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Original Research Article

Immunization coverage in children of 24-35 months of age group in rural field practice areas of medical college, Visnagar, Gujarat, India: a cross sectional study

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ABSTRACT

Background: Immunization plays a crucial role in reducing childhood morbidity and mortality, and higher coverage rates are needed to maintain the expected benefits. Objective was to assess immunization coverage in children of 12-23 months of age group in rural field practice areas of Medical College, Visnagar, Gujarat, India.
Methods: Using the purposive sampling method, a cross sectional community based study was conducted in rural field practice areas of Nootan Medical College and Research Center, Visnagar during June 2021 to December 2021. All 214 children of 24-35 months age group of the areas were included after taking verbal informed consent of their parents or guardians. Vaccination status of the children was verified using the immunization card. Analysis of study was done by using appropriate statistical software.
Results: Total 1934 households were surveyed. There were 214 children in the 24-35 months age group. Mamta card or immunization record was available with 145 (67.8%) mothers of 24-35 months age group of children. Maximum coverage was seen for bacille Calmette-Guerin (BCG) (96.7%) followed by pentavalent/RVV/OPV first dose (95.8%). Measles-Rubella (MR) 2nd dose coverage was 84.6%. Overall, 75.7% of the children in the 24-35 months age group were completely immunized while only 6 children were unimmunized. Dropout rate proportion for pentavalent 1st dose to pentavalent 3rd dose was 3.44% while for BCG first dose to MR second dose was 12.51%.
Conclusions: Complete immunization coverage in children of 24-35 months of age group in rural field practice areas of Medical College, Visnagar was 75.7%.

Keywords: Immunization, Vaccination, Coverage, Immunization status, 24-35 months

INTRODUCTION

Childhood immunization is one the most significant, cost effective preventive public health strategy and needs to be sustained with higher coverage for desired benefits.[1] An estimated 1.5 million unvaccinated children die each year from vaccine preventable diseases (VPDs) therefore, child immunization has to be a priority area with an objective to strengthen and sustain routine immunization (RI) to reduce the incidence of VPDs.[2] The key to improve the status of complete immunization coverage is to monitor the drop outs at all stages of vaccination before the completion of the full course of immunization. The current scenario depicts that immunization coverage has been steadily increasing but the average level remains far less than the desired.[3]

The recent national family health survey-V (NFHS-V) data shows that immunization coverage has been steadily increasing but the average level remains far less than the desired. Still only 76.3% and 76.4% of the infants in

Gujarat and India respectively are fully immunized which is less than the desired goal of achieving 85 per cent coverage.[4,5]

Wide variation among states and areas within a state regarding the immunization coverage was observed. Immunizations services are provided through vast health care infrastructure which primarily include primary health centers and sub-centers. Planning for routine immunization is a continuous process of analyzing data, evaluating progress and constraints and making decisions about reaching programme objectives.[6]

Community based surveys, especially those conducted by independent agencies like us (department from medical college) can provide data that are more realistic. Performing such surveys on a scientifically selected subset of the population can provide crucial information for local health authorities and policy makers. This study was formulated against this background with an objective of assessing the immunization coverage in children of 24-35 months of age group in rural field practice areas of Medical College, Visnagar, Gujarat, India.

METHODS

Using the purposive sampling method, a cross sectional community based study was conducted in rural field practice areas of Nootan Medical College and Research Center, Visnagar of Mehsana district of Gujarat during June 2021 to December 2021. An effort was made to collect data for maximum number of children during the available time period and randomly selected 214 children of 24-35 months age group of the area were included after taking verbal informed consent of their parents or guardians. Performa was prepared on the basis of government immunization card (Mamta card) having information regarding birth weight, date of birth, gender of baby, birth registration, growth chart and their vaccination status. Details of source of vaccination and reasons for partial immunization/non immunization were also included in performa. As the performa was specially prepared for the study, field testing was done and necessary modifications were applied to make it standardized and uniform. Vaccination status of the children was verified using the Mamta card. In conditions where the Mamta card was not available, the mother/parents were asked about the site of vaccinations and the age of vaccination to confirm the vaccines being given. Analysis of study was done by using appropriate statistical software applying suitable statistical tests.

RESULTS

Total 1934 households and 9451 persons were surveyed. The average family size was 4.88 per household. There were a total 4744 males and 4710 females in the area surveyed. There were 224 children in the age group of 0-11 months, 228 children in the 12-23 months age group and 214 children in the 24-35 months age group. There were 291 females who had delivered in the past one year, 754 children less than 3 years and 1018 children less than five years of age in the area surveyed. Number of adolescents (10-19 years) and women in the reproductive age group were 1621 and 2659 respectively (Table 1).

Table 1: Demographic profile of household studied.

S. no.	Parameter	Number
1	Total number of clusters studied	30
2	Total number of the households studied	1934
3	Total number of persons in the households	9451
4	Total number of males in the families	4744
5	Total number of females in the families	4710
6	Total number of children 0-11 months of age	224
7	Total number of children 12-23 months of age	228
8	Total number of children 24-35 months of age	214
9	Total number of children under 3 years of age	754
10	Total number of children under 5 years of age	1018
11	Total number of women who delivered in last one year	291
12	Total number of adolescents (10-19 years) of age	1621
13	Total women in reproductive age (15-49 years) of age	2659
14	Average family size	4.88

Mamta card or immunization record was available with 145 (67.8%) mothers of 24-35 months age group of children. Out of them only 2 (0.9%) mothers did not know about the card or immunization record of their children (Table 2).

Table 2: Availability of Mamta card/immunization record for children.

Availability of Mamta card/immunization record	Age group (24-35 months) Number (%)
Yes	145 (67.8)
No	67 (31.3)
Don't know about card	02 (0.9)
Total	214 (100)

Maximum coverage was seen for Bacille Calmette-Guerin (BCG) (96.7%) followed by pentavalent/Rota virus vaccine (RVV)/oral polio vaccine (OPV) first dose (95.8%). Measles Rubella (MR) 1st dose and 2nd dose coverage were 85% and 84.6% respectively. Diphtheria,

Pertusis and Tetanus (DPT) and OPV first booster dose coverage was 84.6%. Overall, 75.7% of the children in the 24-35 months age group were completely immunized (all vaccinations given as per age), 21.5% of the children were partially immunized (at least one of the vaccines given) while only 6 children were unimmunized (Table 3).

Table 3: Vaccination status of children in 24-35 months of age (n=214).

Indicator	N	%	95% C.I.
BCG	207	96.7	91.78-99.60
Pentavalent/OPV/ RVV 1st dose	205	95.8	90.44-99.14
Pentavalent/OPV/ RVV 2nd dose	203	94.9	89.15-98.62
Pentavalent/OPV/ RVV 3rd dose	198	92.5	89.06-97.16
f-IPV 1st dose	205	95.8	90.44-99.14
f-IPV 2nd dose	198	92.5	89.06-97.16
MR 1st dose	182	85	76.94-91.68
DPT booster 1st dose	181	84.6	76.39-91.31
OPV booster 1st dose	181	84.6	76.39-91.31
MR 2nd dose	181	84.6	76.39-91.31
Overall immunization status			
Completely immunized	162	75.7	66.38-83.95
Partially immunized	46	21.5	13.66-30.52
Unimmunized	06	02.8	0.19-7.52

Reasons for partial or non-immunization were asked to parents/caregivers in the households where the children were not immunized. Most common reason was that they were not aware about missed dose (22 responses) followed by no one contacted (7 responses) and sessions time not convenient (5 responses). Other reasons were need for vaccination not being perceived, no one available to take the child for vaccination and fear of adverse events following immunization (AEFI) (3 responses each) (Table 4).

Table 4: Reasons for not completely/non immunization among 24-35 months of age (n=52) (multiple responses were recorded).

Reason	Number	Percentage
Not aware about missed dose	22	42.31
No one contacted	7	13.46
Session time not convenient	5	9.62
No perceived need	3	5.77
No one to take the child	3	5.77
Fear of AEFI	3	5.77
Not aware where to go	2	3.85
Travelling away	2	3.85
Child sick	1	1.9
Resistant family	1	1.9
Others	11	21.15

Dropout rate proportion for pentavalent 1st dose to pentavalent third dose was 3.44% while for pentavalent first dose to MR 1st dose was 10.8%. The highest covered vaccine was BCG (96.7%) while lowest covered vaccine was MR 2nd dose (84.6%) and the dropout rate proportion for BCG to MR second dose was 12.51% (Table 5).

Table 5: Vaccine drop-out rates (24-35 months).

Vaccine	Coverage of first antigen	Coverage of last antigen	Drop-out rate	Drop-out rate proportion
Penta1 to penta3	95.8	92.5	3.3	3.44
Penta1 to MR1	95.8	85	10.8	11.27
Highest coverage vaccine to lowest coverage vaccine	96.7 (BCG)	84.6 (MR 2)	12.1	12.51

Drop-out rate = coverage of first antigen - coverage of last antigen; drop-out rate % = (coverage of first antigen - coverage of last antigen) × 100 coverage of first antigen

DISCUSSION

Mamta card (immunization card) is a multi-purpose card that includes not only vaccination information, but also important information on maternal and child health. An immunization card is an important tool for assessing immunization status and as a documentation. In our study Mamta card or immunization record was available with 145 (67.8%) mothers of 24-35 months age group of children. In Sheth et al immunization card availability was seen 77.7% of the mothers.[1] The preservation of vaccination cards, however, is still problematic and needs to be encouraged since it is an important document that can be used to determine a child's immunization status.

In Bhatt et al availability of immunization record was 32.8% and 45.3% in rural and urban area respectively.[2]

In Chaudhari et al Mamta card or immunization record was available with 73.6% of mothers of 24-35 months age group of children. Out of total children 75.7% of the children in the 24-35 months age group were completely immunized (all vaccinations given as per age), 21.8% of the children were partially immunized (at least one of the

vaccines given) while 2.8% were unimmunized. Dropout rate percentage for pentavalent 1st dose to pentavalent third dose was 3.44% while for pentavalent first dose to measles was 2.4%. The highest covered vaccine was BCG (96.7%) while lowest covered vaccine was measles second dose (77.6%). The dropout rate percentage was 14.1%. Most common reason for partial/non-immunization was that most of them were not aware of the missed dose (42.3%) (more so for the measles second dose). This was followed by not being contacted to come for vaccination (7 responses), session time not being convenient (5 responses), no perceived need, no one to take the child for vaccination and fear of adverse events following immunization (3 responses each).[3]

Low availability of vaccination card was seen in NFHS 5 Gujarat. As per NFHS 5 Gujarat 76.3% were fully immunized and 75.9% were fully immunized in rural area. Dropout rates were found gradually decreasing in rural area (14.6% in 2015-16 to 8.91 in 2019-20).[4]

In our study, maximum coverage was seen for BCG (96.7%) followed by pentavalent/RVV/OPV first dose (95.8%). MR 1st dose and 2nd dose coverage were 85% and 84.6% respectively. DPT and OPV first booster dose coverage was 84.6% Overall, 75.7% of the children in the 24-35 months age group were completely immunized (all vaccinations given as per age), 21.5% of the children were partially immunized (at least one of the vaccines given) while only 6 children were unimmunized. Similar high coverage of full immunization (84-93%) has been reported by other studies also.[7-10] Therefore, reported data should not be taken as a measure of actual vaccination coverage, while evaluation studies are more likely to accurately reflect the actual situation on the ground.

In our study dropout rate proportion for pentavalent 1st dose to pentavalent third dose was 3.44% while for pentavalent first dose to MR 1st dose was 10.8%. The highest covered vaccine was BCG (96.7%) while lowest covered vaccine was MR 2nd dose (84.6%) and the dropout rate proportion for BCG to MR second dose was 12.51 %. In our study good coverage of pentavalent indicated good service utilization by people of area studied. From pentavalent 1st dose to pentavalent 3rd dose, the drop-out rate was less than 10% (3.44%). Service utilization was also good, indicating an adequate health care infrastructure/resources and good demand in the study area.

In our study, most common reason or un-immunization and partial immunization was that they were not aware about missed dose (22 responses) followed by no one contacted (7 responses). Vohra et al in Lucknow showed that major reasons for non-acceptance/discontinuation of immunization were lack of faith in immunization (21%), child being ill and hence not brought (13.68%).[11] In Khargekar et al according to the respondents, the most common reasons for not immunizing the child was: fear of side effects (40%) followed by unaware of need for immunization (28%). The common reasons for partially immunizing the child were due to visit to native place or other sibling not well (37.5%) followed by time of immunization inconvenient (32.5%).[12] A study conducted at Lucknow by Nath et al showed visit to the native place/village (14.7%), carelessness (11.7%), apprehensiveness due to sick-ness of the child or an elder sibling as a result of vaccination (11.7%), and lack of knowledge (10.4%).[13] Kar et al also revealed that the major cause for incomplete immunization was postponement of vaccination due to illness of the child (30.8%), lack of knowledge of immunization schedule (23.1%), and migration to native village (23.1%).[14] Kadri et al also revealed that the main reason for dropout or non-immunization of the children may be ignorance and illiteracy among parents.[15]

However, study done in rural field practice areas of Nootan Medical College and Research Center, Visnagar of Mehsana district of Gujarat limits us to generalize the results. There is certainly a need for well-planned, large-scale studies using standardized methodologies to estimate coverage of immunization. Multi indicator cluster survey (MICS) with 30 cluster sampling, proposed by the World Health Organization, is a gold-standard method to estimate immunization coverage. When planning these studies it is necessary to ensure that importance is given to accurate evaluation of immunization status and representation of the different regions of Gujarat.

CONCLUSION

Overall, 75.7% of the children in the 24-35 months age group were completely immunized. Immunization is often cited as being one of the most cost-effective public health interventions. Hence, more vigilant surveys should be conducted so that drop-out rate can be reduced and proper actions can be taken.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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