Research Article

Effect of sociodemographic factors on age-appropriate immunization of children in slums of Lucknow, capital of Uttar Pradesh

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Received April 10, 2016. Accepted April 28, 2016

Abstract

Background: Developing countries like India are presently developing new strategies to increase immunization coverage and reach more children with quality vaccine. Children in urban slums have high vulnerability to illnesses as outbreak of vaccine-preventable diseases are more common in these communities, owing to high population density and migratory population.

Objective: To assess the immunization coverage and various sociodemographic factors affecting the same in urban slums of Lucknow.

Material and Methods: A community-based cross-sectional study was conducted in slums of Lucknow city from August 2014 to July 2015. A total 327 children in age group 9 months to 2 years were enrolled in the study and their mothers (or primary caregivers) were interviewed through house-to-house survey with the help of a predesigned, pretested and semi-structured questionnaire.

Results: About one-fourth (24.1%) of the children were completely immunized and 32.4% were partially immunized, while 43.4% were unimmunized. Significant association was found between mother's occupation (p = 0.000), mother's educational status (p = 0.013), and father's educational status (p = 0.023) with immunization status of children.

Conclusion: In this study, overall coverage of immunization was suboptimal in slums. So, there is an urgent need to review the current strategies of immunization with special focus in urban slums.

KEY WORDS: Immunization coverage, partial immunization, slums

Introduction

Immunization is the process of artificially inducing immunity for protection from diseases. This may be done either by stimulating the body's immune system with a vaccine or toxoid to produce antibodies or through the use of an externally produced antibody. The WHO launched the Expanded Programme on Immunization in 1974 with focus on prevention of the six vaccine-preventable diseases by universal immunization.[1] This was endorsed by the Government of India in 1978 with the objective of reducing morbidity, mortality, and disabilities occurring due to these diseases by providing free immunization services to all eligible children. Further, a national sociodemographic goal was set up in National Population Policy (NPP) 2000 to achieve universal immunization of children against all vaccine-preventable diseases by 2010.[2] Urban population in India has increased with a growth rate of 31.8% in the last decade in comparison to 12.3% in rural areas. According to the Census 2011, 65.4 million people are living in slums in India, whereas the

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2016.10042016453	

figure was 45 million during 2001 census.[3] The most cost-effective and easy method for the child survival by preventing infectious diseases is immunization.[4] National Family Health Survey (NFHS) III has shown that only 40% children are completely immunized in slums leaving others vulnerable to various diseases.[5]

Therefore, it is necessary to understand the pattern of utilization of immunization services by the community especially with respect to immunization services. Thus, the present cross-sectional study was undertaken to assess the immunization coverage, and to find out the various reasons responsible for the suboptimal coverage of immunization in the urban slums of Lucknow.

Material and Methods

Study Setting

The study was conducted in slums of Lucknow, capital of Uttar Pradesh.

Study Design

Community-based cross-sectional study.

Study Population

The present study was conducted among children of age group 9 months–2 years, residing in urban slums of Lucknow city.

Study Unit

Children in age group 9 months–2 years.

Duration of Study

The study was completed during the period from August 2014 to July 2015.

Sampling Technique

A total 327 children in the age group of 9 months–2 years were enrolled in the study via multistage sampling. Urban area of Lucknow has six municipal corporation zones. Out of these six zones, four zones were selected by random sampling method. From each selected zones, two wards were selected by simple random sampling method. Thus, total 8 wards were selected. From each selected ward, two slums were selected by simple random sampling method. Thus, a total 16 slums were selected from urban area. Equal number of children in the age group of 9 months–2 years was selected from these slums.

Data Collection Methods

A pretested structured questionnaire was used to collect the information from the study participants. Information was collected on the various sociodemographic factors, about the immunization status, and reasons for partial immunization and nonimmunization of the children. The vaccination card and the recall method were used for the determination of the vaccination status. Mother of the child was the primary respondent; and in their absence, the child's father was interviewed as the next respondent. When both of them were absent, most adult person in the household was interviewed.

Operational Definitions

Completely Immunized:

An infant who has received all vaccinations recommended under National Immunization Schedule appropriate to his/her age.[6]

Partially Immunized

An infant who has received at least one or more of vaccinations recommended under National Immunization Schedule appropriate to his/her age.[6]

Unimmunized

An infant who has not received any vaccination recommended under National Immunization Schedule appropriate to his/her age.[6]

Data Management

The information collected on the study schedule was transferred on the pre designed classified tables and analyzed according to the aims and objectives.

Results

One-fourth (24.1%) of the children studied were fully immunized while the proportions of those with partial or nonimmunization status were about 32.4% and 43.4%, respectively (Table 1).

It was found that OPV-0 and BCG had the maximum coverage of 59.6% and 58.4% followed by DPT-1(48.3%) and OPV-1(49.5%). The coverage for measles vaccine (31.8%) and vitamin A (26.9%) was lowest among all the vaccines. The dropout from OPV I to III was 25.1% followed by DPT I to III and Hep B I to III (28.4% and 26.8%, respectively). The dropout rate from Hep B III to measles was 28.2% (Table 2).

One-fourth of Hindu (26.3%) and one-fifth (20.4%) of Muslim children were immunized. The association between religion and immunization status was found to be statistically

Table 1: Primary immunization status of children (9 months–2 years) (N = 327)

Immunization status	Number	Percentage
Fully immunized	80	24.1
Partially immunized	106	32.4
Unimmunized	143	43.4

Table 2: Coverage of individual vaccines of children (9 months–2 years) (N = 327)

Vaccine	Number	Percentage
BCG	191	58.4
OPV-0	195	59.6
DPT-1	158	48.3
OPV-1	162	49.5
Hep B-1	145	44.3
DPT-2	140	42.8
OPV-2	141	43.1
Hep B-2	132	40.3
DPT-3	113	34.5
OPV-3	114	34.8
Hep B-3	106	32.4
Measles	104	31.8
Vit A-1	88	26.9

nonsignificant. About one-fifth of the children in both joint family and nuclear family were completely immunized (24.2% and 24.5%, respectively). The association between type of family and immunization status was found to be statistically insignificant. Children who belonged to middle socioeconomic status (Modified Kuppuswami Socioeconomic Scale 2014) were 30.0% immunized, while it was quite lower in lower socioeconomic group (23.3%). The association between socioeconomic status and immunization status was found to be statistically insignificant. Only 22.4% of the children who belonged to illiterate mothers were fully immunized, while 40%children of mothers who were educated up to high school level were immunized. The proportion of immunized children increased and unimmunized decreased as we moved from illiterate to those with higher education. It shows a significant association between the immunization status and mother's education. Children belonged to

Table 3: Association between biosocial characteristics of families and routine immunization (N = 327)

Biosocial characteristics		Routine immunization (children of 9 months–2 years)			
		Total	Fully Immunized (n = 80)	Not immunized/ Partially immunized (n = 247)	p value
Religion	Hindu	228	60[26.3%]	168[73.7%]	0.476
	Muslim	98	20[20.4%]	78[79.6%]	
	Sikh	1	0[0%]	1[100%]	
Type of family	Joint	107	26[24.2%]	81[75.8%]	0.544
	Nuclear	220	54[24.5%]	166[75.5%]	
Socioeconomic status#	Upper middle	2	1[50%]	1[50%]	0.569
	Middle	38	11[28.9%]	27[71.1%]	
	Lower middle	148	38[25.6%]	110[74.4%]	
	Lower	138	29[21.01]	109[79.0%]	
Mother's education	Illiterate	254	57[22.4%]	197[77.6]	
	Up to Primary school	66	20[30.3%]	46[69.7%]	
	Up to High school	5	2[40%]	3[60%]	**0.013***
	Intermediate & above	1	0[0%]	1[100%]	
Father's education	Illiterate	216	44[19.9%]	172[80.1%]	
	Up to Primary school	43	18[41.8%]	25[58.2%]	**0.023***
	Up to High school	61	15[24.5%]	46[75.5%]	
	Intermediate & above	7	3[42.8%]	4[57.2%]	
Mother's occupation	Unemployed/Housewife	176	25[14.1%]	151[85.9%]	**0.000***
	Employed	151	55[36.4%]	96[63.6%]	
Father's occupation	Unemployed	3	0[0%]	3[100%]	
	Unskilled	220	49[22.2%]	171[77.8%]	0.325
	Semi-skilled	91	26[28.5%]	65[71.4%]	
	Skilled	13	5[38.4%]	8[61.6%]	
Gender of the child	Male	168	44[26.2%]	124[73.8%]	
	Female	159	36[22.6%]	123[77.2%]	0.300
Birth order	1	89	24[26.9%]	65[73.1%]	
	2	109	32[29.3%]	77[70.7%]	0.124
	3	80	19[23.5%]	61[76.3%]	
	>3	49	5[10.2%]	44[89.8%]	

Modified Kuppuswami Socioeconomic Scale 2014.
*$p < 0.05$, significant.

illiterate fathers were 19.9% immunized and 42.8% whose fathers have up to intermediate education. The proportion of immunized children increased and unimmunized children decreased as we moved from illiterate to higher education. It shows a significant association between the immunization status and father's education. Children belonged to unemployed mothers were 25.5% immunized. Significant association was found between the immunization status and mother's occupation. About 22.6% of the male children and 22.6% female children were immunized. The association between sex and immunization status was found to be statistically insignificant. Children belonged to first birth order were 26.9% immunized and 10.2% in more than third birth order. The association between birth order and immunization status was found to be statistically insignificant (Table 3).

Discussion

Proper immunization is believed to be the most cost-effective way in preventing majority of morbidities and mortalities attributed to vaccine-preventable diseases. Therefore, the study was conducted to ascertain various sociodemographic factors associated with immunization. The current study revealed that despite intense immunization activities, age-appropriate immunization status of children was far from complete. Only one-fourth (24.1%) of the children were fully immunized, whereas majority were found to be partially immunized (32.4%) or unimmunized (43.4%) in the study. The findings are quite similar to the surveys conducted in slums at national level.[7] A study conducted by Gill et al.,[6] also reported similar type of findings. However, figures were much lower as compared to the studies conducted in Punjab (80%),[8] Karnataka (79.5%),[9] and Jamnagar.[10]

Among various sociodemographic factors on age-appropriate immunization, significant association was found between educational status of parents and immunization status. Parents of the majority of partially immunized or unimmunized children were illiterate. Similar findings were also reported by Baliga et al.,[9] and Gill et al.,[6]. Contradictory to the general perception, there was no significant difference in immunization status between male and female children. Similar findings were also reported in other studies.[6,11] Occupation of mother had significant effect on immunization status of the children. Mothers of the majority of unimmunized/partially immunized children were unemployed. In paradox to the studies conducted in other parts of India, this study shows significant association between occupation of the mother and immunization status of the children.[6,9,12]

Unlike various other studies conducted in different part of country,[13–15] this study does not find significant association between socioeconomic status, birth order, type of family, and religion with immunization status of children.

Conclusion

Consistent efforts are needed especially in slum population so that immunization coverage could be achieved to the desired level. Implementation of current strategies in a more strengthening way could optimize the immunization services in the increasing population of slums. There is a need for developing more effective strategies specially focusing on less educated parents, hence increasing their awareness regarding health-care services including immunization.

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How to cite this article: Verma N, Singh JV, Kumari R, Agarwal M, Verma A, Shukla M. Effect of sociodemographic factors on age-appropriate immunization of children in slums of Lucknow, capital of Uttar Pradesh. Int J Med Sci Public Health 2016;5:2264-2268

Source of Support: Nil, **Conflict of Interest:** None declared.