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Original Research Article

Awareness and attitude towards routine immunization of children aged 12-23 months among migrant workers in Southern Karnataka: a community based cross-sectional study

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ABSTRACT

Background: Immunization is one of the most cost-effective public health interventions for preventing childhood morbidity and mortality. The aim of the study was to assess the knowledge and attitude of parents towards routine immunization of children aged 12-23 months among migrant workers and to determine the correlation between knowledge and attitude scores.
Methods: A community-based cross-sectional study was conducted among 500 parents/guardians of migrant children aged 12-23 months in an urban area of Southern District of Karnataka. Data were collected using a pre-tested structured questionnaire assessing knowledge and attitude towards routine immunization. Descriptive statistics, independent *t*-test, and Pearson's correlation coefficient were used for analysis.
Results: Awareness regarding routine immunization was found in 99.2% of parents and 97.2% believing that immunization protects children from diseases. However, substantial misconceptions were observed regarding contraindications to vaccination, as 67.8% considered common cold, 79.6% diarrhoea, and 87.2% fever as contraindications. Most parents expressed a favorable attitude, with 95.0% agreeing that immunization is safe and necessary. The mean knowledge score was significantly higher among parents of fully immunized children compared to partially immunized children ($p<0.001$). A significant positive correlation was observed between knowledge and attitude scores ($r=0.38$, $p<0.001$).
Conclusions: Despite high awareness and positive attitudes towards routine immunization among migrant parents in urban Mysuru, critical knowledge gaps and misconceptions persist, particularly regarding vaccine contraindications. Strengthening targeted health education and behavior change communication through frontline health workers is essential to translate favorable attitudes into informed and sustained immunization practices.

Keywords: Attitude, Knowledge, Migrant workers, Routine immunization, Urban Mysuru

INTRODUCTION

Routine immunization forms a cornerstone of primary health care and is central to achieving global child survival targets, including the sustainable development goals related to under-five mortality reduction.[1] Over the past few decades, expansion of immunization services has contributed substantially to reductions in under-five

mortality worldwide. Despite substantial progress under national and global immunization initiatives, inequities in immunization coverage persist, particularly among marginalized and mobile populations.[2] Globally in 2024, there were 14.3 million children missing out on any vaccination so-called zero-dose children.[3]

The Universal Immunization Programme (UIP) in India seeks to give every kid fair access to immunization treatments. Despite improvements in national immunization coverage over time, discrepancies still exist across various demographic groups because of differences in health service utilization, accessibility, and awareness. Urbanization and internal migration have introduced new challenges for immunization programs, as mobile populations often remain inadequately integrated into local health systems, resulting in gaps in preventive service utilization.[4] Rapid urban growth in developing countries has led to the expansion of informal settlements populated largely by migrant workers engaged in temporary employment. These populations frequently encounter structural barriers such as unstable residence, lack of documentation, limited familiarity with health services at the destination area, and competing livelihood priorities. Such factors may disrupt continuity of immunization services, increasing the likelihood of delayed or incomplete vaccination among children despite the physical availability of healthcare facilities.[5] Evidence from urban settings suggests that mobility-related disruptions and inconsistent interaction with healthcare providers contribute significantly to missed vaccination opportunities among migrant children.[6]

Immunization uptake is significantly influenced by behavioral determinants in addition to structural impediments. Childhood vaccination decisions are influenced by parental knowledge of vaccination schedules, opinions about vaccine safety, and trust in medical services. Studies have shown that while confusion or a lack of clarity regarding vaccination eligibility and scheduling may result in postponement or incomplete immunization, good parental attitudes and sufficient knowledge enable prompt completion of immunization schedules.[7,8]

Although several studies have examined determinants of immunization coverage in general populations, limited evidence is available focusing specifically on knowledge and attitude dimensions among migrant families residing in urban areas. Considering the increasing contribution of migration to urban population growth and the potential vulnerability of migrant children to under-immunization, it is essential to understand the behavioural and awareness-related factors influencing immunization practices in this group.

The present study was therefore undertaken to assess the knowledge, and attitude towards routine immunization among parents of children aged 12-23 months among migrant workers.

METHODS

The present study formed a component of a larger community-based cross-sectional study conducted among migrant worker families residing in an urban area of Southern District of Karnataka. The study was carried out over a period of one year and six months (February 2024 to August 2025). 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 sample size was determined using the prevalence of full immunization among children aged 12-23 months reported in national survey data for urban India.[9] After applying an appropriate design effect to account for cluster sampling, a total of 500 participants were included in the study. Eligible households were approached through field visits, and informed written consent was obtained prior to data collection.

Data were collected using a pretested semi-structured questionnaire administered through face-to-face interviews with parents or guardians. The tool included sections on sociodemographic characteristics, knowledge regarding routine immunization, parental attitudes towards immunization, and immunization practices. Knowledge and attitude components were assessed using structured questions, and scores were calculated based on correct or favorable responses. Information related to immunization status was verified using immunization cards whenever available; in the absence of records, parental recall was considered. Children who had received all age-appropriate vaccines as per the Universal Immunization Programme schedule at the time of survey were classified as immunized till date, while those who had missed one or more scheduled doses were categorized as partially immunized. Data entry and analysis were performed using appropriate statistical software. Descriptive statistics were used to summarize knowledge, attitude, and practice variables. Associations between knowledge, attitude, and immunization status were assessed using the Chi-square test. Mean knowledge and attitude scores between groups were compared using independent sample t-tests, and correlation between knowledge and attitude scores was evaluated using Pearson's correlation coefficient. A p value of less than 0.05 was considered statistically significant.

Ethical approval for the study was obtained from the Institutional Ethics Committee prior to initiation of the study, and confidentiality of participant information was ensured throughout the study period.

RESULTS

The mean age of the children was 25.234±8.42 months. Among the 500 children included in the study, 443 (88.6%) were immunized till date and 57 (11.4%) were partially immunized. The majority of parents/guardians demonstrated good awareness regarding key aspects of

immunization, with almost all being aware of vaccination at birth (98.6%), routine immunization (99.2%), and the protective role of immunization (97.2%). A high proportion were also aware that most vaccines are administered within the first five years of life (87.0%), the need for multiple doses of the same vaccine (87.2%), and the appropriate time to return for the next vaccination (86.6%). Awareness regarding immunization day of the week was observed in 65.4% of participants, and 78.0% were aware of the importance of vaccination during pulse polio campaigns. However, knowledge regarding contraindications to immunization was inadequate, as only 32.2%, 20.4%, and 12.8% of parents correctly identified that common cold, diarrhoea, and fever respectively are not contraindications for vaccination. Awareness about outreach immunization sessions in the area was low (25.8%), and about half of the participants (53.4%) were aware of the involvement of religious or political leaders in immunization activities. Overall, while general awareness regarding routine immunization was high, important knowledge gaps persisted regarding contraindications and service-related aspects of immunization. (Table 1).

Table 1: Distribution of parents/ guardians based on their awareness on immunization (n=500).

Awareness of parents/ guardians on immunization	Aware, N (%)	Not aware, N (%)
Vaccination of child at birth	493 (98.60)	7 (1.40)
Awareness about routine immunization	496 (99.20)	4 (0.80)
Awareness about protectiveness of routine immunization	486 (97.20)	14 (2.80)
Awareness with respect to side effects of immunization	394 (78.80)	106 (21.20)
Awareness that common cold is not a contraindication for immunization	161 (32.20)	339 (67.80)
Awareness that diarrhoea is not a contraindication for immunization	102 (20.40)	398 (79.60)
Awareness that fever is not a contraindication for immunization	64 (12.80)	436 (87.20)
Awareness of immunization day of the week	327 (65.40)	173 (34.60)
Awareness that most of the vaccines are given within five years of age	435 (87.00)	65 (13.00)
Awareness regarding multiple doses of same vaccine	436 (87.20)	64 (12.80)
Awareness regarding the need for vaccination during pulse polio campaign	390 (78.00)	110 (22.00)
Awareness regarding when to return for the next dose of immunization	433 (86.60)	67 (13.40)
Awareness about outreach sessions in their area	129 (25.80)	371 (74.20)
Awareness about involvement of religious/political leaders in immunization	267 (53.40)	233 (46.60)

Note: Row-wise percentage was calculated

The attitude of parents/guardians towards immunization in the present study was largely favorable, reflecting a high level of acceptance of routine immunization services. A substantial proportion of respondents either agreed or strongly agreed that immunization is safe for all children (95.0%), with only 5.0% expressing a neutral opinion and none expressing disagreement. Similarly, 94.8% of parents/guardians agreed or strongly agreed that immunization is necessary for all children, indicating strong perceived importance of vaccination in child health.

With regard to negative perceptions, the majority of participants demonstrated positive attitudes by disagreeing or strongly disagreeing with statements suggesting that immunization is not beneficial (95.4%) or that immunization causes harm to children (93.6%). Only a small proportion remained neutral, suggesting minimal vaccine hesitancy within the study population. Furthermore, compliance with routine immunization was strongly supported, with 94.4% of parents/guardians agreeing or strongly agreeing that adherence to the immunization schedule is necessary (Table 2).

Table 2: Distribution of children based on attitude of parents/guardians towards routine immunization (n=500).

Variables	Attitude towards immunization				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	N (%)	N (%)	N (%)	N (%)	N (%)
Immunization is safe for all children	0 (0.00)	0 (0.00)	25 (5.00)	311 (62.20)	164 (32.80)
Immunization is necessary for all children	0 (0.00)	0 (0.00)	26 (5.20)	284 (56.80)	190 (38.00)
Immunization is not beneficial to children	167 (33.40)	310 (62.00)	23 (4.6)	0 (0.00)	0 (0.00)
Immunization causes harm to children	242 (48.40)	226 (45.20)	32 (6.40)	0 (0.00)	0 (0.00)
Compliance to RI is necessary	0 (0.00)	0 (0.00)	28 (5.60)	256 (51.20)	216 (43.20)

A statistically significant association was observed between immunization status and several awareness-related variables. Parents/guardians who were aware of vaccination at birth, routine immunization, and the protective role of immunization had significantly higher proportions of fully immunized children ($p<0.001$).

Awareness regarding immunization day of the week, knowledge that most vaccines are administered within five years of age, awareness of the need for vaccination during pulse polio campaigns, and awareness about the appropriate time to return for the next dose were also significantly associated with complete immunization ($p<0.001$). However, awareness regarding side effects of immunization, minor illnesses such as common cold, fever, and diarrhoea not being contraindications for vaccination, awareness regarding multiple doses of the same vaccine, outreach sessions in the area, and involvement of religious or political leaders showed no significant association with immunization status ($p>0.05$) (Table 3).

Table 3: Relationship between awareness of parents/guardians regarding immunization and immunisation status (n=500).

Awareness on immunization	Immunised till date (n=443)	Partially immunized (n=57)	χ^2	P value
	Number (%)	Number (%)		
Vaccination of child at birth	443 (100.00)	50 (88.72)	55.176	0.0001
Awareness about routine immunization	443 (100.00)	53 (92.98)	31.338	0.0001
Awareness about protectiveness of routine immunization	443 (100.00)	43 (75.44)	111.941	0.0001
Awareness with respect to side effects of immunization	349 (78.78)	45 (78.95)	0.0010	0.9770
Awareness that common cold as not a contraindication for immunization	147 (33.18)	14 (24.56)	1.7190	0.1900
Awareness that fever as not a contraindication for immunization	56 (12.60)	8 (14.01)	0.0880	0.7670
Awareness that diarrhea as not a contraindication for immunization	90 (20.32)	12 (21.05)	0.0170	0.8970
Awareness of immunization day of the week	312 (70.43)	15 (26.32)	43.430	0.0001
Awareness that most of the vaccines are given within five years of age	413 (93.22)	22 (38.60)	133.27	0.0001
Awareness regrading multiple doses of same vaccine	346 (78.10)	44 (77.20)	0.0240	0.8760
Awareness regarding the need for vaccination during polio campaign	411 (92.78)	22 (38.60)	127.75	0.0001
Awareness about when to return for next dose of immunization	413 (93.22)	23 (40.35)	126.51	0.0001
Awareness about outreach sessions happening in their area	236 (53.27)	31 (54.38)	0.025	0.8740
Awareness about involvement of religious/political leader for immunization in their area	112 (25.28)	17 (29.82)	0.5440	0.4610

Note: Column wise percentage was calculated

Table 4: Relationship between attitude of parents/guardians towards RI immunization and immunization status of the child (n=500).

Variables with immunization status of the child	Attitude towards immunization					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total (100%)
Immunization is safe						
Immunized till date, N (%)	0 (0.00)	0 (0.00)	0 (0.00)	289 (65.24)	154 (34.76)	443
Partially immunized, N (%)	0 (0.00)	0 (0.00)	25 (43.86)	22 (38.60)	10 (17.54)	57
Immunization is necessary						
Immunized till date, N (%)	0 (0.00)	0 (0.00)	0 (0.00)	262 (59.14)	181 (40.86)	443
Partially immunized, N (%)	0 (0.00)	0 (0.00)	26 (45.61)	22 (38.59)	9 (15.8)	57
Immunization is not beneficial to children						
Immunized till date, N (%)	158 (35.67)	284 (64.11)	1 (0.22)	0 (0.00)	0 (0.00)	443
Partially immunized, N (%)	9 (15.8)	26 (45.6)	22 (38.6)	0 (0.00)	0 (0.00)	57
Immunization causes harm to the children						
Immunized till date, N (%)	232 (52.4)	209 (47.17)	2 (0.45)	0 (0.00)	0 (0.00)	443
Partially immunized, N (%)	10 (17.5)	17 (29.82)	30 (52.63)	0 (0.00)	0 (0.00)	57
Compliance to routine immunization is necessary						
Immunized till date, N (%)	0 (0.00)	0 (0.00)	0 (0.00)	234 (52.82)	209 (47.18)	443
Partially immunized, N (%)	0 (0.00)	0 (0.00)	28 (49.12)	22 (38.6)	7 (12.3)	57

A more favorable attitude towards immunization was observed among parents of fully immunized children compared to those with partially immunized children. Among parents of fully immunized children, the majority

agreed or strongly agreed that immunization is safe (100%) and necessary (100%), whereas a considerable proportion of parents of partially immunized children expressed neutral opinions regarding vaccine safety (43.86%) and necessity (45.61%). Negative perceptions such as immunization not being beneficial or causing harm were largely rejected by parents of fully immunized children, while higher neutral responses were observed among parents of partially immunized children. Similarly, compliance with routine immunization was strongly supported among parents of fully immunized children, whereas nearly half of the parents of partially immunized children remained neutral (Table 4).

Table 5: Immunization status of the child and its comparison with parents/guardians mean knowledge and attitude scores by t test.

Variable	Immunization status	Mean	SD	SE	t-value	P value
Knowledge	Immunized till date	10.49	2.08	0.10	8.1364	0.0001
	Partially Immunized	7.96	3.02	0.40		
Attitude	Immunized till date	16.35	1.08	0.05	4.6191	0.0001
	Partially Immunized	15.65	1.09	0.14		

The mean knowledge and attitude scores were significantly higher among parents of fully immunized children compared to those of partially immunized children (Table 5) (Figure 1).

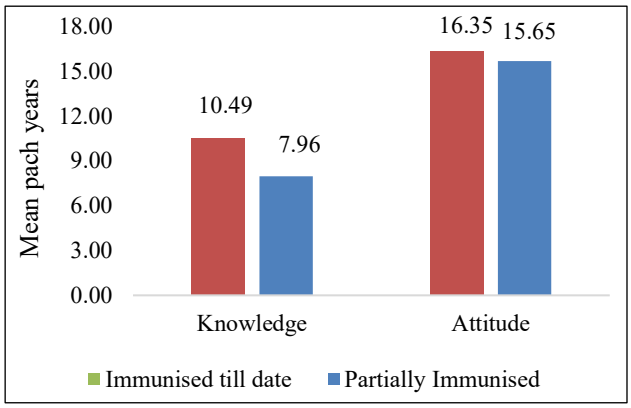

Figure 1: Immunisation status of the child and its comparision with parents/ guardians mean knowledge and attitude scores.

The mean knowledge score among parents of fully immunized children was 10.49±2.08 compared to 7.96±3.02 among parents of partially immunized children, and this difference was statistically significant (t=8.13, p=0.0001). Similarly, the mean attitude score was higher among parents of fully immunized children (16.35±1.08) compared to partially immunized children (15.65±1.09), with a statistically significant difference (t=4.62, p=0.0001).

Table 6 and Figure 2 depict correlation between parents/ guardians knowledge and attitude scores. A significant and positive correlation was observed between knowledge and attitude scores on immunization of the children (p=0.0001). Knowledge and attitude were dependent on each other.

Table 6: Correlation between parents/guardians knowledge and attitude scores by Karl Pearson's correlation coefficient.

Variables	Correlation between parents' knowledge scores with attitude scores		
	r-value	t-value	P value
Attitude scores	0.3798	9.1608	0.0001

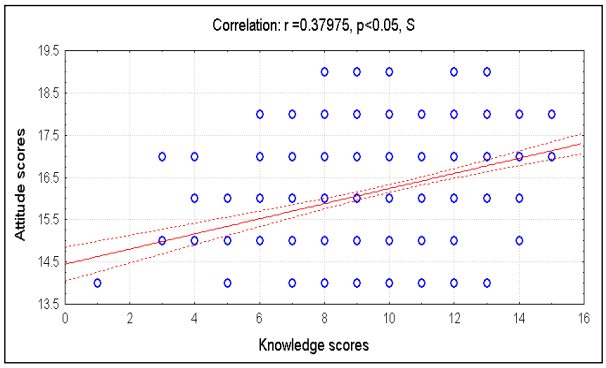

Figure 2: Scatter diagram of correlation between knowledge and attitude scores.

DISCUSSION

The present study assessed knowledge and attitude towards routine immunization among migrant parents of children aged 12-23 months and examined their relationship with immunization status. The findings indicate that although acceptance of routine immunization were high, important knowledge gaps persisted, particularly regarding contraindications to vaccination and service-related aspects. These findings are in line with evidence from a number of published research that show parental perspective and knowledge, particularly among socially and economically challenged groups, are important factors in influencing immunization completion.

In the present study, almost all parents were aware of routine immunization and its protective role, and a high proportion of children were immunized till date. Similar findings have been reported in studies conducted in different parts of India, where most parents recognized the protective benefits of vaccination despite variability in detailed knowledge regarding schedules and vaccine-related information.[10,11] A study from Dehradun reported that the majority of parents had average to good knowledge and positive attitudes towards immunization, but not all of them fully complied, suggesting that awareness by itself might not guarantee that vaccination regimens are followed.[12] Improved outreach efforts, institutional deliveries, and ongoing vaccination campaigns under the Universal Immunization Program may be responsible for the comparatively high degree of awareness seen in this study.

Despite high awareness, substantial misconceptions regarding contraindications were observed, with many parents considering fever, diarrhoea, or common cold as reasons to defer vaccination. Similar misconceptions have been documented in studies from Jharkhand and other regions, where a significant proportion of mothers believed that minor illnesses necessitated postponement of vaccination.[13] Even among groups with otherwise positive attitudes, a lack of knowledge of actual contraindications has been found to be a significant factor in lost immunization opportunities. Research evaluating parental knowledge around the world has also shown that parents are sufficiently aware of the advantages but not enough about the drawbacks and contraindications, highlighting the necessity of targetted educational initiatives.[14] The majority of parents in the current study had a generally positive attitude about routine vaccination, viewing it as essential, safe, and advantageous. Several cross-sectional studies have revealed similar results, showing an association between acceptance of immunization services and good parental attitudes.[10,12] However, there was no significant correlation found between immunization status and awareness of outreach sessions or minor illness contraindications. This suggests that structural factors like accessibility, working hours, and migration patterns may also have an impact on migrant families' utilization of services.

A key finding of this study was the significantly higher mean knowledge and attitude scores among parents of fully immunized children, along with a significant positive correlation between knowledge and attitude scores. Similar observations have been reported in multiple studies, where improved knowledge was associated with favorable attitudes and better compliance with immunization schedules.[14,15] However, the moderate strength of correlation observed in the present study indicates that knowledge and attitude alone do not fully explain immunization behavior, and contextual determinants such as socioeconomic constraints, health system interaction, and mobility patterns must also be considered. The findings of this study have important public health implications. Urban migrant populations often reside in areas with adequate physical access to health services but remain vulnerable to under-immunization due to informational and behavioral barriers. Previous evaluations of immunization programmes in India have shown that migrant children are more likely to experience interruptions in immunization continuity compared to non-migrant populations.[16,17] To translate positive attitudes into consistent immunization practices, it is crucial to improve frontline health workers' interaction with migrant families, increase awareness of minor illnesses and vaccination eligibility, and promote targeted behavior change communication.

The study has certain limitations. Being cross-sectional in nature, causal relationships between knowledge, attitude, and immunization status cannot be established. Immunization status in some cases relied on parental recall, which may have introduced recall bias. Additionally, the findings are limited to an urban migrant population in a single geographical setting and may not be generalizable to other migrant groups.

CONCLUSION

Migrant parents demonstrated high awareness and favorable attitudes towards routine immunization; however, important knowledge gaps, particularly regarding vaccination contraindications and service awareness, persist. Higher knowledge and positive attitudes were significantly associated with complete immunization. Strengthening targeted health education and front line worker engagement is essential to address misconceptions and ensure sustained and equitable immunization coverage among migrant children.

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