Missed opportunities for immunization among children under 5 years in primary healthcare centers in Thi Qar city, Iraq

By Shukur Abdulkareem Mahmood

WORD COUNT 2768
TIME SUBMITTED 11-JUL-2024 03:22PM
PAPER ID 110362505

Missed opportunities for immunization among children under 5 years in primary healthcare centers in Thi Qar city, Iraq

Salar Riyadh Jassim[1], Shukur Abdulkareem Mahmood[2*]

[1]Department of Community Health Techniques, College of Health & Medical Technology, Southern Technical University, Basra, Iraq

[2]Department of Community Health Techniques, Mosul Medical Technical Institute, Northern Technical University, Mosul, Iraq

CORRESPONDING AUTHOR: Shukur Abdulkareem Mahmood.

E-mail: Shukur_Abdulkareem@ntu.edu.iq

ABSTRACT

Background. Immunization is the fundamental public health measure against prevalent pediatric illnesses. However, missed opportunities for immunization may hamper the progress in reducing childhood illness through vaccination Immunization is the safest and effective measure for preventing and eradicating various communicable diseases.

Objective. This study aimed to evaluate the prevalence of MOI among children aged under 5 years.

Methods. A descriptive cross-sectional study was conducted from May 2023 to October 2023 among children under 5 years and their caregivers who were admitted to Primary health care centers in the Thi-Qar city. Data from caregivers was collected using an interview-guided questionnaire.

Results. A total of 425 children and their caregivers were included in this study. 54.1% (n=230) of the children were male while 45.9% (n=195) were female. 13% of children had missed

opportunities for immunization in health care centers. 52.7% (n=30) of reasons related to missed opportunities for immunization were associated to the health care provider, followed by reasons related to the child's caregiver 45.6% (n=26), while the lowest percent was related to the health care center 1.7% (n=1). There were around 45.2% (n=192) of caregivers had a Primary level of education.

Conclusion. The prevalence of missed opportunities for immunization (MOI) in four PHCCs in Thi-Qar city was relatively high. Most reason for MOI was related to health workers. Appropriate policies should not only be developed but also carried out, to make sure that basic health education is available.

Keywords: Immunization; Missed Opportunities; caregiver; Thi-Qar city

INTRODUCTION

Immunizing children in their earliest years of life is one of the most effective methods to enhance community health and reduce the expenses associated with treating vaccine-preventable illnesses [1]. The World Health Organization recognized that one of the main causes of the world's subpar immunization coverage is missed opportunities for vaccination (MOV) [2]. The WHO advises offering vaccination services at every point of interaction with the health system to speed up and maintain the growth of immunization coverage. A missed opportunity for vaccination occurs whenever an eligible individual—anyone who is not vaccinated, has an outdated vaccine, and does not have any vaccination contraindications—interacts with health services without obtaining all of the doses of the vaccine for which they are eligible [3]. The worldwide immunization programs effectively eliminated smallpox from the world in 1980 and nearly wiped out Polio [4]. More than half of all child morbidity and death are caused by infectious diseases that are covered in the EPI. The benefits of comprehensive immunization are missed out on by more than 19 million children annually, and many do not receive any vaccinations at all, resulting in over one million fatalities [5]. Vaccine-preventable illness accounts for over 30% of all fatalities in children under the age of five [6].

The availability of vaccines and supplies for immunization on the global market is usually insufficient to meet the needs of countries' immunization programs. These issues are occasionally tied to political conditions in a certain country [7]. The current recommendation mandates that all vaccinations be administered to children within two years of birth: one dosage of BCG and oral

polio at birth or as soon as possible; the oral polio vaccine (OPV) three times; the pentavalent vaccination three times; three doses of pneumococcal vaccines; rotavirus; inactivated polio vaccine (IPV) – two doses given four weeks apart beginning at the time of delivery; and the first and second doses of measles at 9 and 15 months of age, respectively. Performance of the immunization programs is indicated by DTP3 coverage by the time a child reaches 12 months of age [8]. All levels of government share responsibilities for managing healthcare systems [9].

MATERIALS AND METHODS

Declaration of Ethics

In October 2023, the Scientific and Ethical Committee of the Mosul Medical Technical Institute, Northern Technical University examined and authorized the study protocol, subject information, and consent form, as documented by number 212 on 30/10/2023. Before the collection of specimens, patients provided verbal informed consent.

Administrative Arrangements

Before collecting the data, official approvals were obtained to conduct the study from Thi-Qar Health Directorate / The Training and Human Development Center. During conducting the research, vital ethical standards including respecting the privacy and confidentiality of participants, ensuring the integrity of data collection and analysis, and being transparent about any potential conflicts of interest were taken.

Setting and design of the study:

A cross-sectional study was conducted from May 2023 to October 2023 at four primary healthcare centers in Thi-Qar city. Furthermore, these healthcare centers offer basic maternity and child health services such as prenatal care, postnatal care, and maternal, neonatal, and child vaccination. In this study, systematic random sample technique was used to contact the parents of children under the age of five year. Caregivers who attended the primary healthcare facilities with children aged 5 years or less were included. The sample size for this study was 425, which was calculated using the Open EPI calculator with a 5% margin of error, a 95% confidence interval, and a 50% population distribution.

Study Population

Caregivers of children aged less than 5 years attending a Primary health care centers in the Thi-Qar city for any form of healthcare service on the day of evaluation were encompassed in this research. A child who is eligible to participate must be brought to the primary health care center by an adult caregiver (age ≥ 18 years). It was shown that when a carer brought two or more children to primary health care centers, data for the youngest child would be collected first to prevent the overrepresentation of parents taking care of more than one child.

Data Collection

Data were collected using a structured, tested, interviewer-administered questionnaire. The current study employed WHO-recommended standard questionnaire to evaluate missed opportunities for immunization. We used the child's birth certificate, delivery papers, vaccination card, or memory of the date of birth to determine the exact age of the child whenever possible. Interviews with the parents/guardians were conducted twice weekly. Potential study participants were identified during visits to the health centers. The principal investigator recruited children aged less than five years upon their exit from the facility. Parents or guardians were approached, informed about the purpose and methods of the study, and provided with the opportunity to give voluntary informed consent without coercion. Any questions from the parent/guardian were answered at this stage.

Statistical Analysis

A questionnaire was used to obtain the data. Code sheets applied to store the answers to each question. IBM SPSS 26 used to perform the statistical analysis. Simple frequency and percentage measurements of the data were reported.

RESULTS

A total of 425 individuals who were visited with children under five were contacted. The number of participants was 425 children who were included in this study. Most 43.5% (n=185) of the children participating in this study were aged one year or less, followed by children aged 1-3 years 36.9% (n=157), while the smallest percentage 19.5% (n=83) of children were aged between 3-5 years. 54.1% (n=230) of the children were male while 45.9% (n=195) were female. In addition, most of them were ranked first child their family. The results of our study show that a high percentage 90.6% (n=385) of them were born in the hospital, as shown in **table (1)**.

Table (1): Socio – demographic characteristics of the study sample (Children).

	Category	No.	%
Age of the child			
	1 year or less	185	43.5%
	1-3 years	157	36.9%
	3-5 years	83	19.5%
Gender of the child			
	Male	230	54.1%
	Female	195	45.9%
Child order in the family			
	1	145	34.1%

	2	94	22.1%
	3	79	18.6%
	4	51	12.0%
	5	32	7.5%
	6	12	2.8%
	7	8	1.9%
	8	3	0.7%
Place of delivery			
	Home	40	9.4%
	Hospital	385	90.6%
	PHCC	0	0.0%

Table 2 shows the distribution of the study sample according to the demographic characteristics of the parents or caregivers for the child. Most 66.4% (n=282) of the children had their mothers who cared for them. 70.8% (n=301) of their arrival time to the health center took 5-10 minutes, as most 80.9% (n=344) of them were from the area where the health center was located. Our results also showed that 45.2% (n=192) of the child's caregivers had a primary level of education.

Table (2): Demographic characteristics of the study sample (caregivers) (N=425).

	Category	No.	%
Degree of relationship of the care giver to the child			
	Mother	282	66.4%
	Father	93	21.9%
	Sibling	1	0.2%
	Grandmother / grand father	31	7.3%
	Other	18	4.2%
How far the residence from PHCC			
	5-10 minutes	301	70.8%
	10-19 minutes	93	21.9%
	>20 minutes	31	7.3%
Educational status			
	Illiterate	57	13.4%
	Primary school	192	45.2%
	Secondary school	103	24.2%
	University or more	73	17.2%
Residence			
	Same area of PHC	344	80.9%
	Guest	81	19.1%

Figure 1 shows the prevalence of missed vaccine opportunities, which was 13%. **Figure (2)** shows the distribution of missed vaccine opportunities among the four health centers. It was shown that Al-Rasul Health Center had the highest percentage 37% than other healthcare centers, while Al-Bashaer Health Center had the lowest percentage 10%.

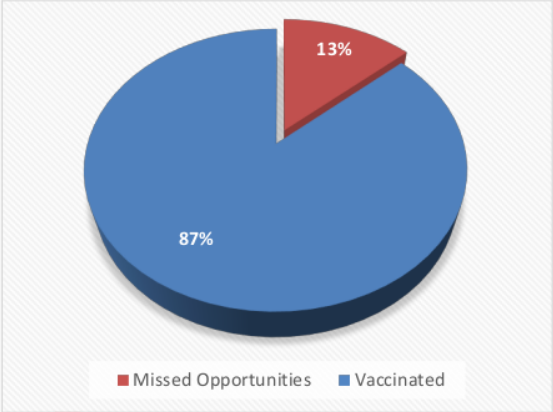

Fig. (1): The prevalence of missed opportunity for immunization in Four PHCCs in Thi-Qar city.

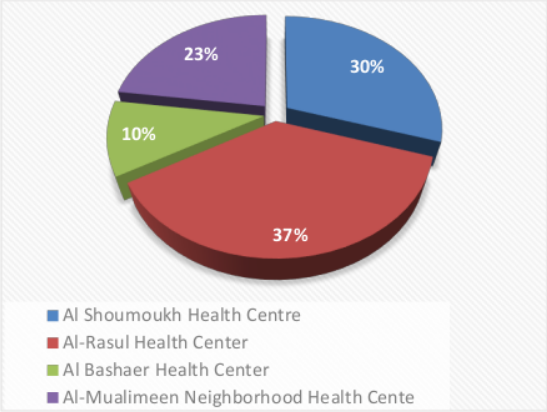

Fig. (2): distribution of Missed Opportunities of four main Health Centers (MHCs) in Thi-Qar city.

Figure 3 shows the reasons associated with missed vaccine opportunities, where the most of reasons 52.7% (n=30) was related to the health care provider, followed by reasons related to the child caregiver 45.6% (n=26), while the lowest percent was related to the health care center 1.7% (n=1).

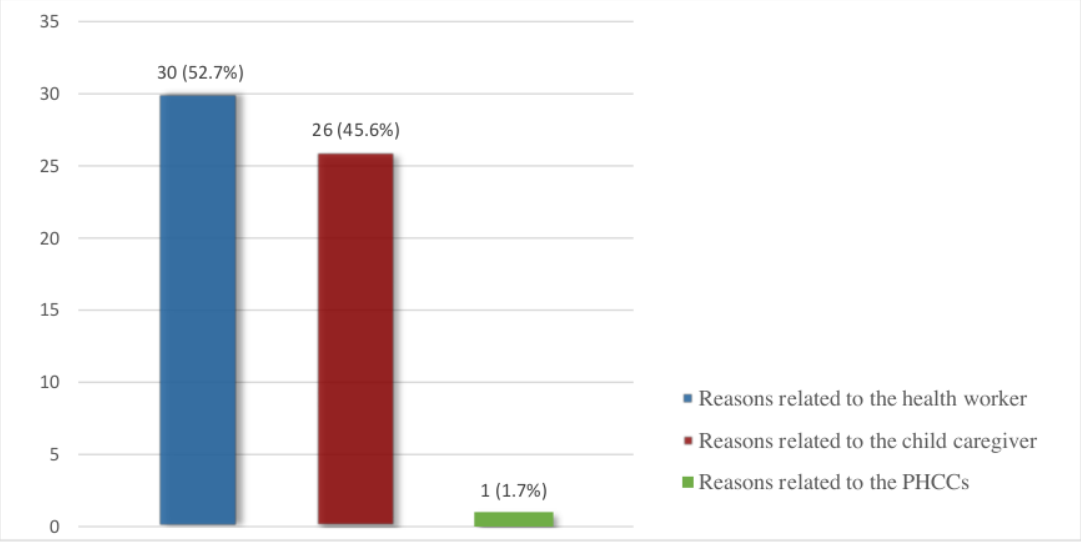

Fig. (3): Reasons related to missed opportunities for immunization among children aged <5years (N=57)

DISCUSSION

Missed opportunities of immunization (MOI) were found in 13% of children a Primary health care centers in the Thi-Qar city. Despite the fact that there was a chance to provide services to the

children during their present healthcare centers. Our result is lower compared to the result of the study conducted in Babylon, Iraq [10], which found missed vaccine opportunities was 61%. At Mwananyamala Regional Hospital, a cross-sectional study was conducted, Tanzania found results similar to our study, which it found that the proportion of missed opportunities of vaccination was 18.2% [11]. One possible explanation is that the majority of studies included involved children under aged under five years, giving in a lower estimate of Missed immunization opportunities. In a recent study that assessed Missed opportunities of vaccination (MOI) with WHO procedure in Malawi and Chad found an MOV prevalence of 86% in Chad and 94% in Malawi among children above 1 year of age, compared with 49% and 61% below 1 year, respectively. Our findings also support the hypothesis that economic and cultural factors impact the inadequate level of immunization coverage in children. This is most likely because access to immunization services might be limited by indirect expenses associated with vaccination, such as transportation. Our study also focused on the factors that contributed to missed opportunities of immunization (MOI). The current research revealed that the greatest (52.7%) common reason for missed opportunity of immunization was reasons related to the health care provider. While a study conducted in Karachi city shows that most 34.37% (n=132) of the reasons were a lack of awareness [12].

Regarding the place of birth of the child, our study showed that most of the children participating in this study were born in the hospital. This finding aligns with the results reported in a study involving 585 children [13], which noted that most (n=541) of the children were born in institutions. In our study, 66.4% of the caregiver were their mother. Also, we noticed that most of the children who came to the health care centers included in this study were ranked the first in the family. This may reflect the family's interest in the first child more than the others. Our results also showed that a high percentage (45.2%) of caregivers had primary education. On the other hand, the study conducted on 489care givers in in Burkina Faso [14], showed that most of the caregivers were uneducated. Regarding the time it takes to reach the health care center, most (70.8%) of them took between 5-10 minutes to reach the PHCCs. This is due to the fact that most (80.9%) of them lived in the same area where the health care center was located. These results confirm the findings of a study conducted among rural Nigerian children, which reported that most children have not long distance far from primary health care center [15].

CONCLUSION

Despite advances in vaccination coverage, MOI remains an important issue. The prevalence of missed opportunity for immunization in Four main PHCCs in Thi-Qar city was relatively high. 54% of missed opportunities causes related to health workers. We recommend for the integration of comprehensive vaccination screening into normal healthcare services, regardless of the reason for the visit, the kind of facility, or the child's age. Appropriate policies should not only be developed,

but also carried out, to make sure that basic health education is available. More study is needed to understand which age groups, geographic locations, and immunization programmers should be focused in order to reduce the overall prevalence of missed immunization chances.

ACKNOWLEDGEMENTS

We are deeply grateful to participants and parents (child's caregiver), and the managers and staff of the health care centers that cooperated with the researchers in Thi-Qar city.

REFERENCES

1. Verma, S.K., H.K. Mourya, A. Yadav, S. Mourya, and D.J.I.J.C.P. Dabi, *Assessment of missed opportunities of immunization in children visiting health facility*. 2017. **4**(5): p. 1748. doi.org/10.18203/2349-3291.ijcp20173778
2. Nnaji, C.A., D. Ndwandwe, M. Lesosky, H. Mahomed, and C.S.J.T.L. Wiysonge, *Tackling missed opportunities for vaccination in a new era of immunisation*. 2021. **398**(10294): p. 21. DOI: 10.1016/S0140-6736(21)01226-5
3. Nnaji, C.A., C.S. Wiysonge, A.A. Adamu, M. Lesosky, H. Mahomed, and D.J.V. Ndwandwe, *Missed opportunities for vaccination and associated factors among children attending primary health care facilities in Cape Town, South Africa: a pre-intervention multilevel analysis*. 2022. **10**(5): p. 785. doi: 10.3390/vaccines10050785
4. Asif Khaliq, A.K., S. Sayed, S. Hussaini, K.A. Kiran Azam, and M.Q. Mehak Qamar, *Missed immunization opportunities among children under 5 years of age dwelling in Karachi city*. 2017.
5. Kassa, B.G. and N.C.J.F.i.P. Lul, *Missed opportunities for immunization among children 0 to 11 months of age that were attended to at debre tabor comprehensive specialized hospital, south gondar zone, Ethiopia*. 2023. **11**: p. 1169328. doi.org/10.3389/fped.2023.1169328
6. Tefera, Y.A., A.L. Wagner, E.B. Mekonen, B.F. Carlson, and M.L.J.V. Boulton, *Predictors and barriers to full vaccination among children in Ethiopia*. 2018. **6**(2): p. 22. DOI: 10.3390/vaccines6020022
7. Ortega, J.L.D., M.A.N. López, D.R. Torres, J.G.R. Castillo, G.A. Carrada, C.O.Z. Ocampo, E.R. Castro, P. Trumbo, D.D. Castañeda, and M.E.G.J.A.J.o.F.E. Sánchez, *Factors associated with missed opportunities for vaccination in children aged< 5 years in Oaxaca, Mexico, 2018*. 2023. **1**(3): p. 1-9. doi.org/10.59273/ajfe.v1i3.7987
8. Abatemam, H., M.A. Wordofa, and B.T.J.P.G.P.H. Worku, *Missed opportunity for routine vaccination and associated factors among children aged 0–23 months in public health facilities of Jimma Town*. 2023. **3**(7): p. e0001819. doi.org/10.1371/journal.pgph.0001819.

9. Abdullahi, S., *Factors affecting completion of childhood immunization in North West Nigeria*. 2018: Walden University. doi.org/10.11604/pamj-cm.2020.3.174.24567
10. Obaid, A.F., Z.A. Abdulrasol, A.M.J. Shlash, M.R. Tuman, and M.D.J.J.o.C.M.S. Hussain, *Assessment of missing opportunity of vaccination at primary health care center: A retrospective study*. 2023. **9**(1): p. 77-81. doi.org/10.22317/jcms.v9i1.1321
11. Hamad, F.S. and F.S.J.T.M.J. Kalabamu, *Missed Opportunity for Vaccination among Children Under-five years of age: A Cross-Sectional Study at Mwananyamala Regional Hospital, Dar es Salaam, Tanzania*. 2021. **32**(2): p. 126-136. doi.org/10.4314/tmj.v32i2.420
12. Khaliq, A., S.A. Sayed, S.A. Hussaini, K. Azam, and M.J.J.o.A.M.C. Qamar, Abbottabad: JAMC, *Missed immunization opportunities among children under 5 years of age dwelling in Karachi city*. 2017. **29**(4): p. 645.
13. Mohanlal, S., J. David, and R.J.I.J.o.C.M.R. Ghildiyal, *Missed opportunities for immunization in hospitalized children in the 1-5 year age group*. 2016. **3**(6): p. 1772-4.
14. Kaboré, L., B. Meda, I. Médah, S. Shendale, L.N. Lochlainn, C. Sanderson, M. Ouattara, W.M. Kaboré, E. Betsem, and I.U.J.V. Ogbuanu, *Assessment of missed opportunities for vaccination (MOV) in Burkina Faso using the World Health Organization's revised MOV strategy: Findings and strategic considerations to improve routine childhood immunization coverage*. 2020. **38**(48): p. 7603-7611. doi.org/10.1016/j.vaccine.2020.10.021
15. Abdulraheem, I., A. Onajole, A. Jimoh, and A.J.J.P.H.E. Oladipo, *Reasons for incomplete vaccination and factors for missed opportunities among rural Nigerian children*. 2011. **3**(4): p. 194-203. doi.org/10.1080/21645515.2022.2076524.