

Care Giver's Knowledge and Practice On Routine Immunization among 12 -23 months children in a Rural Community of West Bengal

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Abstract: Childhood immunization is the most successful and cost-effective public health intervention. It is one of the best indicators to evaluate the health outcomes and services distributed across social and economic groups. A descriptive, cross sectional study was done in a rural block among 210 children between 12 - 23 months and their care givers for duration of 9 months with the objectives of assessment of their knowledge and practice on different aspects of immunization. WHO 30 cluster sampling method was used. Results revealed 82.9% were Hindus, 14.8% were illiterate, 67.1% deliveries were institutional. The male : female children ratio was 3:2. Polio and measles were mostly heard one. One third of the care-givers knew the correct dose of measles vaccination whereas only 4.8% and 7.1% had the right knowledge of three doses for OPV and DPT. Fever (54.3%) and diarrhea (24.8%) cited as main side effects of vaccination. Lack of information, long distance, sick baby on the day of immunization were reported as main reasons of incomplete immunization. The coverage for majority of vaccines was above 90%. Immunization status had significant association with religion, literacy status and place of delivery. Appropriate information, dissemination and aggressive campaigning on immunization is the need of the hour.

Keywords - Immunization, cost-effective, intervention, cross sectional, cluster sampling.

I. Introduction:

In 20th century, immunization has been emerged as the most successful and cost-effective public health intervention. It is one of the best indicators to evaluate the health outcomes and services distributed across social and economic groups as well as one of the best intervention to prevent a series of major illness, particularly in environments where children are undernourished and die from preventable disease. Given the extensive social benefits of immunization, any inequities in the knowledge that leave out large section of the most deprived populations are a cause of serious policy concern. There is evidence of inequities in immunization in India, despite the fact that childhood immunization has been an important part of maternal and child health services since the 1940s.¹ The World Health Organization (WHO) launched the Expanded Program on Immunization (EPI) in 1974 globally with a focus on prevention of the six childhood vaccine-preventable diseases by the year 2000. This was endorsed by the Government of India in 1978.^{2,3} 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 1990.⁴ 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 2010.⁵

Despite the efforts to improve vaccination services, approximately 27 million infants were not vaccinated against measles or tetanus in 2007. As a result, 2-3 million children are dying annually from easily preventable diseases, and many more fall ill⁶. Although estimated global routine measles vaccination coverage reached 82% in 2007, nearly 23.2 million children were unvaccinated. Vaccination coverage has now reached a plateau in many developing countries, and even where good coverage has been attained; reaching children not yet vaccinated has proved difficult. Thus, there is an urgent need to find ways to increase vaccination towards mothers, as well as their perceived motives and technical competence. Uptake of vaccination services is dependent not only on provision of the services but also on other factors including knowledge and attitude of mothers and density of health workers.⁷ The opportunity costs (such as lost earnings or time) incurred by parents may also have an important impact on uptake. Cultural receptivity to perceived modernity and education, as well as trust in health workers, were considered to be the most important factors influencing attitudes. In short, knowing little about vaccination does not necessarily translate into negative attitudes towards it; factors such as trust in health-care providers and culture may be more influential. The impact of high levels of knowledge on subsequent attitudes towards vaccination is unknown. The fundamental question is whether or not resources should be invested in improving parents' knowledge of and attitudes towards vaccination. Although the

evidence is unclear, it is commonly believed, though some disagree, that strengthening advocacy, communication and social mobilization will enhance informed and willing participation in vaccination programme and that vaccination strategies are likely to be more successful if they are based on an understanding of socio-cultural behavior. Since factors influencing demand vary greatly by region and context, findings from one population cannot always be extrapolated to another. Thus, simple operational research into local knowledge and attitudes should become an essential part of every vaccination campaign.⁸

The current level of coverage of 'fully-immunized' children under the national immunization programme is quite low as pointed out by several studies. The main reasons identified for poor coverage include the activities.⁹ The importance of knowledge or awareness and 'not aware of the needs of vaccination' is the main reason for children not being fully immunized.^{1,9} Inadequacy of community participation was also an important factor for poor coverage. Therefore keeping every factor in mind the present study has been carried out with the objectives of assessing the knowledge of routine child immunization among care-givers of 12 to 23 months old children, finding out the coverage of all the vaccines among the recipients and also to identify the practice of routine immunization.

II. Methods :

This descriptive, observational epidemiological study using the cross sectional survey design was carried out for a total period of 9 months. The time was from July 2009 to March 2010. The whole study was carried out in three phases. First phase was scheduled for all the preparation like pre testing of the proforma, accumulation of resources and overall planning. The time needed was one month. All data were collected for a period of next six months. After data collection was done, nearly two months required for the final analysis and writing the report in paper form. The project was conducted in Bolpur block in Birbhum district of West Bengal consisting of 82 villages. The block is the administrative division containing area of 333.92 km.^{10,11} As per 2001 census, Bolpur Sriniketan block had a total population of 175,490 out of which 89,581 were males and 85,909 were females. Bolpur block registered a population growth of 15.42 per cent during the 1991-2001 decade.¹¹

The Bolpur block was selected from the list of all blocks under Birbhum district by the method of simple random sampling. A local register was available from the Block medical officer in health. The register showed that the total number of children in age group 12-23 months was 4327. There was two groups who were studied, firstly care-givers of 12-23 months old children and secondly 12-23 months old children. For selection of sample, WHO 30 cluster sampling method was used. Using this method a total of 30 clusters were selected out of 82 villages. The field unit was the household having children aged 12-23 months. All the villages were initially listed as per standard methods. Then the sampling interval was determined by dividing the total population by desired number of cluster i.e.30. The sampling interval thus came out to be 5850.

Using a random number table, a number less than the sampling interval but having same digits was taken and it came out to be 2559. The cluster that corresponds to the cumulative population containing the selected number was designated as cluster-1. The sampling interval was then added to the previously selected number and thus we got cluster-2. In this way 30 clusters were selected. From each cluster, 7 children between 12 -23 months and their care givers were selected according to the inclusion criteria. For selecting the first household, the last two digits of a currency note was used. After visiting the first household, the second household was chosen which was the nearest, having front door facing the first one. The similar method was done for the subsequent houses. The process continued until all 7 eligible children were found in the defined area. Thus the total number of children and their care givers surveyed were 210. According to WHO module if any house having two children, both of them was included. The survey was done with the help of health workers of the identified clusters after taking the necessary permission from Chief Medical Officer of Health of Birbhum district and also from Block Medical Officer of Health of the block under study.

In methodology proper, schedule was filled up in every selected house. The data on one dose of BCG and measles each; three doses of DPT/OPV were collected. Accuracy on immunization data was improved by checking the immunization cards, and when cards were unavailable, information from mothers were taken. Further, the scar of BCG vaccine was checked for each child. The care givers were asked about the scheduled day of the week for routine immunization in the Government facilities for assessing their knowledge. Universally Wednesday is designated as the day of routine immunization so credit was given if a care-provider answered Wednesday. Another question was put to the care-givers regarding the name of different vaccine preventable diseases under routine immunization programme. Some other questions like correct age, dose, side effects, contraindication of different vaccine under the national immunization programme were present in the schedule. Interview was taken with the help of pre tested, pre-designed schedule. Immunization cards of children was used as one of the main tool. Variables considered under study were age, sex, religion, caste, type of family, literacy status, occupation of father, immunization status of the child, importance of vaccination, disease prevented by the vaccine, number doses of vaccines give, age of vaccination, side-effects and

contraindication of vaccine, source of vaccination and reason of defaulter. After collection of data it was coded, entered into MS Excel and then analyzed with help of EPI INFO 3.4.3 version. Chi square test was used to find out the association between different variables. P value was considered significant if the value was less than 0.05.

III. Results:

Majority (82.9%) of the care givers were Hindus. Among them 64.6% lived in joint family. Among the children under study, 58.6% were male and 41.4% were female. Out of 210 care givers, thirty one (31) were illiterate while 45.6% (95) passed primary school. Only 11.3% had higher secondary or above level of education. 67.1% of the delivery were conducted in the institution. But what was very heartbreaking to see that one third of all deliveries happened at home till date. Out of all home deliveries, 75.4% of home deliveries were conducted by trained birth attendant and this gave a ray of hope for future. 68.1% of children belonged to first order of birth, 29.5% and 2.4% belonged to second and third orders respectively. 83.8% children were completely immunized.(Table 1)

Knowledge of care-givers regarding the various aspects of routine immunization tried to be elicited and it was seen only 36% of care-givers knew that under five children were the candidates for Routine Immunization under national immunization schedule (NIS). The question of whether they have heard of different vaccine preventable diseases, the response was like measles and polio were the most commonly (61 % and 61.9%) heard of all the diseases under NIS followed by Tuberculosis. Among care-givers, the correct age of BCG and Measles vaccination was known to only 15% and 18% respectively while only eleven and nine respondents told about the correct age for DPT and OPV respectively. One third of the care-givers knew the correct dose of measles vaccination whereas only ten (4.8%) and fifteen (7.1%) care givers had the right knowledge of three doses for OPV and DPT. Contraindications of any vaccines was stated as fever (37.5%) , cough and cold (35.2%) whereas 93 care-givers know nothing about it. Fever (54.3%) and diarrhea (24.8%) emerged as main side effects of vaccination. There was no idea regarding any of side effects among more than one third respondents. Lack of information, long distance, sick baby on the day of immunization were reported as main reasons of incomplete immunization. (Table 2) After assessment of vaccine coverage, it was seen that coverage of BCG, three doses of OPV, DPT, Hepatitis-B and Measles was up to satisfactory level. All the percentages were around 90% or above. It was seen that the 3rd dose of both OPV and DPT were a bit less than 90%. (fig.1).The practice of receiving vaccines was quite satisfactory despite lack of knowledge regarding correct age of vaccination. Complete immunization was more among Hindus in respect with Muslims and this difference was statistically significant. Literate care givers preferred complete immunization and it was more among institutional born children. There was difference in the immunization status among literate and illiterate care givers and also among the children born at home and hospital. This difference found to be statistically significant.(table 3)

IV. Discussion:

The analysis of the data regarding the background characteristics revealed that majority of the study subjects were Hindus (82.9%) while 17.1% were Muslims. 135 lived in joint family. It was noticed that 14.8% of care-givers interviewed were illiterate while 45.6% were primary school passed and only 11.3% had higher education. In the present study immunization status seen to be significantly associated with literacy status of care-givers which was similar to the study by Tagbo B.N. et al ¹² in Enugu. Complete immunization was significantly higher among Hindus in the present one whereas this result did not collaborate with the result of study done by Tagbo B.N. et al ¹² as it revealed religious denomination was not significantly associated with immunization status. The difference may be due to geographical differences. Nath B et al¹ found that incomplete immunization was more among children of illiterate mothers, Muslims, mothers living in joint families, higher birth order , babies delivered at home.

Among children of 12-23 months, 58.6% were male and 41.4% were female. The immunization coverage among both sexes are more or less similar(83.7% vs. 83.9%).Therefore child's gender was not a significant factor in determination of immunization status and similar results was depicted in the Mabrouka A.M. et al ¹³ study and also in a study done in Alwar district of Rajasthan¹⁴. Goel N.K. et al ¹⁵ revealed immunization rate was higher in male children (90%) than the female children (80%) and the difference was statistically significant. In the present study institutional delivery was the common practice i.e. 67.1% and three out of every four home deliveries were conducted by trained birth attendant which was a positive indicator of present day health care delivery system. 68.1% of children belonged to first order of birth whereas 29.5% and 2.4% to second and third orders respectively. Complete immunization was significantly more among children who had history of institutional delivery. Kumar D. et al ¹⁶ found in their study in Delhi, immunization status significantly varied with place of delivery. 83.8% children were completely immunized. Similar rate (81%) was observed in the study carried out by Mabrouka A.M. et al ¹³ whereas Singh MC et al ¹⁷ in their study found less

percentage that was 52.5%. The reason for this difference might be due to differences in culture, administrative supervision and many more.

Regarding knowledge of care-givers on various aspects of routine immunization, it was seen that only 36% of care-givers exactly knew that under five children were the candidates for Routine Immunization. The study by Sharma R et al¹⁸ in East Delhi also had a more or less similar result. Among the 6 vaccine preventable diseases, only 61.9% named polio, 61% measles, 52.5% TB, very few named diphtheria, whooping cough and tetanus and none had heard of all the six vaccine preventable diseases. Similar results were also seen in the studies conducted in East Delhi¹³ and Pilani, Rajasthan.¹⁴ Tagbo BN et al¹² and Roos M. et al¹⁹ in their studies reported that eighty-two per cent and more than 85% of the participants had the knowledge of vaccine preventable diseases (VPDs). The percentage in the present study was quite less and this may be due to educational difference of mothers. Correct knowledge about right time and single dose of BCG vaccine was 13.3% and 24.3%, that for OPV was 4.3% and 4.8%, for DPT was 5.2% and 7.1% and for measles 15.7% and 28.1% respectively and all the information were reasonably unimpressive. In the study of Nath B et al¹ that was conducted in Lucknow, 68% and 63% knew correct age and dosage of BCG vaccination. Less than half of the care-givers knew correct age of DPT and measles. Singh M.C. et al¹⁷ in Wardha reported that 60% of the mothers knew the correct age of DPT and OPV while the percentage for measles was 45%. Knowledge regarding correct age and dose of these vaccines in the present study was much less compared to rest two studies. The reason could be due to of different bio-social characteristics of the care-givers and different implementation strategies. Therefore it can be said that, IEC activities focused on immunization need to be implemented with more sincere efforts with special attention on incomplete immunized group of children. In the present study, the knowledge regarding age and dose of BCG and measles vaccines were comparatively better than other studies, this probably due to the fact that these vaccines had a single dose.

Regarding contraindications of vaccines, 44% had no knowledge while 37.5% and 35.2% told about fever, cough and cold respectively. Studies by Singh MC et al¹⁷, contraindications listed by mothers were mild cold (41%), mild fever (24%) or loose stools (14%). 54% and 24.8% of the respondents considered fever and diarrhea as adverse effects of vaccines in the recent one whereas as fever (36%) and pain at injection site (33%) were found as common side effects in the study of Singh M.C. et al¹⁷ carried out in Maharashtra.

The reasons cited for incomplete immunization were mostly obstacles (31.8%); others were misconception e.g. child may be further ill after immunization (11.2%), sick baby on routine immunization day (20.4%). Studies by Roos M et al¹⁹ revealed that the reasons were lack of transport, fear of side effects and misconception (development of autism). Other studies by Kumar D. et al,¹⁶ Mukherjee B. et al²⁰, Manjunath U et al²¹ and Gupta R.S. et al²² also found that inadequate knowledge about immunization and subsequent dose, belief that vaccine causes side-effects, lack of faith in immunization, the major obstacles were busy schedule of mother, illness of child on the day of immunization and also due to lack of information respectively. The knowledge regarding the correct day of conducting routine immunization session was much better (65%) than the other studies²³ and the satisfactory IEC campaigning on immunization program might be one of the reason behind this.

The coverage of BCG (89.1 vs. 89.2) and OPV1 (91.9 vs. 92.0) were almost equal, while coverage for both 2nd and 3rd dose of OPV and DPT vaccine and measles were better than NFHS3. 83.7% of male and 83.9% of female children were completely immunized which was much higher than that of NFHS 3 data²⁴ (61.4% and 66.9% respectively). The rate of complete immunization were more among the Hindus (88.5% and 67.9%) than the Muslims (61.1% and 58.1%) as compared with NFHS 3.

V. Conclusion:

The present study revealed that the knowledge regarding various aspects of Routine Immunization among the care-givers was less. This indicates health education should be emphasized to enhance knowledge of care-givers. This would require appropriate information, dissemination and aggressive campaigning as crucial to success of the program. In spite of such poor knowledge, the practice was satisfactory. This was probably because of blind faith on health workers.

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Table 1: Population characteristics (n=210)

Variables	Number (%)
Religion	
Hindu	174 (82.9)
Muslim	36 (17.1)
Type of family	
Joint	135 (64.6)
Nuclear	75 (35.4)
Level of education	
Illiterate	31 (14.8)
Primary	95 (45.6)
Secondary	59 (28.3)
Higher secondary and above	25 (11.3)
Sex of the children	
Male	123 (58.6)
Female	87 (41.4)
Birth place of children	
Institution	141 (67.1)
Home	69 (32.9)
Birth order of children	
1 st	143 (68.1)
2 nd	62 (29.5)
3 rd	5 (2.4)
Immunization status	
Complete	
Male	103 (83.7)
Female	73 (83.9)
Incomplete	
Male	20 (16.3)
Female	14 (16.1)

Table 2: Immunization related knowledge among care givers (n=210) *

Variables	Number (%)
Name of vaccine preventable diseases heard	
Polio	125 (61.9)
TB	105 (52.5)
Measles	123 (61)
Diphtheria	46 (23.2)
Whooping cough	35 (17.3)
Tetanus	54 (26.3)
Correct age of vaccination	
BCG	28 (13.3)
OPV(all 3 doses)	9 (4.3)
DPT(all 3 doses)	11 (5.2)
Measles	33 (15.7)
Number of doses of vaccine	
BCG	51 (24.3)
OPV(all 3 doses)	10 (4.8)
DPT(all 3 doses)	15 (7.1)
Measles	59 (28.1)
Contraindications of any vaccine	
Fever	79 (37.5)
Cough and cold	74 (35.2)
Seizure	02 (0.9)
Don't know	93 (44.3)
Adverse effects of any vaccine	

Fever	114 (54.3)
Diarrhea	52 (24.8)
Don't know	81 (38.6)
Reasons of incomplete immunization	
Forgot	35 (16.8)
Lack of information	42 (19.8)
Sick baby on R.I.day	43 (20.4)
Misconception	24 (11.2)
Obstacle	67 (31.8)

*Multiple Response

Table 3: Immunization status and socio-demographic variables (n=210)

Variables	Complete immunization No (%)	Incomplete immunization No (%)	Statistics
1. Sex			
Male	103 (83.7)	20 (16.3)	$\chi^2=0.000,$ p=0.97
Female	73 (83.9)	14 (16.1)	
2. Religion			
Hindu	154 (88.5)	20 (11.5)	$\chi^2=134.5,$ p=0.000
Muslim	22 (61.1)	14 (38.9)	
3. Literacy of care givers			
Literate	172 (96.1)	7 (3.9)	$\chi^2=40.08,$ p=0.000
Illiterate	4 (12.9)	27 (87.1)	
4. Place of birth			
Institution	134 (95.0)	7 (5.0)	$\chi^2=40.97,$ p=0.000
Home	42 (60.9)	27 (39.1)	

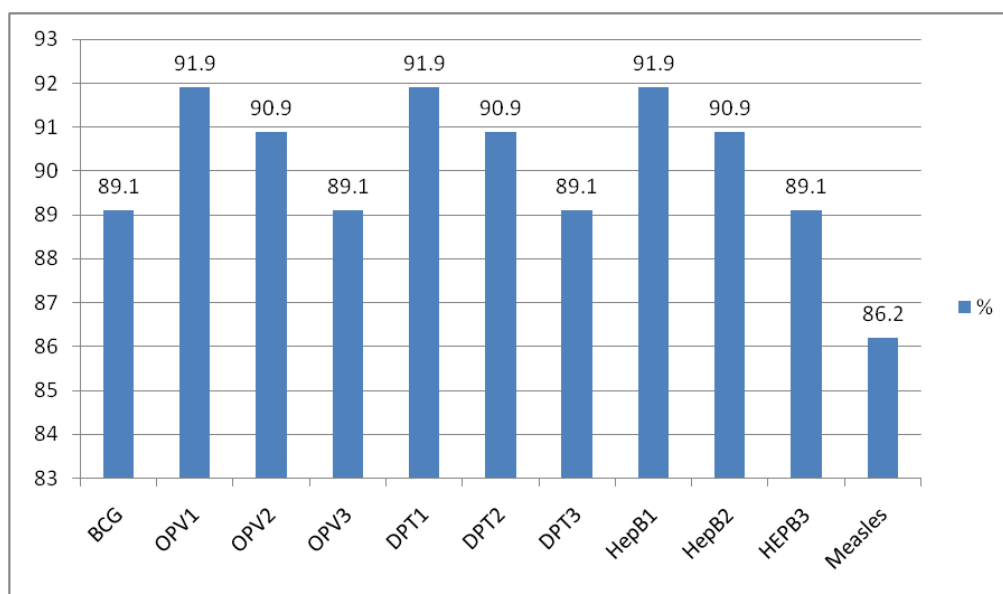


Fig 1: Vaccine coverage

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