

# Assessment of Responsibilities of Parents and Healthcare Workers in Routine Immunisation Practices: A Community-based Cross-sectional Study

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## ABSTRACT

**Introduction:** Every year, nearly two million children die before their 5<sup>th</sup> birthday, with 21.5% of all under five deaths attributed to vaccine-preventable diseases. Approximately 50% of under-vaccinated children come from three countries, including India. In India, the Universal Immunisation Program (UIP) has played a crucial role in eliminating polio and maternal and neonatal tetanus. Both parents and healthcare providers play vital roles in children's immunisation, with healthcare providers raising awareness about the importance of immunisation and parents understanding its significance.

**Aim:** To estimate and assess the responsibilities of parents and healthcare providers in routine immunisation practices.

**Materials and Methods:** A cross-sectional study was conducted in the Department of Community Medicine, Shivamogga Institute of Medical Sciences (SIMS), Shimoga, Karnataka, India among 153 parents or guardians of children aged six months to five years in urban and rural areas of Shimoga district. A questionnaire designed for the study was used, and a pilot study was conducted to test its effectiveness. The study duration was three months, from July 2022 to September 2022. Socio-demographic

details and information on child immunisation were collected. Data were described in terms of frequencies and percentages. The association between knowledge of immunisation and the parents' residence was tested using the Chi-square test, with a significance level set at  $p < 0.05$ .

**Results:** Out of 153 children, 46 (31%) were aged between 1 to 2 years. Among the study participants ( $N=153$ ), 104 (68%) correctly recalled the last vaccine administered to their child, but 117 (76.5%) were unaware of the specific disease it protected against. Additionally, 69 (45.1%) participants were not aware of the four key messages related to immunisation. However, the majority of participants (152, 99.3%) expressed willingness to receive other vaccines. There was a significant ( $p=0.007$ ) difference in knowledge regarding the retention period of a Mother Child Protection card (MCP) for 16 years between rural and urban areas.

**Conclusion:** The responsibilities of parents and healthcare workers were found to be unsatisfactory. Parents mainly relied on Accredited Social Health Activists (ASHAs) for keeping track of immunisation dates, while healthcare workers failed to communicate all four key messages effectively.

**Keywords:** Child, Four key message, Knowledge, Mother child protection card, Vaccination

## INTRODUCTION

Every year, two million children die before their 5<sup>th</sup> birthday, of which 1.5 million deaths could be avoided through vaccination [1,2]. In 2021, 25 million children remained unvaccinated, with 60% of them belonging to 10 countries, including India [3]. Immunisation is a highly successful and cost effective method of preventing Vaccine Preventable Diseases (VPDs) [2]. Prevention is always the best form of protection. The World Health Organisation (WHO) launched the Expanded Program of Immunisation (EPI) in 1974 to develop and expand immunisation programmes worldwide. The goal was to provide immunisation against tuberculosis, polio, diphtheria, tetanus, pertussis, and measles to every child in the world by 1990 [4]. In India, the EPI was launched in 1978 and later, renamed the Universal Immunisation Programme (UIP) in 1985, extending its reach beyond urban areas. The UIP has always been an integral part of the National Health Mission (NHM). In 2014, the Mission Indradhanush (MI) was launched with the aim of achieving 90% full immunisation coverage for children [5]. However, the National Family Health Survey-5 (NFHS-5) reports that only 76.4% of children aged 12-23 months are fully immunised, indicating a need for improved coverage [6].

Various factors contribute to this, including limited accessibility, distance to healthcare centre where vaccination sessions are

conducted, false beliefs, and, most significantly, a lack of awareness about the benefits of immunisation in remote areas where illiteracy, poverty, and distance to healthcare facilities remain major challenges [7]. The success of any social programme relies on awareness among the public, their positive attitudes, and their willingness to participate [7]. The responsibility for a child's vaccination lies with both parents and healthcare workers. However, few studies have assessed this responsibility and the awareness of routine immunisation among parents [8,9]. Additionally, no studies were found regarding the assessment of healthcare providers' responsibility in hospital settings, even though their involvement is crucial for the success of current immunisation programmes and implementing any necessary changes, such as supportive supervision of sessions, to benefit the community.

Therefore, the present study aimed to assess the responsibility of parents and healthcare workers towards routine immunisation practices in the rural and urban field practice area.

## MATERIALS AND METHODS

A community-based cross-sectional study was conducted in areas under Rural Health Training Centres (RHTC) and Urban Health Training Centre (UHTC) attached to a tertiary care teaching hospital, SIMS, Shimoga, Karnataka, India. Data were collected over a three-month

period, from July 2022 to September 2022. Data were collected from mothers or guardians of children aged six months to five years. The study commenced after obtaining approval from the Institutional Ethical Committee (SIMS/IEC/647/2022-23).

**Inclusion criteria:** Mothers or guardians of children between six months to five years who were willing and provided oral consent were included in the study.

**Exclusion criteria:** Mothers or guardians who did not provide oral consent were excluded from the study.

**Sample size calculation:** The calculated sample size was 145, using the formula  $n = \frac{z^2 pq}{d^2}$ .

This calculation assumed an immunisation coverage percentage of 96% in Shimoga district [8], an absolute precision of  $d=3.5$ , a 95% confidence level, and a non response rate of 20%.

## Study Procedure

Out of the three RHTCs and one UHTC attached to the study Institute, two RHTC areas and one UHTC area were randomly selected. Simple random sampling was then conducted to select study participants from the immunisation register. A total of 64% and 36% of informants were interviewed from rural and urban areas, respectively, to match the population distribution of Karnataka in rural (62%) and urban (38%) areas [10]. With the assistance of ASHAs, each participant was located, and face-to-face interviews were conducted using a pretested questionnaire after obtaining informed oral consent. Participants were assured of the confidentiality of the information they provided. A pilot study was conducted with 15 participants to test the questionnaire, and appropriate changes were made. These participants were excluded from the study {Cronbach's alpha value was 0.87, and Coefficient of Variation Ratio (CVR) was 0.7}. The questionnaire was in English but was administered in Kannada as it was not self administered.

The questionnaire included information about socio-demographic details such as the names, ages, and gender of the children, as well as education details of the informants. Informants were interviewed to assess their awareness of immunisation, including knowledge about the last vaccine administered to the child, knowledge about the diseases covered by the vaccines, due visit dates, and information about the four key messages: the vaccine's purpose and the disease it prevents, when and where to come for the next visit, minor side effects and how to manage them, and the importance of keeping and bringing the immunisation card for the next visit [11]. The ASHA workers are responsible for house-to-house visits and educating guardians about child immunisation, raising awareness about immunisation, providing information about visits, and emphasising the importance of preserving the MCP card. Thus, the responsibilities of healthcare workers were indirectly assessed by asking questions about the key messages to caretakers/parents of children under five, provided by healthcare workers. In present study, healthcare workers include all individuals involved in routine immunisation sessions such as health assistant juniors, health assistant seniors, ASHAs, and Anganwadi workers. They provide services like immunisation, beneficiary mobilisation, and health education related to immunisation.

## STATISTICAL ANALYSIS

The data were tabulated in Microsoft Excel 16, and statistical analysis was performed using Epi Info version 7.0 software. The results were presented in the form of tables. Descriptive statistics, such as frequency and percentage, were used and inferential statistical tests, such as the Chi-square test, were used to compare the knowledge of study participants from rural and urban areas.

## RESULTS

There were 153 guardians of the children included in the study, and interviews were conducted with these selected guardians. [Table/Fig-1] describes the socio-demographic data of the children and informants. Out of the 153 children, 46 (31%) were aged between 1-2 years. A total of 77 were males, and 76 were females. The majority of the children resided in rural areas, accounting for 97 (64%).

Variables	Frequency (%) (N=153)
<b>Age of the children (years)</b>	
<12 months	41 (27)
13-24 months	46 (31)
25-36 months	25 (16)
37-48 months	16 (10)
49-60 months	25 (16)
<b>Sex of the child</b>	
Male	77 (50.3)
Female	76 (49.7)
<b>Informant</b>	
Mother	125 (81.7)
Father	19 (12.4)
Others	9 (5.9)
<b>Educational status of the informants</b>	
Illiterate	15 (9.8)
Primary	17 (11.1)
High school	51 (33.3)
Pre University Course (PUC)	40 (26.1)
Graduate and above	30 (19.6)
<b>Area of residence</b>	
Rural	97 (64)
Urban	56 (36)

**[Table/Fig-1]:** Socio-demographic details of the children and the informants.

In the present study, the majority of informants, 104 (68%), correctly recalled the last vaccine administered to the child. However, 36 of them did not know the diseases covered by the vaccine. Out of the 153 participants, 69 of them did not know all four key messages [Table/Fig-2].

Variables	Correct n (%)	Incorrect n (%)
Knowledge about the last vaccine administered to the child	104 (68)	49 (32)
Knowledge about the disease which is covered by the vaccines	36 (23.5)	117 (76.5)
Knowledge about the due visit	119 (77.8)	34 (22.2)
Knowledge about all four key messages	84 (54.9)	69 (45.1)
Knowledge about preserving the MCP card till 16 years	82 (53.6)	71 (46.4)

**[Table/Fig-2]:** Knowledge about the immunisation of children.

The study also analysed the association between knowledge about immunisation and the participants' place of residence [Table/Fig-3]. Knowledge about preserving the MCP card until the child reaches 16 years of age was higher among study participants from rural

Variables		Area of residence		Chi-square value	p-value
		Urban (n=56)	Rural (n=97)		
		No (%)			
Knowledge about last vaccine administered	Correct	34 (60.7)	70 (72.2)	2.138	0.144
	Incorrect	22 (39.3)	27 (27.8)		
Knowledge about the due visit	Correct	44 (78.6)	75 (77.3)	0.032	0.858
	Incorrect	12 (21.4)	22 (22.7)		

Knowledge about preserving the MCP card till 16 years	Correct	22 (39.3)	60 (61.9)	7.272	0.007*
	Incorrect	34 (60.7)	37 (38.1)		
Knowledge about all four key messages	Correct	29 (51.8)	55 (56.7)	0.346	0.556
	Incorrect	27 (48.2)	42 (43.3)		
Knowledge about the disease which is covered by the vaccines	Correct	9 (16.1)	27 (27.8)	2.731	0.098
	Incorrect	47 (83.9)	70 (72.2)		

**[Table/Fig-3]:** Details about the residence of the study participants and knowledge about immunisation status.

\* $p < 0.05$ , Chi-square test has been used

areas, and this difference was statistically significant when compared with those from urban areas.

## DISCUSSION

Immunisation has been highly effective in reducing mortality and morbidity caused by childhood infections [11]. Significant milestones have been achieved through immunisation, such as the eradication of smallpox and the elimination of polio and neonatal tetanus in recent years [5]. The Government of India launched "Mission Indradhanush," which is the largest immunisation programme in terms of beneficiaries and geographical coverage. It aims to target nearly 27 million newborns annually, with nine million sessions conducted each year to achieve full coverage [2]. Despite these efforts, only 65% of children in India receive full immunisation during their first year of life [12]. To improve coverage, it is crucial to raise awareness about the importance of immunisation and ensure that parents have information about immunisation sessions. Parents should know when and where to bring their child, which vaccines have been given, and the importance of upcoming visits [2]. Healthcare workers have the responsibility of disseminating this knowledge to caretakers. The success of an immunisation programme in any country depends more upon local realities and national policies [13]. To author's knowledge, this is a novel study that aimed to assess the responsibilities of parents and healthcare workers regarding routine immunisation practices. A study conducted by Cohen MA et al., assessed the vaccination-related practices of Auxiliary Nurse Midwifery (ANM) and Primary Health Centre (PHC) physicians, including offering vaccination, verifying vaccination status, and counseling parents in India [14].

In present study, data were collected from parents or guardians of 153 children aged between six months and five years. The last vaccine administered to the child was correctly recalled by 68% of the participants. This may be attributed in part to the high literacy rate among the informants. Owais A, conducted a community-based randomised controlled trial in Karachi, Pakistan, and found that an educational intervention designed for a low-literacy population improved DPT-3 (Diphtheria, Pertussis, Tetanus)/Hepatitis B vaccine completion rates by 39% [9]. Thus, providing knowledge about immunisation and vaccines can improve vaccine coverage. The study also revealed that 76.5% of respondents were unaware of the diseases that immunisation is meant to prevent. This lack of understanding aligns with the findings of a study conducted by Singh MC et al., [15].

A positive finding from the study was that 77.8% of the informants were aware of their next scheduled vaccination visit. This demonstrates the effectiveness of healthcare workers in disseminating information about upcoming visits. A qualitative study by Jalloh MF et al., assessed caregiver experiences in navigating childhood immunisation in urban communities in Sierra Leone and found that a sense of parental responsibility motivated caregivers to seek vaccination. Even caregivers who missed vaccination visits felt responsible for getting their children caught up with the next dose [16]. In present study, many parents were exposed to reminders to vaccinate through MCP cards or home visits by ASHA or Anganwadi workers. Total 91% of the informants expressed willingness to receive vaccination, which is consistent with the NFHS-5 data on vaccination coverage in Shimoga

district [8]. Despite a literacy rate of 90%, 45% of the informants were not aware of all four key messages. During the study, it was observed that healthcare workers primarily informed about side effects and upcoming visits, but not about the other key messages. A study by Cohen MA et al., found that 208 (88.1%) and 191 (82.7%) parents were counselled by ANMs and PHC physicians on immunisation, either verbally or through educational materials [14].

Several studies have examined the knowledge and awareness of healthcare workers and beneficiaries regarding the usage of MCP cards [17-20]. Melwani V et al., conducted a cross-sectional study on the knowledge and awareness of the usage of MCP cards among health functionaries and beneficiaries in Bhopal [17]. While details of MCP cards have been extensively studied, knowledge regarding the preservation of MCP cards has received less attention. According to the present study, nearly half of the participants were unaware of the importance of preserving the MCP card until the child reaches 16 years of age. It is crucial to create awareness among beneficiaries about the contents and preservation of the MCP card. All the above findings indicate a lack of shared responsibility between parents and healthcare workers in routine immunisation practices, as the burden of mobilising beneficiaries for immunisation mostly falls on ASHAs. The actual responsibility of healthcare workers remains questionable, as we did not directly assess it to overcome information bias and Hawthorne bias.

Parents should take responsibility for remembering due dates and being knowledgeable about vaccines and the diseases they prevent, which can help reduce the workload of ASHAs and save their valuable time. Information, Education, and Communication (IEC) sessions can be helpful in creating awareness among parents in this regard. It is recommended to make it compulsory for healthcare workers to inform caregivers about all four key messages. Medical officers and lady health visitors should provide supportive supervision to ANMs and staff nurses to ensure efficient communication of the key messages. Periodic training for healthcare workers will also help in conducting the sessions effectively.

## Limitation(s)

A limitation of the study is that the responsibility of healthcare workers could not be directly assessed by observing the immunisation sessions. Instead, it was assessed indirectly by asking guardians about the key messages to avoid Hawthorne bias. In future studies, this limitation can be addressed, and further investigation can be conducted to understand the reasons for not providing all the key messages during immunisation sessions.

## CONCLUSION(S)

The study highlights a significant gap in the responsibilities of parents and healthcare workers regarding immunisation. Indirect assessment of healthcare workers' responsibility through parental awareness of the four key messages revealed unsatisfactory outcomes. Most parents demonstrated a lack of awareness of the four key messages, indicating a potential failure on the part of healthcare workers to effectively communicate the necessary information, including the importance of scheduling post-immunisation visits. Addressing these issues is crucial to improve immunisation practices and overall, healthcare outcomes for children. It is essential to foster collaborative efforts between parents and healthcare providers to bridge this gap and enhance immunisation awareness and adherence.

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