International Journal of Advanced Community Medicine 2024; 7(3): 135-141

International Journal
of Advanced Community Medicine

E-ISSN: 2616-3594
P-ISSN: 2616-3586
www.comedjournal.com
IJACM 2024; 7(3): 135-141
Received: 02-06-2024
Accepted: 08-07-2024

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Parents acceptance, experience and beliefs to vaccinate their children with COVID-19 vaccine in a sample at Al-Imamain Al-Kadhimain Medical city in Iraq 2023

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DOI: https://doi.org/10.33545/comed.2024.v7.i3b.335

Abstract

Background: The United Nations International Children's Emergency Fund (UNICEF) declared the COVID-19 pandemic as the worst crisis for children in its 75-year history. For children under 18, parents are typically the primary decision-makers regarding their children's vaccination. This study aimed to investigate parents' acceptability of vaccinating their children with the COVID-19 vaccine, explore their beliefs about the vaccine, and assess their experiences with COVID-19 and its vaccine. The study also examined the relationship between socio-demographic factors and parents' acceptance of vaccination.

Method: A cross-sectional study was conducted at AL-Imamain Al-Kadhimain Medical City from February to July 2023. The study involved parents with children under 18 years who agreed to participate. The questionnaire covered socio-demographic details, experiences with COVID-19 and the vaccine, and beliefs about COVID-19 vaccines. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 29.

Results: The results showed that 45% of parents were willing to vaccinate their children against COVID-19. The main reasons for vaccine hesitancy included concerns about safety (41.5%) and potential adverse effects (30.3%). Parental acceptance of the vaccine was significantly associated with higher education ($p = 0.012$), being divorced ($p = 0.004$), having received the COVID-19 vaccine ($p = 0.005$), and having undergone a COVID-19 test ($p = 0.01$).

Conclusion: There was a moderate level of parental acceptability of COVID-19 vaccination for children. Acceptance was significantly linked to factors such as education, parental vaccination status, and COVID-19 testing experience.

Keywords: Parents acceptance, experience, beliefs, vaccinate, children, COVID-19 vaccine

Introduction

Coronavirus-2 (SARS-CoV-2) causes severe respiratory infections and disorders, leading to the novel coronavirus disease 2019 (COVID-19). The first case was reported in Wuhan, China, in December 2019, and the World Health Organization (WHO) declared it a global pandemic due to its rapid spread [1]. By June 2023, over 2.4 million people in Iraq had been infected, with more than 25,000 fatalities. To reduce virus transmission, vaccination emerged as a key strategy, although initial hesitancy was observed [2]. Globally, COVID-19 vaccine acceptance rates varied significantly. In East and Southeast Asia, high acceptance rates were recorded, such as over 90% in Indonesia, Malaysia, and China [3]. Latin America also reported high acceptance, including 88% in Mexico, while in Africa, Ethiopia showed a 92% acceptance rate [4]. However, lower rates were observed in parts of the Middle East, with Kuwait (23.6%) and Jordan (36.8%) reporting some of the lowest figures [5]. Multiple factors influence parents' and guardians' acceptability of COVID-19 vaccination for children, including parental age, education, knowledge about COVID-19 prevention, household income, employment status, number of children, and concerns about their child contracting COVID-19 [6]. COVID-19 spreads through respiratory droplets, and transmission can occur even from asymptomatic individuals. The virus can also spread from humans to animals, though the risk of transmission from animals to humans is low [7]. Clinically, COVID-19 presents with a range of symptoms, from mild to severe, and can include fever, cough, shortness of breath, and loss of taste or smell [8]. Diagnostic testing primarily relies on PCR tests, which are more accurate than rapid antigen tests [9].

Although children are less likely than adults to experience severe COVID-19, some, particularly those with comorbidities, are at risk. Vaccinating children can prevent severe outcomes, reduce transmission, and protect vulnerable populations [10]. Preventive measures such as social distancing, hand hygiene, and mask-wearing were implemented early in the pandemic, but vaccination became essential as the virus continued to spread [11]. The global COVID-19 vaccine development effort involved various technological platforms, and Iraq began its vaccination campaign in March 2021. By November 2021, a national mass vaccination campaign targeting over 12 million people, including children aged 12 and above, was launched [12]. The availability of mRNA vaccines, such as Pfizer/BioNTech and Moderna, marked a significant step in immunizing children, despite concerns about side effects, including myocarditis [13]. Vaccine hesitancy, defined as the delay or refusal of vaccination despite availability, remains a challenge. Factors contributing to hesitancy include misinformation, lack of trust in vaccine safety, and varying health beliefs [14]. This study aims to: Investigate parents' acceptability of vaccinating their children under 18 years old with the COVID-19 vaccine. Explore parents' beliefs about COVID-19 vaccination. Understand parents' experiences with COVID-19 and the vaccine. Identify associations between socio-demographic variables, experiences, and parents' acceptance of vaccinating their children with the COVID-19 vaccine.

Method

A cross-sectional study was conducted at Al-Imamain Al-Kadhimain Medical City from February to July 2023 among a convenient sample of parents attending the pediatric outpatient clinic who had children under 18 years and agreed to participate. The sample size was determined using a single proportion formula. Data were collected through a face-to-face interviewer-administered, modified questionnaire. The questionnaire included various sections covering socio-demographic characteristics such as age, gender, education level, marital status, employment status, number of children, and family income. Parents were asked if they would allow their children to receive a COVID-19 vaccine, with responses categorized as "Yes," "No," or "Don't know." The questionnaire also explored parents' COVID-19 and vaccine experiences, including whether they had received the vaccine, taken a COVID-19 test, or had close contacts with COVID-19. Additionally, it gathered information on where they learned about the COVID-19 vaccine. Beliefs about COVID-19 vaccines were assessed with questions regarding safety, vaccine effectiveness in stopping the pandemic, and concerns such as miscarriage, weakened immune systems, and potential misuse of personal data. Responses were categorized into "Agree" or "Disagree." Data analysis was performed using IBM SPSS version 29. Results were presented using frequency, percentage, mean, standard deviation, and range. The significance of differences in qualitative data was tested using Pearson's Chi-square test, with statistical significance set at $p \leq 0.05$. A pilot study involving 10 participants was conducted to test the clarity and consistency of the questionnaire, and these participants were excluded from the final sample. Ethical approval for the study was obtained from Al-Nahrain University College of Medicine and Al-Karkh Health Directorate. Oral informed consent was obtained, and no personal data were recorded to protect participants' privacy.

Results

Regarding age, the highest proportion (38.2%) of the respondents were aged 30–39, about (81.8%) of them were females. In terms of education, the highest proportion of the respondents (77.9%) had primary/secondary education, whiles about (15.5%) had college/High School education. About (92.4%) of the respondents were married, (83.2%) of parents were currently unemployed/housewives. (56.6%) of the respondents had less money than they would need. The highest proportion (46.3%) of them indicated having 3-4 children younger than 18 years. (See Table 1).

Table 1: Socio-demographic characteristics of care giver in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023

Socio-demographic characteristics of care giver		No. (n=380)	%
Age (years)	20-29	134	35.3
	30-39	145	38.2
	40-49	88	23.2
	50years and above	13	3.3
	Mean ± SD (Range)	33.8±8.2 (20-53)	
Gender of caregiver	Male	69	18.2
	Female	311	81.8
Education of caregiver	Illiterate/ Read &Write	25	6.6
	Primary/Secondary school	296	77.9
	College/Higher education	59	15.5
Marital status	Married	351	92.4
	Separated/Divorced	18	4.7
	Widowed	11	2.9
Employment status of caregiver	Employed	64	16.8
	Unemployed/Housewife	316	83.2
Income	Enough	165	43.4
	Not enough	215	56.6
Number of children	1-2	147	38.7
	3-4	176	46.3
	5 or more	57	15.0
Number of males	1-2	282	74.2
	3-4	92	24.2
	5 or more	6	1.6
Number of females	No	73	19.2
	1-2	242	63.7
	3-4	58	15.3
	5 or more	7	1.8

A total of 380 parents and care givers were involved in this study. About (45%) of the care givers indicated their acceptance of the COVID-19 vaccine for their children younger than 18 years. (see Figure 1). The main reasons for non-acceptance of COVID-19 vaccine by parents and care givers were about 41.5% of parents were concerning of inadequate data the safety of the new vaccine, 30.3% of parents were concerning on adverse effects of the vaccine, while 14.9% of parents were against the vaccines in general, 9.2% were concern the vaccine being ineffective, 2.6% of parents had a child with previous adverse reaction to any vaccine, and only 1.5% were concerning on acquiring COVID-19 infection from vaccine (see Figure 2).

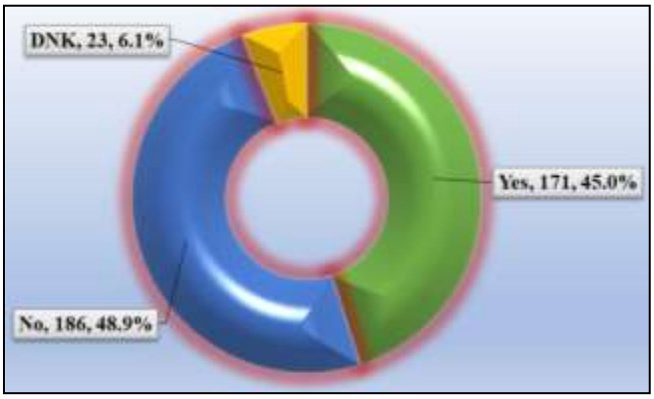

Fig 1: Parents' acceptance to vaccinate their children with COVID-19 vaccine (when vaccine approved) in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023.

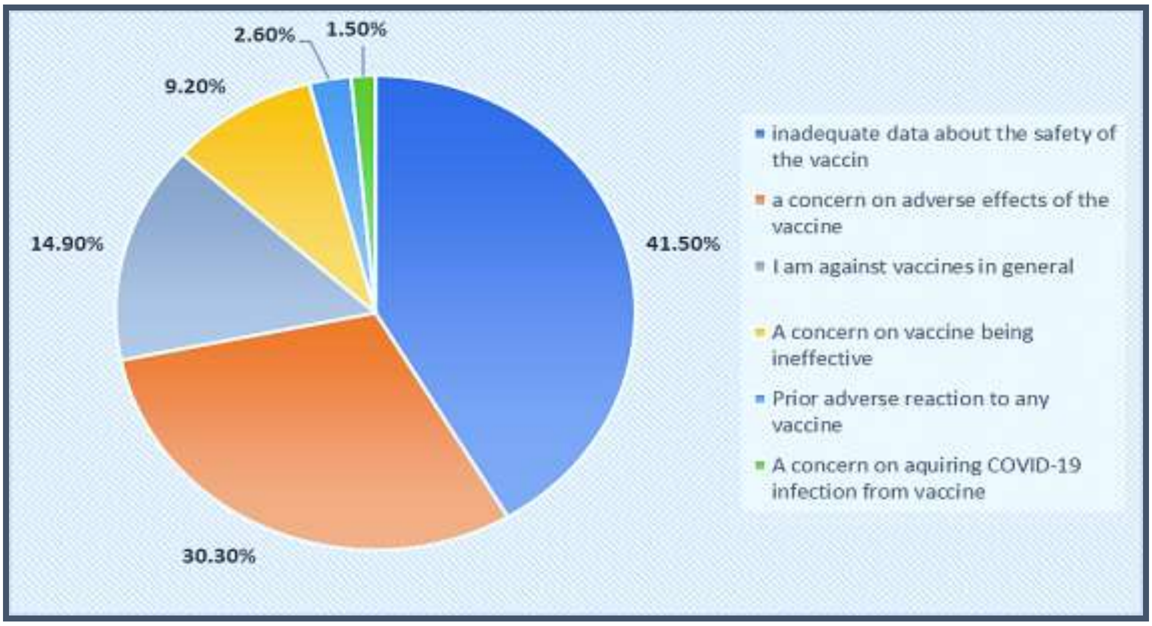

Fig 2: Reason for parents' unwillingness to vaccinate their children (total 209) in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023.

The findings indicate that approximately (57.1%) of parents and care givers had taken COVID-19 vaccine, (65.3%) of parents conducted COVID-19 testing, and about (55.2%) of these tests were negative. About (82.1%) of parents had relatives identified as having COVID-19. Additionally, regarding the child chance of getting COVID-19 about (38.4%) of the respondents indicated that their children had moderate risk of getting COVID-19 (See table 2). About the source of COVID-19 vaccine information most parents and care givers stated that it is mostly from TV (33.9%), and internet (25.5%). (See Figure 3).

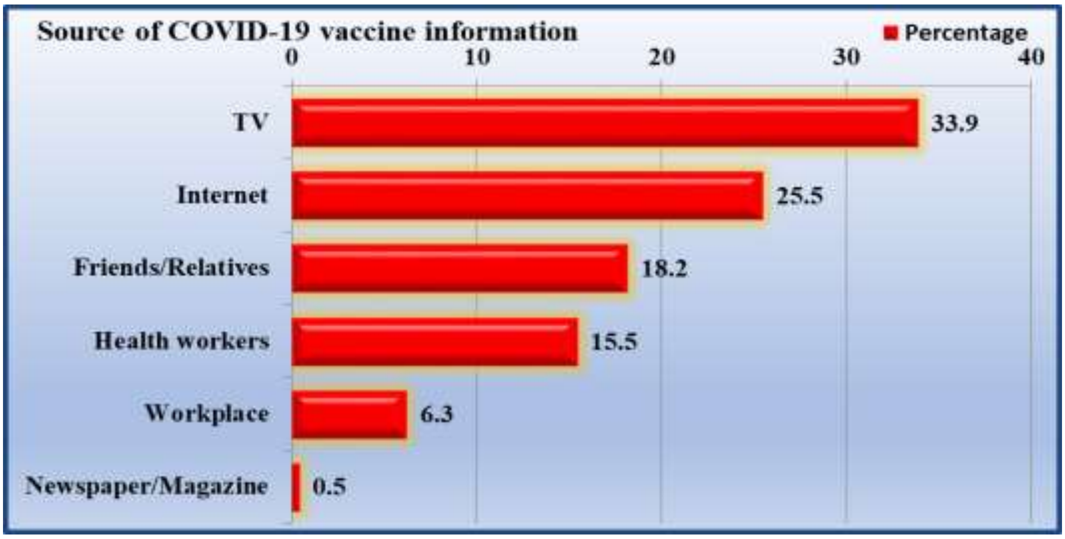

Fig 3: Source of COVID-19 vaccine information of parents in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023.

Table 2: Distribution of the sample regarding COVID-19 & vaccine experience of parents in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023.

COVID-19 experience		No. (n=380)	%
If parent take COVID-19 vaccine	Yes	217	57.1
	No	163	42.9
Had a COVID-19 test	Yes	248	65.3
	No	132	34.7
COVID-19 test results (For Yes n=248)	Positive	111	44.8
	Negative	137	55.2
Would like to do test (For No n=132)	Yes	78	59.1
	No	54	40.9
Know where to do COVID-19 test (for those like to do test n=78)	Yes	74	94.9
	No	4	5.1
Has relatives diagnosed with COVID-19	Yes	312	82.1
	No	41	10.8
	DNK	27	7.1
Child chance of getting COVID-19	No risk at all	59	15.5
	Small	132	34.8
	Moderate	146	38.4
	Great	43	11.3
It is possible for healthy person to have COVID-19	Yes	357	93.9
	No	14	3.7
	DNK	9	2.4
COVID-19 can be cured	Yes	367	96.6
	No	3	0.8
	DNK	10	2.6

There were significant associations between parental acceptance to vaccinate their children and care givers education and marital status at p = (0.012, 0.004) respectively, while there was no difference regarding age, gender, employment status, and income. (See Table 4)

Table 4: Associations of Socio-demographic characteristics and acceptance of the care givers to vaccinate their children with COVID-19 vaccine in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023.

Socio-demographic characteristics		Accept his/her children to be vaccinated (when approved)				P value
		No (n=209)		Yes (n=171)		
		No.	%	No.	%	
Age (years)	20-29	74	55.2	60	44.8	0.9
	30-39	77	53.1	68	46.9	
	40-49	50	56.8	38	43.2	
	50 years or above	8	61.5	5	38.5	
Gender	Male	36	52.2	33	47.8	0.602
	Female	173	55.6	138	44.4	
Education	Illiterate/ Read &Write	14	56	11	44	0.012*
	Primary/Secondary school	173	58.4	123	41.6	
	College/Higher education	22	37.3	37	62.7	
Marital status	Married	196	55.8	155	44.2	0.004*
	Separated/Divorced	4	22.2	14	77.8	
	Widowed	9	81.8	2	18.2	
Employment status	Employed	30	46.9	34	53.1	0.152
	Unemployed/Housewife	179	85.6	137	80.1	
Income	Enough	83	50.3	82	49.7	0.107
	Not enough	126	58.6	89	41.4	

*Significant difference between percentages using Pearson Chi-square test (χ^2-test) at 0.05 level.

There were significant associations between parental acceptance to vaccinate their children and history of Parent taking COVID-19 vaccine, having COVID-19 test, and the degree of child chance of getting COVID-19 at P = (0.005, 0.01, 0.002) respectively. (See Table 4)

Table 4: Significant associations regarding COVID-19 experience with acceptance to vaccinate their children in Al-Imamain Al-Kadhimain Medical City/ Baghdad 2023

COVID-19 experience		Accept his/her children to be vaccinated (when approved)				P value
		No (n=209)		Yes (n=171)		
		No.	%	No.	%	
Parent take COVID-19 vaccine	Yes	106	48.8	111	51.2	0.005*
	No	103	63.2	60	36.8	
Had a COVID-19 test	Yes	144	58.1	104	41.9	0.01*
	No	65	49.2	67	50.8	
COVID-19 test results	Positive	59	53.2	52	46.8	0.158
	Negative	85	62.1	52	37.9	
Child chance of getting COVID-19	Small	72	54.5	60	45.5	0.002*
	Moderate	89	61	57	39	
	Great	28	65.1	15	34.9	
	No risk at all	20	33.9	39	66.1	
It is possible for healthy person to have COVID-19	Yes	199	55.7	158	44.3	0.517
	No	10	43.5	13	56.5	
*Significant difference between percentages using Pearson Chi-square test (χ^2-test) at 0.05 level.						

Discussion

This study found that 45% of parents accepted COVID-19 vaccines for their children, a higher rate compared to previous studies conducted in Iraq (38.3%) and other Middle Eastern countries such as Turkey (36.3%), Jordan (30.2%), and Saudi Arabia (24%) [15-18]. Increased awareness about vaccines may explain the higher acceptance rate. The findings are consistent with studies conducted in the U.S., where 46% of parents accepted the vaccine for their children, and in England, where 48.2% of parents intended to vaccinate their children against COVID-19 [19, 20]. The most common reasons for vaccine hesitancy among parents in this study were concerns about insufficient data on the vaccine's safety (41.5%) and potential adverse effects (30.3%). These concerns align with studies conducted in England, Jordan, and the U.S., where similar fears were cited as major reasons for vaccine hesitancy [18, 20, 21]. Addressing these concerns through clear public communication about vaccine safety, efficacy, and potential side effects is essential. The study found that the primary sources of information about COVID-19 vaccines for parents were TV and the internet. The role of mass media is critical, as misinformation can reduce confidence in vaccines and decrease parents' willingness to vaccinate their children. A study in China highlighted that exposure to positive information about COVID-19 vaccines on social media was associated with higher parental acceptance rates [22]. Higher educational levels were strongly associated with greater acceptance of COVID-19 vaccines for children. This aligns with research showing a positive correlation between parental education and vaccine acceptance (23). Similar findings were reported in Turkey and Saudi Arabia, where more educated parents were more likely to vaccinate their children [4, 16]. Educated parents may be more aware of vaccine safety and benefits. Marital status also played a role, with separated or divorced parents being more likely to accept the vaccine for their children. A national survey found that married participants were more hesitant to vaccinate their children than single participants [24]. The small number of separated parents in this study may explain the higher acceptance rate. Parents who had received the COVID-19 vaccine themselves were more willing to vaccinate their children, consistent with other studies showing that parental vaccination status is significantly associated with their intention to vaccinate their children [18, 19]. This may be due to increased awareness of the vaccine's importance or positive personal experiences with the vaccine. Beliefs about vaccines also influenced vaccine acceptance. Parents who believed in the safety and efficacy of approved vaccines were more likely to vaccinate their children. More than half of the parents in this study agreed that vaccination is the best way to avoid complications from COVID-19, a finding similar to another study conducted in Iraq in 2022 [25]. Additionally, over half of the parents disagreed with the belief that natural immunity is better than vaccine-induced immunity, indicating a positive attitude toward vaccination. Educating the population about vaccines, addressing concerns, and providing accurate information can further increase parental acceptance of COVID-19 vaccines for their children [26].

Conclusion

The mean age of caregivers was 34±8 years, with most being females, primarily educated, married, and unemployed. Less than half of parents were willing to vaccinate their children against COVID-19, citing concerns about vaccine safety and adverse effects. Over half of parents had received the COVID-19 vaccine, with TV and the internet being their primary information sources. Vaccine acceptability was significantly associated with parental education, marital status, prior COVID-19 vaccination, testing history, and perceived risk of child infection.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article
Abdullah SM, Hussain NA. Parents acceptance, experience and beliefs to vaccinate their children with COVID-19 vaccine in a sample at Al-Imamain Al-Kadhimain Medical city in Iraq 2023. International Journal of Advanced Community Medicine. 2024;7(3):135-141.