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Coverage Evaluation of Immunization Services Provided to Children of Age Group (12-23 months) in Urban Slum of Western Gujarat

Mubashshera F Khan[1], Ilesh Kotecha[2], Mittal Rathod[3]

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Author's Affiliation:
[1]Tutor; Dept of Community Medicine; AIIMS Nagpur; Nagpur; [2]Associate Professor; [3]Tutor; Dept of Community Medicine; M P Shah Government Medical college Jamnagar; Jamnagar

Correspondence
Dr. Mubashshera Firdous Khan
Mubashshera_khan@rediffmail.com

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ABSTRACT

Introduction: Infectious diseases are major cause of morbidity and mortality in children. One of the most cost effective and easy methods for the healthy well-being of a child is immunization.

Objectives: 1) the study was designed to assess the immunization status of children of age group of 12-23 in urban slum of Jamnagar. 2) To find out the reasons for partial or un immunization and to know the various determinant of immunization.

Methodology: it was a cross sectional study done in urban slums of Jamnagar. two stage sampling methodology was adopted, in first stage 30 anganwadi were selected by systematic random sampling and in second stage from selected anganwadi 7 children (12-23 months) were chosen randomly. Data entry and analysis was done in Epi info 7.

Result: 93.3% children were having immunization card. Most common place of immunization was mamta session (93.6%), 3.9% at private hospital, 2.5% at government hospital.66.7% children were fully immunized, 30.5% partially immunized 2.9% were unimmunized. Maternal education, socioeconomic status and birth order were found to be determinant of low immunization status. Highest coverage was found for BCG (96.67%) and lowest for measles (71.4%).Most common reason for partial/un immunization was lack of information.

Conclusion: sustained contact between health worker and community are needed to achieve the universal coverage of immunization.

Key word: Mamta card, fully immunized, partially or unimmunized.

INTRODUCTION

The WHO expanded programme on immunization (EPI) recommended that all children receive one dose of BCG, three doses of DPT vaccine, three doses of oral polio vaccine, and one dose of measles vaccine. The coverage of these vaccine preventable diseases has risen significantly since EPI began in 1974 when the global vaccination coverage was only 5%. Despite this progress, an estimated 1.5 million children worldwide die each year of diseases that can readily be prevented by these vaccines. [1]

Routine Immunization is one of the most cost effective public health interventions and was first introduced in India in 1978. Yet, despite the concerted efforts of the government and other health agencies, a large proportion of vulnerable infants and children in India remain unimmunized. India has the highest number (approximately 10 million) of such children in the world. [2]

In India, immunization services are offered free in public health facilities, but despite rapid increases in accessibility, the immunization rate remains low and also there is regional variation in coverage of vaccines. According to the National Family Health Survey (NFHS-4) [3] 2015-2016, in India 62% of the children of age one to two years have been fully immunized , whereas in Gujarat (NFHS-4) only 50.4% children were fully immunized, which is low as compared to national average. [4]And also it is not much changed in last 10 years in Gujarat when we compare the finding with NFHS -3 survey.

According to DLHS-3 [5] (2007-2008) in Gujarat, the coverage of full immunization has decreased from DLHS-1 to DLHS-2 (58.1to 54 percent) and has increased only slightly by 0.8 percent point in DLHS-3.

Slums are high-risk areas leading to a high rate of disease transmission and about 25% of the Indian urban poor currently live in slums. Maternal and child health indicators among slum people show that their health is 2-3 times worse than in urban areas. [6] This study was formulated against this background with an objective of assessing the immunization coverage in urban slum of Jamnagar

The main objective of study was to assess the utilization of immunization services provided in anganwadi through mamta session in urban slum of study area and to know the various determinant of immunization in study population.

MATERIAL & METHODS

Study design & Setting: the Cross sectional study was conducted for six month from January to June 2016 in of urban slums of Jamnagar municipal corporation area. The Municipal Corporation has total population of 5, 29,308 (as per census 2011). There are 19 wards and 64 slum pockets in this Municipal Corporation area. The study was conducted in anganwadi centres situated in slums area.

Sampling Universe: A complete list of the existing Anganwadi centers was obtained from the ICDS office of study area. In urban slum area 297 Anganwadi were there. A ward wise alphabetically listing of all the 297 anganwadi centers was done.

Sampling Method: for choosing the anganwadi, two stage sampling methodology was adopted.

In the first stage, out of 297 anganwadi, 30 were selected by Systematic Random Sampling. Systemic procedure was adopted, first we divide the 297 anganwadi by 30 and got the sampling interval of 10, then one random number is found by pulling one card after shuffling, out of 10 cards serially numbered 1 to 10. We took 6th card and alphabetically 6th number anganwadi was taken as first anganwadi then every 10th anganwadi were chosen subsequently.

Then in second stage from each chosen anganwadi purposively 7 children of age group 12-23 months were selected from that area. Total 210 children were included in study. Data was collected from mother or care taker who ever present at the time of data collection by using predesigned pretested questionnaires.

Sampling had been conducted at household level by using random walk method. Study participant had been chosen from area cater by selected anganwadi centre. Participants were chosen by taking a random number i.e. last two digits of currency note or the household having that number as first household for taking child of desired age group and start from that house every eligible child present in subsequent household were included till 7 children found. In case of non-availability of required no of children; remaining had been taken from adjacent anganwadi centre area.mothers of child were the primary respondent.

Proof of immunization: The child was considered as immunized or not immunized based on information on the immunization card. For those without an immunization card, information from the mother or any other responsible and reliable person in the family stating that child has been immunized was considered. if the mother could not remember anything about the vaccination or in presence of any other confounding factor, the child was considered as not immunized with the vaccine under consideration.

Children of age group 12-23 months and whose parents/guardians were willing to participate in the study were included in the study.

A pretested structured questionnaire was used for data collection over the period of six month. The questionnaire contains socio demographic data, detail information of immunization status, place of immunization, knowledge about four key messages and reasons for partial and non immunization.

Data entry was done using Epi info and analysis was done in SPSS 20 and Microsoft excel 2007. Appropriate statistical test were applied.

Ethical Approval: Ethical approval was taken before the commencement of the study from the ethical committee of the concerned institution. Informed consent was obtained from respondent.

Following definitions were used in present study

Age of the child: age was recorded in complete month. Age was decided from recording on immunization card. For those who did not have this card, age stated by mother/family member was accepted after probe.

Immunization status:

Fully immunized: The child was considered fully immunized if he/she has received one dose of BCG, one dose of measles and three doses of Pentavalent and Oral Polio (apart from zero dose of Oral Polio at birth) by his /her 1st birthday.

Partially-Immunized: Those who have received at least one vaccine of BCG/DPT/OPV/Measles.

Unimmunized: Those children who had received no vaccine up to their first birthday.

Drop-out rate: Proportion of children receives one or more vaccinations but do not return for subsequent doses.

Four key messages assessed in the survey were: 1) What vaccine was given, disease it prevenst?; 2) What are the minor side effect and how to deal with them?; 3)When to come for next visit?; and 4) Keep immunization card safe and bring it in the next visit.

RESULTS

A total of 210 children of 12-23 months of age were included in study. Mothers were primary respondent of majority of children. Equal no. of male and female children was found in present study. Majority of children i.e. 66.3% were Hindu and 33.3% were Muslims. Most of the children were in social class 2, 3, 4 i.e.35.7%, 22.9%, 34.3% respectively and only1.4% children were in social class 5 (Modified B J Prasad classification using CPI 932 of August 2016) [7].83.8% children's mothers were literate. 2/3rd of children were of birth order 1 and 2. Only 2% were of birth order ≥5. 83.3% children were having MAMTA CARD at the time of visit, while 10% were having card according to respondent but not available at the time of survey. Only 6.7% children were not having MAMTA CARD. 92.9% children (12-23 month) were registered at mamta day, and taking the benefit of services provided at mamta session. 2/3rd of children were of birth order 1 and 2. Only 2% were of birth order ≥5.

Table 1: Distribution of children according to immunization status

Vaccination coverage	Boys (n=105)	Girls (n=105)	Total (n=210)
Fully immunized	71 (67.1)	69 (65.7)	140 (66.6)
Partially immunized	31 (29.5)	33 (31.4)	64 (30.4)
Un immunized	3 (2.85)	3 (2.85)	6 (0.029)
BCG	102 (97.2)	101 (96.2)	203 (96.7)
Pentavalent-1	100 (95.2)	99 (94.3)	199 (94.7)
Penatvalent-2	95 (90.4)	99 (89.5)	189 (90)
Pentavalent-3	91 (86.6)	94 (84.7)	180 (85.7)
OPV-1	98 (93.3)	99 (94.3)	197 (93.8)
OPV-2	95 (90.4)	94 (89.5)	189 (90)
OPV-3	91 (86.6)	89 (84.7)	180 (85.7)
Measles	77 (73.3)	73 (69.5)	150 (71.4)
Dropout rates (%)			
BCG-measles	24.5	27.7	26.1
BCG-penta-3	10.7	11.8	11.3
Penta 1 –penta 3	9	10.1	9.5
OPV1-OPV 3	7.14	10.1	10.1

Figure in parenthesis indicate percentage.

Table 2: Determinants of immunization status of children age group (12-23months)

Characteristics	Fully immunized	Partially immunized	Un immunized	Total	Chi Square	df	P value
Gender of child							
male	71 (67.7)	31 (29.5)	3 (2.8)	105 (50)	0.091	2	0.955
female	69 (65.1)	33 (31.4)	3 (2.8)	105 (50)			
Birth order							
≤2	112 (71.7)	39 (25)	5 (3.2)	156 (74.2)	8.62	2	0.013
>2	28 (51.8)	25 (46.3)	1 (1.8)	54 (25.7)			
Literacy Status							
Illiterate	10 (29.4)	22 (64.7)	2 (5.9)	34 (16.2)	53.4	8	0
Primary	35 (52.2)	29 (43.3)	3 (4.5)	67 (31.9)			
Secondary	32 (74.4)	10 (23.3)	1 (2.3)	43 (20.5)			
Higher Secondary	56 (94.9)	3 (5.1)	0 (0)	59 (28.1)			
Graduate & above	7 (100)	0 (0)	0 (0)	7 (3.3)			
Social Class							
1	12 (100)	0 (0)	0 (0)	12 (5.7)	27.4	8	6
2	60 (80)	13 (17.3)	2 (2.7)	75 (35.7)			
3	29 (60.4)	16 (33.3)	3 (6.3)	48 (22.9)			
4	36 (50)	35 (48.6)	1 (1.4)	72 (34.3)			
5	3 (100)	0 (0)	0 (0)	3 (1.4)			
Religion							
Hindu	90 (67.7)	38 (28.6)	5 (3.8)	133 (63.3)	1.52	2	0.46
Muslim	50 (64.7)	26 (33.8)	1 (1.3)	77 (36.7)			

Table 3: Reasons for Non-immunization (Partial & Un-immunized), (Multiple responses; n=70)

Reasons	Respondent
Lack of information	55(78.57%)
Unaware of the need of immunization	32
Fear of Adverse Reaction	16
Wrong idea of contraindication	7
Lack of Motivation	11(15.71%)
Family Objection	4
Religious Belief	3
No faith in immunization	2
Rumors	2
Obstacles	26(37.14%)
Child was ill	19
Vaccinator absent/ session not held	7

Table 4: Practice of FHW regarding FOUR KEY messages

KEY Message	Respondent(%)
What vaccine was given, disease it prevent	79 (37.6)
What are the minor side effect and how to deal with them	117 (55.7)
When to come for next visit	144 (68.6)
Keep immunization card safe and bring it in the next visit	83 (39.5)
All Messages	59 (28.9)

Most common place of immunization in study area was mamta session at anganwadi centre i.e. 93.6%; others were immunized at private hospital (3.9%) and 2.5% were taking vaccine from some other government facility.

Out of total 210 children 66.7% children of age group (12-23 months) were fully immunized, 30.5% were partially immunized and 2.9% were unimmunized. (Table 1)

Though in present study slightly higher numbers of male children were fully / partially immunized as compared to female children but the difference was not statistically significant (p=0.955). Highly Statistical significance association was found between social class, birth order and educational status of mother with immunization status of children (p<o.oo1). Religion was not found to be important determinant of immunization tetanus. (Table 2)

Out of total 210 children highest coverage was seen for BCG vaccine (97.2%) and the coverage of other vaccines were fallen in sequential order. Vaccination status of Pentavalent- 1 vaccine was 95.2% followed by 90.4% coverage of Pentavalent-2 and 86.6% of Pentavalent-3.Coverage for OPV doses was 93.3%,90.4%, 86.6% for OPV 1, OPV 2, OPV 3 respectively. The lowest coverage was observed for measles vaccine i.e. 73.3%. (Table1)

The highest dropout rate is observed in BCG to Measles i.e. 26.1 (overall), the dropout rate of BCG to measles is higher among females (27.7) as compared to male (24.5).The lowest dropout rate was observed for Penta-1 to Penta-3 and OPV 1 to OPV 3 that is 9.54 and 10.1 respectively and there was no gender wise difference observed. (Table 1)

At large the most common reason of partial/un immunization was lack of information (78.57%) about immunization, followed by obstacles (37.14%) and lack of motivation (15.71%). Individually the most common reason was unaware of need of immunization (32), followed by child was ill (19) and fear of adverse reaction (16).(Table 3)

When it comes to assess the proper counseling regarding four key messages, it shows poor result, only 28% mothers were given all four key messages of immunization. (Table 4)

DISCUSSION

Immunization of children is an integral part of maternal and child health programme since adoption of primary health care services in India. Immunization coverage is gradually increasing but still the desired level is not achieved. This happen mostly because the rate of change in vulnerable area is still a slow process. Also there is urban –rural difference and inter district difference in vaccination coverage.

In present study we try to find out the immunization coverage of urban slums area of study area and various factors which affect the immunization status.

The study shows that 93.3% of children were having mamta card (immunization card). According to finding of NFHS-4 survey of Gujarat [4] only 50 percent children had immunization card. Govani K J et al [8] in Ahmedabad and Seth J K et al [9] in Gandhinagar also found the presence of card more than NFHS-4 survey finding

In present study out of total 210 children about 67% children were fully immunized, 33% partially immunized and around 3% un immunized. According to NFHS -4 survey done at Gujarat, the proportion of fully vaccinated children in urban area are 50.4% which is less than present study but district fact sheet of Jamnagar (2015-16) [10] shows the similar result. In a study by sudip Bhavsar et al [10] in same district, he found 85% children were fully immunized and 15% partially immunized which is more than present study. A M Kadri et al [112] and Govani K J et al [8] in their study in Ahmedabad found similar result.

When we see the coverage of individual vaccine the finding of NFHS-4 (2015-16) revealed that in Gujarat urban area the coverage of BCG vaccine

(90%), 3 doses of Polio vaccine(61.5%%), 3 doses of DPT (77.6%), measles vaccine (76.7%) were less as compared to present study finding for all except measles vaccine.

Jamnagar district fact sheet (2015-16) for urban area found similar result to Gujarat NFHS-4 survey

For all the vaccine dropout rate was 10 percent or more than 10%. It was highest for BCG-Measles. This highlight the need of preparing due list and following it during session along with higher and effective use of E-MAMTA.

A M Kadri et al [12] in Ahmadabad observed the dropout rate of 13.9% from BCG to measles and DPT 1 to measles. Dropout rate of DPT 1 to DPT 3 and OPV1 to OPV 3 were 4.3% and 2.6% respectively. This was found to be less than present study. Seth J K et al [9] in his study conducted in Gandhinagar also observed the low drop our rate as compared to present study. The dropout rate for BCG TO measles vaccine was 10.9%, then DPT 1-DPT3 7.53 and OPV1 TO OPV 3 was 6.63.

Maternal education, high birth order and low socioeconomic status were seen as highly significant association with child immunization status of child. Gender and religion were not found to be associated with immunization status in present study.

Devasenapathy N et al [13] in Delhi found the similar result compared to our study, she found that odds of having fully immunized is more mother of higher education and higher social quintile

Kumar D et al[14] in Delhi also found maternal education a important determinant of immunization status ($p<0.05$).

High birth order of child is a important determinant of immunization status of child, directing the sensitization of community for the need of family planning. Study conducted in same district by Dindod S et al [15] (2013) also found a association between birth order and immunization status. She found that higher birth order children were less immunized and the association was significant.

A M Kadri et al [12] and Govani K J et al [8] also didn't found any association between gender and immunization status.

The most frequent cause of for partial and un immunization were lack of information (78.57%) for immunization, followed by obstacles (37.14%) and lack of motivation (15.71%).

Govani K J et al [8] also found that unawareness is major cause of partial/un immunization similar to our study in Ahmedabad, the other reasons he found were off place (20%), and sick child (20%).similar result are documented in other study also in which unawarenss was documented as single most important factor affecting immunization (Mahyavanshi DK et al [16] and Kumar S et al [17]. It emphasizes the need of sustained contact between health worker and mother by arranging mothers meeting at regular meeting.

In Mission Indradhanush there is introduction of properly implementation of four key messages to each and every mother after vaccination of child but the study reveal that only 28 percent mother were aware about timing of next visit, why the vaccine is given, what will be the possible minor side effect and how to deal them and keep immunization card safe. It reveal that still there are communication gap between health worker and parents, so there is need to sensitize the health worker to give proper and timely information to the parents, so that no child is spared because of misconception or ignorance.

ANMs / AWWs play a very important role in the utilization of services. However, emphasis should be on improving the knowledge of community i.e. intensification of IEC, so that center based services can be promoted which helps in improving the quality of services.

CONCLUSION

Low coverage of immunization can be overcome by generating awareness among the community by holding mothers meeting and extensive social behavior change communication programme, inviting opinion and suggestion from them, and enhancing community participation. In addition to that text messaging as reminder and incentivized immunization services are some of the methods that can be explored. There should be Coverage surveys on a periodic basis to check the effectiveness of measures undertaken to improve the coverage and to reduce the drop out rate Improvement should focus on bottleneck by reducing the dropout rate from BCG-Measles and BCG-Pentavalent 3 as the dropout rate is more than 10% and improving the coverage of measles which is least compared to other vaccine.

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