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Immunization Status of Internally Displaced Iraqi Children During 2017

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Abstract

Background: Childhood immunization is the initiation of immunity through application of vaccine as it is considered important for improving child survival. Iraq, currently has about 4 million internally displaced persons, which represents 10.8% of its population and 10% of internally displaced persons worldwide.

Objectives: This study was conducted to assess the immunization status among displaced Iraqi children and to find out if there was any association between immunization status and other variables (Parents occupation and educational levels, child order in his family, marital status of the mother, Presence of vaccination card before or after displacement).

Methodology: A cross sectional study was conducted in four displacement camps in Baghdad with 400 participants of under five years children along nine months duration, data were collected using a questionnaire which was adapted from many literatures with some modification, chi square test was used to show level of association, p value <0.05 considered as significant.

Results: The highest coverage rate for displaced children after displacement was for the first dose of Oral Polio Vaccin (OPV1)+ first dose of Penta Vaccine (PENTA1) (Hexa) and the first dose of ROTA virus vaccines (77.5%), while the lowest vaccination coverage was for the second booster dose of OPV2 nd+ second dose of Dyptheria, Pertusls, Tetanus toxoid vaccines (DPT 2nd booster) in addition to Mumps, Measles, Rubella (MMR) vaccines (40.5%). A highly significant association was found between unvaccinated displaced children and illiterate mothers ($p<0.001$), while a significant association was observed between unvaccinated displaced children and fathers graduated from primary school. Significant association between the birth order of displaced children (≥ 5) and low vaccination coverage.

Conclusion: Highly significant association was found between the vaccination coverage rates before and after displacement. Moreover significant difference between parents educational level, birth order, marital status of the mother, presence and absent of the vaccination card and vaccination team visits to the household (after displaced) and the immunization status.

Keywords: Vaccination coverage; Internally displaced children; Iraq

Introduction

Childhood immunization is the initiation of immunity through the application of vaccines, it is considered important for improving child survival. To date, immunization is a primary health care preventive measure and remains the most cost-effective public health intervention to reduce child morbidity and mortality attributed to infectious diseases [1]. Worldwide, it prevents more than two million deaths each year [2,3]. However, it is unfortunate to say that more than 10 million children in developing countries die every year due to ineffective assessment of valuable interventions such as immunization which would fight common and preventable childhood illnesses [4].

Displaced persons

An internally displaced person (IDP) is someone who is forced to escape his or her home but remains within his or her country's borders. They are often referred to as refugees, although they do not fall within the legal definitions of it [5]. According to the United Nation High Commissioner for Refugees (UNHCR), there were 59.5 million forcibly displaced persons worldwide by the end of 2014 due to persecution, conflict, generalized violence, or human rights violations and this number is only expected to rise due to the numerous ongoing global conflicts [6]. These forcibly displaced populations include both refugees, who cross international borders in their escape from conflict, and internally displaced persons (IDPs) who escape conflict but stay within the borders of their own country [6]. The unique challenges of emergency settings often interfere with the routine health services and prevent access to recommended vaccinations. This disruption of immunization services increases the number of susceptible individuals and creates a population at a particularly high risk for vaccine-preventable diseases (VPDs) targeted for eradication and elimination [7].

Global VPD eradication and elimination initiatives are intensive resources in terms of finance and human resources. Experiences with

GPEI and MRI have shown that populations displaced due to humanitarian emergencies can increase the risk of VPD outbreaks and thereby add to the burden of resources needed to meet VPD eradication and elimination goals [8-12].

Rationale

In Iraq the total number of under-five population in 2016 was 5,651,940 with Kurdistan* involved, and it represented about 14.92% from the total population with a growth rate=2.7% [13]. The number of less than 5 years displaced children in Baghdad Al-Karkh health directorate for 2016 was 1517** and that for Baghdad Al-Resafa was 14194***. Although the mortality of children under 5 years of age has declined to half from 1990 (mortality of about 12.7 million); about 6.3 million still die annually and a quarter of these deaths occur due to vaccine preventable diseases. Specifically, these also include an estimated 1.5 million deaths from diseases for which vaccines are recommended by the World Health Organization (WHO).

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Increasing vaccine coverage has the potential to save lives, prevent disability, reduce health-care costs, and help eradicate vaccine-preventable diseases. Not only this; but improved vaccine coverage also benefits unimmunized children through herd immunity [14]. Applying national immunization program among Iraqi internally displaced children is of great importance to prevent spread of communicable diseases among under five years' children, thus decreasing morbidity & mortality rates among this age group. In Iraq the total number of displaced families for the year 2017 was 728177, distributed on all Iraqi governorates.

Aim of the study

1)To assess the immunization status among displaced Iraqi children.

2) To find out if there is any association between immunization status and other variables (Parents occupation and educational levels, child order in his family, marital status of the mother, Presence of EPI card before or after displacement).

Subjects and Methods

A cross sectional study was conducted in (4) displacement camps:

- Hay Al Jamia'a camp,
- Al- Gazalia camp,
- Al-Nahrawan camp,
- Zayona camp

The study extended for a period from 1st of Dec. 2016 to the end of July 2017 with a conveniant sample of 400 under five years internally displaced children. The Data were collected by a questionnaire which was adapted from many researches [15-19] after some modification to some questions, later it was translated into arabic language. The primary form of modified questionnaire was reviewed by 3 expert spescialists (one in community medicine and two in family Medicine),thereafter the study tool was pretested as a pilot study on 25 participants, who were excluded from the study sample to assess the time needed to fulfill the questionnaire and to test the difficulty of questions if present. The questions were made to obtain information concerning the following:

Demographic data of the involved children in the study

Age of the child, gender, birth order, place of delivery and number of living children in a household.

Vaccination status

Divided into 3 groups

- Vaccinated: when the child had completed all vaccines according to Iraqi national immunization program.
- Partially vaccinated: when the child has not completed his vaccinations up to date.
- Unvaccinated: never received any vaccine.

Demographic data of the parents

Educational level of Father/Mother, marital status of the mother, occupation of Father/Mother, source of information about immunization.

Other variables

- Time of displacement
- Distance from health facility/minutes: (Before displaced, after displaced)
- Presence of EPI card (Before displaced, after displaced)
- Number of vaccination team visits to the household (Before displaced, after displaced)
- Dropouts follow–up by the vaccination team (Before displaced, After displaced)

Statistical analysis

Descriptive statistics was presented in form of 2 graphs, data were introduced into personal computer and statistical package for social science (SPSS) version 22 was used in statistical analysis; Chi square test was used to figure out the significance of association between the immunization status and other variables. P value ≤ 0.05 was set as a cutoff point.

Ethical considerations

- Approval of the scientific committee for the research topic was granted by the scientific council of the Arab board.
- Permission was obtained from the Iraqi ministry of health by an Administrative order directed to the health directorate (Al-Karkh and Al-Resafa) to facilitate the task of obtaining the information from participants.
- Ministry of displacement and migration provided reports about the number of displaced families through the Information and research directorate/department of programs. 2017 (personal communication)
- An article numbered M.O.F/1946 ministry of health/environment, Office of Technical Deputy was addressed to Baghdad Operations Command to facilitate the activity of candidate Thikra H. Hattat to visit Displaced camps to assess the vaccination status to a sample of

under 5 year old children at certain localities (AL_Nahrawan, Hay ALjamiaa, AL_Qazalia) in Baghdad.

- An oral consent was obtained by asking every participant if he was willing to fill up the questionnaires after a brief explanation of the general purpose of the study and its objectives

Results

A total of 400 displaced children in camps were included in the present study with a mean (SD)=(36.6 ± 12.3 months), 28.75% of them were in the age group (49-60 months). 52.25% of them were females, and 23.75% were the first in birth order. More than half (52.25%) of displaced children were partially vaccinated (Table 1).

Variables	No. (400)	-100%
Age mean ± SD (36.6 ± 12.3 months)		
≤ 12 months	5	1.25
13-24 months	88	22
25-36 months	112	28
37-48 months	115	28.75
49-60 months	80	20
Total	400	100%
Gender		
Male	191	47.75
Female	209	52.25
Total	400	100%
Birth order		
1st	95	23.75
2nd	88	22
3rd	61	15.25
4th	58	14.5
≥ 5th	98	24.5
Total	400	100%
Vaccination status		
Fully vaccinated	150	37.5
Partially vaccinated	209	52.25
Unvaccinated	41	10.25
Total	400	100%
Place of delivery		
At home	226	56.5
At hospital	174	43.5
Total	400	100%
Number of living children in a household		
≤ 2	160	40
3-5	196	49
6-8	42	10.5
≥ 9	2	0.5
Total	400	100%

Table 1: Distribution of the children according to demographic variable.

Before displacement, The highest coverage rate (46.2%) for displaced children was for the vaccines Bacillus Calmette Guerin (BCG)+OPV0+first dose of Hepatitis B Virus vaccine (HBV1), while the lowest rate (6.0%) was for the vaccines OPV 1st booster+TETRA 2nd booster (Table 2).

Vaccines	No. of children vaccinated					
	Male		Female		Total	
	No.	%	No.	%	No.	%
BCG+OPV0+HBV1	94	59.5	64	40.5	158	46.2
OPV1+PENTA1(Hexa)+ROTA1	44	51.16	42	48.84	86	21.5
OPV2+TETRA1+ROTA2 (hexa)	35	53.03	31	46.97	66	16.5
OPV3+PENTA2+ROTA3(hexa)	15	53.57	13	46.43	28	7
Measles	50	51.54	47	48.46	97	24.25
MMR1	44	61.11	28	38.89	72	18
OPV 1st booster+TETRA 2nd booster	12	50	12	50	24	6

Table 2: Coverage rate of vaccines before displacement.

The highest coverage rate (77.5%) for displaced children after displacement was for vaccines OPV1+PENTA1 (Hexa) +ROTA1. However, the lower vaccination coverage (40.5%) was for the vaccines OPV 2nd+DPT 2nd booster+MMR (Table 3).

	No. of children vaccinated					
Vaccines	**Male**		**Female**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
BCG+ OPV0 + HBV1	122	52.14	112	47.86	234	58.5
OPV1+PENTA1(Hexa)+ROTA1	154	49.68	156	50.32	310	77.5
OPV2+TETRA1+ROTA2 (hexa)	148	50.68	144	49.32	292	73
OPV3+PENTA2+ROTA3(hexa)	147	51.58	138	48.42	285	71.3
Measles	114	55.34	92	44.66	206	51.5
MMR1	107	52.97	95	47.03	202	50.5
OPV 1st booster+TETRA 2nd booster	86	52.76	77	47.24	163	40.8
OPV 2nd+DPT 2nd booster+MMR 2nd booster	85	52.47	77	47.53	162	40.5

Table 3: Coverage rate of vaccines after displacement.

The average of total vaccination was=55.6%. The highest percentages of educational level for both parents were the primary education. Unfortunately, the majorities (99%) of children fathers were not employed and 5.5% of children mothers were widows (Table 4).

Variables	**No. (400)**	**-100%**
Educational level of mother		
Illiterate	62	15.5
Primary	142	35.5
Intermediate	117	29.25
Secondary	43	10.75
College & higher studies	36	9
Total	400	100%
Educational level of father		
Illiterate	62	15.5
Primary	204	51
Intermediate	55	13.75
Secondary	37	9.25
College & higher studies	42	10.5
Total	400	100%
Occupation of father		
Employed	4	1
Non employed	374	93.5
Total	378	94.5
Occupation of mother		
Non employed	375	93.75
Employed	25	6.25
Total	400	100%
Marital status of mothers		
Married	378	94.5
Widowed	22	5.5
Total	400	100%

Table 4: Distribution of the parents according to demographic variable.

Table 5 showed that there was a highly significant association between the unvaccinated displaced children and their mother's illiteracy ($p<0.001$). In addition, the number of fathers who had completed primary school only and the number of unvaccinated children were strongly related ($p=0.002$). On the other hand, no significant correlation was observed among children of different vaccination status with neither the occupation of mother/father nor the place of delivery.

Variable	**Vaccinated**		**Partially vaccinated**		**Unvaccinated**		**Total**		**P-value**
	No.	**(%)**	**No.**	**(%)**	**No.**	**(%)**	**No.**	**(%)**	
Mother educational level									
Illiterate	40	26.67	2	0.96	20	48.78	62	15.5	<0.001**

Primary	75	50	50	23.922	17	41.46	142	35	
Intermediate	12	8	103	49.28	2	4.88	117	29.25	
Secondary	12	8.67	30	14.35	1	2.44	43	11	
College & higher studies	11	7.33	24	11.4	1	2.44	36	9.25	
Father educational level									
Illiterate	24	16	24	11.48	14	34.15	62	15.5	0.002*
Primary	72	48	112	53.59	20	48.78	204	51	
Intermediate	17	11.33	35	16.75	3	7.32	55	13.75	
Secondary	15	10	21	10.05	1	2.44	37	9.25	
College & higher studies	22	14.67	17	8.13	3	7.32	42	10.5	
Mother occupation									
Employed	12	8	7	3.34	6	14.63	25	6.25	0.976
Non employed	138	92	202	96.65	35	85.37	375	93.77	
Father occupation									
Employed	3	2	1	0.48	1	2.44	4	1	0.081
Non employed	147	98	208	99.5	40	97.56	374	93.5	
Marital status									
Married	142	94.67	201	96.17	35	85.37	378	94.5	0.021*
Widow	8	5.33	8	3.83	6	14.63	22	5.5	
Place of delivery									
Hospital	57	38	103	49.28	14	34.15	174	43.55	0.068
Home	93	62	106	50.72	27	65.85	226	56.5	
*Significant, **Highly significant.									

Table 5: Association between immunization status of the participants and certain variables of parents.

The birth order of the displaced children (≥ 5) had a reliable impact on the vaccination status of the children (p=0.02) While no significant association was observed between children with different immunization status and the following variables: number of living children in a household, presence of EPI card (before and after displacement), vaccination team visits to the household (before displaced), dropouts follow–up team visits (before displacement) and dropouts follow–up team visits (after displacement).

It is worth mentioning that the number of currently unvaccinated displaced children was considerably affected by the absence of EPI before displacement (p<0.001), the absence of EPI after displacement (p<0.001) and the number of regular vaccination team visits (p<0.001) (Table 6).

Variable	Vaccinated		Partially vaccinated		Unvaccinated		Total		P-value
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	
Birth order									
1st	33	22	53	25.36	9	21.95	95	23.75	0.025*
2nd	33	22	51	24.4	4	9.76	88	22	

3rd	24	16	33	15.79	4	9.76	61	15.25	
4th	26	17.33	28	13.4	4	9.76	58	14.5	
≥ 5th	34	22.67	44	21.05	20	48.78	98	24.5	
Total	150	37.5	209	52.25	41	10.25	400	100%%	
Number of living children in a household									
≤ 2	62	41.33	94	44.98	16	39.02	172	43	0.084
03-May	67	44.67	94	44.98	13	31.71	174	43.5	
06-Aug	20	13.33	19	9.09	10	24.39	49	12.25	
≥ 9	1	0.67	2	0.96	2	4.88	5	1.25	
Total	150	37.5	209	52.25	41	10.25	400	100%	
Presence of EPI Card (Before displaced)									
Present	108	72	196	93.78	85	12.2	309	77.25	<0.001**
Not present	42	28	13	6.22	36	87.8	91	22.75	
Total	150	37.5	209	52.25	41	10.25	400	100%	
Presence of EPI Card (After displaced)									
Present	87	58	146	69.86	11	26.83	244	61	<0.001**
Not present	63	42	63	30.14	30	73.17	156	39	
Total	150	37.5	209	52.2541	41	10.25	400	100%	
Vaccination team visits to the household (Before displaced)									
Not Visit	9	6	9	4.31	5	12.2	23	5.75	0.26
Not Regular	101	67.33	133	33.25	26	63.41	260	65	
Regular	40	26.67	67	32.06	10	24.39	117	29.25	
Total	150	37.5	209	52.25	41	10.25	400	100%	
Vaccination team visits to the household (After displaced)									
No Visits	0	-	0	-	0	-	0	-	<0.001**
Not Regular	27	18	174	83.25	14	34.15	215	53.75	
Regular	123	82	35	16.75	27	65.85	185	46.25	
Total	150	37.5	209	52.25	41	10.25	400	100%	
Follow-up dropouts team visits (Before displaced)									
Not Visit	9	6	10	4.78	5	12.19	24	6	0.49
Not Regular	107	71.33	152	72.72	28	68.29	287	71.75	
Regular	34	22.67	47	22.48	8	19.51	89	22.25	
Total	150	37.5	209	52.25	41	10.25	400	100%	
Follow-up dropouts team visits (After displaced)									
Not Visit	0	-	0	-	0	-	0	-	0.08
Not Regular	63	42	68	32.53	19	46.34	150	37.5	

Regular	87	58	141	67.46	22	53.66	250	62.5	
Total	150	37.5	209	52.25	41	10.25	400	100%	
*Significant, **Highly significant									

Table 6: Association between immunization status of the participants and certain demographic variables.

The highest percentage of complete vaccination coverage was observed among the displaced children living in Nahrawan camp and the lowest was in Hay Al Jamia'a and Zayona camps. i.e. un-vaccination rate was higher in Nahrawan camp, followed by Hay Al Jamia camp, then Qazalia camp and last Zayona camp (Figure 1).

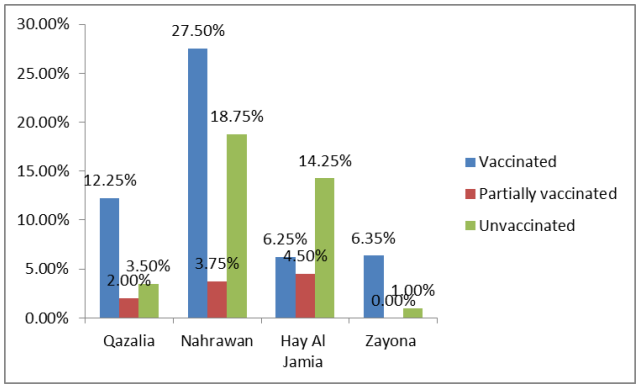

Figure 1: Distribution of the vaccination status according to camps.

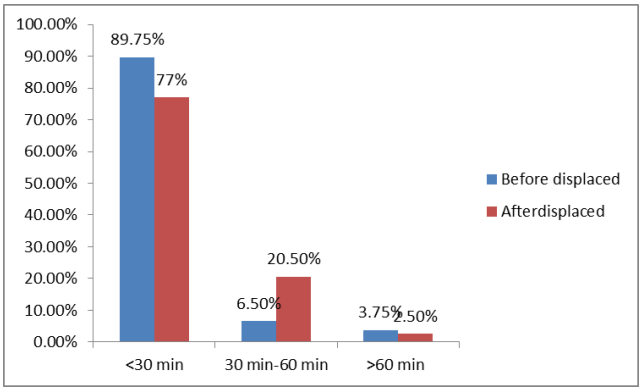

Figure 2: Walking time to immunization service.

The majority of the participants took a walking time to immunization services of less than 30 minutes whether before or after displacement (Figure 2). It is fortunate that a highly significant increase in immunization coverage for all types of vaccine doses given for children was noted after displacement ($p<0.001$) (Table 7).

Variable	Before displaced		After displaced		P-value
	No.	%	No.	%	
BCG+ OPV0 + HBV1					
Yes	158	46.2	234	58.5	<0.001**
No	242	53.8	166	41.5	
OPV1+PENTA1(hexa)+ROTA1					
Yes	86	21.5	310	77.5	<0.001**
No	314	78.5	90	22.5	
OPV2+TETRA1+ROTA2 (hexa)					
Yes	66	16.5	292	73	<0.001**
No	334	83.5	108	27	
OPV3+PENTA2+ROTA3(hexa)					
Yes	28	7	285	71.3	<0.001**
No	372	93	115	28.7	
Measles					
Yes	97	24.25	206	51.5	<0.001**
No	303	75.75	194	48.5	
MMR1					
Yes	72	18	202	50.5	<0.001**
No	328	82	198	49.5	
OPV 1st booster + TETRA 2nd booster					
Yes	24	6	163	40.8	<0.001**
No	376	94	237	59.2	
**Highly significant					

Table 7: Association of vaccination doses before and after displacement.

Discussion

The children of immigrants are at risk of not being fully immunized because of the livelihood insecurity and alienation of their families. Offering antenatal and obstetric care leads to increased immunization uptake; personalized service provision by the health care system significantly increases the likelihood of a child receiving full immunization [17].

Association between parental educational level and the immunization status of children

The current study showed that there was a significant association regarding the parents level of education and the immunization status were, the lower the maternal education level was, the higher percentage

of unvaccinated children was, this because the uneducated mothers had no knowledge and lack of aware¬ness of the importance of immunization so they immunize their children less than the educated mothers. This was in agreement with Subhani et al. [16] study in 2015, when they revealed that the probability of immunizing the children by uneducated mothers was 0.378 times less than the educated mothers.

Moreover a similar result was obtained by Maheshwari et al. [17] study in 2014, which confirmed that maternal education has great impact on acceptance of complete vaccination. In unvaccinated category, 55.1% mothers and 42.7% fathers are illiterate. Also Vikram et al. in 2014 found that children of well-educated mothers are more fully immunized than other [20].

Association between the marital status of the parents & their children's immunization status

The present study showed that there was a significant association between the marital status of the parents and the immunization status of children since the majority of the mothers were married. This was similar to that mentioned by a Report of the National Immunization Survey which revealed that children whose mothers were married were more likely to be fully vaccinated than those whose mothers were widowed, divorced, separated or deceased [21]. The same result was also revealed by Adokiya et al. study in 2016 when he mentioned that children whom respondent's age is 40–49 years, have married mothers, of Kusaasi ethnic groupsm Christian and of female gender were more likely to be fully immunized [22]. However these findings were not in accord with Jani et al. in 2008 who found that the marital status and age of the mothers were not seen to be associated with the use of immunization services [23].

Association between occupation of parents & children immunization status

The current study revealed that there was no association between the parental occupations and the immunization status of their children. Similarly, Okoro et al. [24] study in 2015 mentioned that the maternal occupation did not significantly affect the immunization coverage of children in his study. Culturally the father is considered the bread winner and is expected to provide for the financial needs of the family. Relating to this Bugvi et al. [25] working in Pakistan declared in their study that maternal occupation did significantly affect immunization coverage of children in the general population. A poor unskilled mother is unlikely to immunize her child. Moreover, Russo et al. in 2015 found that the mother's occupation remarkably affects the immunization coverage of children [26].

Association between Birth order and children immunization status

The current study revealed that the birth order of the children and their immunization status were significantly relevant. This was in consistent with Gavrielov-Yusim et al. [27] study in 2012 who concluded that their data substantiate a strong inverse relationship between child's birth order and the chance of receiving privately purchased voluntary varicella vaccination, he demonstrated that birth order plays a significant role and is inversely associated with vaccination in different ethno-religious and socioeconomic groups. Children from small to average-sized households have a higher chance of vaccination compared to their ranking-corresponding peers from large households [27]. This finding could be related to a reduced mothers' attention, along with a growing number of children, due to an increase of duties.

The number of siblings per household as a predictor of full immunization

The current study showed that there was no definite association between the sibling's number and the child vaccination. While Elizabeth et al. [28] in 2015 showed that there was a strong relevance between the family size and the children's full immunization. Mothers with more than four children are two times more likely not to have their children fully immunized compared to those with less than 3. In addition, children from large families have been found to have low vaccine uptake by several investigators. This has been interpreted as reflecting the practical difficulty and expense of having other children at home in taking up the immunization services [29].

Coverage rate of vaccines among displaced children

Before displacement, the highest coverage rate for displaced children was for vaccines BCG+OPV0+HBV1. This may be attributed to the fact that more than three fourth of the children were born in hospitals where these vaccine doses were given soon after birth. This is in agreement with Maheshwari et al. [17] study in 2014 which had the highest coverage rate for the same vaccine doses.

The association between time of displacements & children immunization coverage

The present study demonstrated that there was a highly significant association between the time of displacement (before and after) with the vaccination coverage. Surprisingly, the percentage of vaccination increased highly after displacement. This may be due to the attention drawn to displacement camps whether from the Iraqi government represented by the ministry of health and environment and ministry of immigration and displacement or the non-governmental organizations whether inside Iraq (red Crescent) or globally (WHO, red cross, unicef, human rights) working to maintain descent health services to displaced people.

Association between presence of EPI card (Before/after displaced) and children immunization status

The study demonstrated that the Absence of EPI card (Before/after displaced) was inversely related to the children immunization status. The same findings were declared in Russo et al. [26] in 2015 but with less significant association (P value=0.03) than the current study. Surprisingly, according to results of surveys conducted in African countries [20,30,31] and India, possessing the vaccination card was associated with incomplete vaccination. This was suggested by WHO [32] as might be due to parents over-reporting of vaccine doses for complacency without the possibility of checking the information. This aspect is controversial and may represent a limit to our study. In fact, a recent systematic review on the validity of vaccination card and parents' recall to estimate vaccination coverage [33] suggests that parents' recall information should be cautiously interpreted because it might be not reliable. This issue is not mentioned in WHO EPI-coverage survey guidelines [34].

Association between the children immunization status and vaccination team visits to the household (Before/after displacement)

No association was found between the children immunization status and the number of vaccination team visits before displacement. However, the situation is reversed after displacement since there is a good attention and health care provided to the displaced children in camps which raised a positive association (P<0.001). This is in accord with the results mentioned by Kaji et al. in 2016, but it is not in agreement with the Russo et al. [26] in 2015 where a significant difference was found between children immunization status and vaccination team visits to the household. This may be attributed to the difference in sample size collection.

Conclusion

More than half of the displaced children were partially vaccinated and about ten percent were unvaccinated. Before the displacement, the highest vaccine coverage rate was for BCG+OPV0+HBV1 vaccines and the lowest was for OPV 1stbooster+TETRA 2nd booster vaccines. While after the displacement, the highest coverage was for the vaccines OPV1+PENTA1(Hexa)+ROTA1 and the lowest coverage was for the vaccines OPV 2nd+DPT 2nd booster+MMR.

It was concluded that there was a significant association between the immunization status of different types of vaccines before and after the displacement. Moreover, parents educational level, birth order, marital status of the mother, presence or absensce of the EPI card and vaccination team visits to the household (after displacement) all positively affected the immunization status.

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