Assessment of immunization status among under five children in rural Mangaluru: a cross sectional study

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ABSTRACT

**Background:** Immunization is the process whereby a person is made immune resistant to an infectious disease, typically by the administration of vaccine. If exposure to a disease occurs in a community there is a little to no risk of an epidemic if people have been immunized. This study was to assess the immunization status among children up to 5 years in rural Mangaluru.

**Methods:** A community based cross sectional study was conducted among children of 0-5 years of age group (n=93) in rural Mangaluru using convenient sampling technique. After obtaining oral consent from parents, immunization status of children was assessed using validated questionnaire and details of child found to be partially immunized or not at all, reasons for not giving the vaccine were also collected.

**Results:** 52.7% of the study population was partially immunized and 46.2% were fully immunized; only 83.9% possessed an immunization card. Majority of them have not taken measles/MR (55.9%) and also IPV 1 (46.2%) and Vitamin A2 (61.3%) because of unaware need for further immunization (58%).

**Conclusions:** According to the survey, conducted in rural fields, we found that half of the population was partially immunized. Reasons being lack of awareness, negligence of parents, unaware of 2nd and 3rd dose of vaccines.

**Keywords:** Immunization, National immunization schedule, Children under 5, Mangaluru

INTRODUCTION

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of vaccine. Vaccines stimulate the body’s own immune system to protect the person against subsequent infection or disease.¹

Universal Immunization Programme of May 1974, the WHO officially launched a global immunization programme, known as Expanded Programme on Immunization (EPI) to protect all children of the world against six vaccine-preventable diseases, namely, diphtheria, whooping cough, tetanus, polio, tuberculosis, and measles, EPI was launched in India in January 1978.²

The Indian version, the Universal Immunization Programme (UIP), was launched on November 19, 1985 and was dedicated to the memory of Smt. Indira Gandhi.² At present this is known as National Immunization Schedule (NIS).

Vaccinations prevent us or our child from getting diseases for which there are often no medical treatments. These illnesses can result in serious complications and even death. A small number of people may be susceptible to disease, such as those with impaired immune systems. These people may not be able to get vaccinations or may not develop immunity even after having been vaccinated. Their only protection against certain diseases is for others to get vaccinated so the illnesses are less common. If
exposure to a disease occurs in a community there is a little to no risk of an epidemic if people have been immunized.3

According to the NFHS-4, Karnataka state fact sheet it is seen that children aged between 12-23 months who were fully immunized (BCG, measles and 3 doses each of Polio and DPT) were found to be 63%. In rural areas it was 65% and in urban it is 60%. Most of them received the vaccines from public health facility accounting to 88%.4

Therefore the objectives of this study was to assess the immunization status among under five children in our rural field practice areas, reasons for partial immunization and to know the prevalence of fully immunized under-5 children.

Aim
To assess the immunization status among children up to 5 years in rural field practice areas of Kanachur Institute of Medical Sciences, Mangaluru.

Objectives
- To know the prevalence of fully immunized under-5 children in our rural field practice areas.
- To assess the causes for partial immunization and non-immunization.

METHODS
A community based cross-sectional study was conducted among under five children (n=93) in rural Mangaluru using convenient sampling technique. The period of study was from March 2019 to April 2019. Study area were rural field practice areas of Kanachur Institute of Medical Sciences, i.e., Talapady and Pilikoor.

Sample size
Sample was calculated using the formula,

\[ n = \frac{4pq}{d^2} \]

Where, p=prevalence of children fully immunized at the age of 12-23 months as per NFHS-4=64.8~65 in rural Karnataka.4

\[ q = 100 - p = 100 - 65 = 35 \]

\[ d=\text{allowable error}. \]

Therefore, \[ n = \frac{4 \times 65 \times 35}{100} = 91 \approx 93 \]

Inclusion criteria
Children of 0-5 year’s age group resident of the area were taken as study subjects.

Exclusion criteria
Children/parents who are not willing to participate in the study were excluded.

Data collection
Oral consent was taken from parents and validated questionnaire was used to conduct the study.11 The variables studied cover the details like mother’s/guardian name, age, religion and child’s age, gender, date of birth, whether immunized or not and the source of immunization. If a child was found to be partially immunized or not at all immunized, reasons for not giving the vaccine were explored. The reasons for partial immunization were grouped into 3 main categories namely: Lack of information, lack of motivation and obstacles. At the end of the interview if the child was found to be fully immunized, reminder was given for the next vaccine which was due. If a child was found to be partially immunized or not at all immunized, then the respondent was informed about the vaccines which are needed to be given and the importance of giving them at the earliest.

Operational definitions

Fully immunized
Child who had received all doses of vaccine for which he/she was eligible by age as per National Immunization Schedule, India.2

Partially immunized
Child who was not fully immunized but received only one or two doses of vaccine for his/her age as per National Immunization Schedule, India.

Unimmunized
Child who had not received any vaccine for the age, though eligible.

Data analysis
Data collected were entered in Microsoft excel and data analysis was done using SPSS version 25 and presented using descriptive statistics. Association between two attributes was seen using Chi-square statistics. The results with p-values <0.05 was taken as statistically significant.

RESULTS
A total of 93 children were included in the study. According to Table 1 which shows socio-demographic details of mother/primary care takers the study subjects. 34.4% mothers educational status up to primary school. Majority of mothers were homemakers (98.9%). Mean
age of the mother was found to be 29.1 yrs. with a standard deviation of 4.2 yrs.

**Table 1: Socio-demographic details of mother/primary caretaker.**

| Educational status of mother | Frequency | %   |
|------------------------------|-----------|-----|
| Illiterate                   | 2         | 2.2 |
| Primary school               | 32        | 34.4|
| Secondary school             | 31        | 33.3|
| Pre university and above     | 28        | 30.1|

| Occupation of mother         |          |     |
|------------------------------|----------|-----|
| Homemakers                   | 92       | 98.9|
| Daily labourer               | 1        | 1.1 |
| Farmer                       | 0        | 0   |
| Self employed                | 0        | 0   |
| Government or others         | 0        | 0   |

| Age of mother (in years)     |          |     |
|------------------------------|----------|-----|
| 20-24                        | 15       | 16.1|
| 25-29                        | 32       | 34.4|
| 30-34                        | 34       | 36.6|
| 35-39                        | 12       | 12.9|

**Table 2: Socio-demographic details of children (n=93).**

| Age of child in months       | Frequency | %   |
|------------------------------|----------|-----|
| 0-12                         | 22       | 23.7|
| 12-24                        | 24       | 25.8|
| 25-36                        | 16       | 17.2|
| 37-48                        | 18       | 19.4|
| 49-60                        | 13       | 14.0|

| Gender                      |          |     |
|------------------------------|----------|-----|
| Male                        | 45       | 48.4|
| Female                      | 48       | 51.6|

| Religion                    |          |     |
|------------------------------|----------|-----|
| Hindu                       | 2        | 2.2 |
| Muslim                      | 90       | 96.8|
| Christian                   | 1        | 1.1 |
| Others                      | 0        | 0   |

| Place of delivery           |          |     |
|------------------------------|----------|-----|
| Home                        | 0        | 0   |
| Clinics or hospital         | 93       | 100.0|
| Others                      | 0        | 0   |

According to Table 2, 25.8% children belong to the age group of 12-24 months. Majority 96.8% belongs to Muslim religion. Females account to 51.6% and all of them had institutional delivery.

**Table 3: Immunization status of children (n=93).**

| Schedule       | Vaccine not Taken | Frequency | %   |
|----------------|-------------------|-----------|-----|
| At birth       | BCG               | 1         | 1.1 |
|                | Hep B             | 9         | 9.7 |
|                | OPV 0             | 2         | 2.2 |
| 6 weeks        | OPV 1             | 1         | 1.1 |
|                | Pentavalent 1     | 5         | 5.4 |
|                | IPV 1             | 43        | 46.2|
| 10 weeks       | OPV 2             | 3         | 3.2 |
|                | Pentavalent 2     | 6         | 6.5 |
| 14 weeks       | OPV 3             | 2         | 2.2 |
|                | Pentavalent 3     | 13        | 14.0|
| 9-12 months    | Measles 1/MR 1    | 15        | 16.1|
|                | Vitamin A1        | 22        | 23.7|
| 16-24 months   | DPT Booster 1     | 33        | 35.5|
|                | Measles 2/ MR 2   | 52        | 55.9|
|                | OPV Booster       | 44        | 47.3|
|                | Vitamin A2        | 57        | 61.3|
| 5-6 years      | DPT Booster 2     | 3         | 3.2 |

According to Table 4, vaccines missed by the study subjects, majority were measles 2/MR 2-55.9%, IPV-46.2% and vitamin A2-61.3%. Least missed vaccines were BCG-1.1%, OPV birth dose-2.2%.
Table 5: Reasons for partially immunized or not immunized.

| Reasons for | Frequency | %  |
|-------------|-----------|----|
| Lack of immunization | | |
| Unaware of need for immunization | 29 | 58.0 |
| Unaware of need to return for 2nd or 3rd dose | 13 | 26 |
| Fear of side reaction | 0 | 0 |
| Wrong ideas about contraindication | 0 | 0 |
| Lack of motivation | | |
| Postponed until another time | 3 | 6.0 |
| Cultural or religious reasons | 1 | 2.0 |
| Rumours | 0 | 0 |
| Obstacles | | |
| Place of immunization too far | 0 | 0 |
| Time of immunization inconvenient | 0 | 0 |
| Vaccination absent/ Vaccination not available | 10 | 20 |
| Mother too busy | 2 | 4.0 |
| Family problem including illness of mother | 0 | 0 |
| Child ill-brought but not given immunization | 2 | 4.0 |
| Long waiting time | 1 | 2.0 |

According to the Table 5, reasons for partially immunized or not immunized were unaware of need for immunization 58%, unaware of need to return for 2nd or 3rd dose 26%. Vaccination absent or vaccination not available was 20%, postponed until another time was 6%.

Children up to 12 months had better immunization status as compared to children of 13-60 months age.

Gender of the child and age of the mother did not have any significant association towards immunization status.

DISCUSSION

In our study out of 93 study subjects 24 (25.8%) belonged to the age group of 12-24 months. 51.6% were girls, 96.8% were Muslim by religion, with mean age of the mother being 29.1 years +/- 4.2 years. Majority of them were homemakers by occupation (98.9%) and most of them with primary education (34.4%).

Table 7: Reasons for partially immunized or not being immunized.

| Reasons                          | Our study (%) | In Kumar et al. (%) | In Srivastava et al. (%) | In Khargekar (%) |
|----------------------------------|---------------|---------------------|--------------------------|-----------------|
| Lack of awareness                | 84            | 24.2                | 41                       | -               |
| Negligence by parents            | -             | -                   | 32.5                     | -               |
| Fear of side effects             | -             | -                   | 40                       | -               |
| Visit to native place            | -             | -                   | -                        | 37.5            |
| Inconvenient time of immunization| -             | 22.6                | -                        | -               |
| Postponed until another time     | -             | 22.6                | -                        | -               |

In our study 46% children were found to be fully immunized and 52.7% were partially immunized while 1.1% of children were unimmunized. In a study done in 2015 by Kumar et al. 5 slum areas in Mangaluru Taluk, India total 150 under five children, 58.7% were fully immunized, 41.3% were partially immunize.

In a study done by Srivastava et al, in 2016 urban Bagalkote, showed that out of total 283 under five children 83% children were found to be fully immunized and 16% were partially immunized while 1% of children were unimmunized. In a study done by Khargekar et al, in 2015 in tribal area, Parol, Thane district showed that completely immunized children were 71.1%, partially.

*It was seen that there was a significant association between the age of the child and their immunization status p=0.004 (Chi-Square).
immunized children were 17.8% and 11.1% were not immunized.7

In our study reasons for partially immunized/not being immunized is due to lack of awareness 84% of them whereas in Kumar et al study, and Srivastava et al study 24.2% and 41% respectively.3,6

CONCLUSION

In our study, out of total study population, 46.3% were fully immunized, 52.7% were partially immunized and 1.1% was not immunized. According to NFHS-4, Karnataka state fact sheet it is seen that children aged 12-23 months who were fully immunized, in rural areas was 65% and in urban it was 60%. Though Dakshina Kannada is a developed district in Karnataka, when survey was conducted in our rural field practice areas, we found out that half of the populations were partially immunized. Major reasons being lack of awareness, unaware of 2nd and 3rd dose of vaccines.

Recommendations

Awareness programmes to create knowledge about immunization at community level. Improve knowledge about immunization among mothers. To recommend ASHA workers to encourage mothers/care takers to complete the immunization schedule on time. To promote timely completion of immunization schedule.

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