

A study on awareness and utilization of Mission Indradhanush in an urban slum of Bhubaneswar

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ABSTRACT

Background: India records 5 lakh child-deaths annually due to vaccine preventable diseases. As a strategic endeavor, the Ministry of Health and Family Welfare, Government of India, launched Mission Indradhanush in December 2014 to achieve more than 90% full immunization coverage by the year 2020. **Objectives:** To assess the awareness of the respondents about Mission Indradhanush, to assess their attitude and practices regarding childhood immunization, and to determine the association between knowledge and practice with selected variables. **Materials and Methods:** A cross-sectional study was undertaken from June to September 2017 among mothers with children aged 12–23 months in urban slums under field practice area of Community Medicine Department, Kalinga Institute of Medical Sciences, Bhubaneswar. **Results:** Mean age of the children was 17.23 ± 3.43 months; 65% were males and 35% females. Mean age of the respondents was 24.48 ± 3.97 years; 68% were literate and 94% were Hindus. Majority (76%) belonged to upper-lower Kuppuswamy socio-economic status scale. Only 10% had heard about Mission Indradhanush; health worker (90%) being the most common source of information. A total of 91% believed that vaccination prevented disease. A total of 96% believed that immunization was important for their children. A total of 73% had the maternal and child protection card with them. A total of 72% of children were fully immunized. Of the 28% partially vaccinated children, only 12.5% had heard about Mission Indradhanush. Reasons stated for partial immunization were mother too busy, child illness, and lack of information. **Conclusion:** Very few participants had heard about Mission Indradhanush in this study although most of them were aware of immunization services. Strengthening of Information, Education, Communication (IEC) activities regarding the program—Mission Indradhanush—needs attention. The immunization coverage was satisfactory.

Keywords: Immunization, immunization status, Mission Indradhanush, urban slum

Introduction

Nearly 2–3 million children die each year from vaccine preventable diseases (VPDs).^[1] Evidence shows that unimmunized and partially immunized children are most susceptible to childhood diseases and disability, and run a 3–6 times higher risk of death as compared with fully immunized children. Despite universal immunization program, being operational for the past 30 years, only 65% children in India receive all vaccines during their first year of life. It is estimated that annually, more than 89 lakh children in the

country do not receive all vaccines that are available under the universal immunization program—the highest number compared with any other country in the world.^[2]

There are wide variations in the proportion of partially immunized and unimmunized children within states and districts. Recent evaluations have indicated that the major reasons for inability to reach with all vaccines to children in the country are lack of awareness among parents about the benefits of vaccination, fear of adverse events following immunization and operational reasons, such as nonavailability of vaccines or vaccinators during vaccination sessions. As a strategic endeavor, the Ministry of Health and Family Welfare, Government of India, launched Mission Indradhanush in December 2014 to

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achieve more than 90% full immunization coverage in the country by the year 2020 with a vision that it will eventually close immunity gaps and strengthen immunization coverage.^[2]

In urban areas, a large group of vulnerable population live in slums, where mothers are illiterate and have numerous myths about vaccination; this results in children being unimmunized and increased susceptibility to diseases. Parents are the primary health decision-makers for their children, their knowledge and practices regarding immunization in general have a great impact on the immunization status of their children. With this background, we planned to undertake this study with the objective to assess the awareness of the respondents about Mission Indradhanush, to assess their attitude and practices regarding childhood immunization and to determine the association between knowledge and practice with selected variables.

Materials and Methods

Study design

It was a community-based cross-sectional study.

Study setting

The study was conducted in the urban slums under field practice area of Urban Health and Training Centre (UHTC), Department of Community Medicine. The total population of all the five slums under the field practice area of UHTC is nearly 12,500 with 3200 households.

Study period

The study was conducted over a span of 4 months, that is, from June 01, 2017 to September 30, 2017.

Study population

The study comprised of mothers with children aged 12–23 months. A household was eligible if a child was aged between 12 and 23 months and available in the house. A child aged between 12 and 23 months was identified from the household through house-to-house visits; mother of the child was asked for the child's vaccination/mother and child protection (MCP) card. In case where there were two or more children aged between 12 and 23 months, the youngest child was selected. For the child with immunization card, the information on the doses and types of vaccines was copied from the card. In the absence of vaccination card, mothers were asked for immunization history of the child. The number of doses the child took and its route of administration was the way of collecting immunization history of the child. Information on other variables was asked directly from the child's mother. Mothers of children were interviewed about their knowledge on vaccination and VPD.

Inclusion criteria

- All the mothers with children aged 12–23 months who consented for the study

- Mothers who were residents of that area for a minimum period of one year.

Exclusion criteria

- Those who were not available during the period of visit
- Mothers who were mentally incapacitated.

Sample size

A statistically significant sample size was calculated by applying the sample size formula:

$$n = z^2 pq/d^2$$

n = the sample size to be estimated

z = the standard normal deviate set as 1.96

p = the complete immunization coverage in Odisha which is 0.62*

q = 1–p, which is 0.38

d = the precision error (0.10), considering a confidence interval of 95% and permissible error of 0.10

*As per the Immunization Dashboard (March 2016), Child Health and Immunization Division, Ministry of Health and Family Welfare, Government of India, complete immunization coverage is 62% for Odisha.^[3]

Taking 10% nonresponse rate, a total of 100 children were covered in this survey.

Sampling technique

The subjects were selected using random sampling technique. In the first stage, line listing of all the eligible households was done and 421 households were identified. In the next stage, households were randomly selected till the sample size was achieved.

Study tool

Data was collected using a predesigned, semi-structured schedule under the following sections:

- A) Socio-demographic profile of the respondent
- B) Awareness about Mission Indradhanush
- C) Knowledge, attitude, and practice about immunization

Filled questionnaires were checked for completeness and coded by the researcher.

The knowledge domain was assessed by seven questions, the answer being yes, no, and do not know. "Yes" (correct response) was scored "2" for and "No" (wrong answer) as "1", and "Do not know" were scored "0" for each question. The maximum score for knowledge was 14. 50th percentile was set as cut-off score, so the respondents who scored less than 7 were said to have inadequate

knowledge and those who had score more than and equal to 7 were said to have adequate knowledge about vaccination. The attitude was assessed by five questions, with responses as yes, no, and do not know. “Yes” (correct response) was scored “2” for and “No” (wrong response) as “1”, and “Do not know” were scored “0” for each question and the maximum score was 10. If the respondent’s score was less than 5, she was said to be having negative attitude and if the score was more than and equal to 5, she was said to have a positive attitude. The questionnaire was initially developed in English and later translated into Odia, and translated back to English. The study tool was pretested in another slum near the medical college. Deficiencies in the tool were noted, corrected, and then later used for the study.

Statistical analysis

Data was entered into Microsoft Excel spreadsheet and analyzed using Epi Info 7 software (version 3.5.4). Descriptive statistics were used and Fisher’s exact test as the test of significance; taking a *P* value of < 0.05 as statistically significant.

Ethical implication

Ethical clearance and approval was obtained from the Institutional Ethics Committee. The mothers were briefed about the purpose of the study. Informed written consent was obtained from the participant’s mothers, assuring their full confidentiality and voluntariness, that they had the right to refuse the participation at any stage of data collection.

Operational definitions

Fully vaccinated

A child aged between 12 and 23 months who received one Bacillus Calmette-Guerin (BCG), at least three doses of pentavalent, three doses of oral polio vaccine (OPV), and a measles vaccine was said to be fully vaccinated.^[4]

Partially vaccinated

A child who missed at least one dose of the eight vaccines was said to be partially vaccinated.^[4]

Unvaccinated

A child who does not receive any dose of the eight vaccines was said to be unvaccinated.^[4]

Vaccinated

A child who took at least one dose of the eight vaccines was said to be vaccinated.^[4]

Coverage by card only

Coverage calculated with numerator based only on documented dose, excluding from the numerator those vaccinated by history.^[4]

Coverage by card plus history

Coverage calculated with numerator based on card and mother’s report.^[4]

Results

Mean age of the children was 17.63 ± 3.43 months. A total of 65% of the children were males and 35% females. A total of 97% of the children were delivered at the hospital and 3% were delivered at home.

Mean age of the respondents was 24.48 ± 3.97 years and majority of them (94%) belonged to the age group of 20–34 years. A total of 32% of the respondents were illiterate and 93% of them were housewives; 76% belonged to the upper-lower socio-economic status according to the modified Kuppaswamy scale and 94% of the respondents were Hindus [Table 1].

Only 10% of the respondents had heard about Mission Indradhanush but 95% knew about the ongoing immunization services; the health care workers/doctors/volunteer being the most common source of information in 64% of the respondents, followed by friends and relatives, mass media, etc. [Figure 1].

A total of 73% of the respondents had the MCP card with them; 72% of children were fully immunized and 28% were partially immunized.

Most common reasons cited for partial immunization were lack of information (14.23%) among the respondents [Figure 2].

Husband’s literacy status had a significant positive association with the child’s immunization status. Although socio-economic status of the parents, birth order, and sex of the child were not found to be associated with immunization status of the child in the present study [Table 2].

A total of 64% of the respondents had an adequate knowledge about vaccination; 67.65% of the literate mothers and 56.25% of those who were illiterate had adequate knowledge about vaccination, although this was not found to be statistically significant. Literacy status of the father, birth order of the child, and sex of the child had a positive association with their knowledge about vaccination [Table 3].

A total of 84% of the respondents had a positive attitude about vaccination. As high as 87.23% in the age group of 20–34 years, followed by 50% of those above 35 years had a positive attitude toward vaccination. A total of 91.18% of the literate mothers as well as 68.75% of the illiterate mothers also had a positive attitude. Age of the mother, literacy status of the mother, birth order of the child, and sex of the child had a positive association with attitude toward vaccination [Table 4].

Discussion

Immunization is one of the best cost-effective ways to protect children against VPDs. The results of this study highlighted

Table 1: Socio-demographic details of the respondents (mothers) (n=100)

| Variables | Frequency (in number) | Percentage |
|---------------------------|-----------------------|------------|
| 1. Mother's age | | |
| <20 years | 4 | 4 |
| 20-34 years | 94 | 94 |
| >35 years | 2 | 2 |
| 2. Mother's education | | |
| Illiterate | 32 | 32 |
| Literate | 68 | 68 |
| 3. Mother's occupation | | |
| Unskilled worker | 7 | 7 |
| Housewife | 93 | 93 |
| 4. Socio-economic status* | | |
| Upper | 1 | 1 |
| Lower-middle | 18 | 18 |
| Upper-lower | 76 | 76 |
| Lower | 5 | 5 |
| 5. Religion | | |
| Hindu | 94 | 94 |
| Muslim | 6 | 6 |

*There were no respondents belonging to the category of upper-middle socio-economic scale of modified Kuppuswamy socio-economic status

Table 2: Association between immunization status and selected variables

| Factors | Fully immunized (n=72) | Partially immunized (n=28) | P |
|------------------------------|------------------------|----------------------------|--------|
| 1. Husband's literacy status | | | |
| Literate (n=87) | 69 (79.31%) | 18 (20.69%) | 0.0001 |
| Illiterate (n=13) | 3 (23.08%) | 10 (76.92%) | |
| 2. Wife's literacy status | | | |
| Literate (n=68) | 54 (79.41%) | 14 (20.59%) | 0.03 |
| Illiterate (n=32) | 18 (56.25%) | 14 (43.75%) | |
| 3. Socio-economic status* | | | |
| Middle (n=19) | 12 (63.16%) | 7 (36.84%) | 0.50 |
| Lower (n=81) | 60 (74.07%) | 21 (25.93%) | |
| 4. Birth order of child | | | |
| 1 st (n=52) | 42 (80.77%) | 10 (19.23%) | 0.10 |
| 2 nd (n=41) | 25 (60.98%) | 16 (39.02%) | |
| >3 rd (n=7) | 5 (71.43%) | 2 (28.57%) | |
| 5. Sex of the child | | | |
| Male (n=65) | 51 (78.46%) | 14 (21.54%) | 0.08 |
| Female (n=35) | 21 (60.0%) | 14 (40.0%) | |

*None of the respondents belonged to upper-middle socio-economic scale according to the modified Kuppuswamy scale, so for the analysis purpose upper, upper-middle, and lower-middle category has been merged and named as "middle" and upper-lower and lower has been merged to make "lower" scale

that although only 10% of the respondents had heard about Mission Indradhanush but as high as 95% of them were aware about importance of immunization. This finding is consistent with another study done in Odisha in which 95% respondents considered vaccination as important for their children^[5] but is higher than a study done in Jos North, Nigeria in which nearly 89.6% had good knowledge about immunization.^[6] In our study, the most common source of information regarding immunization were health care workers/doctors/volunteer, followed by friends/relatives and mass media, which accounted

Table 3: Association between socio-demographic variables and knowledge about vaccination

| Socio-demographic variables | Knowledge about vaccination | | P |
|-------------------------------|-----------------------------|-----------------|--------|
| | Inadequate (n=36) | Adequate (n=64) | |
| Age of the mother (years) | | | |
| <20 (4) | 1 (25%) | 3 (75%) | 0.50 |
| 20-34 (94) | 35 (37.23%) | 59 (62.77%) | |
| >35 (2) | 0 (0%) | 2 (100%) | |
| Literacy status of the mother | | | |
| Illiterate (32) | 14 (43.75%) | 18 (56.25%) | 0.37 |
| Literate (68) | 22 (32.35%) | 46 (67.65%) | |
| Literacy status of the father | | | |
| Illiterate (13) | 9 (69.23%) | 4 (30.77%) | 0.018 |
| Literate (87) | 27 (31.03%) | 60 (68.97%) | |
| Birth order of the child | | | |
| 1 st (52) | 24 (46.15%) | 28 (53.85%) | 0.07 |
| 2 nd (41) | 11 (26.83%) | 30 (73.17%) | |
| 3 rd or more (7) | 1 (14.29%) | 6 (85.71%) | |
| Sex of the child | | | |
| Male (65) | 15 (23.08%) | 50 (76.92%) | |
| Female (35) | 21 (60%) | 14 (40%) | 0.0006 |

Table 4: Association between socio-demographic variables and attitude about vaccination

| Socio-demographic variables | Attitude about vaccination | | P |
|-------------------------------|----------------------------|-----------------|--------|
| | Positive (n=84) | Negative (n=16) | |
| Age of the mother (years) | | | |
| <20 (4) | 1 (25.0%) | 3 (75%) | 0.0017 |
| 20-34 (94) | 82 (87.23%) | 12 (12.77%) | |
| >35 (2) | 1 (50%) | 1 (50%) | |
| Literacy status of the mother | | | |
| Illiterate (32) | 22 (68.75%) | 10 (31.25%) | 0.01 |
| Literate (68) | 62 (91.18%) | 6 (8.82%) | |
| Literacy status of the father | | | |
| Illiterate (13) | 10 (76.92%) | 3 (23.08%) | 0.72 |
| Literate (87) | 74 (85.06%) | 13 (14.94%) | |
| Birth order of the child | | | |
| 1 st (52) | 44 (84.62%) | 8 (15.38%) | 0.006 |
| 2 nd (41) | 37 (90.24%) | 4 (9.76%) | |
| 3 rd or more (7) | 3 (42.86%) | 4 (57.14%) | |
| Sex of the child | | | |
| Male (65) | 61 (93.85%) | 4 (6.15%) | 0.0007 |
| Female (35) | 23 (65.71%) | 12 (34.29%) | |

for 64%, 22% and 7%, respectively. In a study by Kumar *et al.* in rural area of Telangana, the major source of information were health workers/doctors (46%), mass media (43%), and friends/relatives (7%).^[7] Total coverage for fully immunized and partially immunized children in the present study was 72% and 28%, respectively, by both card plus recall, which is at par with a study done in Haryana,^[8] but lower than the study done in Nepal where total coverage for fully immunized and not fully immunized children was 92% and 8%, respectively.^[9] This may

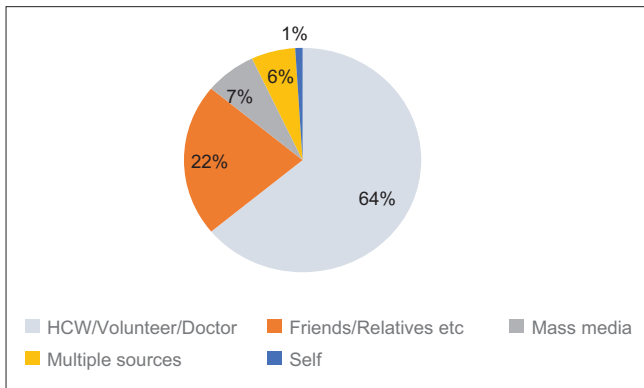


Figure 1: Source of information regarding childhood immunization

be due to the difference in the utilization of the immunization services, which is more than 95% for Nepal. Most common reasons cited for partial immunization in our study was lack of information (14.23%), mother was too busy (7.14%), and child was ill, so not brought for immunization (7.14%). This finding is in contrast with another study done in urban slums of Odisha, where frequent illness of child (42%) and lack of information on date of immunization (39%) were most common reasons for partial immunization.^[5] This difference can be due to the location in which the study was done. Our study was done in the catchment area, which is under the field practice area of a medical college with more awareness activities being done by the students and staffs that increases the utilization of services, whereas the other study gives a general preview of the urban slums of another city of Odisha, that is, Cuttack.

Present study showed that husband’s education/literacy status ($P = 0.0001$) and wife’s literacy status ($P = 0.03$) was positively associated with the vaccination status of children, such as complete and timely immunization, which is consistent with a study done by Xeuatvongsa *et al.* in Lao People’s Democratic Republic^[10] and by Nischal and Bhattacharya in two districts of Haryana.^[8] A total of 64% of the respondents had an adequate knowledge about vaccination in this study, whereas in a study by Birhanu *et al.* in Addis Ababa, Ethiopia, 55% of the mothers had good knowledge.^[11] Literacy status of the mother was not associated with the level of knowledge in the present study, whereas in a study by Chris-Otubor *et al.* in Jos North, Nigeria, mother’s education status was significantly associated with the level of knowledge.^[6] In this study, 84% of the respondents had a positive attitude toward childhood vaccination, which is lower than the study by Birhanu *et al.* in Addis Ababa, Ethiopia where 98.7% mothers had a positive attitude toward vaccination.^[11]

This study had certain limitations. In the unavailability of MCP card, data was collected based on self-reporting, which could lead to issues of reporting bias. Interviews of mothers of only living children (12–23 months) were taken. Hence, there is some bias as those children who died (nonsurvivors), the practices of

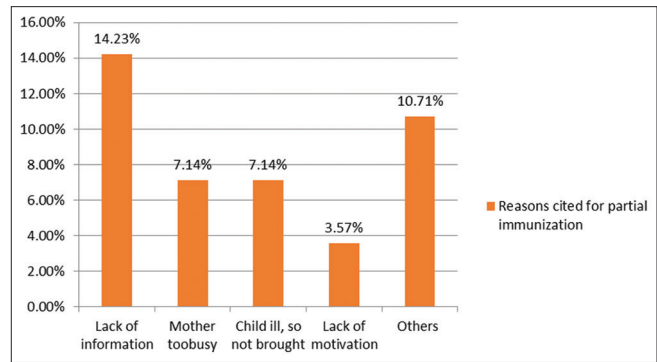


Figure 2: Reasons cited for partial immunization ($n = 28$)

their mothers if could have been taken could have given the real scenario of the community under study. The sampled population chosen is according to the convenience of the researchers, results may not be generalizable to the state as whole.

Conclusion

The study conducted in the urban slums highlighted the fact that in the future, efforts are required to strengthen IEC activities regarding the program—Mission Indradhanush—as very few participants had heard about it. Although most of them were aware of immunization services and the immunization coverage was good. The study results reinforce the recommendations for the periodic assessment and need for awareness generation activities toward the ongoing and new programs launched by the government from time to time. This will also increase the utilization rates of the various VPDs.

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Conflicts of interest

There are no conflicts of interest.

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