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Assessment of immunization coverage among under-five year old children residing in slum settlements in an urban area in coastal Karnataka

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ABSTRACT

Background

National Family Health Survey conducted in the year 2005-6 reported that only 43.5 % of under five year old children are fully immunized in India. Various studies have shown that coverage of immunization among under five year old children living in urban slums is lesser then the national average which makes them susceptible to the various vaccine preventable diseases.

Objectives

To ascertain the coverage of immunization and determinants of its uptake among under five year old children residing in slums of Udupi taluka, Karnataka.

Material and Methods

This study was conducted in the slum settlements of Udupi taluka in Udupi district of Karnataka state. A community based descriptive cross sectional study design was used in the present study. The total number of under five year old children studied was 267 and they were selected by convenience sampling. Information on immunization was obtained from mother, father or any other care giver of child with the help of a pretested semi-structured questionnaire. Data was analysed using SPSS version 15. Proportion of children who were immunized fully, partially or not immunized at all was calculated. Chi-square test was performed to ascertain the factors associated with uptake of immunization by the under five year old children.

Results

It was found that the proportion of under- five year age children that were immunized fully, partially & not immunized at all was 64.8%, 31.5% & 3.7% respectively. In bivariate analysis, family income(p=0.002), variables related to maternal health care like utilization of Thayi card(p=0.002), availing antenatal care(p=0.043) and postnatal care(p=<0.001), tetanus toxoid immunization status of the mother(p=0.034), mother's participation in meeting conducted by AWW/ASHA(p=<0.001) along with place of delivery of the child(p=0.009) and birth order(p=0.048) was associated with immunization status of the children.

Conclusions

Immunization coverage amongst the under-five year old children living in slum settlements is low. Promoting utilization of maternal health care by the pregnant women residing in slum settlements has the potential to increase the coverage of childhood immunization amongst the children residing there.

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INTRODUCTION

Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and it is estimated to avert between 2 and 3 million child deaths each year.[1] Routine immunization is considered as the most cost effective Public Health interventions and was first introduced in India in the year 1978.[2] National family health survey conducted in the year 2005-2006 reports that only 43.5% of children below the age of five years are completely vaccinated.[3] Further analysis of this data by the Urban Health Resource Centre finds that the proportion of under-five year age children among the urban poor who were fully immunized was 39.9 %.[4]

In 2001 the estimated slum population in India was 43 million which more than doubled by the year 2011.[5] Various studies have documented the poor health status of slum dwellers especially children.[6,7] A study by Shrivastava et al found that the diarrhoea and upper respiratory infection were the most common morbidities among under five year old children residing in the slums of Etawah district in Uttar Pradesh.[8] A review by Awasthi S and Agarwal S has found that diarrhoea, fever and pneumonia are the most common morbidities amongst children living in slum settlements in India and affect a considerable proportion of children living there.[9] These studies point towards the grave magnitude of vaccine preventable diseases amongst under-five year age children living in slum settlements in India. This calls for estimating the coverage of childhood immunization among the under-five year old children living in slum settlements in India and understanding the factors associated with its uptake .Therefore the present study was conducted to estimate the coverage of immunization among under-five year old children living in slum settlements of Udupi taluka in Udupi district of Karnataka and ascertain factors associated with its uptake.

SUBJECTS AND METHODS

The present study was conducted in slum settlements in Udupi Taluk, Karnataka during the period of March-August 2013. This study was conducted amongst caregivers of children in the age group 9-59 months using a community based cross sectional study design. Convenience sampling method was used to select study subjects as sampling frame for the study was not available. The sample size for the study was 267, this calculation was based on allowable error (d) of 6%, confidence interval of 95% and estimated proportion 50%. A pretested semi-structured questionnaire was used to collect data for the study and its contents were socio-demographics characteristics of the study subjects, characteristics related to maternal health care, vaccines received by the child till date and reasons for partial or no immunization of the child. The investigator tried to verify information about immunization of the child given by the respondent with the help of immunization card, if available. Immunization with BCG vaccine was confirmed by presence of scar on child's arm. Children who received three doses of DPT, Hep B and OPV (excluding polio 0) and one dose of BCG and Measles by the age of nine months were considered as fully immunized. A child who missed any dose of the vaccines mentioned above was considered as partially immunized and child who didn't receive single dose of a vaccine mentioned above except during pulse polio campaign was considered as not immunized. Ethical approval for the study was obtained from institutional ethics committee of the Institution. Written informed consent was obtained from all the study subjects. Data analysis was done using SPSS version 15. Proportion of children who were immunized fully, partially or not immunized at all was calculated. Chi-square test was used to find factors associated with immunization status of the under five year old children.

RESULTS

In the present study majority (97%) of the respondents were mother of the under-five year old child. With regard to educational status it was found that most of the respondents were illiterate (70.9%). The occupation followed by majority of the respondents was being housewife (49.8%) followed by coolie (47.2%). It was found that fifty percent respondents reported a monthly income of more than INR 5000. With regard to the type of family

majority of the respondents were living in joint family. In this study the proportion of male children was higher as compared to female children. The age distribution of children in the study revealed that almost fifty percent (49%) of the children were in the age group of 12-35 months.

Table 1 Distribution of Socio-Demographic Characteristics of the Respondents (n=267)

Variables	N (%)
Respondent's relation with child	
Mother	259 (97.0)
Father	3 (1.1)
Care Taker	5 (1.9)
Age of the Mother (years)	
≤ 20	47 (17.6)
21-25	131 (49.1)
26-30	78 (29.2)
>30	11 (4.1)
Family Type	
Nuclear	223 (83.5)
Joint	44 (16.5)
Monthly family income (Rs.)	
≤5000	151 (56.6)
5001-10000	108 (40.4)
>10000	8 (3.0)
Education status of Mother	
Illiterate	189 (70.9)
Primary	57 (21.3)
Secondary	19 (7.1)
PUC & Above	2 (0.7)
Occupation of Mother	
Housewife	133 (49.8)
Coolie	126 (47.2)
Fishery	6 (2.2)
Others	2 (0.8)
Sex of the child	
Male	149 (55.80)
Female	118(44.20)
Age(in months) of the child	
< 12	37 (13.9)
12-23	61 (22.8)
24-35	70 (26.2)
36-47	50 (18.7)
48-60	49 (18.4)
Birth order of the child	
1st	104(39.0)
2nd	91(34.0)
3rd & above	72(27.0)

Place of delivery of the child	
Health facility	206(77.16)
Home	61(22.84)

It was found that 64.8 % of the under-five children in this study were fully immunized while the proportion of children who were partially immunized and not immunized was 31.46 % and 3.74 % respectively. This study found that coverage with BCG vaccine was 94.4%. The coverage of three doses of DPT, Oral Polio and Hepatitis B vaccine was found to be 76 % whereas coverage for measles vaccine was 77.2 %.

Table 2 Immunization Coverage with Different Vaccines

Vaccine	Yes N (%)	No N (%)
BCG	252(94.4)	15(5.6)
Scar	248 (92.9)	19(7.1)
DPT_3	203(76.0)	64(24)
$HEPB_3$	203(76.0)	64(24)
OPV_3	203(76.0)	64(24)
Measles	206(77.2)	61(22.8)

This study found that family income(p=0.002), variables related to maternal health care like utilization of Thayi card(p=0.002), availing antenatal care(p=0.043) and postnatal care(p=<0.001), tetanus toxoid immunization status of the mother(p=0.034), mother's participation in meeting conducted by AWW/ASHA(p=<0.001) along with place of delivery of the child(p=0.009) and birth order(p=0.048) were associated with immunization status of the under-five year children.

Table 3 Association Between the Immunization Status of the Child and the Socio-Demographic Variables and Variables Related to Maternal Health Care Utilization

Variables	Immunization Status		p- value
	Fully immunized N (%)	Partially or not immunized N (%)	
Mother's Age (Yrs.)			
≤ 20	27(57.4)	20 (42.6)	.345 Pearson Chi-Square
21-25	90 (68.7)	41 (31.3)	
≥ 26	56 (62.9)	33 (37.1)	
Education of mother			
No education	117 (61.9)	72 (38.1)	.306 Pearson Chi-Square
Primary	41 (71.9)	16 (28.1)	
Secondary & above	15 (71.4)	6 (28.6)	
Others	12 (63.2)	7 (36.8)	
Occupation of mother			
Housewife	79 (59.8)	53 (40.2)	.094 Pearson Chi-Square
Others	94 (69.6)	41(30.4)	
Skilled	8 (44.4)	10 (55.6)	
Monthly income of family (Rs.)			
<2000	12 (42.9)	16 (57.1)	.002 **

2000-5000	74 (60.2)	49 (39.8)	Pearson Chi-Square
>5000	87 (75)	29 (25)	
Mother possessing Thayi card during pregnancy			
Yes	157 (68.6)	72 (31.4)	
No	16 (42.1)	22 (57.9)	.002**
ANC visits			
Yes	173 (65.5)	91 (34.5)	.043*
No	0 (0)	3 (100)	Fisher exact
TT immunization			
Yes	172 (65.6)	90 (34.4)	.034*
No	1 (20)	4 (80)	Fisher exact
Place of delivery			
Health facility	142 (68.9)	64 (31.1)	.009**
Home	31 (50.8)	30 (49.2)	
Number of PNC visits			
No visits	30 (41.7)	42 (58.3)	.000***
One visit	111 (73)	41 (27)	
Two or more visits	32 (74.4)	11 (25.6)	
Birth order			
1st	61 (58.7)	43 (41.3)	.048*
2nd	68 (74.7)	23 (25.3)	
3rd & above	44 (61.1)	28 (38.9)	
Mother possessing immunization card at time of interview			
Yes	52 (81.2)	12 (18.8)	.002**
No	121 (59.6)	82 (40.4)	
Mother's participation in meeting conducted by ASHA/AWW			
Yes	68 (80)	17 (20)	.000***
No	105 (57.7)	77 (42.3)	

** =p ≤0.05, ** = p ≤.01, *** =p ≤ .001*

DISCUSSION

In the present study it was found that the proportion of children who were fully, partially and unimmunized was 64.8%, 31.5% & 3.7 %. It was found that socioeconomic variables like family income, variables related to maternal health care utilization like possession of Thayi card, availing antenatal and postnatal care, and birth order of the child were associated with uptake of immunization by the under-five year old child.

The immunization coverage estimated in the present study is similar to estimates from studies conducted by Kusuma et al and Odusanya et al.[10, 11] However, studies conducted by Kadri et al, Kar et al reported higher coverage of immunization as compared to present study.[12,13] Further, some studies have estimated a lesser immunization coverage than our study like those conducted by Mutua et al and Jain et al.[14,15] The present study found statistically insignificant association between sex of the child and immunization uptake , similar finding was reported by a study conducted by Odusanya et al.[11] However, a study conducted by Mutua et al found this association statistically significant.[14] This study found that association between birth order of the child and immunization uptake was statistically significant. This is similar to the study conducted by Mutua et al.[14]

Antenatal care service utilization by the mother of the children studied was found to have statistically significant association with uptake of immunization by them. Studies conducted by Kusuma et al , Mutua et al, and Koumare et al have reported similar findings.[10, 14, 16] This study found that the delivery of child in a healthcare institution was having a

statistically significant association with uptake of immunization by under-five year old children which might be due to mother's interaction with healthcare system if she delivers in a healthcare facility and this might promote future healthcare seeking for her children.[17] The studies conducted by Kusuma et al and Mutua et al have reported similar findings.[10,14] This study found that association between caregiver possessing immunization card of the child and immunization uptake by the child was statistically significant. Similar finding is reported by Odusanya et al' and Kulkarni et al.[11, 18]In this study the investigator found that immunization cards were not available with majority of respondents making the verification of information provided by them difficult but other ways of verification were tried like looking for scar of BCG vaccination. This study found that coverage of immunization amongst under-five year old children was low living in slum settlement of Udupi taluka is lower than estimates for immunization coverage arrived by District Level Household Survey round 4 conducted in the year 2012-13 for Udupi district and Karnataka state.[19, 20] This study finds that enhancing the utilization of maternal health care could lead to increased immunization coverage amongst the under-five children.

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