

Determinants of Immunization Coverage in Lucknow District

Pratibha Gupta, Daya Prakash, Jyoti Prakash Srivastava

Department of Community Medicine, Era's Lucknow Medical College, Lucknow, Uttar Pradesh, India

Abstract

Background: Immunization remains one of the most important public health interventions and a cost-effective strategy to reduce both the morbidity and mortality associated with infectious diseases. Over two million deaths are delayed through immunization each year worldwide. **Aims:** This study sought to identify specific factors associated with immunization coverage in order to advance improved intervention, policies/strategies therefore raising overall immunization coverage. **Materials and Methods:** A cross-sectional study was conducted among a total of 198 children aged 12-23 months at Urban Health and Training Centre (UHTC), Era's Lucknow Medical College, Lucknow, over a period of 6 months i.e., from July 2012-December 2012. Data were collected, compiled and tabulated using Microsoft Excel and analyzed using SPSS 17.0 version. **Results:** A total of 198 children of age 12-23 months were included in this study, of which 74.7% of children were fully immunized, 11.1% were partially immunized and 14.1% were not immunized at all. The most common reason for partial or non-immunization was family problems (24%) of the respondents followed by lack of knowledge of immunization (20%), and fear of side effects (16%). The odds of risk of partial/non-immunization in illiterate women is 5.78 more than the graduate women ($P = 0.039$). **Conclusions:** Although in the present study, majority of the children were immunized, it is still not up to the mark. We have to make it 100%, so that we can reduce mortality due to vaccine-preventable diseases. Increasing awareness and reducing fear of side effects of immunization among parents through health education, counseling, etc. can increase the percentage of immunized children.

Keywords: Children, Determinants, Immunization, Mothers, Urban areas

Address for correspondence: Dr. Pratibha Gupta, 5/351, Viram Khand - 5, Gomtinagar, Lucknow-226 010, Uttar Pradesh, India.
E-mail: pratibha_jayant@yahoo.co.in

Introduction

Immunization remains one of the most important public health interventions and a cost-effective strategy to reduce both the morbidity and mortality associated with infectious diseases. Over two million deaths are delayed through immunization each year worldwide.^[1] Despite this, vaccine-preventable diseases remain the most common cause of childhood mortality with an estimated three million deaths each year.^[2] Uptake of vaccination services is dependent not only on provision of these services, but also on other factors including knowledge and attitude of mothers.^[3,4]

According to the Global Routine Vaccination Coverage (GAVI) 2010, about 19.3 million children were not fully vaccinated and remained at risk for diphtheria, tetanus and pertussis, and other vaccine-preventable causes of morbidity and mortality, and about 50% of these children are from India, Nigeria, and Congo.^[5] The most important indicators mentioned in the Millennium Development Goals (MDGs) are the under-5 mortality rate (U5MR), infant mortality rate (IMR) and proportion of 1-year-old children immunized against measles (P1MV). About one-quarter, or 25%, of under-5 mortality is due to vaccine-preventable diseases.^[6]

The World Health Organization (WHO) launched the Expanded Program on Immunization (EPI) in 1974 globally with the focus on prevention of the six childhood vaccine-preventable diseases by the year 2000. This was endorsed by the Government of India in 1978.^[7] Later, on November 19, 1985, the Universal Immunization Program (UIP) was introduced in India with the objective to cover at least 85% of all infants by 1990.^[8]

Access this article online

Quick Response Code: 	Website: www.najms.org
	DOI: 10.4103/1947-2714.152076

Further, a national socio-demographic goal was set up in National Population Policy (NPP) 2000 to achieve universal immunization of children against all vaccine-preventable diseases by 2010.^[9] In addition, evaluation of immunization coverage provides evidence whether substantial progress toward achieving vaccination targets is being made. Such positive evidence is required for continuing support from donor supported initiatives like the Global Alliance for Vaccines and Immunizations (GAVI).^[10]

The current study seeks to determine whether the situation has improved since and to more fully identify risk groups and reasons for under-immunization. This study sought to identify specific factors associated with immunization coverage in order to advance improved intervention, policies/strategies and therefore raising overall immunization coverage.

Materials and Methods

The present study is a cross-sectional study conducted among children aged 12-23 months at Urban Health and Training Centre (UHTC), Era's Lucknow Medical College, Lucknow, for a period of six months i.e., from July 2012 to December 2012.

Sampling technique

The present study was conducted during July 2012 -December 2012. A total of 198 children aged 12-23 months attending outpatient department (OPD) at Urban Health and Training Centre (UHTC), Era's Lucknow Medical College, Lucknow were included in the study. This study was conducted after the ethical clearance from the ethical committee of Era's Lucknow Medical College, Lucknow.

Tools of data collection

The investigating tool used is a preformed, pretested questionnaire. Questions regarding biosocial characteristics and immunization status of the children were asked from the mother accompanying the child. In case the mother was not present, then any other person accompanying the child was interviewed regarding biosocial characteristics and immunization status. As this study was conducted among mothers attending OPD at urban health center, so the immunization status was determined on the basis of mother's recall and record at the urban health center. Definitions of key indicators were taken from NFHS-3, India.

Statistical analysis

Data were collected, compiled and tabulated using Microsoft Excel and analyzed using SPSS 17.0 version

for calculation of percentages, and Chi-square test was applied to find out various statistical associations.

Results

A total of 198 children of 12-23 months of age were included in this study of which 100 were males and 98 were females. Total 80.8% of children were Muslims and 19.2% were Hindus. In all, 76.8% of children belonged to nuclear families and 23.2% belonged to joint families. Parents of most of the children were educated. Only 37.4% of fathers and 22.2% of mothers were illiterate [Table 1].

Among immunized children, majority (83.8%) of the children were delivered at government/private hospital and only 16.2% of the children were delivered at home [Table 2].

Immunization status was ascertained by mother's recall accompanying the child. In present study 74.7% of children were fully immunized, 11.1% partially immunized and 14.1% were not immunized at all. The

Table 1: Socio-demographic characteristics of children between 12-23 months

Variables	No. (198)	% (100)
Religion		
Hindu	38	19.2
Muslim	160	80.8
Type of family		
Nuclear	152	76.8
Joint	46	23.2
Gender		
Male	100	50.5
Female	98	49.5
Father's education		
Illiterate	74	37.4
Primary/Junior	38	19.2
Secondary	74	37.4
Graduate and above	12	6.1
Mother's education		
Illiterate	44	22.2
Primary/Junior	60	30.3
Secondary	84	42.4
Graduate and above	10	5.1
No. of living children within the family		
1-3	140	70.7
4 and above	58	29.3

Table 2: Place of birth

Place	No. (198)	(%)
Govt./Private hospital	166	83.8
Home	32	16.2

percentage of non-immunized children were more among female children (20%) [Table 3].

Most common reason for partial or non-immunization was family problems (24%) of the respondents followed by unawareness of immunization (20%), and fear of side effects (16%). Other reasons were child too young for immunization, illness of child and parents have no faith in immunization (12%) [Table 4].

The odds of risk of partial/non-immunization in illiterate women is 5.78 more than the graduate women ($P = 0.039$). The odds of risk of partial/non-immunization of the families having 4 or more children are 6.074 more than the families having 1-3 children ($P < 0.0001$). The odds of risk of partial/non-immunization is 45.818 in home deliveries than in institutional deliveries ($P = 0.0001$) [Table 5].

Discussion

In present study, we have tried to find out various reasons responsible for partial or non-immunization and compared it with findings of various other studies. In the present study, 74.7% of children were fully immunized, 11.1% partially immunized and 14.1% were not immunized at all. In a study by Nath *et al* in Lucknow,^[11] only 44.1% of children were completely immunized, which is way less than observed in our study. In a study by Joshi *et al.*,^[12] in Bareilly district, only 50% were fully immunized and 22.5% were non-

Table 3: Immunization status of children between 12-23 months

Immunization status	No. (198)	% (100)
Fully immunized	148	74.7
Partially immunized	22	11.1
Not immunized	28	14.1

Table 4: Reasons for partial immunization and non-immunization of the children according to respondents

Reasons	Partial immunization/ Non immunization	No. (50) (%)
Child too young for immunization	6	12
Unawareness for immunization	10	20
Fear of side effects	8	16
Family problems	12	24
Place and time of immunization not known	2	4
Child was ill	6	12
No faith in immunization	6	12

immunized. In contrast to our findings, as per NFHS-III^[13] only 23% children were fully immunized in Uttar Pradesh and 33.6% were not immunized at all. Kar *et al.*,^[14] in their study in a slum of Delhi and Yadav *et al.*,^[15] in the state of Madhya Pradesh reported a higher percentage (above 60%) of fully immunized children, which is similar to our study.

In the present study, the most common reason for partial or non-immunization was family problems (24%) of the respondents followed by unawareness of immunization (20%), and fear of side effects (16%). Other reasons were child too young for immunization, illness of child, and parents having no faith in immunization (12%). In a study by Joshi *et al*,^[12] important reasons for non-immunization were lack of awareness in both the urban (28.6%) and rural (78.6%) areas and lack of availability of services in rural areas (87.2%). In a study by Nandan *et al.*,^[16] and Chaturvedi *et al*,^[17] non-availability of services was reported to be the single most common reason for non-immunization.

According to another study by Nath *et al*,^[11] the commonest reason for the partial immunization of the child was the unavailability of both the parents (17.2%) to fulfill the child's health needs, as they were preoccupied in the livelihood-generation activities. This reflects the unmet needs of the community, which require organization of outreach services on fixed date and timing with prior information to the locality. Other reasons for partial immunization were missing of the dose due to visit to native place/village (14.7%) compared to 23.1% in the study done by Kar *et al*,^[14] carelessness (11.7%), apprehensiveness due to sickness of the child or an elder sibling as a result of vaccination (11.7%) and lack of knowledge (10.4% *vs.* 23.1% by Kar *et al*,^[14]).

In the present study, illiteracy was found to be significantly associated with partial or non-immunization. Similarly Nath *et al.*,^[11] also reported that illiteracy of the mother was significantly associated with partial immunization, and this has also been documented in other studies.^[18,19] Interestingly in this study, higher illiteracy rate in male compared to female was found, which seems to be unusual according to other studies in India.

Maina *et al.*,^[20] in their study found that maternal education was one of the factors that was significantly associated with immunization coverage. In Kaptombwo, the proportion of fully immunized children of mothers/guardians who had attained secondary school education and above was 81.6%, which is higher than those who had attained primary school education (76.7%) and even those with no formal education (42.9%). Previous studies have shown a significant association between

Table 5: Immunization status in relation to socio-demographic characteristics of the children

Variable	Fully immunized	Partially/Not fully Immunized	OR	95% CI		P value
	No. (%)	No. (%)		Lower	Upper	
Religion						
Hindu	32 (84.2)	6 (15.8)	Ref.			
Muslim	116 (72.5)	44 (27.5)	2.023	0.791	5.171	0.141
Type of family						
Nuclear	112 (73.7)	40 (26.3)	Ref.			
Joint	36 (78.3)	10 (21.7)	1.286	0.585	2.828	0.532
Father's education						
Illiterate	40 (54.1)	34 (45.9)	4.25	0.871	20.749	0.074
Primary/Junior	32 (84.2)	6 (15.8)	0.937	0.163	5.399	0.942
Secondary	66 (89.2)	8 (10.8)	0.606	0.112	3.272	0.561
Graduate and above	10 (83.3)	2 (16.7)	Ref.			
Mother's education						
Illiterate	18 (40.9)	26 (59.1)	5.778	1.096	30.447	0.039
Primary/Junior	50 (83.3)	10 (16.7)	0.8	0.147	4.343	0.796
Secondary	72 (85.7)	12 (14.3)	0.667	0.126	3.526	0.633
Graduate and above	8 (80.0)	2 (20.0)	Ref.			
No. of living children within the family						
1-3	114 (81.4)	26 (18.6)	Ref.			
4 and above	34 (58.6)	24 (41.4)	3.095	1.577	6.074	0.001
Place of birth						
Institutional deliveries	144 (86.7)	22 (13.3)	Ref.			
Home deliveries	4 (12.5)	28 (87.5)	45.818	14.658	143.219	<0.0001

immunization coverage and residing in an area with high levels of maternal/guardian education.^[21]

In the present study, children born at home were either non-immunized or partially immunized than those born in hospital. Similar findings were also observed by, Nath *et al.*^[11] Mothers who deliver at home may be non-users of health services in general and have to be targeted for utilization of health services. In a study in Kenya, Maina *et al.*,^[20] found that a child who was delivered in a health facility was 2.26 times more likely to receive full immunization compared to one delivered at home (by self) or by a traditional birth attendant. Other investigators have also found similar associations between the place of birth of the child and immunization.^[22] In the present study, high birth order is significantly associated with risk of partial or non-immunization. Similar findings were also observed by Nath *et al.*,^[11] in their study. In this study, participants have been recruited among health services users who have better vaccination status compared to the whole population. This was the limitation for the study as well for the comparability with population or community-based studies.

Conclusion

Although in the present study, a majority of the children were immunized, it is still not up to the mark. We have

to make it 100%, so that we can reduce mortality due to vaccine-preventable diseases. Increasing awareness and reducing fear of side effects of immunization among parents through health education, counseling, etc. can increase the percentage of immunized children. Making immunization services easily available to beneficiaries is again an important aspect for increasing immunization among children. There is need to strengthen communication, education and information skills of health workers to improve service provision and health education among mothers/guardians. The surveillance and referral systems in the area also need reinforcing so as to identify defaulters of immunization and reduce the drop-out rate.

Acknowledgment

We thank all the members of management committee and staff of Era's Lucknow Medical College, Lucknow, UP, India, and the patients attending OPD at UHTC for their support throughout the study.

References

1. World Health Organization (WHO). Immunization, vaccines and biologicals.
2. Centre for Global Development. Making Markets for vaccines: From ideas to actions. Washington DC: Centre for Global Development; 2005.

3. Matsumura T, Nakayama T, Okamoto S, Ito H. Measles vaccine coverage and factors related to uncompleted vaccination among 18-month-old and 36-month-old children in Kyoto, Japan. *BMC Public Health* 2005;5:59.
4. Torun SD, Bakirci N. Vaccination coverage and reasons for non-vaccination in a district of Istanbul. *BMC Public Health* 2006;6:125.
5. Centre for Disease Control and Prevention (CDC) Global Routine Vaccination Coverage, 2010. *MMWR Morb Mortal Wkly Rep* 2011;60:1520-2.
6. Kalaivani K, Mathiyazhagan T, Patro BC. Editorial. *News Lett Nat Inst Hlth Fam Welfare* 2006;8:1-2.
7. Park K. Principles of epidemiology and epidemiologic methods. *Text Book of Preventive and Social Medicine Jabalpur, India*; 2005. p. 103.
8. Chapter VI. Annual report. Ministry of Health and family Welfare: New Delhi; 1992-93. p. 2.
9. National Population policy 2000, Ministry of Health and Family Welfare. Government of India: New Delhi; 2000.
10. Brugha R, Starling M, Walt G. GAVI, the first steps: Lessons for the Global Fund. *Lancet* 2002;359:435-8.
11. Nath B, Singh JV, Awasthi S, Bhushan V, Kumar V, Singh SK. A study on determinants of immunization coverage among 12-23 months old children in urban slums of Lucknow district, India. *Indian J Med Sci* 2007;61:598-606.
12. Joshi HS, Gupta R, Singh A, Mahajan V. Assessment of immunization status of children between 12-23 months in Bareilly District. *Nepal J Epidemiol* 2011;1:47-50.
13. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS-3), 2005-06, India: Key Findings. Mumbai: IIPS.
14. Kar M, Reddaiah VP, Kant S. Primary immunization status of children in slum areas of South Delhi – The challenge of reaching the urban poor. *Indian J Community Med* 2001;26:151-4.
15. Yadav JR, Singh P. Immunization status of children and mothers in the state of Madhya Pradesh. *Indian J Community Med* 2004;29:147-8.
16. Nandan D, Dabral SB. Report-Multi Indicator Rapid Assessment Survey, Uttar Pradesh -District Etah, Mathura and Almorah Department of SPM, SN Medical College, Agra, 1995-96.
17. Chaturvedi M, Nandan D, Gupta SC. Rapid assessment of immunization practices in Agra District. *Indian J Public Health* 2007;51:132-4.
18. Singh P, Yadav RJ. Immunization status of children of India. *Indian Pediatr* 2000;37:1194-9.
19. Suresh K, Saxena D. Trends and determinants of immunization coverage in India. *J Indian Med Assoc* 2000;98:10-4.
20. Maina LC, Karanja S, Kombich J. Immunization coverage and its determinants among children aged 12-23 months in a peri-urban area of Kenya. *Pan Afr Med J* 2013;14:3.
21. Kamau N, Esamai FO. Determinants of immunization coverage among children in Mathare Valley, Nairobi. *East Afr Med J* 2001;78:590-4.
22. Jani JV, De-Schacht C, Jani IV, Bjune G. Risk factors for incomplete vaccination and missed opportunity for immunization in rural Mozambique. *BMC Public Health* 2008;8:161.

How to cite this article: Gupta P, Prakash D, Srivastava JP. Determinants of immunization coverage in Lucknow district. *North Am J Med Sci* 2015;7:36-40.

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