

Original Research Article

A cross sectional study on immunization status among children 12 to 24 months of age in urban field practice area of tertiary health care centre, Hyderabad

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ABSTRACT

Background: Immunization is a process in which a person is made resistant to infectious disease, by the administration of vaccine. Immunization is averting an estimated 2-3 million deaths every year. Deaths among under 5 children from measles and its complication is the major killer worldwide. As per 2017 global coverage of measles is 89% and pentavalent (diphtheria, pertussis, tetanus) its 85%. Still 71 countries have yet to achieve global vaccine action plan (GVAP) target of 90% coverage of 3 doses of DTP. India is one among these countries with only 63.9% coverage, and the state of Telangana has coverage of 67.5% according to National family health survey-4 (NFHS-4) (2015-2016).

Methods: A community based cross sectional study was conducted among 12-24 months age children, sample size of 199 is calculated by using the formula of $4pq/l^2$ and by considering the immunization coverage of 66.7% according to the NFHS-4 (2015-2016) of Telangana state and allowable absolute error of 7% and nonresponsive rate of 10%, simple random sampling technique was used and data collected by using semi-structured questionnaire, data was analysed using MS-office and OpenEpi.

Results: Among 199 study population 136 children were Hindus and 53 were Muslims and 10 from other religion. Mean age and standard deviation of study population was 14 ± 4.56 . Among total population 72.9% (145) are completely immunized, 25% (50) are partially immunized 2.04% (4) are unimmunized.

Conclusion: Immunization coverage was higher in the present study then the state of Telangana i.e., 67.5% as per NFHS-4.the rural population.

Keywords: Immunization, Vaccines, Immunization coverage, 12-24 months, Urban slums, Hyderabad

INTRODUCTION

Immunization is a process by which children are exclusively protected against vaccine preventable diseases. According to United Nation Children's Fund (UNICEF) it is the most cost effective public health intervention against vaccine preventable diseases in reducing the mortality and morbidity, which precludes around 2-3 million deaths among under five age group children annually throughout

the world.¹⁻⁴ Globally expanded programme on immunization was started in the year 1974 with the aim of preventing deaths among children against vaccine preventable diseases.⁵

A per UNICEF report 2017 deaths among under five age group children from measles and its complication declined by 85% globally and 87% in Sub-Saharan Africa between 2000 to 2016, World Health Organization (WHO) declared

India as a polio free nation in 2013, and in 2015 it declared India as neonatal tetanus free nation.¹

Deaths due to measles, a major killer among under five aged children, declined by 80 percent worldwide from 2000 to 2017 preventing an estimated 21.1 million deaths. And as on March 2019, all WHO region countries have eliminated maternal and neonatal tetanus a disease with a fatality rate of 70 to 100 per cent among new-borns, except 13 countries.^{1,5}

According to WHO in 2018, an estimated 19.4 million infants globally were unable to avail routine immunization services such as 3 doses of diphtheria, tetanus, pertussis (DTP) vaccine. Around 60% of children who failed to avail immunization were from Angola, Brazil, Democratic Republic of the Congo, Ethiopia, India, Indonesia, Nigeria, Pakistan, Philippines and Viet Nam.⁵

Globally in 2018 rate of coverage for the third dose of the diphtheria, tetanus and pertussis vaccine (DTP3) reached 86 percent, up from 72 percent in 2000 and 20 percent in 1980. Still, progress has stalled over the present decade, and 83 countries have yet to achieve the Global vaccine action plan (GVAP) target of 90 percent or greater coverage of DTP3.⁶

Indian scenario

In the year 1985 universal immunization program was introduced in India with the aim of increasing the coverage of immunization of at least 85% of infants under the program by 1990.

India accounting for 2.6 million of the under-vaccinated children even with 89% coverage of a cohort of 23 million surviving infants.⁶

India depicts increase in immunization coverage from 44% as per National family health survey-3 (NFHS-3) (2013-2014) to 62% as on NFHS-4 (2015-2016)⁷ though there is increase in immunization compared to NFHS-3 but this state of progress is not enough to reach upto 90% coverage to attain the goal of sustainable developmental goal 3.2.

Operational definitions

Fully immunized

Child of 12 to 24 months who has received all primary doses of vaccines i.e., zero dose of Oral poliovirus vaccine (OPV), Bacille Calmette-Guerin (BCG) and Hepatitis B, three doses of DPT and bivalent oral poliovirus vaccine (bOPV), two doses of Inactivated polio vaccine (IPV), one dose measles along with vitamin A upto 9 months of age.

Partially immunized

A child who has missed at least any one of primary doses upto 9 months of age.

Completely immunized

If a child who has taken all primary doses along all booster doses of vaccine upto 5 years of age.

Non immunized

Children who were not immunized even for single vaccine. Children who were not vaccinated against any vaccines under universal immunization coverage.

Need for the study

Present study was conducted to find out immunization coverage among children of 12 to 24 months in urban slums infield practice area of Osmania Medical College as very limited number of studies were conducted on immunization coverage among children.

Aim

Aim of the study was to determine the immunization status among children 12 to 24 months of age in urban field practice area of tertiary health care centre.

Objectives

The objectives of the study were to estimation of the immunization coverage among children 12-24 months of age and to study the factors influencing the immunization among the study population.

METHODS

A community based cross sectional study was conducted among 199 study population of 12-24 months age group children. In the urban field practice area of Osmania Medical College for a period of 5 months (i.e., August 2018 to December 2018). Sample size of 199 is calculated by using the formula of Z^2pq/l^2 and by considering the immunization coverage of 66.7% according to the NFHS-4 (2015-2016) of Telangana state and allowable absolute error of 7% and nonresponsive rate of 10%.

$$N = Z^2pq/l^2$$

Z=confidence (i.e., for 95% of confidence interval (CI) z value is 1.96).

p=prevalence,

q= 100-p,

l= allowable error.

$$N = 4 \times 66.7 \div 7 \times 7 = 181$$

By considering non-responsive rate as 10% sample size of 199 is attained.

Sampling technique

The sample technique used was simple random sampling technique.

Sampling procedure

Enlisting of the study population was done by visiting 14 Anganwadi centres of field practice area with the help of Accredited social health activist (ASHA), children of 0-2 years of age were around a total of 1712 (one thousand seven hundred twelve), of them children of 12 to 24 months were 1050 (one thousand fifty) they were enlisted by giving them serial numbers and random numbers were generated using random number table in Microsoft excel version 2007 until sample size was attained.

Study population

The study population included children of 12-24 months.

Inclusion criteria

The inclusion criteria for the study were children between 12- 24 months age group who were residing in the urban field practice area of Osmania medical college and children of 12- 24 months age group whose parents gave consent to participate in the study.

Exclusion criteria

The exclusion criteria for the study were children who are seriously ill among study population, whose parents were not present during the visit and those and children whose parents were not willing to participate in the study.

Data collection method and analysis

Data was collected after taking consent from the mother and by interviewing the mother by using semi-structured questionnaire consisting of identification data and WHO immunization coverage evaluation format and also by cross checking with the Mother and child protection (MCP) cards. Data was analyzed using Microsoft office excel 2007 and OpenEpi info 3.01 version.

RESULTS

Socio-demographic profile of the study population

As present study was conducted among 199 study population in urban slums, according to present study, majority of the study population belongs to the upper lower class 30.65% (61) followed by lower class 30.15% (60) according to modified Kuppaswamy classification (table 1). Among study population majority were Hindus i.e., 62.8% (125) followed by 35.1% (64) Muslims and 5.1% (10) were from other religion. In this study boys 54.27% (108) were more compared to girls 45.72% (91).

Table 1: Description about sociodemographic variables of study population (n=199).

Sociodemographic variables	Total N (%)
Socio-economic classification of study population according to modified Kuppaswamy	
Upper class	8 (4.01)
Upper middle	20 (10.5)
Lower middle	50 (25.12)
Upper lower	61 (30.65)
Lower class	60 (30.15)
Coverage of individual vaccine	
BCG	185 (93.4)
OPV	164 (82.9)
Pentavalent	164 (82.9)
IPV	120 (60.34)
Measles	136 (68.34)
Vitamin-A	136 (68.34)
Immunization status of study population	
Fully immunized	145 (72.9)
Partially immunize	50 (25)
Delivery points of immunization services, total (n=195)	
Government	154 (78.9)
Private	41 (21.02)

Mean age group (months) of study population was 14 ± 4.56 (mean \pm standard deviation (SD)). Majority of study population belong to joint family 65.3% (130) which includes both horizontal extension and vertical extension, followed by nuclear family 34.7% (69). Literacy status among mothers of study population includes, illiterates 13.06% (26), majority of the mothers completed primary education 40.2% (80) and 11.55% (23) of them completed secondary education, 10.5% (20) mothers were completed intermediate. working mothers were 41.7% (83) and housewife were 58.29% (116). Among study population 74.8% (149) were on breastfeeding along with supplementary feeds and rest of the babies 50 (25.12%) were only on supplementary feeding.

Immunization status

Among 199 study population, 145 (72.9%) were fully immunized, 50 (25%) were partially immunized and 4 (2.1%) were non-immunized. 4 (2.1%) non-immunized children were belonging from Muslim community and reason for non-vaccination among them was non-willingness of father for any vaccination because of cultural and religious beliefs and lack of awareness about the benefits of vaccination among children. Among Hindus 107 (85.6%) were full immunization and 18 (14.4%) were partially immunized. Among Muslims 28 (43.75%) were accounted for full immunisation and 32 (50%) were partially immunization. Children from other communities 10 (100%) were fully immunized.

Table 2: Immunization coverage of study population (n=199).

Variables	Fully immunized N (%)	Partially immunized N (%)	Non immunized N (%)	Total (n=199)	Chi square and p value
Gender					
Male	73 (67.59)	32 (29.6)	3 (2.7)	108	X ² =2.79 p=0.09
Female	72 (79.12)	18 (19.78)	1 (1.098)	91	
Literacy status of mother					
Illiterate	12 (46.15)	10 (38.4)	4 (15.38)	26	X ² =5.106 p=0.02*
Primary	60 (75)	20 (25)	-	80	
Secondary	57 (78.08)	16 (21.9)	-	73	
Intermediate	16 (80)	4 (20)	-	20	
Religion					
Hindu	107 (85.6)	18 (14.4)	-	125	X ² =31.6 p=0.000*
Muslims	28 (43.75)	32 (50)	4 (6.25)	64	
Others	10 (100)	-	-	10	

*There was significant statistical association between religion, literacy status of mother and immunization among study population with statistically significant association.

Fully immunized status was more among Hindus when compared to Muslims with a statistically significant association ($p=0.000^*$) (Table 2). Among partially immunized children the commonest reason according to the respondents is unavailability of both the parents accounting for 48% (24), fear of injection accounting for 28% (14) of the children, baby felt sick of previous immunization accounting to 20% (10) and lack of knowledge of subsequent doses accounting for 8% (4) of partial immunization. Among 199 study population of 77.3% population availed immunization services at government institutes and 20.6% population availed immunization services at private setups and 2.1% did not utilize immunization service at any health facility.

Among study population immunization of BCG vaccine was accounted for 185 (93.4%), followed by OPV and pentavalent vaccines accounted for 164 (82.9%), measles and vitamin-A constituted by 136 (68.34%) of the study group. Among boys, full immunized were 73 (67.59%) and partially immunized were 32 (29.6%) followed by non-immunized were 3 (2.7%), whereas girls who were immunized among them, fully immunized were 72 (79.12%), partially immunized were 18 (19.78%) and non-immunized were only 1 (1.09%), there was no significant statistical association found between study population based on gender $p=0.09$ (Table 2). Based on literacy status, mothers who were illiterate, full immunization coverage was constituted by 12 (46.15%), partial immunization accounted by 10 (38.4%), and non-immunized were 4 (15.38%). Among literate mothers' full immunization was taken by 133 (76.8%) study population and partial immunization was taken by 40 (23.12%) (table 2) study population. Fully immunized babies are significantly more among literate mothers than illiterate mothers ($p=0.02^*$) (Table 2).

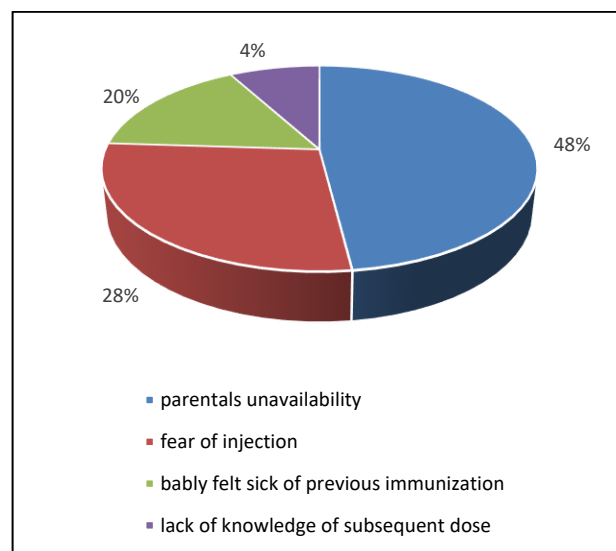


Figure 1: Distribution of reason for partial immunization status of study population.

DISCUSSION

Immunization among children of under-five contribute to the prevention of deaths due to vaccine preventable diseases, which contributes to the reduction of infant mortality rate and under five mortality both globally and nationally and also attainment of Sustainable development goal (SDG) 3.2 in reduction of under-five mortality. Attaining high level of immunization coverage among developing countries like India is a big challenge because of its varied customs and cultural practices. National health policy 2017 of India, targeting of attainment of 90% immunization coverage among all under five age group children.

According to present study immunization coverage was 72.9% which was higher than NFHS-IV survey report (2015-2016) which was only 62% of immunization among children of 12 to 23 months.⁷

According to Murekhar et al immunization coverage among study population was 69.7% were fully immunized and 17.7% were partially immunized and 12.6% were non-immunized, but according to present among the total study population 72.9% population were partially immunized and 25% were partially immunized and 2.1% were non-immunized, immunization coverage of study population is more in the present study compared to Murekhar et al.⁸

According to Venkatachalam et al fully immunization coverage is among male study population was 80% and female study population was 78% and partial immunization among boys and girls was 18% and 20 % respectively and according to present study fully immunization coverage among boys was 67.59% and girls was 79.12% and partial immunization coverage among boys and girls was 29.6% and 19.78% respectively which was less compared Venkatachalam et al.⁹

According to Singh et al 95.56% study population availed immunization services at government health facility and 3.54% study population availed immunization at private health facility and according to present study 78.9% study population availed immunization at government health facility and 21.02% availed immunization at private health facility, utilization of immunization services at government health facility was less among present study compared to Singh et al.¹⁰

In the present study 145 (72.9%) were fully immunized, 50 (25%) were partially immunized and 4 (2.1%) were non-immunized. Non immunized children belong to Muslim community and reason for non-vaccination among them was non-willingness of father for any vaccination because of cultural and religious beliefs and lack of awareness about the benefits of vaccination among children. Fully immunized children are significantly more among Hindu community than other communities taken in the present study. Partially immunized children are more among Muslim community. The commonest reason found in the present study was is unavailability of both the parents accounting for 48% (24) followed by fear of injection accounting for 28% (14) of the children, baby felt sick of previous immunization accounting to 20% (10) and lack of knowledge of subsequent doses accounting for 8% (4) of partial immunization. This demand strengthening the health team for creating awareness on the importance of vaccines, complete immunization and its benefits, role in preventing diseases and development of immunity against communicable diseases. Literacy status of mothers also shows significant association among fully immunized children than partially immunized children. In the present study 93.4% of the study population was taken BCG in higher rates compared to other vaccines. as the willingness of parents remains the most important factor for non-

immunization among Muslim community children, more focus should be taken in the particular aspect of educating the parents in a proper manner.

Limitation of the study

Children of 12-24 months who were registered at Anganwadi center were only included in the study population.

CONCLUSION

Overall immunization coverage of Telangana is higher than the average National Immunization coverage as per NFHS-4, present study also shows higher immunization of 72.9%, compared to that of overall Telangana immunization coverage i.e., 67.5% as per NFHS-4. Higher coverage may be the attribute by national scheme of Mission Indradhanush which was launched in the year 2014, and later intensified sessions of Mission Indradhanush to drive the nation towards coverage and sustain of 90% coverage by 2020 in India. Appropriate interventions are future needed to reach upto the dropouts and also community intervention measure to future reduce stigma towards immunization which was observed in the present study.

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

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