluntary.

Table 1. General features of study population (n = 816).

Item	No.	%
Age		
18–30	427	52.3
31–40	152	18.6
41–50	131	16.1
≥51	106	13.0
Sex		
Male	369	45.22
Female	447	54.78
Education		
Illiterate	26	3.19
Primary school	60	7.35
Secondary school	63	7.72
University	508	62.25
Higher education	159	19.49
Occupation		
Student	345	42.28
employed	350	42.89
non employed	121	14.83
Marital status		
Single	385	47.181
Married	421	51.593
Divorced	2	0.245
Widowed	8	0.980
History of chronic diseases		
Yes	220	26.96
No	596	73.04

3. Statistical analysis

The obtained data were exported and saved into an Excel program and later on managed by SPSS software program Version 26. The results were presented into appropriate tables arranged for this purpose in the form of number, percent. Z-test for one proportion was used to estimate any significant statistical difference. P-value of 0.05 or less was considered a cut off point for significance.

4. Results and discussion

Table 1 shows that near half of respondent (52.3%) in the age group (18–30). Female was forming 54.78%. About two third (62.25%) with university education. 42.89% of them were employed and 51.59% of them were married. Approximately three forth of them (73.04%) had no history of chronic diseases.

Table 2 revealed that more than half of participants (54.29%) had been infected by covid-19-virus and 45.71% was not infected by the virus. About two third (63.85%) were vaccinated against covid-19-virus, and (65.07%) were willing to get the vaccine

Table 2. Study population acceptance to covid-19 vaccination, (n = 816).

Had you ever infected by covid-19-virus	No	%	p-value*
Yes	443	54.29	0.000
No	373	45.71	0.000
Had you received covid-19 vaccine			
Yes	521	63.85	0.000
No	295	36.15	0.000
Will you get vaccinated, if possible?			
Yes	531	65.07	0.000
No	174	21.32	0.000
May be	111	13.60	0.000

*Z-test for one proportion is used.

In Table 3 it was found that majority of study population (81.74%) considered the doctor's recommendation is an important factor in vaccination decision-making. And 65.44% of them thought that the incidence of COVID-19 cannot be reduced without vaccination. On other hand 63.97% of them assumed that COVID-19 vaccination is an effective way to prevent and control COVID-19. While only 44.24% of them trust big pharmaceutical companies.

Table 4 demonstrates that 83.33% of study contributors considered that newly discovered COVID-19 vaccines may have serious side effects. Half of them (50.25%) thought that COVID-19 pandemic cannot be eradicated even if everyone in the society maintains the preventive measures without vaccination. More than half (56.37%) thought that the vaccines may contain heavy metals or odd materials. While, 25.37% of them believed that it may cause autism, 44.36% assumed that it may cause infertility and 41.30% expected that the vaccine may make genetic changes among humans.

Identifying public acceptance, attitude and perception towards vaccination against COVID-19 is required to understand the cause of people hesitation towards vaccination as this can help health authorities boost vaccine acceptance to limit the spread of the disease (Karlsson et al., 2021).

At the time of data collection of the present study, there were 54.29% of participants had been infected by covid-19-virus, 63.85% were vaccinated against covid-19-virus, and 65.07% were willing to get the vaccine. Comparing; to Alnatour D, et al. Alnatour et al., 2023 study in Jordan, 52.5% of the study sample reported not being infected, and 80.9% had received at least one dose of the vaccine. Meanwhile, an Indian study reported that 70.44% of participants willing to get vaccinated (Kishore et al., 2021). Also in Sandooja C et al. study 72.2% of respondents were vaccinated (Sandooja et al., 2022). Higher proportion of vaccination was reported by Mahmoud et al. in Arabia Saudi 96.1% received the vaccine and 37.9% were previously infected by COVID-19 (Mahmoud et al., 2023). The variation may be related to the reporting of COVID-19 infection across various studies represent the confirmed diagnostic cases which may be less than the actual number.

Regarding participants' attitude toward covid-19 vaccination apart from trusting doctors' recommendations for vaccination decision-making; the majority of them considered to have a moderate positive attitude. While, only 44.24% of them trusted the big pharmaceutical companies. In contrast Olaimat AN, et al. study in Jordan found that majority of respondents had a positive attitude toward COVID-19 vaccination (Olaimat et al., 2022). In Islam Md et al. study in Bangladesh demonstrate that an overall positive attitude score was among 78% of participants (Islam et al., 2021). Likewise, 81.5% of participants had a positive attitude toward covid-19 vaccinations in an Indian study (Venkataraman et al., 2023). On other hand in Tahir et al. study in Pakistan there was 66.8% of study population showed a positive attitude towards the vaccination (Tahir et al., 2021). This variation in attitude toward covid-19 vaccination

Table 3. Study population attitude toward covid-19 vaccine, (n = 816).

Statement	Agree No. (%)	Borderline No. (%)	Disagree No. (%)
I believe that covid-19 vaccine will help to protect people who take it.	485 (59.44)	269 (32.97)	62 (7.60)
COVID-19 vaccination is an effective way to prevent and control COVID-19.	522 (63.97)	229 (28.06)	65 (7.97)
Doctor's recommendation is an important factor in vaccination decision-making.	667 (81.74)	108 (13.24)	41 (5.02)
I believe better to delay vaccination until I confirmed the vaccine safety.	359 (44.00)	193 (23.65)	264 (32.35)
I will take the COVID-19 vaccine without any hesitation.	511 (62.62)	169 (20.71)	136 (16.67)
I will also encourage my family/friends/relatives to get vaccinated.	504 (61.76)	182 (22.30)	130 (15.93)
It is not possible to reduce the incidence of COVID-19 without vaccination.	534 (65.44)	181 (22.18)	101 (12.38)
I am trust big pharmaceutical companies.	361 (44.24)	278 (34.07)	177 (21.69)

Table 4. Study population perceptions' toward Covid-19-vaccine, (n = 816).

Statements	No	%	p-value
Do you think the newly discovered COVID-19 vaccines have serious side effects?			
Yes	680	83.33	0.000
No	136	16.67	0.000
Do you think that if everyone in the society maintains the preventive measures, the COVID-19 pandemic can be eradicated without vaccination?			
Yes	406	49.75	0.000
No	410	50.25	0.000
Do you think the newly discovered COVID-19 vaccines may contain heavy metals or odd materials?			
Yes	460	56.37	0.000
No	356	43.63	0.000
Do you think the newly discovered COVID-19 vaccines may cause autism			
Yes	207	25.37	0.000
No	609	74.63	0.000
Do you think the newly discovered COVID-19 vaccines may affect fertility			
Yes	362	44.36	0.000
No	454	55.64	0.000
Do you think the newly discovered COVID-19 vaccines may make genetic changes among humans			
Yes	337	41.30	0.000
No	479	58.70	0.000

*Z-test for one proportion is used.

may be related to novelty of the virus and the vaccines which produced within a relatively short period and conflicting information from different sources which the public received.

In the present study 83.33% of participants considered that newly discovered COVID-19 vaccines may have serious side effects. Similarly, in a Nigerian study 70.4% of medical students were worries about the side effects of Covid-19 vaccines (Orok et al., 2022). Also, The majority of nurse student (78.6%) at University of Sulaimani considered the vaccine may have side effects (Noori et al., 2023). And in Bibi, A et al. study in Pakistan, only half of respondents (51.8%) considered that the vaccine is safe (Bibi et al., 2023). However, 70.6% of participants of Jing R study in China believed that vaccines generally were safe (Jing et al., 2022). Likewise, the majority (87.9%) of participants considered the vaccine is safe for use in Sandooja C et al. study (Sandooja et al., 2022). The publics' concerns about the safety of the vaccine in general depend on amount and type of information and health education delivered to them.

In the current study half of participants (50.25%) thought that COVID-19 pandemic cannot be eradicated by maintaining the preventive measures without vaccination. Similarly, 56.0% of participants in Bibi, A et al. study thought the same thing (Bibi et al., 2023). However, 60.1% of nurse students at University of Sulaimani thought that the COVID-19 pandemic can be eradicated by preventive measures, only (Noori et al., 2023).

In the present study more than half (56.37%) of participants thought that the vaccines may contain heavy metals or odd materials. Higher proportion of participants (73.9%) in Al-Qerem W et al. study had similar thought (Al-Qerem et al., 2022).

It was found that 25.37% of study population in the present study believed that covid-19 vaccines may cause autism. While, in Al-Qerem W et al. study 13.6% of study population afraid that the vaccine may cause autism (Al-Qerem et al., 2022). Also, 44.36% of the existing study population assumed that it may cause infertility, Comparable proportion (46.0%) had the same concerns in Al-Qerem W et al. study (Al-Qerem et al., 2022). Similarly, 55.4% and 53.6% of study population in Khaja ASS, et al. study is Saudi Arabia believed that the vaccine affect fertility and alter the genes consequently (Khaja et al., 2021). Equally, in Al-Qerem WA et al. study there were concerns among study population about the presence of heavy metals or odd materials in the vaccine or the association between vaccines and autism or fertility (Al-Qerem and Jarab, 2021). Equally, Ajana et al., found that some public had concerns related to the safety of the vaccine and its potential effect on fertility and DNA makeup Ajana et al., 2022. These worries and myths surrounding covid-19 vaccination most probably related to the raped emerging pandemic with a lot off news with inconsistent information from different forms of mass media and internet. These issues frighten the public which form a real challenge in the control of the pandemic. In order to end these myths its need time and there should

be is enough effort and collaboration from everyone (Cordero, 2022).

5. Conclusions

The participants of this study had a modest positive attitude toward covid-19 vaccination and the majority had fears about the safety of the vaccine although about half of them realized that the disease cannot be eradicated with preventive measures only. Also considerable proportions of participants believed the myths that related to the presence of heavy metals in the vaccine or it may cause autism or infertility.

It is recommended to improve health literacy of the general public by developing a health education programs related to the methods of prevention and control of communicable diseases in general and pandemic measures that could be adopted for any emerging new epidemic or pandemic.

Conflict of interest

No conflict of interest was existed.

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