Missed Opportunities of Immunization among Children Aged Less than Five Years Old Attending Primary Health Care Centers in Baghdad

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ABSTRACT

Background: Immunization can be defined as the process of protecting a person from a specific disease; this happens automatically when a person gets an infection and develops his own antibodies.Immunization is the most cost–effective way to control vaccine preventable diseases.Vaccines have saved millionsof lives worldwide

Objectives: To estimate the prevalence of missed opportunities for immunization amongchildren aged less than 5 years attending primary health care centers of family medicine in Baghdad city

Methods: A cross-sectional study was carried out in four primary health care centers of family medicine in Baghdad city, two in Al-Karkh side and two in Al-Rusafa side of Baghdad from the 15th of November 2011 to the 15th of April 2012.The sampling design was a non-probability convenient sample.

Result: A total of 635 children aged less than 5 years of both genders attending the primary health care centers for reasons other than immunization were screened for missed opportunities of immunization. The results of the study sample included (635) childrenof which females comprising 44.1% and males comprising 55.9%. The overall prevalence of missed opportunities was 11% (the prevalence of missed opportunities for females was 12.1% and for males was 10.1%), (the prevalence of missed opportunities in Al-Karkh side of Baghdad was 10.9% and in Al-Rusafa side of Baghdad was 11.1%). The identified reasons for partial immunization frommost to least common reasons were child sickness in 31.42%, mother forgetfulness in 30%, social problems in 12.85%, parental refusal in 11.43%, moving to new place in 4.3%, vaccine un-trust in 4.3%, fear from vaccine side effects in 2.85%, and vaccine unavailability in 2.85%.

Conclusion: Routine assessment of immunization status should be performed for all children visiting health services. Ensuring that all clinics are providing education about the importance of timely childhood immunization and completeness of the entire schedule of vaccination.

Keywords: Immunization, Vaccine, Primary health care, Missed opportunities.

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Immunization can be defined as the process of protecting a person from a specific disease; this happens automatically when a person gets an infection and develops his own antibodies[1]. Immunization is the most cost–effective way to control vaccine preventable diseases, vaccines have saved millions of lives worldwide[2].

The ultimate goal of immunization is eradication of disease; the immediate goal is prevention of disease in individuals or groups[3]. To accomplish these goals, physicians must make timely immunization, including active and passive immune prophylaxis, a high priority in the care of infants, children, adolescents and adults[4].

A worldwide revolution in immunization program development has occurred since the inception of the Expanded Program on Immunization (EPI)[5]. The EPI aims of delivering the primary immunization series to at least 95% of infants[6].

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A direct approach to increase immunization coverage is to provide immunization to all eligible persons at every opportunity. The strategy of immunization at every opportunity has been recommended by EPI Global Advisory Group (GAG) since 1983, since that times the EPI (GAG) has recommended that program managers seek way to reduce miss opportunities for immunization[5].

Objectives of the study: to estimate the missed opportunities for immunization among children aged less than 5 years attending primary health care centers of family medicine in Baghdad city and to find reasons contributed to partial immunization and identify factors associated with missed opportunities for immunization.

Methods

The present study is a cross-sectional study. It was conducted from the 15th of November 2011 to the 15th of April 2012. Data collection included two days a week and four hours a day from 9:00 am to 1:00 pm; the study period for each PHCC was five weeks.

A convenient sample of four PHCCs of family medicine in Baghdad city were selected (two in Al-Karkh side and two in Al-Rusafa side), the number of children < 5 years of age attending these PHCCs was put in consideration to select these PHCCs.

The study population included children below 5 years of both genders who attended the selected PHCCs for reasons other than immunization. Children who had contraindications to immunization and children, whom immunization information couldn't be checked through immunization card, or child health care file, were excluded from the study.

The sample size of the study was 635 eligible children, 118 children from Al-Mansour PHCC, 212 children from Al-Salam PHCC, 124 children from Al-Mustansria PHCC, and 181 children from Kadhim Abd-Alnabi PHCC.

This study was approved by the local ethics committee and by the Iraqi Ministry of Health, Council of Arab Board of Health Specialization and the administrations of the selected PHCCs.

Structured direct interview questionnaire was used; the questionnaires were filled by the researchers through direct interview with children companions.

Statistical analysis was done using statistical program (SPSS version 18: Statistical Package for Social Science). Chi square test for goodness of fit used to test the significance of observed distributions. Findings with P value less than 0.05 considered significant.

Results

The study sample included 635 children comprised of 280 (44.1%) females and 355 (55.9%) males. Among the selected children, 565 (89%) were adequately vaccinated according to national immunization schedule and 70 (11%) did not receive all the recommended vaccines by age who were considered as missed opportunities for immunization (MOI).

In this study there is no significant association (P>0.05) between MOI and different children age groups. However, although there is no significant association statistically, yet the maximum number of MOI occurred in age groups (≥15 to <18), (≥9 to <15) and (≥6 to <9) months in which MOI in these age groups were 17.6%, 16.7%, and 15.8%, respectively. The minimum number of MOI occurred in age group (birth to 2) months in which MOI was only 5.3%.

The geographical distribution of study sample shows no significant differences (P>0.05) between MOI in Al-Karkh (36%) and MOI in Al-Rusafa (34%).

Reasons contributed to partial immunization as respondents answers from most to least common reasons were; child sickness in 22 cases (31.42%), mother forgetfulness in 21 cases (30%), social problems in 9 cases (12.85%), parental refusal in 8 cases (11.43%), moving to a new place in 3 cases (4.3%), vaccine un-trust in 3 cases (4.3%), fear from vaccine

side effects in 2 cases (2.85%), and vaccine unavailability in 2 cases (2.85%).

The factors associated with MOI as respondents answers are seen in table (1).

Table (2) shows the distribution of the study sample according to maternal education level in relation to MOI**,** in which there is significant association (P<0.05). The percentage of MOI was higher among low maternal educational level (24% in illiterate, can read and write) as compared with high educational levels (5.7% in Diploma, University and postgraduate).

Table (3) shows the distribution according to paternal educational level in relation to MOI**,** in which there is significant association (P<0.05). The percentage of MOI was higher among low paternal educational level (25.7% in illiterate, can read and write) as compared with high educational levels (10.9% in Diploma, University and post graduate).

The distribution of study sample according to paternal occupation is seen in table (4) in which there is significant association (P<0.05) between MOI and paternal occupation, the percentages of children with MOI were higher among students fathers (66.7%) and free business fathers(12%).

Table (5) shows that there is significant association (P<0.05) between children with MOI and immunization status of siblings, the percentage of children with MOI was higher for whom siblings with incomplete immunization according to age (41.1%).

The sources of knowledge for following up the schedule of children immunization among child health caregivers were from most to least [immunization card (96.2%), private doctor (2.3%), family (1%), health staff visiting home during outreach vaccination sessions (0.32%), and no source (0.16%)], respectively.

Table (6) shows that there is significant decrease (p<0.05) in the number of children with MOI among child health caregivers whose knowledge for following up the immunization schedule depended on immunization card and doctor (10.8%), (7.1%), respectively.

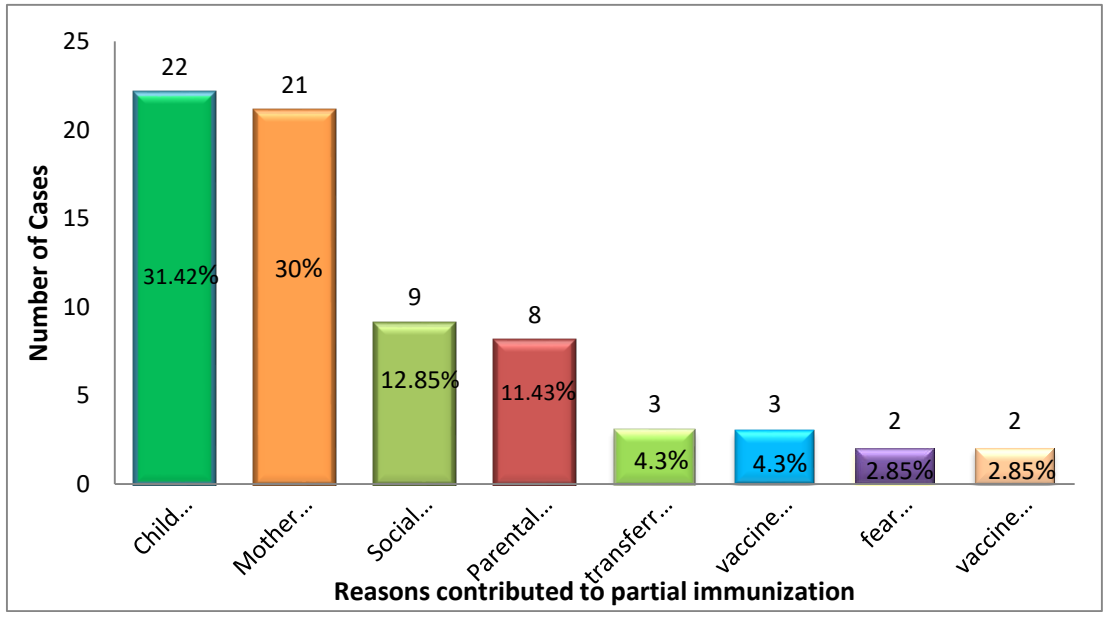

Figure 1: Reasons contributed to partial immunization as respondents answered.

Table 1: Factors associated with missed opportunities for immunization.

Factors associated with MOI	Children with MOI	Percentage %

No surveillance for child immunization	43	61.43
False contraindication about child sickness	12	17.14
Child immunization in other PHCC	8	11.43
Forgotten immunization card	4	5.71
Crowdedness	2	2.85
Vaccine unavailability	1	1.42
Total	70	100

Table 2: Distribution of the study sample according to maternal education level in relation to missed opportunities for immunization.

Maternal education	Children received all needed vaccines No. (%)	Children with MOI No. (%)	Total No. (%)
Illiterate + read & write	38 (76.0)	12 (24.0)	50 (100)
Primary	228 (88.4)	30 (11.6)	258 (100)
Intermediate + Secondary	179 (89.5)	21 (10.5)	200 (100)
Diploma + University	116 (94.3)	7 (5.7)	123 (100)
Postgraduate	4 (100)	0 (0)	4 (100)
Total	565 (89.0)	70 (11.0)	635 (100)

P value= 0.012

Table 3: Distribution of the study sample according to paternal education levelin relation to missed opportunities for immunization.

Paternal education	Children received all needed vaccines No. (%)	Children with MOI No. (%)	Total No. (%)
Illiterate + read & write	26 (74.3)	9 (25.7)	35 (100)
Primary	177 (87.6)	25 (12.4)	202 (100)
Intermediate +Secondary	216 (91.9)	19 (8.1)	235 (100)
Diploma + University	139 (89.1)	17 (10.9)	156 (100)
Postgraduate	7 (100)	0 (0.0)	7 (100)
Total	565 (89.0)	70 (11.0)	635 (100)

P value= 0.026

Table 4: The distribution of the study sample according to paternal occupationin relation to missed opportunities for immunization.

Paternal occupation	Children received all needed vaccines No. (%)	Children with MOI No. (%)	Total. No. (%)
Free business	361 (88.0)	49 (12.0)	410 (100)
Employed	198 (91.2)	19 (8.8)	217 (100)
Retired	5 (100)	0 (0.0)	5 (100)
Student	1 (33.3)	2 (66.7)	3 (100)

P value=0.009

Table 5: Distribution of the study sample according to immunization status of siblings in relation to missed opportunities for immunization.

Siblings Immunization status	Children received all needed vaccines No. (%)	Children with MOI No. (%)	Total No. (%)
Complete immunization according to age	532 (91.9)	47 (8.1)	579 (100)
Incomplete immunization according to age	33 (58.9)	23 (41.1)	56 (100)
Total	565 (89.0)	70 (11.0)	635 (100)

P value=0.000

Table 6: Distribution of the study sample according to sources of knowledge for following up the schedule of immunization in relation to MOI.

Source of knowledge	Children received all needed vaccines No. (%)	Children with MOI No. (%)	Total No. (%)
Health staff visiting home during outreach sessions	0 (0.0)	2 (100)	2 (100)
Doctor	13 (92.9)	1 (7.1)	14 (100)
Immunization card	521 (89.2)	63 (10.8)	584 (100)
Family	4 (50)	2 (50.0)	6 (100)
No source	0 (0.0)	1 (100)	1 (100)
Total	538 (88.8)	69 (11.2)	607 (100)

P value=0.002

Discussion

The prevalence of MOI in the current study was 11%. WHO global review of 79 MOI studies (59 from developing countries) revealed that the prevalence of MOI was 32%[7]. Other studies like Abdulraheem et al study in the North of Nigeria found that the prevalence of MOI was 33.4%[8], while Sulieman et al study in Riyadh capital of Saudi Arabia revealed that the prevalence of MOI was 12%[9].

The above results show that the prevalence of MOI in this study is lower than that reported in the studies of other developing countries. That difference may be attributed to the stringent follow up of the vaccination status of children attending studied PHCCs.

Regarding age distribution, in this study the prevalence of MOI increases as the child becomes older. This finding may be explained by the inadequate knowledge of parents toward the national immunization schedule, and health workers were more concerned to follow up the immunization status of infants rather than older children. This finding agrees with Sarab KA et al in Tikrit city which found a drop of vaccination status as child age is increased, and also this is what was found by Al-Sheikh OG et al in Salahddin, and Farizo et al in Pakistan[10-12].

Child sickness was responsible for (31.42%) of the reasons for partial immunization in this study suggesting that parents and health workers may have had misconception that minor illness is an absolute contraindication to vaccination or it may be due to the lack of following-up immunization status of a sick child in his subsequent visits to the PHCC.

It was found that mother forgetfulness was responsible for (30%) of the reasons for partial immunization in this study and this can be attributed partially to mother ignorance and improper communication of health workers in the PHCCs with child health care givers.

The results for the main reasons of partial immunization are consistent with findings by Jinan ARN study which revealed that social problems and child ill health were major reasons for immunization delay in Basra[13]. In a study done by L Samad et al in UK, the reasons reported by mothers of partially immunized children were mainly child sickness (45%) and problems with health services / communication (32%)[14].

In this study no screening of child immunization status in PHCCs was responsible for (61.43%) of the factors associated with MOI, and this agrees with WHO global review of MOI studies which revealed that negative health worker attitudes such as no screening for immunization was found to be the major reason for missed opportunities (35% of all reasons given for missed opportunities) [7]. In India, Muranjan et al study found that the most common factor associated with MOI was no screening (94%)[15].

This study shows significant association between children with MOI and Paternal education levels, the percentage of MOI was higher among low Paternal educational levels as compared with higher paternal educational levels and this is consistent with finding by Abdulraheem et al study in Nigeria which showed that more than two-thirds (70.4%) of mothers with missed opportunities for vaccination had either primary school education or no formal education[8]. This finding is also in support of Altinkaynak et al report that education of parents increases the chance of a child vaccination and reduces missed opportunity[16]. This finding may be explained by the fact that educated parents were more aware about importance of vaccination status of their children.

This study shows significant association between children with MOI and paternal occupation, the percentage of children with MOI was higher among fathers with free business occupation (12%) and this agrees with Altinkaynak et al study which showed similar finding[16].

Regarding immunization status of siblings, there was significant association between children with MOI and their siblings having incomplete immunization according to age (41.1%). This result is in accordance with Borus PK. study which showed similar findings[17].

This study reveals that the main dependable source for following up child immunization was immunization card (96.2%) and also there was significant decrease in the number of children with MOI among child health caregiver whose knowledge for following up the immunization schedules depended on immunization card and doctor. these results agree withDaly D et al study which revealed that children without a health immunization card were more likely to be missed and Perry H et al who found that lost or misplaced immunization cards were a common issue that hindered children immunization[18,19].

In conclusions; the prevalence of missed opportunities for immunization among children less than five years old attending four PHCCs of family medicine in Baghdad was relatively low, with no significant difference for gender or geographical area.

The identified reasons for partial immunization from most to least common reasons were: child sickness, mother forgetfulness, social problems, parental refusal, moving to new place, vaccine un-trust, fear from vaccine side effects and vaccine unavailability.

The identified factors associated with missed opportunities from most to least common factors were: no screening for child immunization, false contraindication, child immunization in other PHCC, forgotten immunization cards, crowdedness and vaccine unavailability.

Significant related conditions for missed opportunities were low parental education levels, paternal occupation, incomplete immunization of siblings, reason for attending PHCC and the source of knowledge that was depended on for following up the schedule of immunization.

References

1. Stanfield P, Balladin B, Versluys Z. Child Health: A manual for medical and Health workers in Health centers and Rural hospitals. 2nd ed. Nairobi, Kenya: Sunlitho Ltd; 1999. P.84-105.
2. Editorial viral hepatitis. Viral hepatitis board, August 2001; 9(1).
3. Turner HS, Janet LH. The History and Practice of College Health, 1st ed. The University Press of Kentucky. 2002. p 363.
4. Pickering LK, Baker CJ, Long SS, McMillan JA. Red Book: 2006 report of the committee on Infectious diseases, 27th ed. ELK Grove Village, IL. American Academy of Pediatrics 2006; 1: 1.
5. Hutchins SS, Jansen HAFM, Robertson SE. Missed Opportunities for Immunization, Review of Studies from Developing and Industrialized Countries. Geneva: WHO, 1992: 8-9. WHO/EPI/GEN/92.8.
6. Challenges in global immunization and the Global Immunization Vision and Strategy 2006-2015. Weekly epidemiological record / Health Section of the Secretariat of the League of Nations 2006, 81(19):190-195.
7. Hutchins SS, Jansen HAFM, Robertson SE, Evans P, Kim-Farley RJ. Studies of missed opportunities for immunization in developing and industrialized countries. WHO Bullet OMS 1993; 71:549-60.
8. Abdulraheem IS, Onajole AT, Jimoh AAG and Oladipo A. Reasons for incomplete vaccination and factors for missed opportunities among rural Nigerian children. Journal of Public Health and Epidemiology 2011; 3(4):194-203.
9. Al-Shehri SN, Alshammri SA,Khoja TA. Missed opportunities for Immunization in Riyadh capital of Saudi Arabia. Can Fam Physician 1992; 38:1087-91.
10. Sarab KA, Ashoor RS, Ruqiya ST. Factors predicting Immunization coverage in Tikrit city. Middle East Journal of Family Medicine 2008;6(1): 8.
11. Al-Sheikh OG, Al-Samarrai JI, Al-Sumaidaie MM, Mohammed SA, Al-Dujaily AA. Immunization coverage among children born between 1989 and 1994 in Saladdin Governorate, Iraq. Eastern Mediterranean Health Journal 1999; 5(5):933-40.
12. Farizo KM, Stehr-Green PA, Markowitz LE, Patriarca PA. Vaccination levels and missed opportunities for measles vaccination: a record audit in a public pediatric clinic. Pediatrics 1992; 89 (4 Pt 1): 589-92.
13. Samad L, Butler N, Peckham C, Bedford H. Incomplete immunization uptake in infancy: Maternal reasons. Vaccine 2006; 24 (47-48): 6823-9.
14. Jinan ARN. Knowledge, attitude, and practice of mothers regarding vaccination in Basra city. A dissertation submitted to the Iraqi committee for Medical Specialization in Community Medicine 2008. P36.
15. Muranjan M, Mehta C, Abhijit Pakhare. An Observational, Health Service Based Survey for Missed Opportunities for Immunization in India. Indian Pediatrics 2011; 48: 635.
16. Altinkaynak S, Ertekin V, Guraksin A, Kilic A. Effect of several socio demographic factors on measles immunization in children of Eastern Turkey. Public Health 2004; 118: 565-9.
17. Borus PK. Missed Opportunities and inappropriately given vaccines reduce immunization coverage in facilities that serve slum areas of Nairobi. East African Medical Journal. 2004; 81(3): 125.
18. Daly D, Nxumalo MP, Biellik RJ. Missed opportunities for vaccination in health facilities in Swaziland. SAMJ 2003; 93(8): 609.
19. Perry H, Nurani S, Quaiyum MA, Jinnah SA, Sharma A. Barriers to Immunization among women and children living in slums of zone 3 of Dhaka, Bangladesh: A qualitative assessment. International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) 2007; working paper no. 166: p 23.

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