

Immunization Status of Children 12–36 Months Age of Migrant Workers and Factors Associated with it in Urban Areas of Bangalore East

Shweta Neminath Kurkuri, Mangala Subramanian¹

Department of Community Medicine, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru, ¹Department of Community Medicine, Vydehi Institute of Medical Sciences and Research Centre Bangalore, Karnataka, India

Abstract

Background: Immunization is a cost-effective weapon against vaccine preventable diseases. Children of migrant workers suffer from lack of immunization because of frequent shift of places, poor knowledge, and low socioeconomic status. To assess the immunization status of children 12–36 months of age of migrant workers and factors associated with it. To identify the reasons for non-immunization or partial immunization among these children. **Material and Methods:** A cross-sectional study was conducted among 500 migrant workers' children aged 12–36 months residing in Urban Bangalore east from February 2019 to August 2020. A cluster sampling method was incorporated. The data were collected using pre-tested semi-structured questionnaire. Data were analyzed using Epi-info™ Version 7.2.1 and SPSS version-21. Data were summarized in percentages, mean, standard deviation, and logistic regression. **Results:** The mean age of the children was 25.2340 ± 8.42 months. Out of 500 children, 88.60% were fully immunized, 11.40% were partially immunized, and no child was unimmunized. Significant predictors of immunization status of children were education of father and immunization card. Common reasons for dropout were inconvenient time (80.70%), unaware of need (77.19%), and busy schedule of parents (75.44%). The dropout rate of BCG to MR-1, Penta-1 to Penta-3, and Penta1 to MR-1 was 6.49%, 0.85%, and 2.12%, respectively. **Conclusions:** Immunization coverage in the present study was 88.60%. Inconvenient time was the main reason behind partial immunization.

Keywords: Bangalore East, children 12–36 months, factors associated, immunization, migrants

BACKGROUND

Immunization is the most successful and cost-effective weapon against vaccine preventable diseases. Infectious diseases like tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, hepatitis B, H. Influenza, measles, and rubella can be prevented by immunization.^[1] According to the WHO (July 2018), global vaccination coverage among children is 85%. If this is improved, 1.5 million deaths can be avoided.^[2]

According to Intensified Mission Indradhanush, vaccination coverage was 65% (2014). India aims to increase full immunization coverage to >90% by December 2020.^[3] In India, under-five mortality rate is 39/1000 live births (LB), infant mortality rate 34/1000 LB, and neonatal mortality rate 24/1000 LB.^[4]

Children suffer from lack of immunization because of frequent shift of places, lack of knowledge, and low socioeconomic status.^[5] By active immunization, mortality

rate can be reduced, especially among children of migrant workers.

OBJECTIVES

1. To assess the immunization status of children 12–36 months of age of migrant workers
2. To assess the factors associated with the immunization status
3. To identify the reasons for non-immunization or partial immunization among these children.

Address for correspondence: Dr. Shweta Neminath Kurkuri, 1283/1, 2nd Cross, Krishnamurthy Puram, Mysuru - 570 004, Karnataka, India.
E-mail: shweta.n.kurkuri@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kurkuri SN, Subramanian M. Immunization status of children 12–36 months age of migrant workers and factors associated with it in urban areas of Bangalore East. *Indian J Community Med* 2024;49:104-9.

Received: 23-01-23, **Accepted:** 31-10-23, **Published:** 12-01-24

Access this article online

Quick Response Code:



Website:
www.ijcm.org.in

DOI:
10.4103/ijcm.ijcm_42_23

MATERIALS AND METHODS

A community-based cross-sectional analytical study design was adopted. All the migrant areas under each Primary Health Centres of Bangalore Urban East were included. Duration of the study was one year and six months, from February 2019 to August 2020. Children of migrant workers aged between 12 and 36 months who were residing in migrant areas of Urban Bangalore east were the study population.

Sample size was calculated based on NFHS-4 data where the prevalence of children 12–23 months who were fully immunized in urban parts of India was 63.9%.^[6] The required sample size was 246. A design effect of 2 was added to account for cluster randomization, and the information was gathered from 500 participants.

The cluster sampling method was incorporated in the study. About 50 clusters/migrant areas were selected using probability proportional to size (PPS), and 10 children from each cluster were selected. Up to 500 children aged 12–36 months were included from these migrant areas.

Parents/guardians who gave consent to participate in the study and children who were present during the study period were included and children 12–36 months of age without adult informant were excluded from the study.

The interviewer used a pre-tested semi-structured questionnaire after pilot study and validating the questionnaire. Age of the child was confirmed from parents/guardians, birth certificate and immunization cards. A child was considered immunized based on the immunization card. In the absence of it, the presence of BCG scar and information from parents/guardians was considered. If the child was not immunized, then the most important reasons for non-immunization were enquired.

OPERATIONAL DEFINITIONS

Full immunization – All immunization received before 1 year of age – 1 dose of BCG, M/MR, JE; 2 doses of IPV; 3 doses of OPV, Pentavalent/DTP, RVV, PCV (JE, RVV, and PCV only in endemic areas).^[7]

Complete immunization – All immunization received before 2 year of age – second dose of M/MR, JE; 1 booster dose of OPV, DPT.^[7]

Left outs – Beneficiaries who are neither identified nor listed and hence not immunized by the health workers.^[8]

Drop out – Children who receive one or more vaccination but do not receive subsequent immunization.^[8]

Migrant – The person residing in brick kilns, rice mills, slums, construction sites, nomads, temporary settlements, and families coming from outside Bangalore and residing for more than one month prior to the date of interview and up to 6 months.^[9]

Data entry and data analysis

Data were entered and analyzed in Epi info™ software and

Statistical Package for Social Sciences (SPSS). The data were summarized and presented as frequencies and percentages using appropriate tables and graphs. Various tests like the Chi-squared test, odds ratio with 95% confidence interval, and multiple logistic regression were applied. Adjusted odds ratio was calculated. *P* value < 0.05 was considered statistically significant.

RESULTS

The mean age of the children was 25.23 ± 8.42 months. There were 47.60% females and 52.40% males. Majority (36.80%) of the children belonged to 31–36 months of age group and 44.20% children were of birth order one. Nearly 73.00% of the children belonged to Hindu religion and to a nuclear family (72.80%). The study showed that 14.20% fathers were married before 21 years of age (18–20 years) and 16.80% mothers were married before 18 years of age. Majority (47.20%) of the fathers of study participants were more than 30 years of age and 43.40% of mothers were between 25 and 29 years of age. Illiteracy was more among fathers when compared with mothers. Fathers of 31.79% children were construction workers. Nearly 5.00% children belonged to upper middle class, 25.60% children belonged to lower middle class, and 69.40% children belonged to upper lower class according to modified Kuppaswamy classification.

It was observed that 38.20% children always utilized a healthcare facility followed by 60.00% and 1.80% of children who sometimes and never utilized a healthcare facility. About 83.00% of mothers of children had registered during antenatal period. Nearly 99.20% were aware about routine immunization (RI) and 97.20% considered that RI would protect their children. Awareness about RI day of the week was seen among 65.40% parents/guardians and awareness about when to return for next vaccination was seen in 86.60%.

Among 500 children, 59.20% had immunization card. Majority of the vaccines were received from government setup followed by private setup.

The primary vaccine coverage is depicted in Figure 1.

In the present study, 379 children of 500 children were of 18–36 months of age group and hence were eligible for OPV booster, DPT 1st booster, and MR 2nd dose. Coverage of various vaccines among migrant worker children aged 18–36 months is depicted in Figure 2.

In the present study, out of 500 children, 275 children were eligible for three doses of RVV as these children were from endemic areas. The RVV-1st, 2nd, and 3rd doses were received by 257 (93.45%), 256 (93.09%), and 256 (93.09%).

In the present study, out of 500 children, 487 children were from JE endemic areas. Of 487 children, 280 were eligible for 1st dose and 207 children were eligible for 2nd dose of JE. Out of 280 children who were eligible for JE-1st dose, 216 (77.14%) received vaccine and 64 (22.86%) did not receive. Out of

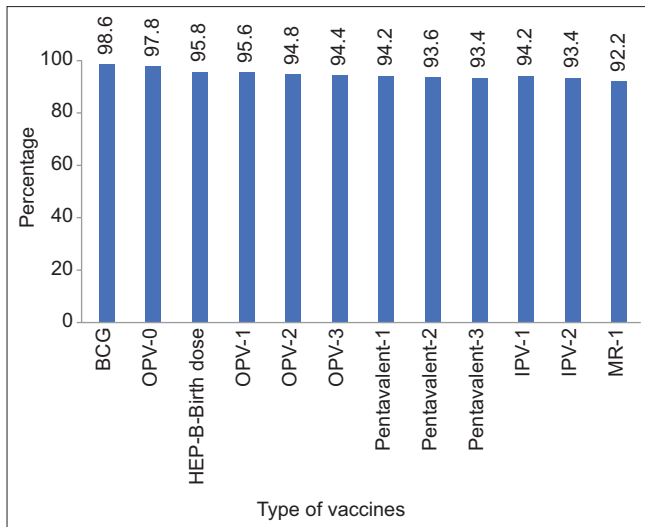


Figure 1: Coverage of primary vaccines among migrant worker children aged 12–36 months (N = 500). Note: BCG: Bacillus Calmette–Guerin, OPV: Oral Polio Vaccine, HEP-B-Birth Dose: Hepatitis-B birth dose, IPV: Inactivated Polio Vaccine, MR: Measles Rubella Vaccine

207 children who were eligible for JE-2nd dose, 85 (41.06%) received vaccine and 122 (58.94%) did not receive.

Table 1 depicts the dropout rate during immunization among the study participants.

Among 500 children, a number of children immunized till date with all applicable vaccines are 443 (88.60%) and number of children who were partially immunized were 57 (11.40%). No child was left unimmunized. Reasons for partial immunization are shown in Table 2.

In univariate analysis, age of the child; parent's education; birth order; presence of immunization card; antenatal care registration; and awareness about RI, RI day of the week, when to return for next dose, and its protectiveness were found to significantly associated with immunization status of the child. However, there was no statistically significant association between immunization status and gender, type of family, religion, socioeconomic status, parents age, and their age at marriage. Multiple logistic regression analysis was applied for the various factors influencing immunization status of the children and is depicted in Table 3.

After adjusting with other variables, fathers' education and the presence of immunization card were the factors determining the immunization status of the child.

DISCUSSION

Immunization is a weapon against many vaccine preventable diseases. Immunizing a child reduces infant morbidity and mortality rate to a significant extent. Frequent shift of place and poor knowledge regarding immunization among migrants leads to poor utilization of immunization services and also make them vulnerable to vaccine preventable disease. The present study was conducted among 500 children of migrant workers aged 12–36 months residing in urban Bangalore East.

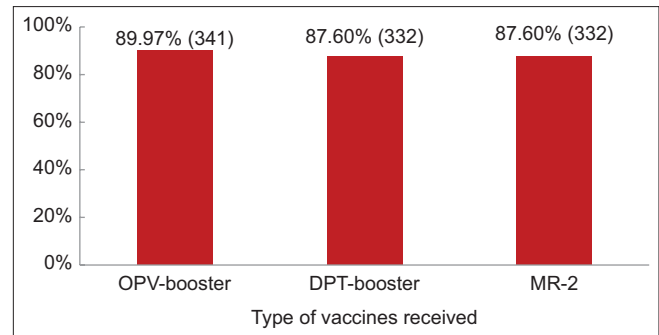


Figure 2: Coverage of OPV-booster, DPT-booster, and MR-2 vaccines among migrant worker children aged 18–36 months (n = 379). Note: OPV: Oral Polio Vaccine, DPT- Booster: Diphtheria Pertussis Tetanus- Booster vaccine, MR- Measles Rubella Vaccine

The coverage of full/complete immunization in the present study was 88.60%. This was comparable with CES-IMI 2018^[10] where 93.30% of the children were fully immunized. However, the study by Kumar P *et al.*^[11] from Bihar reported full immunization coverage rate of 55.43% among 12–23 months of age children. The study done by Singh and Rawat^[12] in 2014–2015 among children 12–60 months of age, reported full immunization to be 34.60%. A study done by Gokhale CN *et al.*^[13] showed full immunization to be 36.1%. Another study done by Vaidya VM *et al.*^[5] in 2012, Anand *et al.* in 2013–14,^[14] and Sengupta P *et al.*^[15] reported full immunization to be only 20%, 30%, and 37.4%, respectively, which were very less when compared to the present study.

In the present study, the coverage of partial immunization was 11.40%. The two most common reasons for partial immunization in the present study were inconvenient time for parents/guardians to take their children for immunization and unaware of need for immunization. In a similar study done by Nath *et al.*^[9] in 2012, among children 12–23 months of age in Haridwar showed the percentage of partial immunization to be 76.00% and the reason being poor knowledge regarding immunization. Another study done by Geddam *et al.*^[16] reported partial immunization to be 38.70% and reason being lack of awareness among parents regarding importance of routine immunization. However, a study done by Dutta *et al.*^[17] in 2016 reported partial immunization to be only 0.60%. The most common reason was because of busy schedule of the parents. Fear of side effects (60%) and inconvenient time (52%) were the reasons for partial and non-immunization in a study done by Singh and Rawat^[12] The study by Pakhare *et al.*^[18] in 2011 demonstrated that the most common reason for partial immunization among migrant children was lack of knowledge of place and time of immunization.

None of the children in the present study were unimmunized. Similar findings were observed in study done by Dutta R *et al.*^[17] in 2016. In a CES-IMI 2018,^[10] 1.2% of the children were unimmunized. A study done by Hu Y *et al.* in East China^[19] showed that 13.20% of the migrant workers children were unimmunized. Another study done by Mishra S *et al.*^[20] among children of tribal migrants showed that 40.40% were unimmunized.

Table 1: Drop-out rate during immunization among the study participants

Antigens	Drop-out rate
BCG to MR-1	6.49%
OPV-1 to OPV-3	1.26%
OPV-1 to OPV-2	0.84%
OPV-2 to OPV-3	0.42%
Penta-1 to Penta-2	0.64%
Penta-2 to Penta-3	0.21%
Penta-1 to Penta-3	0.85%
BCG to Penta-1	4.46%
BCG to Penta-3	5.27%
Penta-1 to MR-1	2.12%
Penta-3 to MR-1	1.28%
MR-1 to MR-2	27.98%
RVV-1 to RVV-3	0.39%
JE-1 to JE-2	60.65%

BCG: Bacillus Calmette–Guerin, OPV: Oral Polio Vaccine, Penta: Pentavalent vaccine, MR: Measles Rubella Vaccine, RVV: Rotavirus Vaccine, JE: Japanese Encephalitis vaccine

Table 2: Among study participants who were partially immunized, distribution of reasons for partial immunization (n=57)

Reasons for Partial Immunization	n	Percentage
Time of immunization inconvenient	46	80.7
Unaware of need for immunization	44	77.19
Busy schedule of parents	43	75.44
Unaware of need to return for next dose of immunization	41	71.93
Migration	34	59.65
Lack of motivation	33	57.89
Family problems including mother's illness	27	47.37
COVID-19 pandemic	24	42.11
Child ill and hence not brought for immunization	17	29.82
Fear of side effects	16	28.07
Child ill and is brought for immunization but not given	10	17.54
Unavailability of vaccine	10	17.54
Place of immunization far and unknown	5	8.77

Multiple responses. Numbers are not mutually exclusive

Male children were more likely to be immunized till date when compared with females. However, there was no association between gender and immunization status of the children. Similar findings were reported by Mishra S *et al.*^[20] among children of tribal migrants where immunization uptake among females was poor. Anand S *et al.*^[14] also reported similar findings in their study done in 2013-14. This highlights the negligence of the parents/guardians about immunization of the female children.

Children of birth order 1 (90.05%) and 2 (90.80%) were more likely to be immunized till date when compared with children of birth order of 3 and more. The reason could be due to better awareness among the parents in the recent years

following GOI initiatives on immunization although there was no association between birth order and immunization status of the child. However, Kumar P *et al.*^[11] in their study reported that children with birth order of more than 2 were more fully immunized when compared with children of birth order 2 or less. This difference was statically significant. This finding was contradictory to our study.

It was observed in the present study that education of father was associated with better immunization status of the child. Children of literate fathers were more likely to be immunized till date. This could be due to better immunized awareness among literate fathers. However, it was seen that after adjusting with other variables in multivariate analysis, partial immunization was more likely to be associated with father's who were literate. This implies that other factors do influence the immunization status of the child other than fathers' education alone.

A significant association was observed between education of parents and complete immunization in a study done by Gokhahe CN *et al.* in 2014^[13] and Singh and Rawat *et al.*^[12] in 2014-15. A similar observation was also reported in a study done by Pakhare AP *et al.*^[18] in 2011 among children of migrant sugarcane workers where children of educated father's had better immunization status. Another study done by Kusuma YL *et al.*^[21] in 2010 among children up to 2 years of age showed that education of the mother was significantly associated with full immunization status of the children. However, in the present study, there was no statistically significant difference observed between education of mother and immunization status of the child.

Study participants' mother for whom ANC registration was done had better immunization status. Similar findings were reported in studies done by Gokhale CN *et al.*^[13] in 2014. Children who were born in hospital setup had better immunization status when compared to children who were delivered at home. This was comparable to study done by Pakhare *et al.*^[18] in 2011 among migrant sugarcane workers children. Awareness about when to return for next dose of vaccine was associated with better immunization status of the child in our study and also in study done by Kumar P *et al.*^[11] Study respondents possessing immunization card were more likely to be immunized till date. This association was statistically significant.

Limitations

In the present study, 40.80% of children did not have an immunization card. History given by parents/guardians was considered to assess vaccination taken by the child. This could have led to recall bias.

The coverage of BCG vaccine in the present study was based on the details in the immunization card, history given by parents/guardians, or presence of scar. Therefore, in the absence of the above, the child was considered unimmunized. This might impact the coverage of BCG vaccine though the child was vaccinated.

Table 3: Multiple logistic regression analysis for the various factors influencing immunization status of the children

Sl. No.	Variables	Unadjusted OR	95% C.I.		P	Adjusted OR	95% C.I.		P
			Lower	Upper			Lower	Upper	
1.	Age groups (months)								
1.a	≤18	Reference				Reference			
1.b	19-24	2.46	1.29	4.69	0.0060	0.27	0.07	1.12	0.0710
1.c	25-30	13.71	6.37	29.54	0.0001	6.80	1.00	46.25	0.0500
1.d	≥31	7.76	4.93	12.23	0.0001	3.73	0.89	15.64	0.0720
2.	Birth order								
2.a	One	Reference				Reference			
2.b	Two	9.88	5.91	16.51	0.0001	0.86	0.26	2.80	0.7970
2.c	Three	6.27	3.32	11.85	0.0001	0.38	0.08	1.74	0.2120
2.d	Four	3.25	1.06	9.97	0.0390	0.31	0.04	2.48	0.2710
2.e	Five	1.00	0.25	4.00	1.0000	0.12	0.01	2.69	0.1830
3.	Mother's education								
3.a	Illiterates	Reference				Reference			
3.b	Primary	17.583	9.829	31.457	0.0001	1.21	0.36	4.10	0.7610
3.c	Middle	15.5	3.71	64.764	0.0001	0.79	0.11	5.64	0.8130
3.d	High school	10.25	3.672	28.616	0.0001	0.64	0.10	4.26	0.6420
4.	Father's education								
4.a	Illiterates	Reference				Reference			
4.b	Primary	9.47	5.75	15.61	0.0001	0.27	0.08	0.97	0.0450
4.c	Middle	17.50	4.21	72.76	0.0001	0.09	0.01	0.95	0.0450
4.d	High school	11.75	4.23	32.61	0.0001	0.28	0.03	2.61	0.2660
5.	Utilization of healthcare facility								
5.a	Never	Reference				Reference			
5.b	Sometimes	5.52	4.03	7.56	0.0001	12.65	.	.	1.0000
5.c	Always	94.50	23.46	380.63	0.0001	204.06	.	.	1.0000
6.	Antenatal care registration								
6.a	No	Reference				Reference			
6.b	Yes	14.96	10.06	22.25	0.0001	1.41	0.26	7.71	0.6950
7.	Awareness about routine immunization								
7.a	No	Reference				Reference			
7.b	Yes	8.36	6.29	11.11	0.0001	.	.	.	0.9990
8.	Protectiveness of Routine immunization								
8.a	No	Reference				Reference			
8.b	Yes	10.30	7.53	14.09	0.0001	.	.	.	0.9970
9.	Awareness about routine immunization day of the week								
9.a	No	Reference				Reference			
9.b	Yes	20.80	12.39	34.92	0.0001	2.96	0.99	9.07	0.0500
10.	Awareness about when to return for next dose of immunization								
10.a	No	Reference				Reference			
10.b	Yes	17.96	11.80	27.33	0.0001	0.84	0.18	3.96	0.8200
11.	Immunization card								
11.a	Absent	Reference				Reference			
11.b	Present	73.00	27.22	195.81	0.0001	10.51	2.73	40.44	0.0010

OR: Odds ratio

CONCLUSION

In the present study, 88.60% of children were immunized till date and 11.40% were partially immunized. No child was unimmunized.

The most common reason for partial immunization in the present study was inconvenient time followed by unaware of need for immunization and busy schedule of parents. The drop-out rate of BCG–MR1 was 6.49%, Penta 1–Penta 3 was 0.85%, and Penta 1–MR1 was 2.12%.

Fathers' education and the presence of immunization card were found to have significant association with the immunization status of the children.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Park K. Park's Textbook of Preventive and Social Medicine. 24th ed. Jabalpur India: Banarsidas Bhanot; 2017. pp. 130-2.
2. World Health Organization. Immunization Coverage. Geneva: 2018. Available from: <https://www.who.int/news-room/facts-in-pictures/detail/immunization>. [Last accessed on 2018 Sep 08].
3. Government of India. Ministry of Health and Family Welfare. Immunization: Mission Indradhanush Guidelines. 2014. Available from: https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guidelines_for_immunization/Mission_Indradhanush_Guidelines.pdf. [Last accessed on 2018 Sep 21].
4. Government of India. Ministry of Home Affairs. Census of India-Sample Registration Sample. 2016. Available from: <https://main.mohfw.gov.in/sites/default/files/04%20ChapterAN2018-19.pdf>. [Last accessed on 2018 Oct 14].
5. Vaidya VM, Hanumante NM, Joshi, AM, Mahajan S. Immunization status of under-five children in migrants from Periurban areas of Pune. *Natl J Community Med* 2013;4:457-60.
6. Government of India. National Health and Family Welfare (NFHS) 4. Child Immunization and Vitamin A Supplementation. 2018. Available from: <https://rchiips.org/nfhs/pdf/NFHS4/India.pdf>. [Last accessed on 2020 Sep 8].
7. Government of India. Immunization handbook for medical officers Reprint 2017. 2017. Available from: https://www.nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guidelines_for_immunization/Immunization_Handbook_for_Medical_Officers%202017.pdf. [Last accessed on 2018 Sep 08].
8. Government of India. Immunization Handbook for Medical Officers. 2008. Available from: <http://www.nihfw.org/pdf/NCHRC-publications/immunization.pdf>. [Last accessed on 2018 Sep 08].
9. Nath L, Kaur P, Tripathi S. Evaluation of the universal immunization program and challenges in coverage of migrant children in Haridwar, Uttarakhand, India. *Indian J Community Med* 2015;40:239-45.
10. Government of India. Ministry of health and family welfare. Immunization Division: Intensified Mission Indradhanush Coverage Evaluation Survey. 2018 Jan. 2017. Available from: https://www.nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guidelines_for_immunization/IMI_CES_Survey_Report.pdf. [Last accessed on 2020 Jan 21].
11. Kumar P, Ranjan A, Kumar D, Pandey S, Singh CM, Agarwal N. Factors associated with immunisation coverage in children of migrant brick kiln workers in selected districts of Bihar, India. *Indian J Comm Health* 2020;32:91-6.
12. Singh N, Rawat CMS. Assessment of immunization status of under-five children in migrants of Haldwani block, District Nainital. *Indian J Appl Rev* 2018;7:231-2.
13. Gokhale CN, Shanbhag SS, Shinde RR. A cross-sectional review of immunization status of under-five children amongst brick-kiln workers' settlements. *Indian J Appl Rev* 2018;7:277-9.
14. Anand S, Verma P, Sinha U, Mahawar P. Evaluation of primary immunization coverage in migratory labor population of urban areas in Bhopal city. *Pediatr Oncall J* 2014;11:36-9.
15. Sengupta P, Benjamin AI, Babu BV. Evaluation of a community-based intervention to improve routine childhood vaccination uptake among migrants in urban slums of Ludhiana, India. *J Public Health* 2016;39:805-12.
16. Geddard JB, Kommu PR, Ponna SN, Mamidi RS, Kokku SB, Dudala SR, *et al*. Immunization uptake and its determinants among the internal migrant population living in nonnotified slums of Hyderabad city. *J Fam Med Prim Care* 2018;7:796-803.
17. Dutta R, Dekal P, Jain T, Jeyapal DR, Sivakumar K, Ramachandran A. Primary immunization coverage among Migrant children in the age group of 12 to 23 months in Sriperumbudur Taluk, Kanchipuram District. *Indian J Comm Health* 2017;29:114-7.
18. Pakhare AP, Pawar R, Lokhande GS, Datta SS. Does seasonal migration for sugarcane harvesting influence routine immunization coverage? A cross-sectional study from rural Maharashtra. *Indian J Public Health* 2014;58:116-20.
19. Hu Y, Chen QL, Chen Y, Qi X. Determinants of childhood immunization uptake among socio-economically disadvantaged migrants in East China. *Int J Environ Res Public Health* 2013;10:2845-56.
20. Mishra S, Kusuma YS, Babu BV. Immunization uptake among children of a migrant tribal community living in an Eastern Indian city. *J Pediatr Sci* 2013;5:e194.
21. Kusuma YL, Kumari R, Pandav CS, Gupta SK. Migration and immunization: Determinants of childhood immunization uptake among socioeconomically disadvantaged migrants in Delhi, India. *Trop Med Int Health* 2010;15:1326-32.