

Original Article

Barriers to Childhood Vaccination: A Cross-Sectional Study

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Abstract

Background: Routine childhood vaccination is a crucial public health measure that considerably lowers the burden of several preventable diseases. However, multiple barriers continue to hinder optimal uptake.

Aim: to explore the perceptions, experiences, and potential barriers to childhood vaccination.

Method A cross-sectional study was conducted between July and September 2023 using a questionnaire form given to each participant who brought their children to the vaccination centre at the "Shuhada Saif Saad" clinic in Kerbala, Iraq.

Results: 100 participants were involved in the study. A 55% of the children between the ages of 1 to 12 months, mostly live in the city, and their parents mostly have a primary school educational level, with more than 90% of the children not having any chronic illnesses. 68% of the participants believe a lack of awareness of the benefits of child vaccination can be a barrier to child vaccination, whereas 82% believe that limited resources and health infrastructure, and 31% found that a lack of healthcare staff serves as a barrier to their child vaccination. The most common side effect of the vaccine reported was fever. Time limitation was the most common challenge in obtaining vaccination, as well as missing vaccination doses.

Conclusion: The study identifies several barriers to childhood vaccination, including limited awareness, inadequate healthcare infrastructure, time constraints, and misinformation. Addressing these issues through interventions such as public education campaigns, enhanced healthcare access, and innovative vaccination delivery methods like home vaccination could improve vaccination rates and contribute to better health outcomes for children.

Keywords: Children, Vaccine hesitancy, Public health

Introduction

Childhood immunization has effectively eliminated diseases once considered fatal (Kurosky, Davis and Krishnarajah, 2017). Routine childhood vaccination is a crucial public health measure that considerably reduces the burden of several preventable diseases (Carpiano *et al.*, 2019). Children receive vaccinations throughout their first two years of life to protect themselves and establish herd immunity against preventable diseases, avoidable diseases, and adverse occurrences. Due to their weakened immune systems and

higher vulnerability, children under the age of two should receive vaccinations (Bell, Simmonds and MacDonald, 2015).

There are several social benefits to immunizing children, such as equity of healthcare, strengthening both health and social care infrastructure, improving life expectancy, and women's empowerment (Rodrigues and Plotkin, 2020). One of the foremost perceivable benefits is deflected therapeutic use by preventing a disease outbreak through immunization. The financial costs of treatment, such

as doctor and drug expenses, hospitalization costs related to travel costs, and wage loss of caregivers, may be deflected, as well as reducing antimicrobial resistance (Nandi and Shet, 2020). Bocquier, A. Ward, Jeremy Raude, Jocelyn Peretti-Watel, Patrick Verger, Pierre (2017) 'Socioeconomic differences in childhood vaccination in developed countries: a systematic review

About 1.4 million fatalities per year are attributed to pneumonia and diarrhea, two of the main causes of child mortality. By using the currently available vaccines, it is possible to avoid 59% of deaths from pneumonia and 29% of deaths from diarrhea (Campbell *et al.*, 2011). Other illnesses, including malaria, may soon be vaccine-preventable (Ohene-Adjei *et al.*, 2023), and other major causes of pediatric mortality, like measles and meningitis, are currently preventable with readily available and efficient immunizations (Liu *et al.*, 2012).

Despite the availability of several reported strategies to optimize childhood immunization uptake, several barriers to childhood immunization lead to poor uptake or errors in immunization dosage and timing (Levi, 2007), which may include but are not limited to geography, gender, ethnic group, race, religion, mother's place of origin, family income, education, and work, health system and policy related barriers (Adorador *et al.*, 2011; Adedokun *et al.*, 2017; Bocquier *et al.*, 2017). As for that the current study aimed to explore the perceptions, experiences, and potential barriers to childhood vaccination.

Methods

A cross-sectional study was conducted in Kerbala province in Iraq, at a vaccination centre at the "Shuhada' Saif Saad" clinic. A convenient sample of children who came to get vaccinated with their parents between July and September 2023 was selected. The inclusion criteria were those children aged between one month to 8 years, living in Kerbala province, registered at the above-mentioned vaccination centre, and did not have any illness that contradicts vaccination. The exclusion criteria for children with acute illness or fever at the time of

vaccination, having a known allergy to any vaccine component, or with known immunodeficiency disorders for live vaccines, and those who did not register at the vaccination centre. The data was collected using a questionnaire form given to each participant by the researcher. In contrast, the researcher was present to answer any inquiries or clear up any confusion. The participants were also provided information regarding the study objectives and the time needed to fill out the questionnaire form. All recorded responses were obtained with the full consent of the participants. For complete transparency, the questionnaire was taken in Arabic, accounting for the participants' educational background and multilingual status, or lack thereof, and to facilitate participants' completion of the forms with less difficulty.

The questionnaire was developed based on previously published studies (Guye *et al.*, 2023; Jelly *et al.*, 2023; Kaufman *et al.*, 2024), which consists of two parts, the first part considers the demographic data of the participants' children, and the second part consists of a series of questions (questions 1-18) that cover a range of topics, including concerns about vaccine side effects, access to vaccinations, challenges in obtaining vaccines, reasons for missed vaccinations, awareness about the benefits of vaccinations, cultural and religious influences, misinformation, healthcare infrastructure, administrative procedures, and trust in healthcare staff. The study followed the principles described in the Declaration of Helsinki and received approval from the scientific and ethical committee of the College of Pharmacy, University of Kerbala (Project No: 2025HU1). The data was collected using Microsoft Excel, and the descriptive data were expressed as frequencies and percentages.

Results

One hundred participants were included in the study. A 55% of the children between the ages of 1 to 12 months, mostly live in the city, and their parents mostly have a primary school educational level, with more than 90% of the children not having any chronic illnesses **Table 1.**

The results show that a 68% of the participants believe lack of awareness of the benefits of child vaccination can be a barrier to child vaccination, whereas an 82% of the participants believe that limited resources and health infrastructure can act as a barrier to their child vaccination, and 31% found that lack of healthcare staff serve as a barrier to their child vaccination **Table 2**.

The most common side effect of the vaccine reported by the study participants was fever (62%), followed by swelling in the injection site (13%), **Figure 1**.

The results also show that time (64%) was the most common challenge in obtaining vaccination, followed by the financial cost (26%), **Figure 2**.

In addition, time was the common reason behind missing vaccination doses **Figure 3**.

Moreover, the results show that vaccines can trigger illnesses (35%) was among the misinformation received about vaccination **Figure 4**.

Furthermore, the results show that home vaccination (62%) was among other suggestions by study participants for improving access to vaccinations and overcoming potential obstacles **Figure 5**.

Table 1 The Demographic Data of the Study Participants

	Variables	Frequency
Gender	Male	50
	Female	50
Age	1 m – 12 months	55
	1 y – 2 years	22
	2 y – 4 years	21
	4 y – 8 years y	17
Residence	Rural	7
	Urban	93
Parental educational level	Primary school	49
	Secondary school	27
	University	22
Chronic Illness	Yes	9
	No	91

Table 2 Barriers to Childhood Vaccination

NO.	Questions	Responses	
		Yes (%)	No (%)
1	Do you have any suggestions for improving access to vaccinations and overcoming potential obstacles?	33	67
2	Do you believe that fear of vaccine side effects is a major barrier preventing you from vaccinating your children? Are you concerned about potential side effects such as allergies, rashes, or others? What symptoms, if any, did your child experience after vaccination? Did receiving the vaccine lead to any infectious diseases for your child?	37	63
3	Is there a shortage of vaccines in your area or at the health centre you frequent?	30	70
4	Do you find it challenging to identify the required vaccines for each age stage of your children?	7	93
5	Have you ever had a negative experience with vaccinations	13	87
6	Have you faced any challenges or difficulties in obtaining vaccinations for your children, such as financial costs and limited time to schedule vaccination appointments?	55	45
7	Have there been any vaccinations that you may have missed, and if so, what was the reason behind it?	45	55
8	Do you believe that a lack of awareness about the benefits of vaccinations is a primary reason why parents refrain from vaccinating their children?	68	32
9	Does cultural and religious knowledge impact parents' decisions regarding vaccinating their children?	36	64
10	Have you ever received misinformation about vaccinations? If yes, what kind of information was it?	29	71
11	Do you consider the distance and difficulty in accessing vaccination centres as a barrier to vaccinating your children?	26	74
12	Do you believe that vaccines compromise your child's immune system?	3	97
13	Do you believe that limited resources and health infrastructure in remote areas act as barriers for parents in vaccinating their children?	82	18
14	Do you believe that administrative procedures and required paperwork for vaccination pose obstacles?	20	80
15	Do you believe that the instructions and guidance provided by health centres regarding vaccination are unclear or insufficiently detailed? Also, do you think the lack of adequate awareness about the importance of vaccinating children is a major obstacle?	26	74

16	Do you find it challenging to deal with long waiting queues at vaccination centres? Additionally, do you believe that technological challenges, such as online registration or booking, are obstacles to vaccinating children?	26	74
17	Is the requirement for multiple doses of vaccinations a reason that prevents you from vaccinating your children?	21	79
18	Does a lack of trust in the healthcare staff serve as a barrier for you in vaccinating your children?	31	69

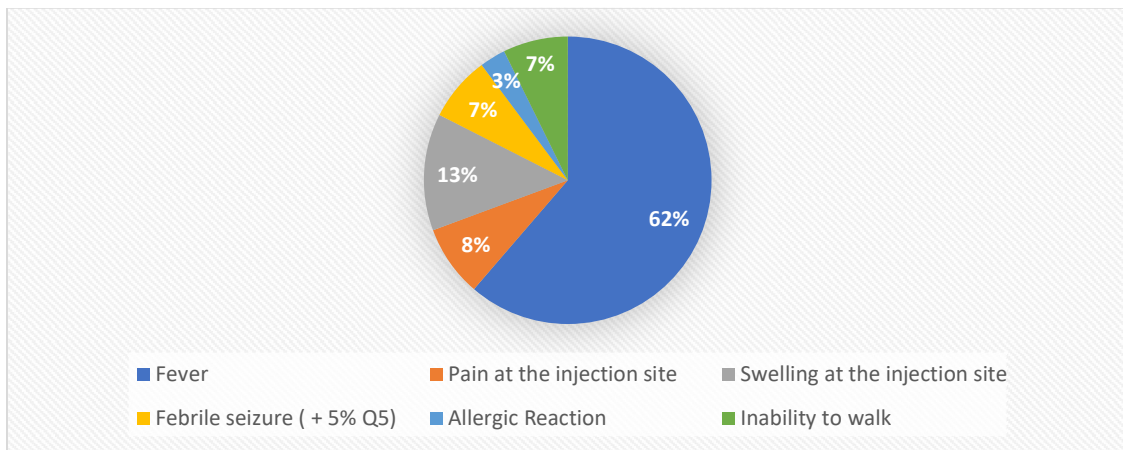


Figure 1 The most common side effect reported from the vaccination

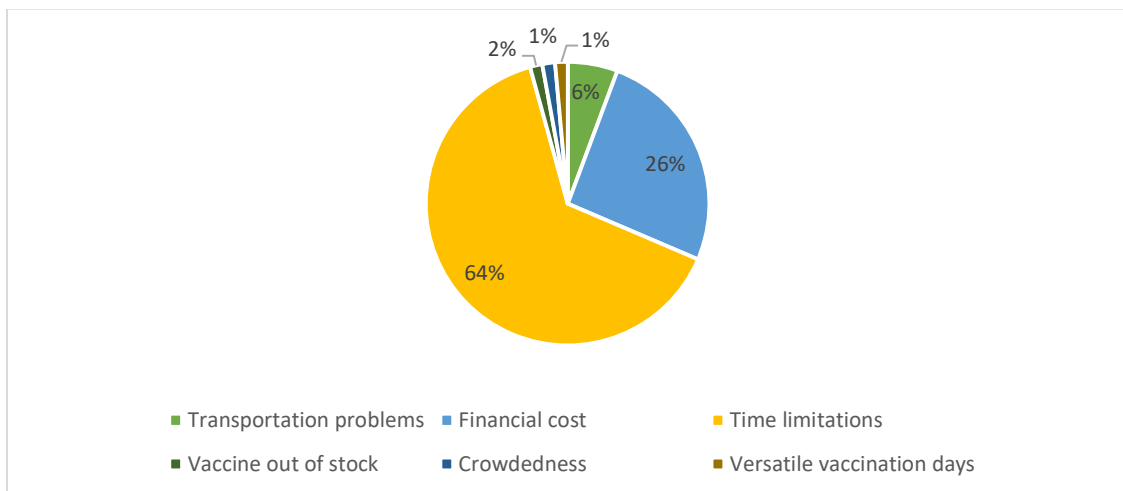


Figure 2 Challenges for obtaining vaccination

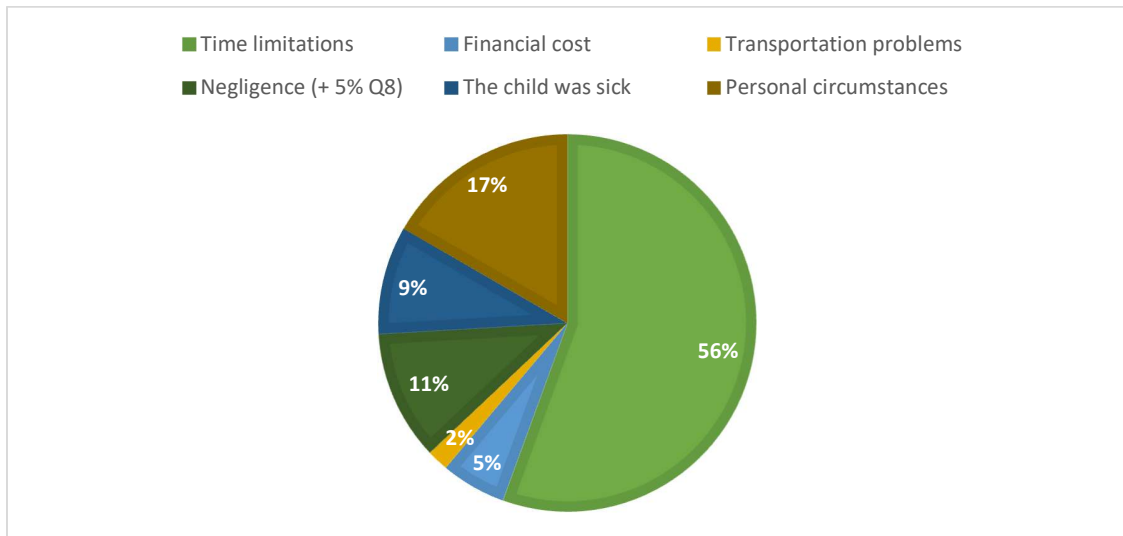


Figure 3 Reasons behind missing vaccine doses

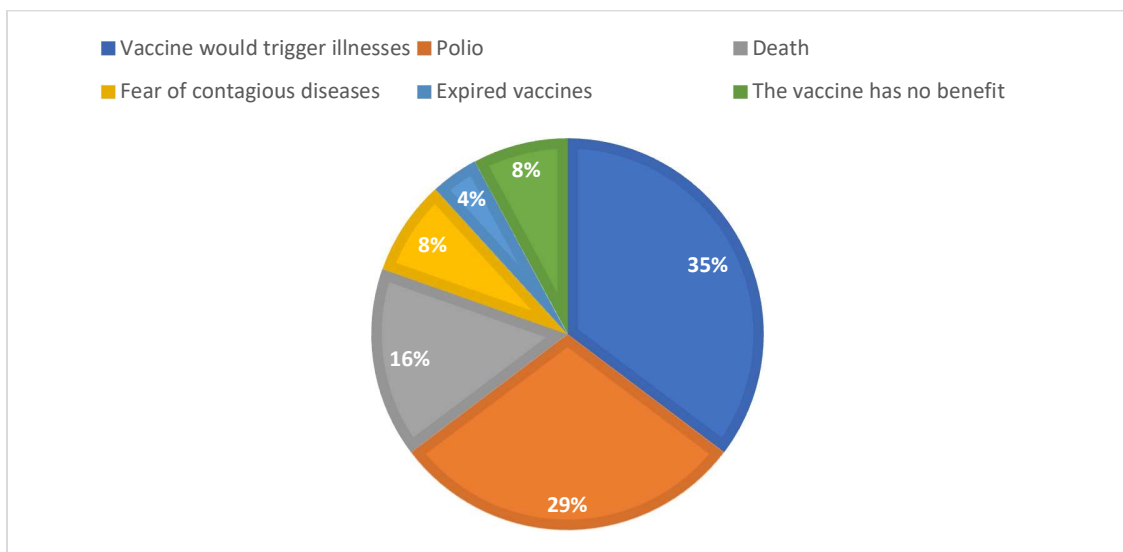


Figure 4 Misinformation received about the vaccination

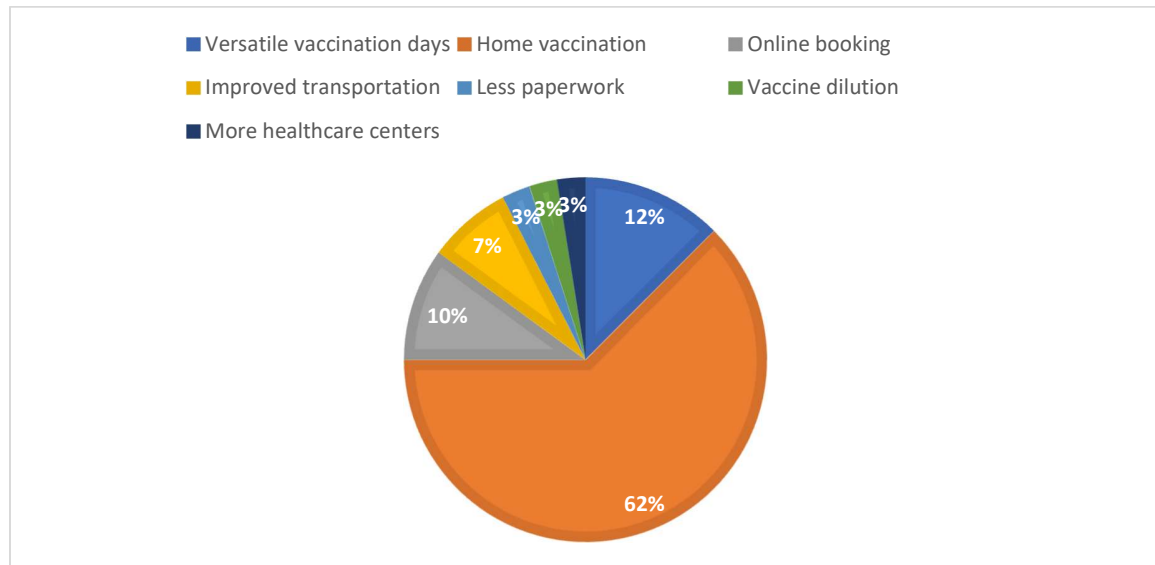


Figure 5 Suggestions for improving access to vaccination and overcoming potential obstacles

Discussion

The findings from the current study provide valuable insights into the barriers and challenges faced by parents regarding child vaccination. A key demographic characteristic of the study sample was the age group of children, with most of the participants being between 1 to 12 months. These children predominantly live in urban areas, and a high proportion of parents with only primary school education. This demographic detail is important, as it may be associated with reduced awareness of health-related issues, including child vaccination.

One of the most significant findings in this study is the perception that a lack of awareness regarding the benefits of vaccination is a major barrier to child vaccination, which is in agreement with a previously published study by Gore *et al* (Gore *et al.*, 1999). This suggests that increasing awareness about the importance of immunization could play a crucial role in improving vaccination rates. Educational interventions that highlight the long-term health benefits of vaccination and dispel common misconceptions could help mitigate this barrier.

Furthermore, a large proportion of participants identified limited resources and health infrastructure as a barrier, indicating that inadequate healthcare facilities or services may contribute to difficulties in accessing vaccinations. This is compatible with a previously published study by Ganczak *et al* (Ganczak *et al.*, 2022). This could be due to factors such as insufficient vaccination centres, limited vaccine availability, or inadequate scheduling options.

Another noteworthy finding is that the participants cited the lack of healthcare staff as a barrier to vaccination. This suggests that staffing shortages or insufficient healthcare personnel may further hinder timely access to vaccinations, in line with the previously published study by Olaniyan *et al* (Olaniyan *et al.*, 2022). Addressing staffing shortages through increased recruitment, training, or expanding vaccination outreach programs could help overcome this issue.

The study revealed that fever was the most commonly reported adverse effect of vaccines, followed by swelling at the injection site. These findings are consistent with typical vaccine side effects, which are generally mild and temporary

(Stratton, Howe and Johnston, 1994). However, misconceptions about vaccine safety, such as the belief that vaccines trigger illnesses, highlight the importance of educating the public about the safety and efficacy of vaccines to reduce fear and misinformation.

Additionally, Iraq faces considerable vaccine uptake barriers due to post-conflict health system deterioration and limited healthcare capacity, especially in rural places (Ibrahim *et al.*, 2021). Widespread mistrust in government and international agencies further hinders public health efforts (Al Janabi, 2023). Cultural standards and low health literacy, particularly among women, contribute to vaccine hesitancy (Elbarazi *et al.*, 2022). These issues are compounded by misinformation and a lack of political stability. Addressing them requires community engagement and tailored, culturally sensitive interventions (Thamer Kadum Yousif Al Hilfi, 2014).

The study also found that time was an important barrier to obtaining vaccinations, with parents indicating that busy schedules made it difficult to keep up with vaccination appointments. This was further reflected in the finding that time was a common reason for missed vaccination doses, which is compatible with the previously published study by Esposito *et al* (Esposito, Principi and Cornaglia, 2014). Addressing this issue may involve improving the accessibility of vaccination services, such as extending clinic hours, providing mobile vaccination units, or offering weekend vaccination appointments. Additionally, financial cost was identified as a barrier by a smaller proportion of participants, suggesting that cost may be a consideration for some families, although it was less important compared to other challenges.

Participants also suggested home vaccination as a potential solution to improve access and overcome barriers. This recommendation aligns with previous research advocating for more flexible and accessible vaccination options. Home vaccination programs could be particularly beneficial for families with mobility issues, time, or those living in

underserved areas where healthcare facilities are less accessible.

The current study has several limitations. First, it employs a cross-sectional design, which restricts the ability to establish causality or determine the directionality of the relationship between barriers and vaccination uptake. Longitudinal studies would offer a more comprehensive understanding of how these barriers evolve and their long-term impact on vaccination behaviour. Additionally, the study relies on self-reported data, which may be subject to recall bias, social desirability bias, or inaccuracies in participant reporting. The sample size is relatively small and may not fully represent the broader population, particularly as most participants are from urban areas and have parents with low educational levels, which could affect the generalizability of the findings. These limitations highlight the need for further research with different study designs, more diverse populations, and more rigorous data collection methods to gain a deeper understanding of the complex factors influencing childhood vaccination uptake.

Conclusion: The study highlights several barriers to child vaccination, including lack of awareness, insufficient health infrastructure, time, and misinformation. Interventions aimed at addressing these issues, such as public education campaigns, improvements in healthcare accessibility, and innovative vaccination delivery methods like home vaccination, may help to enhance vaccination rates and ensure better health outcomes for children. Future research should continue to explore these barriers in different populations and settings to develop more targeted strategies for improving vaccination coverage.

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