



EVALUATION OF IMMUNIZATION COVERAGE AMONG THE CHILDREN AGED 12 - 23 MONTHS IN URBAN AREA OF PATNA CITY

Community Medicine

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ABSTRACT

BACKGROUND: Immunization is one of the most cost-effective interventions that prevent needless suffering through sickness, disability and death. The benefits of immunization are not restricted to improvement in health and life expectancy but also have social and economic impact at both community and national levels. Immunization averts an estimated 2 to 3 million deaths every year from diphtheria, tetanus, pertussis (whooping cough) and measles, however an additional 1.5 million deaths could be avoided if global vaccination coverage improves. **MATERIAL AND METHODS:** This is Community based cross sectional study. Total 450, children study, in the Study design: Community based patna city, area, and Department of community medicine, at Nalanda medical college and Hospital, Patna, Bihar. cross sectional study. Study population: 450 children. Sampling technique: WHO-30 Cluster sampling. **CONCLUSION:** The immunization coverage in the urban area of Patna has improved markedly over the past years. Sustained improvement of the immunization coverage levels can be achieved by concentrating on the factors which are influencing utilization of immunization services.

KEYWORDS

primary immunization status, 12-23 months children, WHO-30 Cluster sampling.

INTRODUCTION

Immunization interventions have proven to be a success across the globe and today reach out to over 100 million children per year. Immunization is one of the most cost-effective interventions that prevent needless suffering through sickness, disability and death. The benefits of immunization are not restricted to improvement in health and life expectancy but also have social and economic impact at both community and national levels. Immunization averts an estimated 2 to 3 million deaths every year from diphtheria, tetanus, pertussis (whooping cough) and measles, however an additional 1.5 million deaths could be avoided if global vaccination coverage improves. The Global Vaccine Action Plan (GVAP) is a roadmap to prevent millions of deaths through more equitable access to vaccines. Countries are aiming to achieve vaccination coverage of at least 90 percent nationally and 80 percent in every district by 2020. While the GVAP should accelerate control of all vaccine-preventable diseases, polio eradication is set as the first milestone. It also aims to spur research and development for the next generation of vaccines. Immunization forms a critical component of primary health care and ensures nations health security. Although international agencies such as World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF) and now Global Alliance for Vaccines and Immunizations (GAVI) provide extensive support for immunization activities, the success depends on local realities and national policies. This is particularly true for a nation like India with population more than 1 billion and more than 25 million new births every year. A successful immunization program is of particular relevance to the need of the hour is to systematically examine all sources of data reflecting inequities in vaccination. Such an exercise would be beneficial in identifying the groups of infants at highest risk of remaining unvaccinated and also the characteristics of infants with high as well as low vaccination coverage status. In order to increase immunization coverage among the children, the underlying factors for utilization of immunization services and the reasons for not immunizing their children should be known. Evaluation of the immunization coverage patterns helps in bridging the knowledge gap and in making necessary interventional strategies at family, community and country level. Since limited studies are available in this part of the state, the present study was undertaken to obtain the baseline data about the immunization coverage and to find out the various factors associated with immunization status of the children aged 12 to 23 months in urban area of Patna City, India, as the country contributes to one fifth of global under-five mortality with a significant number of deaths attributable to VPDs.

OBJECTIVES

To assess the primary immunization coverage in children aged between 12- 23 months. To determine the factors influencing the utilization of immunization services.

Review of Literature

The impact of vaccination on health of the world's people is hard to exaggerate. With the exception of safe water, no other modality, not even antibiotics, has had such a major effect on mortality reduction and population growth. Edward Jenner's work with cow pox vaccination holds title to the first scientific attempt to control the infectious disease by means of a deliberate systematic inoculation. A study carried out by Punith K et al evaluate primary immunization coverage of children aged 12 to 23 months using cluster sampling revealed that the percentage of completely immunized, partially immunized and unimmunized children were 84.09%, 14.09% and 1.82% respectively. The reasons for non immunization were lack of awareness of need of immunization, lack of information about the place of immunization and fear of side reactions. Rapid Survey On Children (RSOC) that among children aged 12-23 months, a large proportion received BCG (91%), first injection of DPT (89%) and first dose of polio (90%). However, subsequently, there were dropouts in the vaccination and ultimately, only about three fourth of the children received third injection of DPT (75%) and third dose of polio (74%) and 79% of the children received measles vaccine. Two in every three children (66%) received first dose of hepatitis vaccine, however subsequently only one-third (34%) of children could complete the schedule of three doses. The dropouts in vaccinations were quite high. From the first to third dose of DPT, Polio and hepatitis the dropout rates (estimated as ratio of the difference between the percentage of children who received first and third dose and percentage of children who received first dose, and expressed in percentage) were 16%, 18% and 48% respectively. About two in every three children (65%) aged 12-23 months received complete schedule of the vaccination i.e. they got complete protection from six diseases. At the same time 7% of the children did not receive a single vaccine. So among all the children aged 12-23 months, 65 % received full immunization, 7% received no immunization and remaining 28% received only partial immunization. Immunization status was not significantly related to socioeconomic status as the percentage of children who were fully immunized were equally high in both upper and lower socioeconomic class ($p=0.315$). Educational status of the father and the mother were significantly related to immunization status ($p<0.001$).

MATERIAL AND METHODS

This is Community based cross sectional study. Total 450, children study, Study design: Community based patna city, area, and Department of community medicine, at Nalanda medical college and Hospital, Patna, Bihar. cross sectional study. Study population: 450 children. Sampling technique: WHO-30 Cluster sampling. The present study was carried out in Patna city. Patna district is situated in the south part of Bihar State. In the earlier days, The Patna city is a divisional head quarter of patna region of Bihar state. Historically from 12th century many dynasties like It is situated between $76^{\circ}.04'$ and $77^{\circ}.42'$ east longitude and $17^{\circ}.12'$ and $17^{\circ}.46'$ south latitude and the general elevation ranges from 300 to 750 meters above mean sea level.

Inclusion Criteria

Children aged between 12 and 23 completed months as on the day of study. Children who are residents of Patna city for more than 1 year.

Exclusion Criteria

Children below 12 months and above 23 months. Those mothers not willing to participate in the study.

Sampling Technique: WHO 30 Cluster sampling technique was used for the selection of subjects. The sample size to assess immunization coverage in children aged 12-23 months was obtained by using the formula

$$n = \frac{DE \times Z^2 \times P \times (1-P)}{d^2}$$

collection of data: After taking consent (Annexure-I), data was collected from the immediate caretakers of children using predesigned questionnaire (Annexure-II). Immunization, cards of the children and mothers were verified to assess their immunization status. In case of children without immunization card, immunization history was collected from the caretaker regarding the time when the child was immunized and the site of injection. BCG scar was used to evaluate whether BCG was given. A house to house visit was done and data was collected from the informants (preferably mothers) using a predesigned and pretested questionnaire after obtaining their informed consent for the study. On visiting the cluster area a landmark was identified and randomly one direction was selected. The number of houses which was located along the direction was counted. The first household was randomly selected, and the eligible subject in that household sampled. After the first household, the next household, which is closest to the previous house, was visited. Each next household was studied in a sequence until a total of 15 eligible children in the age group 12-23 months will be covered. In this way all the 30 clusters was studied.

RESULTS

Distribution of the children according to socio-demographic determinants

Variables		Frequency (n=450)	Percentage
Age in months	12-14	128	28.4
	15-17	84	18.7
	18-20	106	23.6
	21-23	132	29.3
Gender	Male	246	54.7
	Female	204	45.3
Religion	Hindu	236	52.4
	Muslim	214	47.6
Caste	OBC	310	68.9
	SC	125	27.8
	ST	15	3.3
Socioeconomic status (Modified Kuppuswamy classification)	Class I	2	0.4
	Class II	59	13.1
	Class III	178	39.6
	Class IV	203	45.1
	Class V	8	1.8
Type of family	Joint	132	29.3
	Nuclear	318	70.7

The above table shows that the majority of children belonged to age group of 21-23 months (29.3%), followed by 12-14 months (28.4%), 18-20 months (23.6%), and 15-17 months (18.7%). Majority of the children 246(54.7%) were males followed by 204(45.3%) females. Majority i.e. 236 (52.4%) of the children belonged to Hindu religion followed by 214 (47.6%) children who belonged to Muslim religion, Majority i.e. 310 (68.9%) of the children belonged to OBC caste followed by 125 (27.8%) of children to SC caste and 15 (3.3%) of children to ST caste. The socioeconomic classification was considered based on Modified Kuppuswamy Classification (Annexure-III). Majority of the children belonged to class IV i.e. 203 (45.1%), followed by class III-178 (39.6%), class II-59 (13.1%), class V-8 (1.8%) and least were in the class I-2(0.4%). Majority i.e. 318 (70.7%) of the children belonged to Nuclear type of family and 132 (29.3%) children belonged to Joint family. Majority of the mothers of children i.e. 184 (40.9%) of them studied up to high school, 90 (20.0%) of them studied up to diploma, 64 (14.2) of them, studied up to middle school, 53 (11.8%) of them were illiterate, 36(8.0%) of them, studied up to graduate, 18 (4.0%) of them studied up to Primary school, and 5 (1.1%) of them studied up to post graduate, Majority of the fathers of children

i.e. 219 (37.1%) of them were employed in skilled work, 72 (16.0%) of them were in clerical work, 70 (15.6%) of them were in unskilled work, 57 (12.7%) of them were semi-professionals, 18 (4.0%) of them were in un-skilled work, 8 (1.8%) of them were professionals, and 6 (1.3%) of them were unemployed.

Distribution of children based on age of mother

Mother's age in years	Frequency	Percentage
16-20	27	6.0
21-25	252	56.0
26-30	139	30.9
31-35	21	4.7
36-40	11	2.4
Total	450	100.0

The above table shows that, majority i.e. 252 (56.0%) of mothers of study subjects were in the age group of 21-25 years, followed by 139 (30.9%) of mothers the age group of 26-30 years, 27 (6.0%) of mothers in the age group of 16-20 years, 21 (4.7%) of mothers in the age group of 31-35 years and 11 (2.4%) mothers were in the age group of 36-40 years. Among females, 151(74.0%) children were Fully immunized and 53(26.0%) were Partially immunized. When the immunization status was compared based on gender of the children, it was observed that the percentage of fully immunized children among male and female children was 74.4% and 74.0% respectively. There was no statistically significant difference of immunization status among male and female children ($p>0.05$).

Reasons for failure of immunization (n = 116)

Reasons for failure of full immunization	No	%
Lack of information	55	47.4
Lack of motivation	28	24.2
Obstacles	33	28.4
Total	116	100.0

In the above table reasons for partial immunization and non immunization are considered under the heading reasons for failure of immunization. Caretakers of children who were partially and non immunized were asked the reason for not immunizing the child. The reasons were grouped under three categories as **lack of information, lack of motivation and obstacles**. Multiple responses were observed from some caretakers. It was observed that majority of the caretakers quoted lack of information (47.4%), obstacles (28.4%) and lack of motivation (24.2%) as the reason for incomplete immunization.

Our study found that the major reasons for incomplete immunization under the category lack of information was that, majority of the caretakers quoted fear of side reactions (23.2%) followed by unaware of the need for immunization (8.6%). Under the category obstacles for incomplete immunization was illness of the child because of which parents did not take the child to the immunization centre (14.6%) and mother being too busy (5.1%) in her household work to take the child for immunization.

DISCUSSION

The present cross-sectional study was conducted in the urban city the objective of assessing the primary immunization coverage in children aged 12-23 months and to study the factors affecting the utilization of immunization services and also to find out the reasons for partial or non immunization of the children.

Socio-demographic profile of the study subjects Age: In our study we found that out of the 450 children majority of children were in the age group of 21-23 months (29.3%). In a similar study done by Nawaz AS et al showed that with respect to the age distribution 30.0% of the children belonged to the age group of 18-20 months. In another study done by Vidyasagar and Kujur K, it was seen that 95.5 % of the children were above the age of 17 months.

Gender: In the present study out of the 450 children 54.7% of the children were males and 45.3% were females. Similar findings with respect to the gender distribution were found in a study conducted by Parashar A et al which showed that 51% were males and 49 % were females. In another study done by Baghel PS et al in Guwahati it was observed that 54.9% were males and 45.1 % were females.

Religion: In our study done on 450 children we found that 52.4% of children were Hindus and 47.6% were Muslims. In a study done by

Srivastava AK et al showed that 76% of the children were Hindu and 24% were Muslim. In another,

Caste: In the present study we observed that out of the 450 children, 68.9% of children belonged to Others category, 27.8% belonged to scheduled caste (SC) and only 3.3% belonged to scheduled tribe (ST). Similar findings with respect to the caste distribution was found in a study conducted by Shrivastava N et al⁵⁶ which showed 41.38 % were belonging to general category, 18.60% belonged to scheduled caste (SC) and 16.88% belonged to scheduled tribe (ST).

Type of family: In our study conducted on 450 children we observed that most of the children i.e. 70.7% lived in joint families while 29.3% lived in nuclear families. In an another study conducted by Devasenapathy N et al with respect to the type of family distribution showed 71.48% were belonged to joint families and 28.52% of children belonged to non nuclear families. In a study done by Khokar A et al revealed that 71.7% were nuclear families while 28.3% were joint type of families.

Socio-economic status: Our study revealed that, majority of the children belonged to Class IV (45.1%) and Class III (39.6%), while only 1.8% belonged to Class V and 0.4 % belonged to Class I. In a study conducted by Jatti GM et al which stated that 67.10% of the families belonged to class IV and 19.50% of children belonged to class III. Majority of the respondents quoted lack of information (47.4%) as the main reason, followed by obstacles (52.4%) and lack of motivation (24.5%).

In the category lack of information, 23.2% of the respondents did not immunize their children because of fear of side reactions while 8.6% were unaware of the need for immunization and 6.8% were unaware of the need to return for second or third dose and also wrong ideas about contraindications.

The major obstacles that prevented the utilization of the immunization services was the illness of child (14.6%) due to which the parents could not take the child for immunization. The other major obstacle was the mother being too busy (5.17%) in the household work.

In the category lack of motivation, 8.6% of the parents postponed immunizing their children until another time while 6.89% had heard of rumours about immunization. Study carried by Kar M et al showed that the major cause for incomplete immunization was postponement of immunization due to the illness of the child whereas mother's lack of information about place, schedule and eligible age of immunization constituted the main reason for non-immunization. Study carried out by Yadav RJ et al showed that the main reason for incomplete immunization were lack of information and obstacles. Kulkarni P et al in their study carried out in Hyderabad revealed that the most common reason for the partial immunization of the child was the unavailability of both the parents. Sickness of siblings and lack of knowledge regarding the subsequent vaccination were the other reasons found.

CONCLUSION

The primary immunization coverage in children aged 12-23 months in urban area of Kalaburagi was found to be 74.2%. Our study showed that 334 (74.2%) were fully immunized, 112 (24.9%) were partially immunized and 04 (0.9%) were non immunized. This shows that the immunization status is still not upto the accepted levels as set by the Government of India. The coverage for BCG, Pentavalent3, OPV3 and Measles was 98.0%, 92.9, 92.9% and 75.5% respectively.

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