

DETERMINANTS OF UNDERNUTRITION IN CHILDREN UNDER FIVE

Assessing Maternal Knowledge,
Attitudes and Practices in
Mobile Creches' Centres in Delhi NCR

2025



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Executive Summary

This research report presents a comprehensive assessment of the determinants of undernutrition among children under five years of age attending Mobile Creches (MC) centres across Delhi NCR, with a particular focus on maternal knowledge, attitudes and practices (KAP). Undernutrition remains a critical barrier to child survival, development and well-being in India, particularly among children from migrant families and the urban poor. Despite decades of government programmes and interventions, high levels of stunting, wasting and underweight persist—disproportionately affecting the most vulnerable.

The study offers an evidence-based understanding of the complex drivers of undernutrition in marginalised urban settings, especially among children of migrant construction workers and slum-dwelling communities. According to NFHS-5 (2019–21), 35.5% of children under five in India are stunted, 32.1% are underweight and 19.3% are wasted. In comparison, this study found that 38.1% of children were stunted, 23.4% underweight and 6.6% wasted—figures notably higher among children living at construction sites.

Study Objectives and Methodology

The study draws on the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition. It aims to assess the immediate, underlying and enabling causes of undernutrition; examine disparities across age, gender, caste and geography; and inform equity-centred, context-responsive interventions. A mixed-methods approach was employed, combining anthropometric data from 961 children, structured surveys with 810 mothers and nine focus group discussions to ensure both depth and inclusivity.

Key Findings

Significant nutritional disparities emerged across location, gender, caste and age. Children at construction sites showed particularly high levels of stunting (65.2%), wasting (68.3%) and underweight (69.3%), with girls being the most vulnerable. In urban slums, undernutrition was more prevalent among boys. Children under 36 months were most severely affected by stunting and underweight.

Caste-based inequalities were also pronounced. Children from Scheduled Tribes (ST) reported the highest stunting (47.1%), while those from Scheduled Castes (SC) had the highest rates of wasting (6.6%) and underweight (25.5%). Children from OBC and General categories consistently fared better nutritionally.

Maternal knowledge and caregiving practices were strongly linked to child nutrition outcomes. While 97.81% of mothers recognised the importance of prenatal checkups, only 48.28% knew that at least four visits are recommended. Awareness was highest among graduate mothers (75.5%) and lowest among those with no formal education (28.8%). Despite high institutional delivery rates (79.06%), uptake of key government schemes such as PMMVY remained low (17.44%).

Knowledge of exclusive breastfeeding was generally high—76.35% of mothers defined it correctly—yet critical gaps persisted, especially regarding its continuation during child illness (only 31.04% awareness). Younger mothers (<20 years) reported better breastfeeding practices (92.3%) compared to older mothers (70.3%). Household income also played a role: 70.8% of higher-income mothers practised exclusive breastfeeding versus 63.6% of lower-income mothers.

Complementary feeding knowledge was widespread (88.85%), and 82.77% of mothers introduced semi-solids on time. However, many also reported early exposure to low-nutrient processed foods such as biscuits. Mothers from lower-income households showed notably high awareness (95.5%), and younger mothers were more likely to follow age-appropriate feeding practices.

Dietary patterns revealed an over-reliance on ultra-processed foods, with 85.1% of mothers perceiving them as nutritious. Over half of all children consumed such foods at breakfast. Intake of fruits, vegetables and



protein-rich foods remained critically low, with diets skewed towards carbohydrates. Dairy consumption was higher among younger children—53.5% consumed dairy at dinner, compared to only 21.1% of older children—yet protein intake overall remained inadequate.

Vaccination coverage stood at 55.46%, with better outcomes among educated mothers (67%) and middle-income families (60.4%). Hygiene practices were encouraging—95.31% of children practised handwashing before meals. However, 22% of households lacked toilet access, contributing to a high illness burden: 89.58% of children had fallen ill in the past year.

These patterns reflect deeper systemic and behavioural causes, which are further categorised below through the lens of the UNICEF framework.

Determinants of Undernutrition

Immediate determinants

including poor diets, frequent illness and inadequate hygiene—had direct impacts on wasting and underweight.

Underlying determinants

such as maternal knowledge, exclusive breastfeeding and responsive feeding practices shaped children's nutritional status.

Enabling determinants

like household income and birth order also played a role: children from wealthier families and those born earlier in the birth order were less likely to be stunted.

Children whose mothers had stronger knowledge and caregiving behaviours consistently showed better nutritional outcomes. Notably, even when knowledge was limited, positive attitudes and caregiving practices helped reduce undernutrition. These insights reinforce the urgent need to strengthen maternal education and behaviour change programmes as core strategies for improving child health.



Programme and Policy Recommendations

To tackle these complex challenges, a dual response is essential—at both programmatic and policy levels.

Programmatically, the recommendation for Mobile Creches are following:

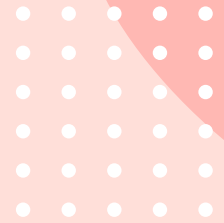
- Revise diet charts to include diverse, nutrient-rich options for breakfast and evening snacks.
- Engage fathers alongside caregivers using flexible sessions and digital tools to improve child nutrition.
- Support caregivers with affordable local recipes, responsive feeding training, and promote home-cooked meals over processed snacks.

At the policy level, the recommendations are following:

- Update ICDS per-child funding to reflect inflation and support diverse, culturally appropriate diets.
- Ensure universal PDS access, including migrants, with an expanded, nutrient-rich food basket.
- Recognise Creches and Anganwadi centres as a crucial mechanism for reducing undernutrition burden especially for children below 3 years.
- Provide all mothers with unconditional maternity benefits equivalent to six months' minimum wage.
- Regulate marketing and sales of ultra-processed foods near childcare centers with warning labels and ad bans.

Together, these measures can lay the foundation for lasting impact—ensuring that no child is left behind, regardless of caste, gender or setting.





Introduction



Introduction

Every child has the right to adequate nutrition—an essential foundation for survival, growth and development. Early years are especially critical, as good nutrition during this period supports healthy brain development, strengthens the immune system and sets the stage for a child's physical, cognitive and emotional well-being (CDC, 2014). However, when children are deprived of proper nutrition in these formative years, the consequences can be severe and lasting. Undernutrition can lead to stunting, wasting and underweight—conditions that not only increase a child's vulnerability to illness but also impair cognitive and physical development, limiting learning capacity and future potential (Grantham-McGregor, 2007). These impacts are often carried forward into adolescence and adulthood, perpetuating the cycle of poverty and inequality. Ensuring that all children have access to adequate nutrition from the start is not only a moral imperative—it is essential for building a healthier, more equitable future.

Evidence from recent national and global data highlights the urgency of addressing undernutrition in India. According to the National Family Health Survey-5 (2019–2021), about 35.5% of under-5 children are stunted, 19.3% are wasted and 32.1% are underweight. Similarly, the Global Nutrition Report (2024) states that 34.7% of under-5 children in India are stunted and 17.3% are wasted. While there has been some improvement in these indicators, the figures continue to reflect a significant public health challenge.

Undernutrition is a multifaceted and complex issue with profound intergenerational consequences. Multiple interlinked factors contribute to this condition, including maternal undernutrition; food insecurity; inadequate sanitation and hygiene practices; low maternal body mass index (BMI); frequent episodes of diarrhoea and acute respiratory infections (ARI) in children; and limited access to quality healthcare services (Chatterjee et al., 2016; Sinha, Dua, Bijalwan, Rohatgi & Kumar, 2018). Inadequate or inappropriate feeding practices have also been identified as major determinants of undernutrition (Yue et al., 2016). Research further underscores the critical relationship between maternal knowledge, feeding behaviours, and the nutritional status of young children (Pinto, Aranha & Lobo, 2023). As the primary caregivers, mothers play a crucial role in shaping dietary patterns and the caregiving environment for young children (Abbi, Christian, Gujaral & Gopaldas, 1988). Whether acquired formally or informally, mothers' knowledge about health and nutrition significantly enhances feeding practices and promotes better health outcomes in their children (Shahid, 2022).



Recognising the crucial role that mothers play in influencing the nutritional well-being of young children, this study aims to evaluate the knowledge, attitudes and practices (KAP) of mothers whose children under five years of age are enrolled in Mobile Creches' centres across the Delhi National Capital Region (NCR). These centres serve children from migrant and urban slum communities—a population often challenged by food insecurity, inadequate housing, poor sanitation and limited access to affordable healthcare. While these centres provide children with supplementary nutrition including two hot cooked meals and snacks during the eight hours children spend there daily (six days a week), their dietary intake during the remaining 16 hours at home remains largely undocumented. This gap in understanding limits our ability to fully address the drivers of undernutrition in these vulnerable communities.

Maternal KAP directly influences feeding practices, health-seeking behaviours and overall caregiving—all of which are critical determinants of child nutrition. This study, set within the context of Mobile Creches, seeks to generate critical insights into the underlying determinants of undernutrition among children from migrant and



urban slum communities. The findings aim to guide the design of context-specific interventions that strengthen maternal knowledge, foster positive attitudes and promote effective caregiving practices—ultimately supporting improved nutritional outcomes and healthier growth for young children in these vulnerable settings.

This study is grounded in the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition (2020), which provides a comprehensive model to understand the multifaceted causes of undernutrition in children under five years of age. The framework categorises determinants into three interrelated domains: immediate determinants, underlying determinants and enabling determinants. Immediate determinants include diet, health and hygiene and care for both mother and child. Underlying determinants encompass food, practices and services available to women and children in their households and communities. Enabling determinants refer to political, financial, social and cultural factors that facilitate proper nutrition for mother and child. By applying this framework, the study aims to assess how maternal knowledge, attitudes and practices influence these determinants, thereby affecting the nutritional status of under-5 children in Mobile Creches' centres.





Scope & Locus of the Study



Scope & Locus of the Study

Delhi NCR presents a pertinent context for examining undernutrition among under-5 children, particularly those enrolled in the centres of Mobile Creches. Despite being the national capital with dual levels of governance, the city continues to grapple with stark inequalities. Urban slums and migrant communities remain disproportionately affected by poverty, inadequate housing, poor sanitation and limited access to essential health and nutrition services. According to the National Family Health Survey (NFHS-5), 21.7% of children under five in Delhi are underweight, 30.9% are stunted and 11.1% are wasted—highlighting the enduring public health challenge of child undernutrition in the capital.

Mobile Creches, established in 1969, has played a pioneering role in addressing these challenges by delivering integrated early childhood care and development services to children from marginalised communities in Delhi NCR. Operating six days a week, these centres offer a safe and nurturing environment where children receive healthcare, early learning, parenting support and two nutritious meals and snacks each day. Their longstanding presence and community-based approach make Mobile Creches an ideal setting for investigating how maternal knowledge, attitudes and practices (KAP) intersect with broader determinants of undernutrition.

This study focuses on children enrolled in Mobile Creches centres, to understand how mothers' knowledge, attitudes and practices influence child nutrition outcomes. It examines key factors such as prenatal and postnatal care, exclusive breastfeeding, complementary feeding, dietary intake, child health and illness, caregiving practices by both mothers and fathers, parental education, food security, access to healthcare and sanitation. Additionally, the study explores disparities in undernutrition across urban slums and construction sites in Delhi NCR, providing valuable insights to improve child nutrition and well-being in vulnerable communities.

Methodology and Sampling

Objective

The primary objective of this study is to investigate the prevalence and determinants of undernutrition among under-5 children in the Delhi NCR (National Capital Region). Specifically, the study aims to:

- ***Understand the relationship between mothers' nutrition knowledge, attitudes and practices and the nutritional status of children under five years of age.***
- ***Examine the immediate, underlying and enabling determinants of undernutrition among children under five in Delhi NCR.***

Research Questions

The study seeks to answer the following key questions:

- a. What is the prevalence and severity of undernutrition among under-5 children, and what are its contributing factors?
- b. What are the key socio-economic and environmental factors (e.g., sanitation, water, household fuel) contributing to undernutrition in this age group?
- c. How does access to healthcare services and government nutrition programmes affect the rate of undernutrition among under-5 children?
- d. What role do parental education and occupation play in the prevalence of undernutrition among children under five?
- e. How do early childhood feeding practices, diet diversity and food security impact undernutrition in this group?
- f. What are the barriers to accessing nutrition education and resources among migrant families in Delhi NCR?



- g. What is the contribution of NHM/WCD schemes (PMMVY, JSY, MCP card and ICDS) to nutritional outcomes among under-5 children?

The study employs a comprehensive, mixed-methods approach to assess maternal and child nutrition, integrating quantitative surveys, anthropometric measurements and qualitative focus group discussions (FGDs). Details of the methodology and sampling are provided in Table 1.

Anthropometric Measurements

Height and weight measurements were collected from 961 children using standardised tools, including stadiometers and weighing scales. The sample included one child from each of 659 mothers and two children from 151 mothers, all of whom were interviewed as part of the study. Participants were selected through simple random sampling, with approximately 21 children identified from each of the 46 Mobile Creches' centres.

Quantitative Survey

A structured survey was administered to 810 mothers of children under five years of age to collect data on prenatal care, exclusive breastfeeding, complementary feeding practices, dietary patterns, health and hygiene behaviours and father involvement. This method provided quantitative insights into maternal and child nutrition practices.

Focus Group Discussions (FGDs)

Nine FGDs were conducted with mothers, fathers and centre staff to explore qualitative aspects of maternal and child nutrition, including caregiving practices, nutritional knowledge and barriers to appropriate feeding.

This multifaceted approach allows for a comprehensive understanding of the factors influencing maternal and child nutrition, combining quantitative data with qualitative insights to inform effective interventions.

Table 1: Details of methodology and sampling

Methodology	Target Group	Sample Size
Quantitative survey (structured questions on prenatal care, exclusive breastfeeding, complementary feeding, dietary patterns, health and hygiene, and father involvement)	Mothers of children under 5 years	810
Anthropometric measurement (height and weight of children using MC's stadiometers and weighing scales)	Children under 5 years	961
Focus Group Discussions (FGDs)	Mothers, fathers, and centre staff	9

The Geographical Context

The geographical setting of the study sheds light on the living conditions of communities in both urban slums and construction sites, highlighting shared challenges related to infrastructure, environmental hazards and socio-economic instability. This context is crucial for understanding how location-based factors impact health, safety and access to essential services, particularly for migrant workers and their young children.



The study encompasses 46 childcare centres, with 18 situated in urban slums and 28 at construction sites, distributed across Delhi, Noida, Ghaziabad and Gurgaon. Both environments present significant risks for residents. Urban childcare centres are located in densely populated areas, often surrounded by small-scale industries (MSMEs) and household-based factories. Some urban centres are situated in communities adjacent to landfills and sewage treatment plants, where improper waste disposal releases pollutants, contributing to poor health conditions. These communities consist primarily of migrant workers or slum dwellers engaged in small-scale industries or household-based enterprises, navigating overcrowded conditions with limited access to basic amenities such as healthcare and sanitation.

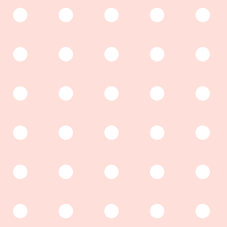
Similarly, construction-site childcare centres are located on the outskirts of the city, in areas such as Sohna Road in Gurgaon and Raj Nagar Extension in Ghaziabad, where underdeveloped infrastructure further intensifies vulnerability. These sites lack essential civic amenities such as hospitals, schools and markets, making daily life particularly challenging. Employers provide basic accommodation within the labour camps, including rooms, water and toilet facilities, but safety risks remain high due to excavation, demolition activities and the operation of heavy machinery—all of which pose direct threats to young children and contribute to environmental pollution.

Despite geographical differences, both urban and construction-site settings face significant infrastructural challenges and environmental hazards that impact the health and well-being of children and families. Recognising these shared vulnerabilities is essential for developing targeted interventions aimed at improving the nutritional status of children under five in these areas.

Table 2: Distribution of MC's centres in Delhi NCR

Distribution of MC's Centers in Delhi NCR	Delhi	Uttar Pradesh		Haryana Gurgaon	Total
		Ghaziabad	Noida		
Centers in urban slums	13	-	4	1	18
Centers in construction sites	4	1	12	11	28





Socio-Demographic Characteristics of the Population



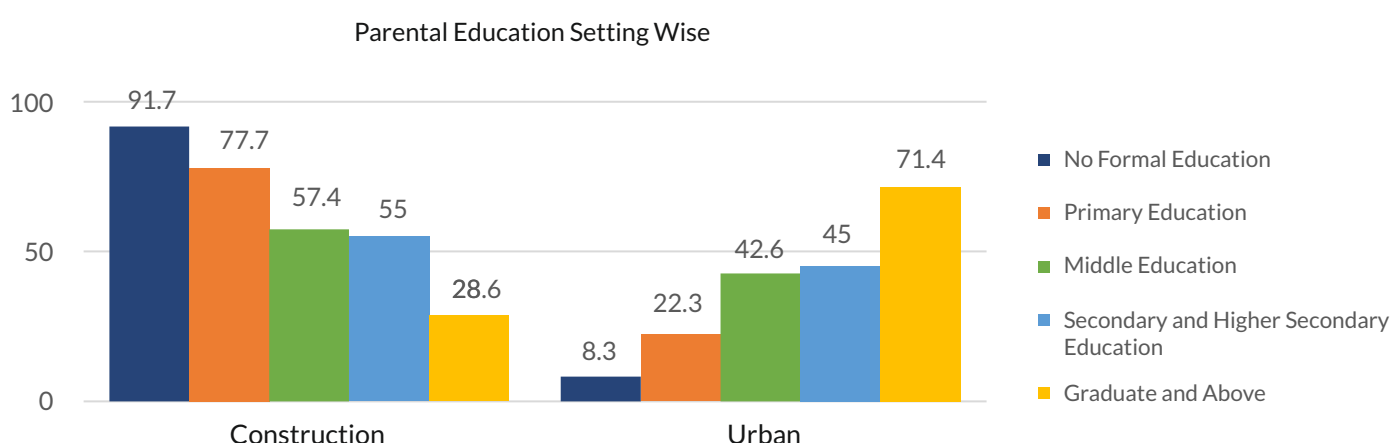
Socio-Demographic Characteristics of the Population

The study sample consists of 810 households, primarily representing migrant families originating from several states across India. The largest groups are from Uttar Pradesh (34.6%), Bihar (27.5%) and West Bengal (9%), followed by smaller proportions from Delhi (7.4%), Madhya Pradesh (6.9%), Chhattisgarh (5.6%), Jharkhand (4.3%), Rajasthan (1.6%) and Haryana (1.5%) (as mentioned in Annexure Table 1). Smaller representations come from Assam, Uttarakhand, Odisha and Punjab, each contributing less than 1% to the sample. The average duration of residence in the Delhi NCR region is six years (mean = 6.19, SD = 0.28), with 20% of households having relocated multiple times within the region in the past two years due to livelihood-related challenges. The majority of the population is Hindu (81.1%), followed by Muslims (8.3%), with small groups of Christians and Sikhs. In terms of caste, 9.3% are from the General category, 37.4% from Scheduled Castes (SC), 4.6% from Scheduled Tribes (ST) and 48.7% from Other Backward Classes (OBC).

Housing conditions vary sharply between urban and construction site dwellers. Approximately 54% of families (434 households) reside at construction sites, often in makeshift shanties lacking basic amenities such as kitchens and toilets—highlighting the precariousness of their living conditions. In contrast, 46% of families (376 households) live in urban slums, where conditions, though informal, tend to be more stable than those at construction sites.

Construction sites exhibit a significantly higher concentration of parents with no formal education (91.7%), compared to urban slums, where only 8.3% fall into this category. Among those with graduate-level or higher education, the majority (71.4%) are engaged in urban sector work, while only 28.6% are employed in construction (Fig. 1). The gap is especially pronounced among caste groups: 95.2% of parents with no formal education belong to SC/ST/OBC communities, while only 4.8% are from the General category. As education levels increase, the proportion of individuals from the General category also rises—24.5% of those with graduate-level or higher education belong to this group—underscoring the deep interlinkages between caste, education and upward mobility.

Figure 1: Difference in parental education at construction sites and at urban slums

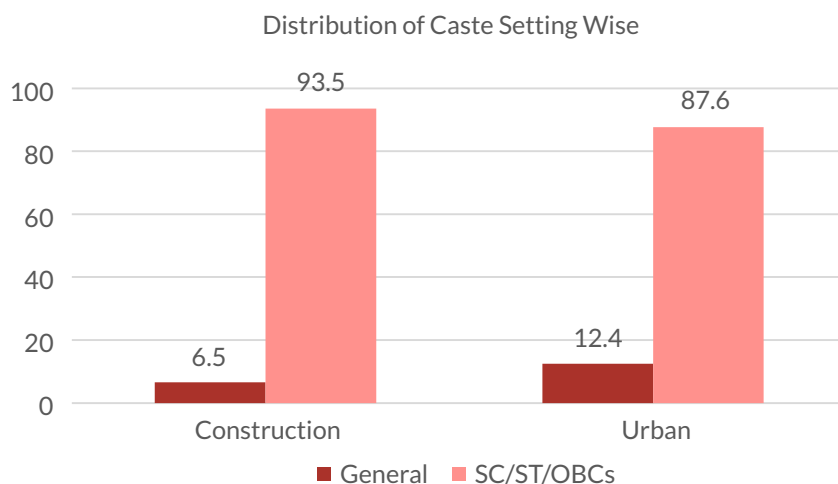


From a gender perspective, educational disparities are also evident. Among mothers, 42.2% have never attended school, 14.8% have completed primary education, 17.2% have reached middle school, and 22.4% have completed secondary or higher secondary education. Only 3.4% have pursued higher education at the graduate level or beyond. Fathers tend to have higher educational attainment: 27.5% lack formal schooling, 18.6% have completed primary education, 22.5% have reached middle school, and 26.5% have completed secondary or higher secondary education. Notably, 4.8% of fathers have completed higher education.



A clear divide in employment patterns also exists—particularly across caste and gender lines. From Figure 2, it is evident that a significant majority of the SC/ST/OBC group (93.5%) is employed in the construction sector, while only 6.5% of the General category works in this sector. Conversely, 87.6% of individuals from the SC/ST/OBC group are employed in urban slums, compared to 12.4% from the General category.

Figure 2: Caste Distribution Among Construction Workers and Urban Slum Dwellers

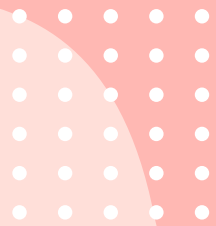


Gendered disparities in employment are also evident. Among women, 30% work in construction, while 28% are employed in domestic work. Smaller proportions are involved in factory work (4%), small businesses (4%), or home-based garment work (3%). In contrast, men have more diverse employment avenues: 57% work in construction, 15% in factories, 14% in small businesses, 8% in office jobs, 2% in home-based garment work, and 1% as street vendors.

Monthly household expenditure patterns further reflect socio-economic inequalities across caste groups and residential settings. Among SC/ST/OBC households, 94.7% report spending less than Rs. 5,000 per month, while households from the General category are more evenly distributed across higher expenditure brackets. By location, 78.9% of construction site households report monthly expenditure below Rs. 5,000, compared to 21.1% of urban households. Conversely, 64.1% of urban households report monthly spending above Rs. 15,000, while only 35.9% of construction-site households fall into this category.



Prevalence of Undernutrition Among Under-5 Children

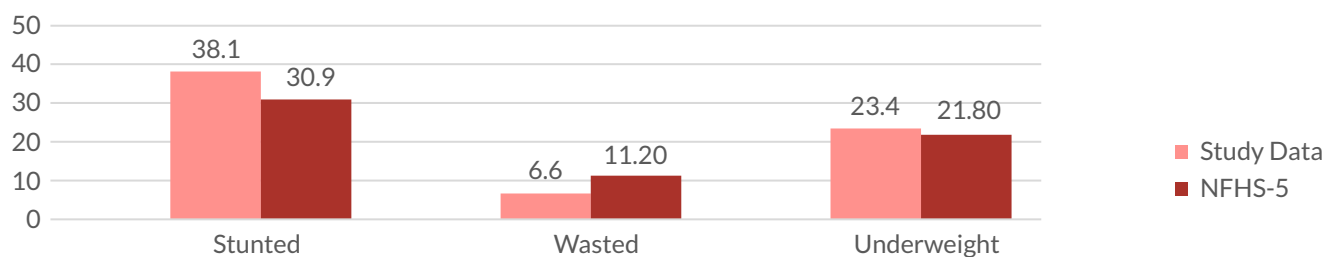


Prevalence of Undernutrition Among Under-5 Children

The study identifies a concerning prevalence of undernutrition among children under five years of age attending childcare services at Mobile Creches in Delhi NCR. Findings, as presented in Figure 3, indicate that 38.1% of children are stunted, 23.4% are underweight and 6.6% are wasted. In comparison, data from the National Family Health Survey (NFHS-5) for Delhi (2019–21) report slightly lower rates—30.9% stunted, 21.8% underweight and 11.2% wasted among under-5 children.



Figure 3: Prevalence of Undernutrition among under -5



This graph highlights the persistent challenge of child undernutrition in the state and underscores the need for targeted interventions to address nutritional deficiencies and improve early childhood health outcomes.

Prevalence of Undernutrition Among Children by Gender and Setting

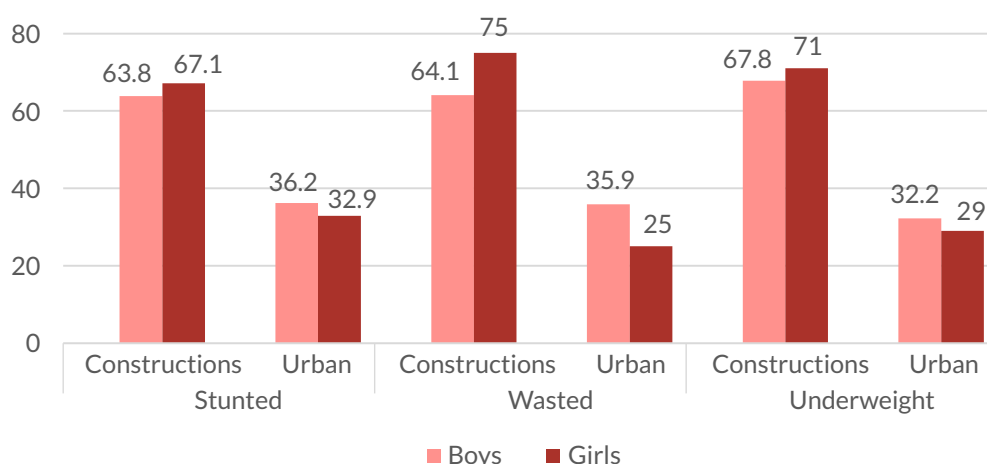
The graph below presents the prevalence of stunting, wasting and underweight among children under five years of age, categorised by gender and setting—construction sites versus urban slums. Children residing at construction sites experience substantially higher levels of undernutrition, with 65.2% affected by stunting, 68.3% by wasting and 69.3% by underweight. In contrast, children in urban slums show comparatively lower prevalence rates: 34.8% for stunting, 31.7% for wasting and 30.7% for underweight.

A gender-based analysis reveals that girls living at construction sites face the highest nutritional burden, with 67.1% experiencing stunting, 75% wasting and 71% underweight. Among boys in the same setting, the figures are slightly lower—63.8% stunted, 64.1% wasted and 67.8% underweight. In urban slums, the pattern is reversed: boys exhibit marginally higher rates of undernutrition compared to girls. Boys recorded 36.2% stunting, 35.9% wasting and 32.2% underweight, while the corresponding rates for girls were 32.9%, 25% and 29%, respectively.

These findings highlight the acute nutritional vulnerability of children under five at construction sites—particularly girls, who consistently exhibit worse outcomes than their male counterparts. Meanwhile, in urban slums, boys show slightly higher undernutrition rates, emphasising the need for targeted, gender-sensitive interventions to address these disparities across different living environments.



Figure 4: Prevalence of undernutrition by gender and setting wise

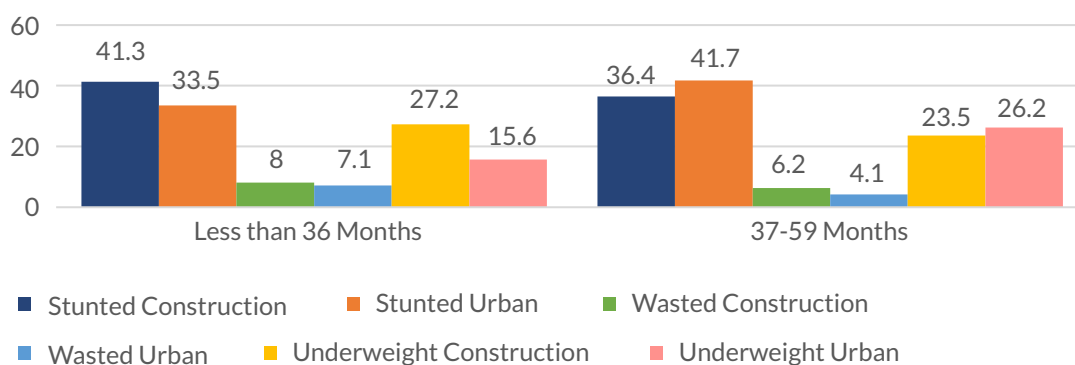


Prevalence of Undernutrition Among Children Across Age in Construction and Urban Settings

A comparison of the nutritional status of children under five—based on age group (less than 36 months and 37–59 months) and living environment (construction sites vs. urban settings)—reveals notable disparities in undernutrition, as illustrated in Figure 5. The analysis focuses on three key indicators: stunting, wasting and underweight.

Children under 3 years living at construction sites face markedly higher rates of undernutrition compared to their urban counterparts. Stunting affects 41.3% of these children, versus 33.5% in urban slums; underweight prevalence is significantly higher at 27.2%, compared to 15.6%; and wasting is also elevated (8.0% vs 7.1%).

Figure 5: Prevalence of undernutrition by age group



In contrast, among children aged 37–59 months, nutritional differences between construction and urban settings are less consistent. Stunting is slightly higher in urban slums (41.7%) than at construction sites (36.4%), while wasting remains more common at construction sites (6.2% vs 4.1%). Underweight prevalence is marginally higher among urban children (26.2%), compared to 23.5% at construction sites.

These findings reveal a clear age-related disparity in undernutrition, with children under 3 years—especially those in construction settings—experiencing the highest levels of stunting, wasting and underweight. This age group represents a critical window for development, during which inadequate nutrition can result in long-term

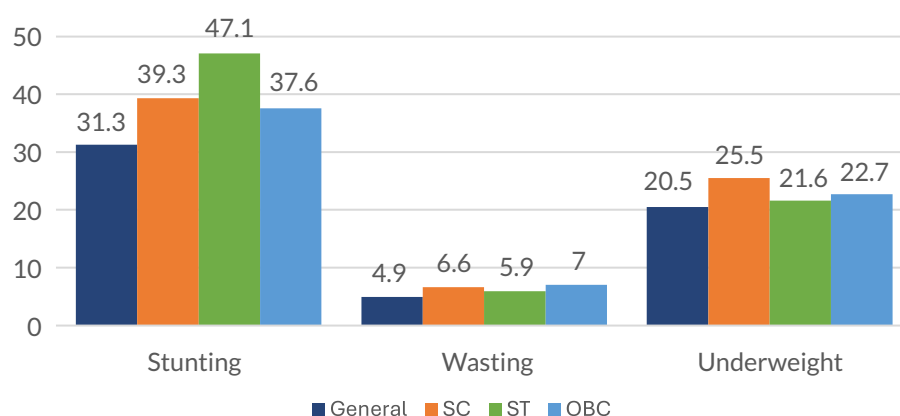


physical and cognitive impacts. In comparison, undernutrition among children aged 3–5 years is less pronounced and more variable.

These insights highlight the urgent need to prioritise nutrition interventions during the first three years of life, to ensure healthy growth and break the intergenerational cycle of undernutrition.

A deeper caste-wise analysis reveals that children from Scheduled Tribes (ST) bear the highest burden of stunting (47.1%), while those from Scheduled Castes (SC) record the highest prevalence of wasting (6.6%) and underweight (25.5%). In contrast, children from Other Backward Classes (OBC) and the General category exhibit comparatively better nutritional outcomes across all three indicators as shown in Figure 6.

Figure 6: Prevalence of undernutrition by caste



Mothers' Knowledge, Attitudes and Practices Regarding Maternal and Child Health



Mothers' Knowledge, Attitudes and Practices Regarding Maternal and Child Health

This section examines mothers' Knowledge, Attitudes and Practices (KAP) regarding maternal and child health, organised into five key thematic areas: prenatal care, exclusive breastfeeding, complementary feeding, eating patterns among young children, and vaccination and hygiene. Each theme includes specific indicators designed to capture critical behaviours and decision-making patterns relevant to maternal and child health.

Mothers' responses were categorised as either positive or negative based on their alignment with recommended health practices, as outlined in Table 6. This classification reflects the extent to which their knowledge, attitudes and practices conform to established guidelines.

Furthermore, each theme was analysed in relation to demographic variables such as maternal age, parental education, monthly household expenditure, residential setting (construction site vs. urban slum), caste, religion and duration of stay in Delhi NCR, to understand the influence of socio-economic and cultural context on maternal and child health behaviours.

The underlying framework assumes that knowledge forms the foundation, which shapes attitudes, and in turn guides health and nutrition-related behaviours—ultimately impacting maternal and child health outcomes.



Table 6: Mothers' Responses Regarding Knowledge, Attitudes and Practices (in %)

Themes	Knowledge indicators	Mothers' Knowledge	Practice indicators	Mothers' Practice	Attitude indicators	Mothers' Attitude
		Positive		Positive		Positive
Prenatal	Expecting mothers should undergo at least four prenatal checkups at an ASHA centre, with a doctor, or at an AWC, PHC or government dispensary.	48.28	Mothers registered their pregnancies with local health workers.	98.44	Perception of prenatal visits to ANMs or dispensaries as beneficial.	97.81



Themes	Knowledge indicators	Mothers' Knowledge	Practice indicators	Mothers' Practice	Attitude indicators	Mothers' Attitude
		Positive		Positive		Positive
	Awareness of Pradhan Mantri Matru Vandana Yojana	67.5	Mothers carried MCP card with them.	46.77	Perception of prenatal visits to ANMs or dispensaries as difficult.	5.21
	Awareness of Janani Suraksha Yojana	80.31	Mothers completed at least four prenatal checkups with local health workers.	40.31		
			Mothers received antenatal checkups during the first trimester.	70.45		
			Mothers completed the prescribed supplements during pregnancy.	79.45		
			Mothers maintained adequate nutrition during pregnancy.	73.33		
			Mothers utilised institutional delivery services.	79.06		
			Mothers received benefits under the Pradhan Mantri Matru Vandana Yojana.	17.44		
			Mothers received benefits under the Janani Suraksha Yojana.	45.4		
Exclusive breast-feeding	Awareness that colostrum should be fed to newborns.	58.23	Early initiation of breastfeeding as the first feeding practice.	86.35	Perception of difficulty in practicing exclusive breastfeeding	7.08



Themes	Knowledge indicators	Mothers' Knowledge	Practice indicators	Mothers' Practice	Attitude indicators	Mothers' Attitude
		Positive		Positive		Positive
	Knowledge of the definition of exclusive breastfeeding.	76.35	Early initiation of breastfeeding within one hour of birth.	65.31		
	Knowledge of the recommended duration of exclusive breastfeeding.	66.25	Mothers practicing exclusive breastfeeding for their infants.	70.35		
	Awareness that breastfeeding should continue when the child is ill.	31.04				
	Awareness of the health benefits of exclusive breastfeeding for infants.	97.71				
Complementary feeding	Awareness that complementary foods should be introduced between 6 and 8 months of age.	88.85	Initiation of complementary feeding with semi-solid foods between 6 and 8 months.	82.77	Mothers' belief in the importance of providing nutritious food for their child's growth and development.	97.71
					Mothers' belief in the importance of offering a variety of foods—including fruits, vegetables and proteins—to young children.	97.71
					Mothers' belief in the importance of limiting sugary foods and processed snacks in their child's diet.	84.69



Themes	Knowledge indicators	Mothers' Knowledge	Practice indicators	Mothers' Practice	Attitude indicators	Mothers' Attitude
		Positive		Positive		Positive
					Mothers' confidence in preparing healthy and nutritious food for their child.	95.52
Eating patterns among young children	Perception that junk food is nutritious for young children.	85.1				
Vaccination, hygiene and health			Practice of vaccinating children as per the schedule on the MCP card.	55.46		
			Practice of obtaining a birth certificate for the child.	78.6		
			Percentage of children who fell ill in the past 12 months.	89.58		
			Percentage of children who wash their hands before eating.	95.31		
			Percentage of households with toilets within the premises.	78.96		
			Percentage of households with access to safe drinking water.	97.2		



a. Prenatal Care

The indicators explored in this analysis include prenatal check-up visits, government schemes such as the Pradhan Mantri Matru Vandana Yojana (PMMVY) and Janani Suraksha Yojana (JSY), pregnancy registration, antenatal care during the first trimester, maternal nutrition, and institutional deliveries.

Knowledge regarding prenatal care reveals a concerning gap in maternal awareness. Approximately 48.28% of mothers recognise the importance of attending at least four prenatal check-ups, whereas a slightly higher proportion (51.72%) do not possess this critical knowledge. Awareness of government welfare schemes is comparatively higher: about 67.5% of mothers are informed about PMMVY, and 80.31% are familiar with JSY (Table 6). **This suggests that while awareness of financial support schemes is relatively widespread, the value of routine prenatal care remains under-recognised.**



Mothers' age, education level, income, residence, caste, and length of stay are key factors influencing awareness and utilisation of prenatal care (Annexure 5). Only 15.4% of mothers under 20 years are aware of the need for four or more check-ups, compared to 47.8% of those aged 20 and above. **However, it is important to note that the proportion of younger mothers in the study was relatively small.** Education plays a significant role: just 28.8% of mothers with no formal education understand the need for regular check-ups, whereas awareness rises to 75.5% among graduate mothers. Similarly, 86.8% of graduate mothers are familiar with JSY, compared to 78.4% among those with no education.

Awareness also increases with income: 36.4% of mothers in the lowest income group know about the four-check-up recommendation, compared to 50.6% in the highest. **Location matters too**—58.1% of urban mothers are aware, compared to just 41.2% at construction sites. **Caste disparities are evident:** 63.9% of general category mothers are aware, versus 45.8% among SC and 31% among ST mothers. Longer-term residents in Delhi NCR show stronger awareness: 55.1% of those who've lived there for 3+ years knew of the four-check-up standard, compared to 33.8% of newer migrants.

Attitudes towards prenatal care are overwhelmingly positive. A vast majority (97.81%) consider visits to ANMs or dispensaries beneficial, suggesting strong trust in the system. Only 5.21% find these visits difficult, likely due to challenges such as migration, livelihood pressures, or poor access to health facilities.

While positive attitudes cut across demographics (Annexure Table 7), some patterns emerge: **15.4% of mothers under 20** find prenatal visits challenging, versus 5.1% of older mothers. **Among those with no formal education, 6.5% reported difficulty**, compared to 5.7% of graduates. Curiously, perceived difficulty was higher among wealthier households (9%) than among the lowest income group (4.5%). ST (2.4%) and OBC (4%) mothers reported fewer access challenges compared to the general category (6.9%). Longer-term residents again fare better, with fewer perceiving difficulty in accessing services.

Despite high registration (98.44%), actual practice falls short. Only 46.77% of mothers carry the MCP card. Though 70.45% received antenatal care in the first trimester, just 40.31% completed four or more visits. Nutrition-related practices also show gaps: 79.45% completed supplement courses, and 73.33% had access to nutritious food.



One mother at a construction site reflected:

“During my pregnancy, I was fine. I didn’t have any problems. I didn’t take any medicines, even though ASHA did give them to me. I wasn’t aware of their benefits for the baby, so I took them inconsistently, sometimes following my whims, often skipping them entirely. I never went for check-ups because I believed they were only necessary if I faced any issues, and since I didn’t, I didn’t see the need to consult a doctor. Though I had some vomiting, but it stopped after 1–2 months. I ate dal once or twice a week and sabzi—like gobi, aaloo, baingan, and palak—three to four times a week. Fruits, however, were rare, only two or three times a month.” This quote underscores a deeper issue: **even with access, understanding remains limited.**

Institutional deliveries are relatively high at 79.06%, yet uptake of schemes is low—just 17.44% received PMMVY benefits, and 45.4% accessed JSY support.

Socio-economic factors continue to shape practice. Among mothers under 20, only 15.4% completed four or more visits and 30.8% had an MCP card. In contrast, older mothers (20+) had better engagement: 39.6% completed visits, 47.7% carried the card. Education is also a clear determinant: only 18% of mothers with no formal schooling completed four or more visits, and 69.1% had institutional deliveries. These figures climb among more educated mothers—46.5% with secondary/higher education completed the visits, and 86.9% delivered in institutions.

Residence makes a difference: in urban slums, 53.5% completed visits and 84.5% delivered in institutions, compared to 31.4% and 75.7% at construction sites. Early antenatal care is more common among urban dwellers (76.3%) than site-based mothers (64.5%).

Caste-based variation persists: only 21.4% of ST and 36.9% of SC mothers completed the four-visit standard, compared to 58.3% of general category mothers. Long-term residents again show stronger engagement: 47.9% of mothers living 3+ years in NCR met the visit target, versus 26.4% of newer arrivals. Early checkups followed the same trend (74.2% vs. 67.2%).

Conclusion

There is a clear and urgent need to bridge the gap between knowledge, attitude and practice in prenatal care. While pregnancy registration is nearly universal, too few women complete the recommended four check-ups. **Awareness and use of tools like the MCP card, regular pre-natal visits, and supplements remain insufficient—despite their proven impact on reducing undernutrition in children under five.** Encouragingly, institutional deliveries and awareness of financial schemes like PMMVY and JSY are more common, **but these must be matched by improvements in actual service utilisation and behavioural change.**

b. Exclusive Breastfeeding

The indicators explored in this analysis include whether mothers feed colostrum (the thick, yellow milk) as the first food, whether breast milk is given during illness, the understanding that exclusive breastfeeding refers to feeding only breast milk, the recognition of the recommendation to practice exclusive breastfeeding until six months, and the belief in the role of breastfeeding in fostering a healthy bond between mother and child.

Knowledge of exclusive breastfeeding among mothers is good, with 76.35% correctly identifying it as feeding only breast milk, and 66.25% aware that it should be practiced for the first six months of life. However, only 31.04% of mothers knew that breast milk should be given during a child’s illness, and 41.77% were unaware of the importance of feeding colostrum—**the first yellowish milk rich in antibodies**—to newborns. Despite these gaps, 97.71% of mothers recognised the overall benefits of exclusive breastfeeding, indicating strong general awareness.

Mothers’ age, education, household income, and caste significantly influence maternal knowledge of exclusive breastfeeding (see Annexure Table 5). Younger mothers, particularly those under 20 years of age, show high



levels of knowledge, with 100% acknowledging that exclusive breastfeeding is recommended until six months and recognising its importance in fostering a healthy bond between mother and child. Mothers aged 20 years or more also display high knowledge levels, with 93.2% understanding the recommendation for exclusive breastfeeding and 97.6% recognising its role in promoting a healthy bond. Furthermore, knowledge about feeding colostrum as the first food is higher among mothers aged 20 years or more, with 41.4% reporting this practice, compared to 30.8% among younger mothers.

Knowledge that breastfeeding strengthens the mother–child bond and that exclusive breastfeeding is recommended for the first six months is consistent across all education levels. However, awareness regarding the importance of colostrum remains limited. Interestingly, a higher percentage of mothers with no formal education (41%) recognised the value of colostrum compared to only 32.1% of mothers with graduate or higher education—**indicating a specific knowledge gap that formal education alone may not address.** Monthly household expenditure has little impact on awareness of breastfeeding’s general benefits, with all income groups recognising its role in strengthening the bond and the six-month recommendation. However, mothers with lower incomes (less than ₹5,000) show lower awareness of colostrum’s benefits, with only 27.3% acknowledging its value, compared to 42.1% of mothers in the highest income bracket (above ₹15,000). Awareness among mothers in construction areas and urban slums is generally similar, with construction settings occasionally demonstrating higher awareness than urban slums. Caste also affects breastfeeding knowledge: mothers from Scheduled Tribes (ST) and Scheduled Castes (SC) exhibit lower awareness levels compared to those from the General category.

Attitudes towards exclusive breastfeeding (EBF) are predominantly positive, with 92.92% of mothers not perceiving it as difficult, indicating strong acceptance and support for the practice within households and communities. This is crucial, as EBF during the first six months plays a vital role in promoting infant growth and immunity. However, 7.08% of mothers reported challenges, which may stem from issues like insufficient milk supply, returning to work, or a lack of family and community support. One mother, working as a domestic helper, shared that *“she stopped breastfeeding her 4-month-old daughter because she is constantly dealing with water at work. She feared the baby might catch a cold and, to be safe, decided to stop”*.

Attitudes towards exclusive breastfeeding vary across socio-economic groups (see Annexure Table 7). Mothers aged 20 years and above tend to hold a slightly more favourable view, with 7.5% perceiving EBF as challenging, compared to 7.7% of younger mothers. Educational background shows limited influence—7.2% of mothers with no formal education report difficulty, whereas 9.4% of graduate-level mothers find it more challenging. In contrast, income shows a clearer link: 18.2% of mothers from low-income households (earning less than ₹5,000) report difficulty, compared to just 6.9% from households earning ₹15,000 or more. Mothers living in urban slums report more challenges than those working at construction sites—**possibly because construction workers can return home or visit a centre to breastfeed**, an option less available to women in urban slum areas. Caste-based disparities are also evident, with mothers from Scheduled Tribes (ST) reporting the highest perceived difficulty with EBF.

Practice of exclusive breastfeeding is critical for newborn health. The data indicates that 86.35% of mothers initiated breastfeeding as the first food. However, only 65.31% breastfed within the first hour of delivery—a crucial period for neonatal outcomes. About 70.35% of mothers practiced EBF for the recommended first six months. Yet, understanding of EBF remains inconsistent. One mother said, *“I exclusively breastfed my child for 6 months, although we gave him a little water after 2 months and biscuits before 6 months. I am not fully aware of the benefits of breastfeeding but was advised to consult a doctor if the child was unable to consume breast milk, to check for any health issues.”*

Younger mothers—especially those under 20—show higher rates of EBF, with 92.3% adhering to the recommendation of feeding only breast milk during the first six months. In contrast, mothers aged 20 and above report a lower rate of 70.3%. However, older mothers are more likely to initiate breastfeeding appropriately: 85.6% gave breast milk as the first food and 65.5% did so within the first hour, compared to 76.9% and 53.8%,



respectively, among younger mothers.

Parental education influences breastfeeding practice. Among graduate-level mothers, 71.7% practice EBF, while 69.8% of mothers with no formal education do so. Household income is a strong determinant: 88% of higher-income mothers (earning more than Rs. 15,000 per month) report practising EBF, compared to only 63.6% of those earning less than Rs. 5,000. Urban mothers are more likely to practice EBF (73.5%) than those living at construction sites (69%). Caste disparities also exist: mothers from Scheduled Tribes (ST) have the lowest EBF rate (64.3%), compared to 75% among General caste mothers. Additionally, mothers who have lived in the same area for three or more years report better adherence to recommended practices, such as initiating breastfeeding within one hour, feeding breast milk first, and maintaining EBF (see Annexure Table 6).

Conclusion

The analysis of Knowledge, Attitude, and Practice (KAP) related to exclusive breastfeeding highlights that demographic factors significantly shape maternal behaviour. **Younger mothers, those with higher education, greater household income, urban residence, and longer durations of stay in Delhi NCR** tend to exhibit better awareness, more positive attitudes, and improved practices. While awareness about specific aspects—like colostrum and breastfeeding during illness—remains limited, actual breastfeeding practices are comparatively stronger, suggesting a gap between knowledge and behaviour that may be shaped by cultural beliefs, experience, or community support systems.

c. Complementary Feeding

This subsection explores maternal **Knowledge, Attitudes and Practices (KAP)** related to the initiation of complementary feeding. Key indicators include the timely introduction of complementary foods **between 6 and 8 months of age**, mothers' awareness of the importance of providing nutritious foods, their understanding of the need to limit sugary items, and their confidence in preparing healthy, age-appropriate meals for their infants.

Knowledge regarding complementary feeding suggests that **the majority** of mothers are aware that complementary feeding, alongside breast milk, should commence between **6 and 8 months** of age, with **88.85% correctly identifying this timeframe**. However, **11.15% remain uninformed on this critical aspect**.

Younger mothers (under 20 years) exhibit slightly higher awareness, with **92.3% correctly identifying** the recommended age for introducing complementary foods, compared to **88.8% among mothers aged 20 years and above**. Awareness is relatively consistent across educational backgrounds: **89.9% of mothers with no formal education responded correctly**, while mothers with graduate-level education and above reported a slightly lower rate at **86.8%**. Mothers from lower-income households (earning less than Rs. 5,000 per month) demonstrate the highest awareness at **95.5%**, compared to **89.3% among those earning more than Rs. 15,000**. Awareness is also similar across different settings, with **89.3% of urban mothers and 88.6% of construction-site residents** responding correctly. **Caste-wise differences in awareness are minimal**. In terms of duration of stay within Delhi NCR, mothers who have lived in the area for **1–2 years report the highest awareness (92.6%)**, followed by those residing for 2–3 years (90%) (Annexure Table 5).

Attitudes towards complementary feeding are **largely positive**. Mothers demonstrated a high level of awareness and favourable attitudes regarding complementary feeding practices. An overwhelming **97.7% of respondents acknowledged the importance of providing nutritious food** for their child's growth and development, and an equal percentage emphasised the necessity of offering a variety of foods, including fruits, vegetables and proteins. While overall awareness was strong, slightly fewer mothers (**84.7%**) recognised the need to limit sugary foods and processed snacks in their child's diet. Encouragingly, **95.5% of mothers expressed confidence** in their ability to prepare healthy meals for their children, indicating a strong foundation for promoting healthy complementary feeding practices at the household level.



Mothers across various **age, education, income, caste, religion, and duration of stay** groups consistently **demonstrated a strong belief** in the importance of nutrition for their child's development. They also widely acknowledged the necessity of providing a diverse diet. When it comes to limiting sugary and processed snacks, **84.1% of mothers aged 20 years or older agreed**, compared to **76.9% of younger mothers**. **Educationally, mothers with graduate-level education or higher showed 75.5% awareness**, while those with no formal education reflected a higher belief at **82.7%**. In terms of income, mothers from lower-income groups strongly supported limiting sugary snacks, with **90.9% agreeing**, compared to **83.7% among higher-income mothers**. Across all these groups, mothers **expressed strong confidence** in their ability to prepare nutritious food (Annexure Table 7).

Practice data indicate that **82.77% of children were introduced to semi-solid foods between 6 and 8 months**, in accordance with guidelines for infant and young child feeding. However, **17.23% of children did not receive complementary foods within this window**, suggesting potential delays and associated nutritional risks.

Despite awareness among mothers that children should begin semi-solid foods after six months, qualitative findings reveal **significant challenges** in ensuring appropriate and adequate complementary feeding. While most mothers have initiated the practice, many reported introducing **low-nutrient processed foods—particularly biscuits like Parle-G—either before six months or shortly thereafter**. These foods often become a staple in the child's diet. A mother from the Narela centre shared that her daughter **has been consuming biscuits and chips** almost daily since turning six months. Another mother mentioned **giving biscuits and water to her five-month-old to help keep her hydrated**.

While mothers generally understand the concept of complementary feeding—often referencing foods like **khichdi, daliya and halwa—putting this knowledge into consistent practice remains a challenge**. In many households, children's diets **lack variety and nutritional adequacy**. One mother shared that her 10-month-old typically consumes milk and biscuits in the morning, rice and vegetables at lunch, and lentils with roti at dinner. **She prepares halwa or kheer only on Sundays**, which her daughter enjoys. Pulses are served once or twice a week, vegetables like cauliflower, potato, brinjal and spinach are given three to four times a week, and fruits are included only two to three times a week.

Feeding routines are often **irregular**, with several mothers indicating that meals are provided based on the child's demand. As one mother explained, ***"I don't tell her when to eat; when she says she is hungry, then I give her food."***

Younger mothers (under 20 years) demonstrate slightly **better adherence, with 92.3% initiating complementary feeding within the recommended age range**, compared to **88.8% among mothers aged 20 or older**. Mothers with no formal education still show relatively high compliance (**89.9%**), a trend that remains consistent across educational levels: **90.3% with primary education, 88.2% with middle schooling, and 88.6% with secondary or higher secondary education**. Interestingly, mothers with graduate-level or higher education show a slightly lower rate of timely initiation at **86.8%**.

Income also appears to influence practice. Mothers from lower-income households (earning less than Rs. 5,000) report the **highest adherence (95.5%)**, while the rate slightly declines across income brackets: **89.2% for Rs. 5,000–10,000, 88% for Rs. 10,000–15,000, and 89.3% for more than Rs. 15,000**. Geographic setting also plays a role, with **urban mothers showing slightly better adherence (89.3%)** than those in construction sites (**88.6%**). Practice rates are nearly **uniform across caste groups**. In terms of migration status, mothers who have stayed in the area for **1–2 years show the highest compliance (92.6%)**, followed by **2–3 years (90%)**, **less than a year (87.6%)**, and **three or more years (88.1%)** (Annexure Table 6).

Conclusion:

While mothers across diverse socio-economic backgrounds demonstrate strong awareness about the



importance of nutrition and dietary variety in complementary feeding, variations in practice remain—particularly regarding the timely introduction of solid foods and the reduction of sugary snacks. Interestingly, younger mothers and those with higher education levels tend to have lower adherence to recommended practices, suggesting a disconnect between knowledge and implementation that may require targeted behavioural interventions and community support mechanisms.

d. Eating Patterns Among Young Children

This subsection explores maternal awareness, attitudes and practices related to ultra-processed foods (commonly referred to as junk food), alongside the eating patterns of children under five in the past 24 hours.

Knowledge regarding ultra-processed food remains limited among mothers, with widespread misconceptions about its nutritional value. A total of 85.1% of mothers believe that ultra-processed foods are healthy for young children, while only 14.9% correctly identify them as not nutritious. This gap in awareness is consistent across socio-economic groups, showing minimal variation by parental education, household income or caste.

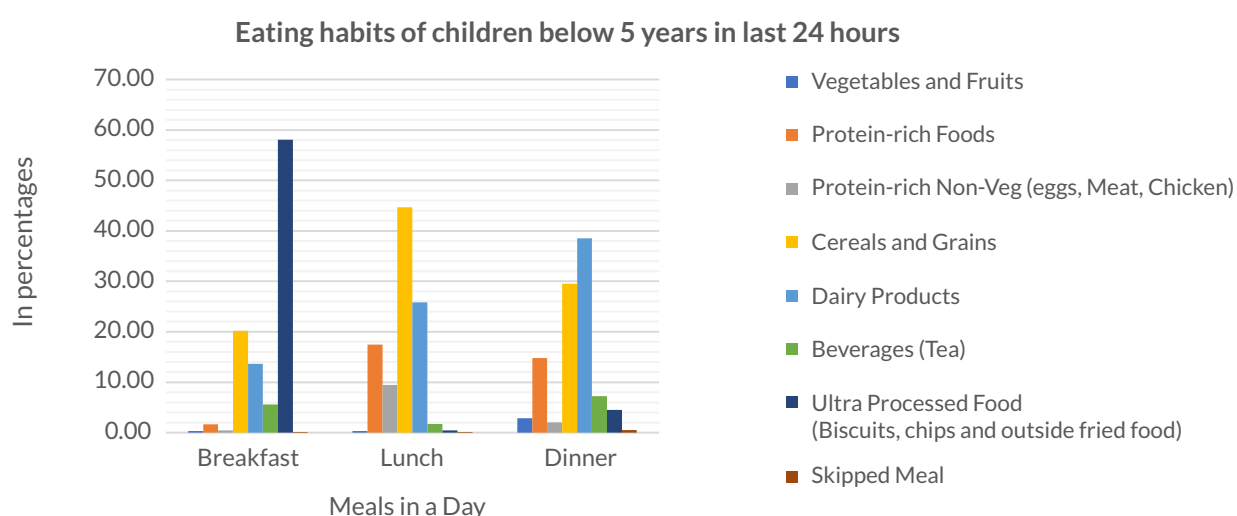
The age of the mother reveals some variation in perception. Among mothers under 20 years, 92.3% believe junk food is nutritious, compared to 82.8% among mothers aged 20 years or more, suggesting that younger mothers may have lower awareness of appropriate child nutrition.

However, the belief that junk food is nutritious remains high across all education levels—from mothers with no formal education to those with graduate-level qualifications or higher. This suggests that formal education may not necessarily translate into accurate nutritional knowledge.

The perception that junk food is healthy is also prevalent across residential settings, with 82.1% of construction site families and 84.5% of urban households sharing this belief, indicating little difference by location.

Dietary Patterns and Food Choices of Children Under Five: A 24-Hour Snapshot

Figure 7: Dietary habits of under-five children in last 24 hours



The dietary patterns and food choices of children under five years **raise significant concerns** regarding their nutritional quality. Data from a 24-hour food intake assessment highlight a strong preference for ultra-processed foods such as **biscuits, chips and fried snacks**—particularly at breakfast, where more than half (58.08%) of the children consumed these items. This trend **remains consistent** across age groups, with **56.2% of children under 3 years (less than 36 months)** and **60.1% of children aged 3 to 5 years (37–59 months)** starting their day with ultra-processed foods, as illustrated in Table 7.

In contrast, the intake of nutrient-dense foods like vegetables and fruits **was critically low across all meals**, with the highest consumption recorded at dinner—**2.2% for younger children and 3.7% for older children (37–59 months)**.

Protein-rich food consumption **showed a modest improvement** with age, particularly at lunch and dinner. **Older children consumed more protein-rich foods (20.3% at lunch and 19.3% at dinner)** compared to younger children (**14.8% and 11.0%**, respectively). Similarly, **non-vegetarian protein sources** such as eggs, meat and chicken were **slightly more prevalent in the diets of older children**, though still **low overall**.

Dairy intake was notably higher among younger children, **especially at dinner**, where **53.5% consumed dairy**, compared to only **21.1% of older children**. Cereals and grains **formed a substantial part of meals** for both age groups, **peaking at lunch—37.5% for younger children and 52.8% for older ones**—indicating a **carbohydrate-heavy diet with limited variety**.

A particularly concerning trend was the **early introduction of tea**. Tea consumption was highest at dinner (**6.5% for children under 3 and 8.1% for 3–5-year-olds**) but was also **present at breakfast and lunch in smaller proportions**. Although meal skipping was not widespread, a few instances were recorded, especially at dinner.

Table 7: Eating Patterns of Children Under 3 and Aged 3–6 in the Past 24 Hours (in percentages)

Food Category Consumed in the Past 24 Hours	Breakfast		Lunch		Dinner	
	less than 36 months	37-59 months	less than 36 months	37-59 months	less than 36 months	37-59 months
Vegetables & Fruits	0.4	0.2	0	0.7	2.2	3.7
Protein-Rich Foods	2.3	0.9	14.8	20.3	11.0	19.3
Protein-rich Non-Veg (Eggs, Meat, Chicken)	0.8	0.0	8.2	10.7	2.0	2.1
Cereals & Grains	14.7	26.0	37.5	52.8	22.1	38.1
Dairy Products	20.7	6.1	37.9	12.1	53.5	21.1
Beverages (Including Tea)	4.8	6.5	1.2	2.3	6.5	8.1
Ultra Processed Foods (Biscuits, chips, Outside Fried Food)	56.2	60.1	0.0	0.9	2.5	6.8
Skipped Meals	0	0.2	0.2	0	0.2	0.8



Daily Expenditure on Ultra-Processed Foods by Families

The table below presents spending patterns on ultra-processed foods among families living in **construction sites and urban slums**, disaggregated by **child's gender, age group, and household income**.

In construction settings, **boys are primarily concentrated in the ₹6–10 (33.7%) and ₹10–15 (30.7%) daily spending brackets**. In contrast, **girls show a more even distribution, with 23.7% falling in both the ₹1–5 and ₹15+ categories**.

In urban slums, boys similarly cluster within the **₹6–10 (34.8%) and ₹10–15 (29%) brackets**. Urban girls, however, **display a stronger concentration in the ₹6–10 category (42.2%)**, reflecting a more consistent mid-range spending pattern compared to girls in construction sites.

Table 8: Daily Family Expenditure on Ultra-Processed Foods by Demographics and Location

Daily Expenditure on Ultra-Processed Foods by Families	Construction					Urban				
	1-5 rupees % (n)	6-10 rupees % (n)	10-15 rupees % (n)	More than 15 Rupees % (n)	Total (N)	1-5 rupees % (n)	6-10 rupees % (n)	10-15 rupees % (n)	More than 15 Rupees % (n)	Total (N)
Gender of the Child										
Boy	18 (47)	33.7 (87)	30.7 (80)	18 (47)	261	21 (29)	34.8 (48)	29(40)	15.2 (21)	138
Girl	23.7 (52)	24.7 (54)	28.3 (62)	23.7 (52)	219	16.3 (22)	42.2 (57)	26.7 (36)	14.1 (19)	135
Age of the Child										
<36 months	24.8 (55)	27.9 (62)	28.8 (64)	24.8 (55)	222	22.4 (35)	37.2 (58)	28.8 (45)	10.9 (17)	156
37-59 months	17.1 (44)	30.6 (79)	30.2 (78)	17.1 (44)	258	13.7 (16)	40.2 (47)	26.5 (31)	19.7 (23)	117
Average Monthly Expenditure HH										
Up to 10000	18.8 (32)	30.6 (52)	28.2 (48)	18.8 (32)	170	20.5 (15)	37 (27)	28.8 (21)	12.3(9)	73
Rs.10,000-15000	16.1 (24)	28.9 (43)	32.2 (48)	16.1 (24)	149	18.3 (20)	37.6 (41)	33.9(37)	10.1 (11)	109
More than 15000	26.8 (42)	28.7 (45)	29.3 (46)	26.8 (42)	157	19 (16)	36.9 (31)	20.2 (17)	23.8 (20)	84

Age-wise, younger children (**under 36 months**) in construction-site families display a **more balanced distribution** of daily expenditure. In contrast, older children (**aged 37–59 months**) are more concentrated in the **mid-range spending brackets—30.6% spend ₹6–10, and 30.2% spend ₹10–15 per day**.

In urban households, younger children also demonstrate a **strong mid-range preference**, with **37.2% falling in the ₹6–10 and 28.8% in the ₹10–15 categories**. However, **only 10.9%** of this group spend more than ₹15 per day. Among urban children aged 37–59 months, **daily expenditure increases significantly—40.2% spend ₹6–10, 26.5% spend ₹10–15, and 19.7% exceed ₹15**, indicating a **rising trend of ultra-processed food consumption with age**.

When viewed through the lens of household income, construction-site families earning **up to ₹10,000** and those earning **₹10,000–15,000** report **relatively uniform expenditure** across all brackets. However, among **higher-income families (earning more than ₹15,000)** at construction sites, **26.8% spend more than ₹15 per day**, suggesting that **increased income may be associated with greater consumption of ultra-processed foods**. In urban slums, families in the **₹10,000–15,000 income range** predominantly fall into the **₹6–10 (37.6%) and**



₹10–15 (33.9%) brackets. This reflects a concentration in mid-range spending, with fewer households reaching the highest expenditure tier.

Drivers of Processed Food Consumption

Over half of mothers (54.27%) reported giving processed foods because “children eat it happily,” underscoring the strong influence of children’s preferences on household food choices. Additionally, 14.38% noted that their children disliked home-cooked food, while 11.04% cited lack of time to cook due to work pressures. The easy availability and low cost of snacks like biscuits and chips—often sold near homes and childcare centres—were also mentioned by 6.98% of mothers as contributing factors. These findings reflect a convergence of drivers: child preference, caregiver constraints, and the surrounding food environment.

Mothers further explained that their decision to offer processed snacks is not solely based on children’s demands but is shaped by social expectations and time limitations. Many described feeling emotional pressure when their children cried or became upset upon being denied such foods. One mother captured the social judgement she faced, stating, *“What kind of parents are we? Both of us are earning, and still we don’t buy what our child wants. What will people think? Both parents work, and yet they can’t even afford five rupees? So, we give in.”* This reflects how community perceptions—particularly around financial capacity and caregiving—can influence everyday food decisions.

Time constraints, especially during morning routines, emerged as a critical factor in food choices. Both mothers and fathers shared that in the rush to drop their children at the crèche and reach work on time, they often relied on quick options like biscuits or chips. One mother explained, *“When we are in a hurry and the child demands chips or biscuits, we give it to avoid delays. If we’re late, we risk salary deductions or reprimands from our employers.”* Another added, *“If I don’t buy the snacks, my daughter will be late to the crèche.”* A third mother noted, *“My husband also buys them for our daughter since we have only one child.”*

Fathers also play a significant role in snack provision. Mothers shared that fathers are usually the ones giving money to children for snacks, often fulfilling requests even when funds are limited. Some fathers reportedly purchase snacks on credit when their child insists. One mother shared, *“My son knows that his father leaves for the office at 7:00, so he wakes up at 6:00. He is afraid his father might leave without giving him money for chips. He asks him to buy them and even asks for 20 rupees in advance.”* Another reflected, *“When we ask our husbands for money, they don’t give it to us. But when our children ask, they do. So what can we do?”*

Several mothers also described how children are more likely to insist on snacks when accompanied by their fathers. As one mother noted, *“My child used to buy snacks from the shop because he would insist his father purchase them.”* Fathers, being more likely to visit shops and take their children along, often give in when children cry or persist. One mother remarked, *“We tell our husbands not to buy snacks from outside, but the children cry for them.”*

These accounts reveal a complex interplay of parental roles, child preferences, social pressures, and convenience in shaping the consumption of ultra-processed foods in low-income households.

e. Vaccination, Health and Hygiene

The indicators examined include **vaccination coverage as recorded** in the Mother and Child Protection (MCP) card, challenges in accessing age-appropriate vaccinations, hand hygiene practices, and the availability of toilet facilities.

Attitudes towards age-appropriate vaccination **were generally positive**, as the majority of mothers (91.15%) reported no difficulty, in contrast to only 8.85% who expressed challenges (see Table 7).

Challenges in accessing age-appropriate vaccination were more evident among certain socio-demographic



groups (Annexure Table 7). A significantly higher proportion of younger mothers (under 20 years) reported difficulties (23.1%) compared to their older counterparts (8.9%). Educational status also influenced access: 10.1% of mothers with no formal education faced challenges, compared to only 7.5% of those with graduate-level or higher qualifications. Interestingly, mothers from higher-income households reported more difficulties (10.7%) than those from lower-income groups. Urban slum dwellers reported slightly fewer difficulties (7.9%) compared to those residing at construction sites (9.8%). Migration status also emerged as a key determinant: mothers who had lived in Delhi NCR for 1–2 years experienced the highest difficulty (11.1%), followed closely by those residing for less than a year (10.9%). Longer-term residents reported fewer access issues (7.9%–8%).

Practice-related data show that vaccination coverage in Delhi NCR, as verified through the MCP card, stands at 55.46%. When combining mothers' recall with MCP card records, the coverage increases to 87.4%. Despite these figures, 89.58% of children experienced illness in the past 12 months, indicating a significant health burden. On a positive note, hygiene practices appear strong, with 95.31% of children reported to wash their hands before meals—an essential behaviour for preventing infections. Basic sanitation facilities are available in 78.96% of households, although 22% still lack access to toilets. Additionally, 97.2% of families reported access to safe drinking water, a key factor in preventing waterborne illnesses (see Table 7).

Vaccination coverage based on the MCP card reveals significant variation across socio-demographic groups (Annexure Table 6). Younger mothers (under 20 years) report lower adherence (46.2%) compared to those aged 20 and above (56.2%). Educational attainment shows a strong positive correlation: coverage rises from 42.4% among mothers with no formal education to 67% among those with secondary or higher secondary education. A similar pattern is observed in birth certificate possession, increasing from 71.9% to 94.3% with higher education levels.

Household income also plays a key role. Only 40.9% of children from families earning less than Rs. 5,000 per month were vaccinated, compared to 60.4% in households earning Rs. 10,000–15,000. Urban residents had higher coverage (62.9%) than those living at construction sites (52.2%). Caste-wise, Scheduled Tribes had the lowest coverage (35.7%), while General caste groups had the highest (61.1%).

Duration of residence in Delhi NCR also **influences vaccination outcomes**. Mothers living in the region for over three years reported 60.9% coverage, compared to 50.7% among recent migrants.

These trends indicate that higher education, better income, urban residence, and longer duration of urban stay are positively associated with improved vaccination practices.





Analysis of Maternal Knowledge, Practices, and Attitudes in Relation to Child Nutrition outcomes



Analysis of Maternal Knowledge, Practices, and Attitudes in Relation to Child Nutrition Outcomes

This section presents findings from the Knowledge, Attitudes, and Practices (KAP) analysis, examining maternal behaviours in relation to child nutrition outcomes. A structured scoring framework was developed using a questionnaire designed to assess key dimensions of maternal knowledge, attitudes, and practices related to child health and nutrition. The tool included 10 questions on knowledge, 8 items on attitudes, and 18 practice-based indicators. Responses were scored as '1' for a correct or positive response and '0' for an incorrect or negative one. Individual scores for knowledge, attitude, and practice were calculated separately. Based on their cumulative scores, mothers were classified into two categories: low KAP (0–18) and high KAP (18–36).



Table 9: Relationship Between Maternal Knowledge, Attitudes, and Practices (KAP) and Nutritional Outcomes Among Children Under Five

Combinations of Maternal Knowledge, Attitudes, and Practices (KAP)	Stunting	Wasting	Underweight
	Yes % (n)	Yes % (n)	Yes % (n)
High Knowledge, High Practice, High Attitude (N=328)	31.3 (102)	4.6(15)	19.5 (64)
High Knowledge, High Practice, Low Attitude (N=29)	44.8 (13)	10.3(3)	24.1 (7)
High Knowledge, Low Practice, High Attitude (104)	41.2 (42)	9.6(10)	27.9 (29)
High Knowledge, Low Practice, Low Attitude (N=5)	75 (3)	0 (0)	20 (1)
Low Knowledge, High Practice, High Attitude (N=266)	42.4 (111)	7.3 (19)	24.8 (66)
Low Knowledge, High Practice, Low Attitude (N=22)	40.9 (9)	4.5 (1)	31.8 (7)
Low Knowledge, Low Practice, High Attitude (N=53)	28.3 (15)	3.8 (2)	11.3 (6)
Low Knowledge, Low Practice, Low Attitude (N=2)	50 (1)	0 (0)	50 (1)



The Knowledge, Attitude, and Practice (KAP) classification revealed that the highest proportion of mothers with high overall KAP scores had the following characteristics: 48.94% possessed a middle and above level of education, 71.43% reported a monthly household expenditure of Rs.10,000 or more, 37.3% resided at construction sites, and 46.6% lived in urban slum areas. The second-largest group, comprising mothers with low knowledge but high levels of attitude and practice, included 43.23% with middle and above-level education, 65.41% with a monthly household expenditure of Rs.10,000 or above, 33.8% residing at construction sites, and 31% in urban slum settlements. In the group characterized by high knowledge, low practice, and high attitude, 37.5% of mothers had attained a middle and above level of education, 59.62% reported household expenditures of Rs.10,000 or more, 14.4% were living at construction sites, and 10% in urban slum areas. These findings suggest a positive correlation between mothers' educational attainment and economic status and their overall KAP outcomes.

Importantly, the analysis of maternal KAP in relation to child nutritional status reveals that these variations in mothers' knowledge, attitudes, and practices tends to influence child's nutritional health. As shown in table 9, children of mothers with high levels of knowledge, positive attitudes, and appropriate nutrition related practices (40.5%, $n = 328$, $N = 809$), tend to exhibit the lowest prevalence of undernutrition: stunting at 31.3%, wasting at 4.6%, and underweight at 19.5%. This group represents the most favourable KAP combination, underscoring the importance of an integrated approach where knowledge, motivation, and behaviour align to promote optimal child health.

In comparison, mothers with low knowledge but high attitude and practice (32.8%, $n = 266$) also demonstrated relatively better outcomes, with stunting at 42.4%, wasting at 7.3%, and underweight at 24.8%. These findings suggest that consistent caregiving behaviours and supportive attitudes may partially offset a lack of formal nutrition knowledge.

Conversely, mothers with high knowledge and positive attitudes but poor practices (12.8%, $n = 104$) recorded elevated levels of undernutrition, with stunting at 41.2%, wasting at 9.6%, and underweight at 27.9%. This disparity highlights that knowledge and intention alone are insufficient without effective, consistent implementation in daily caregiving.

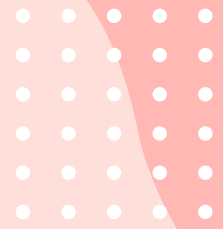
Smaller subgroups—such as those with low scores across all KAP dimensions ($n = 2$)—exhibited erratic or higher rates of undernutrition, reinforcing the critical role of maternal practice in shaping child nutritional status.

A two-sample t-test was conducted to compare the KAP (Knowledge, Attitude, and Practice) scores across different settings. The results revealed a statistically significant difference ($p = 0.015$), indicating that the intervention was more effective at construction sites compared to urban slums.

In conclusion, among the three KAP pillars, maternal practice emerges as the most decisive factor in influencing child nutrition outcomes. Regardless of knowledge or attitude, it is the actual application of appropriate feeding, hygiene, and health-seeking behaviours that most directly affects child health. Therefore, efforts to combat undernutrition should not only build knowledge and foster positive attitudes, but also focus on enabling and sustaining practical caregiving behaviours, especially among socio-economically disadvantaged groups.



Association Between Mothers' Knowledge, Attitude and Practice in Relation to Undernutrition of Children Below 5 Years



Association Between Mothers' Knowledge, Attitude and Practice in Relation to Undernutrition of Children Below 5 Years

An analysis of maternal knowledge, attitudes, and practices and their association with child nutritional status, as presented in Table 10, reveals significant relationships with the prevalence of stunting, wasting, and underweight among children under five. Notably, several maternal knowledge and practice variables showed statistically significant correlations with stunting and underweight, indicating that higher maternal knowledge and appropriate caregiving behaviors are associated with better child nutrition outcomes. These findings underscore the critical role of maternal understanding and behavior in combating child undernutrition.



Table 10: Association between mothers' knowledge, attitudes, and practices (KAP) with nutritional outcome of under five children

	Stunted			Wasted			Underweight		
	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value
Knowledge									
Awareness of the health benefits of exclusive breastfeeding for infants									
Exclusive breastfeeding supports bonding and disease prevention	62.6 (580)	37.4 (347)	0.003	93.4 (867)	6.6 (61)	0.639	77.0 (722)	23.0 (216)	0.050
Don't know	31.8 (7)	68.2 (15)		90.9 (20)	9.1 (2)		59.1 (13)	40.9 (9)	
Junk food is nutritious to young children									
Yes	70.2 (99)	29.8 (42)	0.027	92.9 (130)	7.1 (10)	0.792	80.4 (115)	19.6 (28)	0.238
No	60.4 (488)	39.6 (320)		93.5 (757)	6.5 (53)		75.9 (620)	24.1 (197)	



	Stunted			Wasted			Underweight		
	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value
Practice									
Mothers registered their pregnancy to local health workers									
Yes	62.2 (581)	37.8 (353)	0.079	93.5 (874)	6.5 (61)	0.293	77 (728)	23 (217)	0.006
No	40 (6)	60 (9)		86.7 (13)	13.3 (2)		46.7 (7)	53.3 (8)	
Frequency of Illness Episodes in Children Under Five (Past 12 Months)									
No	100 (1)	0 (0)	0.487	0	100 (1)	0.004	100 (1)	0 (0)	0.877
1-5 episodes	61.3 (455)	38.7 (287)		93.1 (689)	6.9 (51)		76.6 (573)	23.4 (175)	
6-10 episodes	68.1 (62)	31.9 (29)		93.5 (87)	6.5 (6)		75.5 (71)	24.5 (23)	
More than 10 episodes	56.3 (9)	43.8 (7)		94.1 (16)	5.9 (1)		70.6 (12)	29.4 (5)	
Children washing their hands before eating food									
Yes	62 (561)	38 (344)	0.505	93.5 (846)	6.5 (59)	0.003	76.1 (696)	23.9 (218)	0.554
No	59.5 (25)	40.5 (17)		93 (40)	7 (3)		84.1 (37)	15.9 (7)	
Birth order									
One	63.3 (498)	36.7 (289)	0.054	93.4 (737)	6.6 (52)	0.863	77.7 (617)	22.3 (177)	0.177
Two	56.2 (86)	43.8 (67)		93.4 (142)	6.6 (10)		71.3 (112)	28.7 (45)	
Three	33.3 (3)	66.7 (6)		88.9 (8)	11.1 (1)		66.7 (6)	33.3 (3)	
Monthly household expenditure									
Less than Rs. 5000	63.6 (14)	36.4 (8)	0.042	100 (22)	0 (0)	0.589	72.7 (16)	33.3 (9)	0.919



	Stunted			Wasted			Underweight		
	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value
Rs.5000-10,000	59.1 (152)	40.9 (105)		91.8 (236)	7.9 (24)		74.9 (194)	25.3 (78)	
Rs.10,000-15000	62.5 (175)	37.5 (105)		93.9 (263)	5.4 (17)		78.1 (221)	20.9 (67)	
More than 15000	68.1 (156)	31.9 (73)		93.9 (215)	7 (20)		76.3 (177)	23.2 (67)	
Food that children love to eat/finish very fast									
Vegetables & Fruits	63.3 (19)	36.7 (11)	0.093	96.6 (28)	3.4 (1)	0.356	76.7 (23)	23.3 (7)	0.019
Protein-Rich Foods	72 (18)	28 (7)		92 (23)	8 (2)		76 (19)	24 (6)	
Protein-rich Non-Veg (Eggs, Meat, Chicken)	56.8 (21)	43.2 (16)		84.2 (32)	15.8 (6)		57.9 (22)	42.1 (16)	
Cereals & Grains	62.6 (301)	37.4 (180)		93.1 (448)	6.9 (33)		77.1 (373)	22.9 (111)	
Dairy products	59.2 (100)	40.8 (69)		95.3 (162)	4.7 (8)		76.4 (133)	23.6 (41)	
Beverages (Tea)	34.8 (8)	65.2 (15)		100 (23)	0 (0)		69.6 (16)	30.4 (7)	
Ultra Processed Foods (Biscuits, Chips, Outside Fried Foods)	62 (49)	38 (30)		93.7 (74)	6.3 (5)		75.9 (60)	24.1 (19)	
Skipped Meals	0 (0)	100 (2)		100 (2)	0 (0)		0 (0)	100 (2)	
Attitude									
Perception of Difficulty in Practising Exclusive Breastfeeding									
Difficult	62.1 (41)	37.9 (25)	0.353	89.4 (59)	10.6 (7)	0.012	72.1 (49)	27.9 (19)	0.027
Not Difficult	62 (544)	38 (333)		93.8 (824)	6.2 (54)		77.2 (684)	22.8 (20)	
Mothers' Confidence in Preparing Healthy and Nutritious Food for Their Child									



	Stunted			Wasted			Underweight		
	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value	No % (n)	Yes % (n)	p value
Confident	62.2 (564)	37.8 (343)	0.333	93.5 (849)	6.5 (59)	0.441	77.1 (707)	22.9 (210)	0.070
Not confident	54.8 (23)	45.2 (19)		90.5 (38)	9.5 (4)		65.1 (28)	34.9 (15)	
Confident	62.2 (564)	37.8 (343)	0.333	93.5 (849)	6.5 (59)	0.441	77.1 (707)	22.9 (210)	0.070
Not confident	54.8 (23)	45.2 (19)		90.5 (38)	9.5 (4)		65.1 (28)	34.9 (15)	

1. Knowledge

i. Exclusive Breastfeeding Benefits

Mothers who understood that exclusive breastfeeding fosters a healthy mother–child bond and protects against infections had significantly better child nutrition outcomes. In this group, stunting prevalence was 37.4%, notably lower than 68.2% among mothers who responded “don’t know” ($p = 0.003$). Similarly, underweight prevalence was lower among knowledgeable mothers (23.0%) compared to those lacking this knowledge (40.9%, $p = 0.050$). No significant association was found for wasting ($p = 0.639$). These findings suggest that maternal awareness of breastfeeding benefits is positively associated with improved long-term child nutrition, particularly in reducing chronic undernutrition.

ii. Perception of Junk Food

A significant difference in stunting was observed between mothers who believed junk food is nutritious and those who disagreed ($p = 0.027$). Surprisingly, children of mothers who believed junk food is nutritious had lower stunting prevalence (29.8%) compared to those who did not (39.6%). No significant association was found with wasting ($p = 0.792$) or underweight ($p = 0.238$), although children of mothers who rejected junk food exhibited slightly higher underweight rates.

2. Practices

i. Pregnancy Registration

Registration of pregnancy appears to significantly reduce underweight prevalence. Mothers who registered their pregnancies had children with a notably lower underweight rate (23.0%) compared to those who did not register (53.3%, $p = 0.006$). This underscores the potential impact of early engagement with maternal health services, which may facilitate better monitoring and timely intervention. Although the associations with stunting ($p = 0.079$) and wasting ($p = 0.293$) were not statistically significant, the trends suggest a protective effect on child growth and nutritional status.

ii. Frequency of Illness in Past 12 Months

Illness frequency had varying impacts on child nutrition. Stunting was highest among children with more than 10 illness episodes (43.8%), followed by those with 1–5 episodes (38.7%) and 6–10 episodes (31.9%), though



the difference was not statistically significant ($p = 0.487$). Wasting, however, showed a significant association with illness frequency ($p = 0.004$): children with 1–5 episodes had a wasting prevalence of 6.9%, while those with 6–10 episodes had 6.5%. No significant differences in underweight prevalence were found across categories ($p = 0.877$), although there was a slight increase among children with more than 10 episodes (29.4%).

iii. Handwashing Before Eating

Children who washed their hands before meals had a significantly lower prevalence of wasting (6.5%) compared to those who did not (7.0%, $p = 0.003$). No statistically significant differences were observed for stunting or underweight. These findings highlight the protective role of basic hygiene practices in preventing acute malnutrition.

iv. Birth Order

The prevalence of stunting increased with higher birth order, from 36.7% among first-borns to 66.7% among third-borns ($p = 0.054$). Wasting prevalence also rose from 6.5% to 10.5% (non-significant, $p = 0.238$), and underweight from 23.0% to 33.3% ($p = 0.177$). While not all differences were statistically significant, the consistent trend suggests that increased birth order may contribute to nutritional risk, likely due to resource dilution and caregiving challenges.

v. Monthly Household Expenditure

A statistically significant association was observed between monthly household expenditure and stunting prevalence ($p = 0.042$). Children from households spending more than ₹15,000 had the lowest stunting prevalence (31.9%), while those from households spending ₹5,000–10,000 exhibited higher stunting (40.9%). Although associations with wasting ($p = 0.589$) and underweight ($p = 0.919$) were not statistically significant, underweight was most prevalent in households spending less than ₹5,000 (33.3%). This underscores the critical role of economic resources in shaping child nutrition outcomes.

vi. Food Liked by Young Children

The analysis of children's food preferences revealed a clear association with nutritional status. Children who liked nutritious food groups such as vegetables, fruits, cereals, dairy, and plant-based proteins had lower undernutrition rates. For instance, among children who liked vegetables and fruits, only 23.3% were underweight ($p = 0.019$). Similarly, underweight prevalence was 22.9% among children who preferred cereals and 23.6% among those who liked dairy. Conversely, children favouring tea (65.2% of stunted) and fast food or sweets (38% of stunted; 24.1% of underweight) were more likely to be undernourished. Most concerning were children who skipped meals—100% were stunted, wasted, and underweight ($n = 2$). Interestingly, although animal-based protein is typically beneficial, 43.2% of stunted and 42.1% of underweight children reported liking non-vegetarian food, suggesting that preference does not always translate to consumption, possibly due to affordability or access issues.

3. Attitudes

i. Perception of Exclusive Breastfeeding Difficulty

Mothers who reported exclusive breastfeeding as “not difficult” had children with significantly lower rates of wasting (6.2%) and underweight (22.8%), compared to those who found it “difficult” (wasting: 10.6%, $p = 0.012$; underweight: 27.9%, $p = 0.027$). Although the difference in stunting was not statistically significant ($p = 0.353$), these results suggest that a more positive perception of exclusive breastfeeding may contribute to better child nutrition, particularly in reducing the risk of acute and moderate malnutrition. This finding highlights the value of building maternal confidence and reducing barriers to breastfeeding support.



Conclusion

The findings clearly demonstrate that maternal knowledge, attitudes, and practices play a critical role in shaping child nutrition outcomes. For example, mothers who were aware that exclusive breastfeeding strengthens immunity and promotes mother–child bonding had children with significantly lower rates of stunting (37.4%) and underweight (23.0%), in contrast to those who were unaware (stunting: 68.2%, $p = 0.003$; underweight: 40.9%, $p = 0.050$). This underscores the protective role of informed maternal behaviour in preventing chronic undernutrition.



Engagement with maternal health services also showed a strong association with nutritional outcomes. Children of mothers who had registered their pregnancies exhibited notably lower underweight prevalence (23.0%) compared to those whose pregnancies were unregistered (53.3%, $p = 0.006$). This suggests that early and sustained contact with health systems can facilitate improved growth and care outcomes.

Hygiene-related practices, such as handwashing before meals, were associated with significantly lower rates of wasting (6.5% vs. 7.0%, $p = 0.003$). Similarly, frequent illness episodes—particularly more than 10 per year—were associated with higher stunting (43.8%) and wasting (6.9%) rates, illustrating the link between infection burden and nutritional status.

Birth order emerged as another influencing factor, with stunting prevalence increasing from 36.7% among first-borns to 66.7% among third-born children ($p = 0.054$). Though not statistically significant across all nutrition indicators, the trend points to resource dilution and caregiving strain in larger families.

Household economic status significantly impacted nutrition. Children in households with monthly expenditure above ₹15,000 had the lowest stunting prevalence (31.9%), while those in the ₹5,000–10,000 range exhibited higher stunting (40.9%, $p = 0.042$). A similar but non-significant trend was noted for underweight and wasting, reinforcing the importance of economic stability in supporting child health.

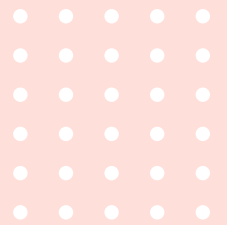
Children's food preferences also reflected nutritional disparities. Those who liked nutrient-rich foods such as fruits, vegetables, dairy, and cereals had lower underweight prevalence (e.g., 23.3% for vegetable and fruit preference, $p = 0.019$). Conversely, preferences for fast food, tea, and sugary snacks correlated with higher stunting and underweight rates. Among children who skipped meals—though few in number—100% were stunted, wasted, and underweight, revealing an extreme nutrition deficit in this group.

Lastly, maternal perception of breastfeeding difficulty also influenced outcomes. Children of mothers who did not find exclusive breastfeeding difficult had notably lower wasting (6.2%) and underweight (22.8%) prevalence compared to those who found it challenging (wasting: 10.6%, $p = 0.012$; underweight: 27.9%, $p = 0.027$).

The analysis highlights the multifaceted nature of undernutrition, where maternal awareness, behaviour, socio-economic conditions, and caregiving attitudes converge to determine child health outcomes. Interventions must therefore go beyond information dissemination to actively support mothers in translating knowledge into sustained, actionable caregiving practices—particularly in low-resource, high-stress environments.



Determinants of Undernutrition Among Children Under Five



Determinants of Undernutrition Among Children Under Five

Undernutrition is influenced by a range of factors that can be categorised into immediate, underlying, and enabling determinants, as outlined in the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition. Based on the analysis presented, this study identifies the following key factors contributing to undernutrition among children under the age of five:

Immediate Determinants

- **Food Preferences:** Children's food preferences play a critical role in shaping their nutritional status. Children who preferred nutrient-dense foods such as vegetables, fruits, dairy, and cereals exhibited significantly lower rates of undernutrition. For example, among children who liked vegetables and fruits, only 23.3% were underweight, compared to 76.7% among those who did not. Conversely, children who preferred less nutritious items—such as junk food, tea, and fast food—demonstrated higher rates of undernutrition.
- **Illness Frequency:** Frequent episodes of illness were directly associated with acute malnutrition (wasting). Children who experienced more than 10 illness episodes recorded the highest prevalence of stunting (43.8%) and wasting (6.9%). This underscores the detrimental impact of recurrent infections on child nutritional outcomes.
- **Hand Hygiene:** Poor hand hygiene, specifically not washing hands before meals, was linked with slightly higher rates of wasting (7.0% vs. 6.5% among those who did). This suggests that even basic hygiene practices can offer protection against acute malnutrition.

Underlying Determinants

- **Maternal Knowledge of Exclusive Breastfeeding (EBF):** Mothers aware of the benefits of exclusive breastfeeding—such as promoting bonding and preventing infections—had children with significantly lower stunting (37.4%) and underweight (23.0%) prevalence, compared to children of mothers who were unaware (stunting: 68.2%, underweight: 40.9%).
- **Pregnancy Registration:** Mothers who registered their pregnancies had children with a significantly lower prevalence of underweight (23.0%) than those who did not (53.3%). Early engagement with healthcare services during pregnancy facilitates better monitoring and care, thereby improving child growth and nutrition outcomes.
- **Perception of Junk Food:** Interestingly, children of mothers who believed junk food is nutritious had a lower prevalence of stunting (29.8%) compared to those whose mothers disagreed (39.6%). However, this counterintuitive finding should be interpreted with caution, as it may reflect confounding factors or limitations in sample size within the subgroup.

Enabling Determinants

- **Socioeconomic Status (Household Income):** Household income strongly influenced child nutrition outcomes. Children from households with monthly spending above ₹15,000 had the lowest stunting prevalence (31.9%), while those in the ₹5,000–₹10,000 range had significantly higher stunting (40.9%). This finding highlights the role of economic resources in ensuring access to adequate nutrition and healthcare.
- **Birth Order:** Higher birth order correlated with increased risk of undernutrition. Stunting rates rose from 36.7% among first-born children to 66.7% among third-born children. This may reflect greater competition for household resources and attention in larger families, potentially compromising the nutrition of later-born children.



Conclusion

The determinants of undernutrition in children under five, as revealed in this study, reflect a complex interaction between immediate causes (such as dietary habits and illness), underlying factors (including maternal knowledge and health service utilisation), and enabling conditions (like income and family structure). Addressing undernutrition therefore requires integrated, multi-pronged strategies that simultaneously enhance maternal education, improve access to healthcare, support household economic stability, and encourage behaviour change around feeding and hygiene practices.



Conclusion and Recommendations

This study was undertaken to assess the prevalence and key drivers of undernutrition among children under five years of age attending Mobile Creches (MC) centres in Delhi NCR. The findings reveal a substantial burden of stunting, wasting, and underweight, underscoring the urgent need for targeted, equity-driven nutrition interventions. The study makes three core contributions:

1. Understanding the Prevalence and Complexity of Undernutrition

Beyond quantifying undernutrition, the study applied the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition to unpack its multi-layered causes. It explored immediate factors (such as inadequate dietary intake and illness), underlying causes (including food insecurity, maternal care practices, and access to health services), and enabling conditions (such as poverty, migration, and housing instability). This comprehensive approach enables the identification of strategic entry points for multisectoral programme action.

2. Disaggregated Analysis to Highlight Equity Gaps

The study disaggregated data by caste, age, gender, and living conditions (construction sites vs. urban slums), revealing stark inequities. Children under 3 are more undernourished at construction sites. Scheduled Tribe (ST) and Scheduled Caste (SC) children were significantly more vulnerable, reflecting deeply rooted structural inequalities. These findings reaffirm the need for equity-focused and context-specific strategies that prioritise the most marginalised populations.

3. Identifying Gaps in Maternal Knowledge and Practices

Significant gaps emerged in maternal knowledge, attitudes, and practices (KAP) around child health and nutrition. While awareness of exclusive breastfeeding and institutional deliveries was relatively strong, there were critical deficits in areas such as complementary feeding, engagement with prenatal care, and the use of MCP cards, immunisation schedules, and dietary planning during pregnancy and early childhood. These gaps were closely associated with adverse child nutrition outcomes. Strengthening behaviour change communication, enhancing maternal education, and deepening community-level engagement are essential to address these deficiencies and improve child nutrition and development.

Integrated Framework for Tackling Undernutrition: Programmatic and Policy Recommendations

The study underscores the need for coordinated action across both programme and policy levels. While programme-level interventions address immediate household and community needs, policy-level measures ensure systemic, long-term improvements. Together, they provide a roadmap for sustained impact.

Comprehensive Programme-Level Strategies

1. Revision of Diet Chart for Nutritional Adequacy

Revise existing diet charts to incorporate a more diverse and nutrient-dense range of food items, particularly for breakfast and evening snacks.

2. Engaging Fathers to Enhance Household Nutrition Practices

Recognize and utilize the role of fathers in child nutrition by engaging them alongside primary caregivers. Implement flexible engagement strategies (e.g., evening or weekend sessions), and leverage digital platforms (e.g., short videos, WhatsApp messages).

3. Promote Affordable, Local Diets and Responsive Feeding

Provide caregivers with simple, cost-effective recipes using local ingredients, supported by cooking



demonstrations and visual guides. Train caregivers to recognize hunger cues and practice responsive feeding. Encourage home-cooked meals as healthier alternatives to ultra-processed snacks.

Policy-Level Recommendations

1. Revision of Per-Child Cost Norms under ICDS

Update cost norms under the Integrated Child Development Services (ICDS) to reflect inflation and support provision of balanced, diverse diets that align with local food cultures, thereby enhancing the effectiveness of supplementary nutrition services.

2. Universalization and Diversification of the Public Distribution System (PDS)

Ensure universal access to the PDS, including for migrant and geographically excluded populations, based on current demographic data. Expand the food basket to include nutrient-rich items to better address food and nutrition insecurity.

3. Recognizing the Critical Role of Creches and Anganwadi Centres in Reducing Early Childhood Undernutrition

These centres provide essential nutrition, healthcare, and early development support to children under three, promoting optimal growth. Strengthening their role is vital for effective public health strategies addressing childhood undernutrition.

4. Universal and Unconditional Maternity Entitlements

Provide all mothers with universal, unconditional maternity benefits equivalent to a minimum of six months' income at minimum wage. This measure will support exclusive breastfeeding, maternal wellbeing, and optimal child nutrition.

5. Regulation of Ultra-Processed Foods in Childcare Environments

Introduce and enforce regulations to restrict the marketing and sale of ultra-processed foods in and around early childhood care settings. Policies should include mandatory front-of-pack warning labels and prohibitions on advertisements targeting young children to foster healthier food environments.



References

1. Abbi, R., Christian, P., Gujaral, S., & Gopaldas, T. (1988). Mothers' nutrition knowledge and child nutritional status in India. *Food and nutrition bulletin*, 10(3), 1-4.
2. Center on the Developing Child (CDC), Harvard University. (2014). InBrief: The foundations of lifelong health.
3. Chatterjee, K., Sinha, R. K., Kundu, A. K., Shankar, D., Gope, R., Nair, N., & Tripathy, P. K. (2016). Social determinants of inequities in under-nutrition (weight-for-age) among under-5 children: a cross sectional study in Gumla district of Jharkhand, India. *International journal for equity in health*, 15, 1-9.
4. Global Nutrition Report. (2025.). India nutrition profile. Retrieved May 30, 2025, from <https://globalnutritionreport.org/resources/nutrition-profiles/asia/southern-asia/india/>
5. Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., & Strupp, B. (2007). Developmental potential in the first 5 years for children in developing countries. *The lancet*, 369(9555), 60-70.
6. PINTO, P. R., ARANHA, P. R., & LOBO, M. R. (2023). Correlation of Mother's Knowledge on Child Nutrition, Feeding Practices and Nutritional Status of Children in Karnataka, India: A Cross-sectional Study. *Journal of Clinical & Diagnostic Research*, 17(11).
7. Sinha, R. K., Dua, R., Bijalwan, V., Rohatgi, S., & Kumar, P. (2018). Determinants of stunting, wasting, and underweight in five high-burden pockets of four Indian states. *Indian journal of community medicine*, 43(4), 279-283.
8. Shahid, M., Cao, Y., Ahmed, F., Raza, S., Guo, J., Malik, N. I., ... & Maryam, R. (2022). Does mothers' awareness of health and nutrition matter? a case study of child malnutrition in marginalized rural community of Punjab, Pakistan. *Frontiers in Public Health*, 10, 792164.
9. UNICEF. (2020). UNICEF conceptual framework on the determinants of maternal and child nutrition. United Nations Children's Fund. <https://www.unicef.org/media/113291/file/UNICEF%20Conceptual%20Framework.pdf>
10. Yue, A., Marsh, L., Zhou, H., Medina, A., Luo, R., Shi, Y., ... & Rozelle, S. (2016). Nutritional deficiencies, the absence of information and caregiver shortcomings: a qualitative analysis of infant feeding practices in rural China. *PloS one*, 11(4), e0153385.



Annexures

Table 1: Geographic distribution of participants/households

Representation from states	N	%
Uttar Pradesh	280	34.6
Bihar	223	27.5
West Bengal	73	9.0
Delhi	60	7.4
Madhya Pradesh	56	6.9
Chhattisgarh	45	5.6
Jharkhand	35	4.3
Rajasthan	13	1.6
Haryana	12	1.5
Other States (Assam, Uttarakhand, Odisha, Punjab)	13	1.6
Total	810	100

Table 2: Educational status of mothers

Mothers' Education	N	%
No formal School	342	42.2
Primary Education	120	14.8
Middle Education	139	17.2
Secondary and Higher Secondary Education	181	22.4
Graduate and above	28	3.4
Total	810	100

Table 3: Educational status of fathers

Fathers' Education	N	%
No formal School	223	27.5
Primary Education	151	18.6
Middle Education	182	22.5
Secondary and Higher Secondary Education	215	26.5
Graduate and above	39	4.8
Total	810	100



Table 4: Understanding impact of socio-economic factors on caste

	General	SC	ST	OBC	SC/ST/OBCs	Total	
	% (n)	% (n)	% (n)	% (n)	% (n)	N	%
Construction	6.5 (34)	33.1 (172)	6.7 (35)	53.7 (279)	93.5 (486)	520	100
Urban	12.4 (36)	44.5 (129)	2.8 (8)	40.3 (117)	87.6 (254)	290	100
Monthly Expenditure							
Less than Rs. 5000	5.3 (1)	31.6 (6)	10.5 (2)	52.6 (10)	94.7 (18)	19	100
Rs.5000-10,000	4.8 (12)	35.9 (89)	6 (15)	53.2 (132)	95.1 (236)	248	100
Rs.10,000-15000	8.8 (24)	41.9 (114)	5.1 (14)	43.8 (119)	90.8 (247)	272	100
More than 15000	12 (31)	33.6 (87)	3.9 (10)	50.6 (131)	88.1 (228)	259	100
Parental educations							
No Formal Education	4.8 (7)	26.2 (38)	12.4 (18)	56.6 (82)	95.2 (138)	145	100
Primary Education (Upto 5th)	5.8 (8)	42.4 (59)	4.3 (6)	47.5 (66)	94.2 (131)	139	100
Middle Education (6-8th)	7.7 (14)	42.1 (77)	2.2 (4)	47.5 (87)	91.8 (168)	183	100
Secondary and Higher Secondary Education (9-12th)	9.6 (28)	37.1 (108)	5.2 (15)	48.1 (140)	90.4 (263)	291	100
Diploma (Includes Vocational)	0 (0)	33.3 (1)	0 (0)	66.7 (2)	100 (3)	3	100
Graduate and Above (Includes Masters)	24.5 (12)	36.7 (18)	0 (0)	38.8 (19)	75.5 (37)	49	100
Total	8.5 (69)	37.2 (301)	5.3 (43)	48.9 (396)	91.4 (740)	810	100



Table 5: Influence of demographic variables on awareness levels on prenatal care, breastfeeding and child nutrition

Themes			Prenatal						Exclusive breastfeeding						Complementary feeding		Processed food			
Indicators	4 or more prenatal checkup visits should be done by expecting mothers		Aware of Pradhan Mantri Matru Vandana Yojana		Aware of Janani Suraksha Yojana		Colostrum (thick yellow milk) should be fed to children		Breastmilk should be fed to children during illness		Exclusive breastfeeding means only breast milk		Exclusive breastfeeding is recommended till 6 months		Breastfeeding develops a healthy bond between mother and child		Complementary feeding along with breastmilk should be initiated by 6-8 months		Junk food is nutritious to young children	
	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Good (%)	Poor (%)
Age of mothers																				
Less than 20 years	84.6	15.4	30.8	69.2	15.4	84.6	69.2	30.8	38.5	61.5	23.1	76.9	0	100	0	100	7.7	92.3	7.7	92.3
20 years or more	52.2	47.8	32	68	19.9	80.1	58.6	41.4	28	72	23.6	76.4	6.8	93.2	2.4	97.6	11.2	88.8	17.2	82.8
Maternal education																				
No Formal Education	71.2	28.8	32.4	67.6	21.6	78.4	59	41	25.9	74.1	19.4	80.6	5	95	1.4	98.6	10.1	89.9	17.3	82.7
Primary Education	58.2	41.8	36.6	63.4	13.4	86.6	64.9	35.1	26.1	73.9	26.1	73.9	7.5	92.5	1.5	98.5	9.7	90.3	21.6	78.4
Middle Education	51.3	48.7	29.9	70.1	21.4	78.6	53.5	46.5	31	69	21.9	78.1	4.8	95.2	2.1	97.9	11.8	88.2	14.4	85.6
Secondary and Higher Secondary	47.5	52.5	29.6	70.4	22.2	77.8	57.6	42.4	29.3	70.7	25.9	74.1	8.1	91.9	3	97	11.4	88.6	17.2	82.8
Graduate and above	24.5	75.5	39.6	60.3	13.2	86.8	69.7	32.1	22.6	77.4	20.75	79.25	7.5	92.5	3.77	96.22	13.2	86.8	13.2	86.8
Monthly household expenditures																				
Less than Rs. 5000	63.6	36.4	22.7	77.3	27.3	72.7	72.7	27.3	22.7	77.3	18.2	81.8	4.5	95.5	0	100	4.5	95.5	18.2	81.8
Rs.5000-10,000	49	51	30.9	69.1	17	83	62.2	37.8	24.3	75.7	23.6	76.4	8.1	91.9	1.9	98.1	10.8	89.2	18.1	81.9
Rs.10,000-15000	58	42	33.2	66.8	20.1	79.9	55.1	44.9	28.3	71.7	25.4	74.6	6	94	1.8	98.2	12	88	18	82
More than 15000	49.4	50.6	32.6	67.4	22.3	77.7	57.9	42.1	32.6	67.4	21.9	78.1	6	94	3.9	96.1	10.7	89.3	15.5	84.5
Sites																				
Constructions	58.8	41.2	32.8	67.2	19.3	80.7	58.8	41.2	26.6	73.4	22.9	77.1	6.7	93.3	1.7	98.3	11.4	88.6	17.9	82.1
Urban	41.9	58.1	30.6	69.4	21	79	58.8	41.2	30.9	69.1	24.7	75.3	6.5	93.5	3.4	96.6	10.7	89.3	15.5	84.5
Caste																				
General	36.1	63.9	29.2	70.8	13.9	86.1	63.9	36.1	33.3	66.7	22.2	77.8	8.3	91.7	2.8	97.2	12.5	87.5	15.3	84.7
SC	54.2	45.8	33.2	66.8	20.7	79.3	56.9	43.1	27.1	72.9	20.7	79.3	5.4	94.6	2	98	10.8	89.2	15.6	84.4
ST	69	31	28.6	71.4	23.8	76.2	64.3	35.7	23.8	76.2	33.3	66.7	11.9	88.1	2.4	97.6	9.5	90.5	16.7	83.3
OBC	53	47	31.8	68.3	20	80	58.5	41.5	28.5	71.5	25	75	6.8	93.3	2.5	97.5	11.3	88.8	18.5	81.5



Themes	Prenatal						Exclusive breastfeeding						Complementary feeding						Processed food	
Indicators	4 or more prenatal checkup visits should be done by expecting mothers		Aware of Pradhan Mantri Matru Vandana Yojana		Aware of Janani Suraksha Yojana		Colostrum (thick yellow milk) should be fed to children		Breastmilk should be fed to children during illness		Exclusive breastfeeding means only breast milk		Exclusive breastfeeding is recommended till 6 months		Breastfeeding develops a healthy bond between mother and child		Complementary feeding along with breastmilk should be initiated by 6-8 months		Junk food is nutritious to young children	
	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Poor (%)	Good (%)	Good (%)	Poor (%)
Religion																				
Hindu	52.7	47.3	31.5	68.5	20	80	58.5	41.5	28.7	71.3	23.7	76.3	6.1	93.9	2.6	97.4	11.5	88.5	17.1	82.9
Muslim	53.9	46.1	33.1	66.9	20.1	79.9	59.1	40.9	26.6	73.4	23.4	76.6	9.1	90.9	1.3	98.7	9.1	90.9	16.9	83.1
Other (Christian, Sikh)	25	75	50	50	0	100	75	25	0	100	25	75	0	100	0	100	25	75	25	75
Years of stay in Delhi NCR																				
less than a year	66.2	33.8	30.8	69.2	15.4	84.6	62.2	37.8	28.4	71.6	24.9	75.1	5.5	94.5	2.5	97.5	12.4	87.6	17.9	82.1
1-2 years	52.8	47.2	33.3	66.7	19.4	80.6	64.8	35.2	23.1	76.9	20.4	79.6	6.5	93.5	1.9	98.1	7.4	92.6	13.9	86.1
2 to 3 years	53.6	46.4	29.3	70.7	17.1	82.9	60.7	39.3	25	75	22.9	77.1	6.4	93.6	1.4	98.6	10	90	16.4	83.6
3 and above	44.9	55.1	33.2	66.8	23.5	76.5	54.3	45.7	30.7	69.3	24.1	75.9	7.5	92.5	2.8	97.2	11.9	88.1	17.7	82.3



Table 6: Understanding influence of demographic variables on the practice of mothers on prenatal care, breastfeeding, and child nutrition

Themes	Prenatal																Exclusive Breastfeeding						Complimentary feeding		Cards					
Indicators	Registered pregnancy		Carrying MCP card		4 or more ante-natal visit		Received antenatal checkup in first trimester		Women had proper nutritious meal during pregnancy		Institutional delivery		Get benefit of PMMVY		Get benefit of JSY		Breast-milk was given as the first food to the children		Breast-milk given within 1st hour of delivery		Exclusive breast-feeding to the children		Initiated semi-solid food to the children b/w 6-8 months		Vaccination based on MCP card		Birth certificate			
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Age of mother																														
Less than 20 years	0	100	69.2	30.8	84.6	15.4	38.5	61.5	7.7	92.3	30.8	69.2	88.9	11.1	54.5	45.5	23.1	76.9	46.2	53.8	7.7	92.3	7.7	92.3	53.8	46.2	23.1	76.9		
20 years or more	1.5	98.5	52.3	47.7	60.4	39.6	31.1	68.9	26.9	73.1	21	79	81.9	18.1	55	45	14.4	85.6	34.5	65.5	29.7	70.3	11.2	88.8	43.8	56.2	20.1	79.9		
Maternal Education																														
No Formal Education	1.4	98.6	71.2	28.8	82	18	59	41	37.4	62.6	30.9	69.1	77.7	22.3	57.8	42.2	20.1	79.9	38.1	61.9	30.2	69.8	10.1	89.9	57.6	42.4	28.1	71.9		
Primary Education	3	97	64.2	35.8	70.9	29.1	70.1	29.9	32.8	67.2	28.4	71.6	83.5	16.5	62.1	37.9	18.7	81.3	41	59	31.3	68.7	9.7	90.3	54.5	45.5	26.1	73.9		
Middle Education	2.7	97.3	51.9	48.1	59.4	40.6	66.8	33.2	23	77	23.5	76.5	82.4	17.6	53.7	46.3	18.7	81.3	34.2	65.8	29.4	70.6	11.8	88.2	43.3	56.7	21.9	78.1		
Secondary and Higher Secondary Education	0.3	99.7	40.4	59.6	53.5	46.5	71.4	28.6	22.9	77.1	13.1	86.9	83.3	16.7	51.5	48.5	8.4	91.6	31.6	68.4	28.3	71.7	11.4	88.6	33	67	15.2	84.8		
Graduate & above	0	100	45.3	54.7	24.5	75.5	16.9	83.1	15.1	84.9	13.2	86.8	81.25	18.75	52.2	47.8	0	100	28.30	71.7	28.3	71.7	13.2	86.8	45.28	54.72	5.7	94.3		
Monthly household expenditures																														
Less than Rs. 5000	0	100	81.8	18.2	72.7	27.3	36.4	63.6	31.8	68.2	22.7	77.3	88.2	11.8	50	50	36.4	63.6	36.4	63.6	36.4	63.6	4.5	95.5	59.1	40.9	22.7	77.3		
Rs.5000-10,000	2.3	97.7	56.4	43.6	56	44	29.3	70.7	33.6	66.4	20.8	79.2	83.2	16.8	59.1	40.9	15.1	84.9	15.1	84.9	25.1	74.9	10.8	89.2	49	51	20.1	79.9		
Rs.10,000 -15000	1.4	98.6	51.9	48.1	62.9	37.1	29.3	70.7	18.4	81.6	25.4	74.6	79.9	20.1	58.4	41.6	14.5	85.5	14.5	85.5	32.5	67.5	12	88	39.6	60.4	22.3	77.7		
More than 15000	0.9	99.1	47.6	52.4	62.2	37.8	35.2	64.8	28.3	71.7	16.7	83.3	81.5	18.5	47.5	52.5	12	88	12	88	29.2	70.8	10.7	89.3	42.9	57.1	18	82		
Sites																														
Constructions	2.1	97.9	62.8	37.2	68.6	31.4	35.5	64.5	30.4	69.6	24.3	75.7	82.8	17.2	53.9	46.1	15.8	84.2	15.8	84.2	31	69	11.4	88.6	47.8	52.2	22.4	77.6		
Urban	0.3	99.7	34.4	65.6	46.7	53.3	23.7	76.3	19.6	80.4	15.5	84.5	80.7	19.3	57	43	12.4	87.6	12.4	87.6	26.5	73.5	10.7	89.3	37.1	62.9	16.2	83.8		
Caste																														
General	1.4	98.6	50	50	41.7	58.3	25	75	15.3	84.7	12.5	87.5	80.4	19.6	48.4	51.6	20.8	79.2	20.8	79.2	25	75	12.5	87.5	38.9	61.1	11.1	88.9		
SC	1	99	49.5	50.5	63.1	36.9	29.5	70.5	28.5	71.5	24.1	75.9	81.2	18.8	53.4	46.6	12.2	87.8	12.2	87.8	28.8	71.2	10.8	89.2	43.1	56.9	21.7	78.3		
ST	4.8	95.2	69	31	78.6	21.4	57.1	42.9	28.6	71.4	28.6	71.4	90	10	56.3	43.8	11.9	88.1	11.9	88.1	35.7	64.3	9.5	90.5	64.3	35.7	28.6	71.4		



Themes	Prenatal																Exclusive Breastfeeding						Complimentary feeding		Cards			
Indicators	Registered pregnancy		Carrying MCP card		4 or more ante-natal visit		Received antenatal checkup in first trimester		Women had proper nutritious meal during pregnancy		Institutional delivery		Get benefit of PMMVY		Get benefit of JSY		Breast-milk was given as the first food to the children		Breast-milk given within 1st hour of delivery		Exclusive breast-feeding to the children		Initiated semi-solid food to the children b/w 6-8 months		Vaccination based on MCP card		Birth certificate	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
OBC	1.5	98.5	53.5	46.5	60.5	39.5	31	69	27	73	19.5	80.5	82.1	17.9	57.2	42.8	15.5	84.5	15.5	84.5	30	70	11.3	88.8	43.5	56.5	19.5	80.5
Religion																												
Hindu	0.9	99.1	50.4	49.6	60.8	39.2	30.3	69.7	27.6	72.4	21.4	78.6	82.7	17.3	54.5	45.5	13.4	86.6	13.4	86.6	30	70	11.5	88.5	41.3	58.7	20.6	79.4
Muslim	3.9	96.1	35.7	64.3	61	39	35.1	64.9	22.1	77.9	20.1	79.9	80.6	19.4	56.9	43.1	19.5	80.5	19.5	80.5	27.3	72.7	9.1	90.9	55.8	44.2	18.2	81.8
Other (Christian & Sikh)	0	100	75	25	50	50	25	75	0	100	25	75	0	100	75	25	25	75	25	75	25	75	25	75	25	75	25	75
Years of stay in Delhi NCR																												
less than a year	2	98	73.1	26.9	73.6	26.4	32.8	67.2	29.4	70.6	26.9	73.1	84.2	15.8	54.1	45.9	13.9	86.1	13.9	86.1	31.3	68.7	12.4	87.6	49.3	50.7	20.4	79.6
1-2 years	2.8	97.2	66.7	33.3	63	37	45.4	54.6	27.8	72.2	22.2	77.8	84.7	15.3	46	54	18.5	81.5	18.5	81.5	33.3	66.7	7.4	92.6	54.6	45.4	21.3	78.7
2 to 3 years	0	100	51.4	48.6	62.9	37.1	32.1	67.9	24.3	75.7	22.1	77.9	77.8	22.2	60.3	39.7	16.4	83.6	16.4	83.6	29.3	70.7	10	90	40.7	59.3	22.9	77.1
3 and above	1.4	98.6	37.4	62.6	52.1	47.9	25.8	74.2	25.5	74.5	17.2	82.8	81.7	18.3	56.2	43.8	13	87	13	87	27.1	72.9	11.9	88.1	39.1	60.9	18.6	81.4



Table 7: Influence of demographic variables on mothers' attitude on prenatal care, nutrition and vaccine

Themes	Prenatal						Exclusive Breastfeeding								Vaccination	
Indicators	Prenatal visit was beneficial		Pre-natal visit was difficult		Exclusive breast-feeding was difficult		Providing nutritious food for your child's growth and development is essential		Providing a variety of food for young children is necessary		Limit sugary foods and processed snacks		Confident in making healthy food for your child		Age-appropriate vaccine was difficult	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Age of mothers																
Less than 20 years	0	100	84.6	15.4	92.3	7.7	0	100	0	100	23.1	76.9	0	100	76.9	23.1
20 years or more	1.9	98.1	94.9	5.1	92.5	7.5	2.3	97.7	2.1	97.9	15.9	84.1	4.3	95.7	91.1	8.9
Maternal Education																
No Formal Education	1.4	98.6	93.5	6.5	92.8	7.2	3.6	96.4	5	95	17.3	82.7	139	95	89.9	10.1
Primary Education	0.7	99.3	95.5	4.5	91.8	8.2	3	97	3	97	17.2	82.8	134	96.3	93.3	6.7
Middle Education	3.2	96.8	95.7	4.3	89.3	10.7	2.1	97.9	1.6	98.4	10.2	89.8	187	96.3	90.4	9.6
Secondary and Higher Secondary Education	1	99	94.3	5.7	94.9	5.1	1.3	98.7	0.7	99.3	17.2	82.8	297	95.3	90.2	9.8
Graduate and Above	5.7	94.3	94.3	5.7	90.6	9.4	1.9	98.1	1.9	98.1	24.5	75.5	1.89	98.11	7.5	92.5
Monthly household expenditures																
Less than Rs. 5000	0	100	95.5	4.5	81.8	18.2	9.1	90.9	4.5	95.5	9.1	90.9	4.5	95.5	90.9	9.1
Rs.5000-10,000	2.7	97.3	96.1	3.9	92.7	7.3	1.2	98.8	2.7	97.3	13.9	86.1	3.5	96.5	92.7	7.3
Rs.10,000-15000	1.1	98.9	96.1	3.9	92.9	7.1	2.8	97.2	1.8	98.2	17.7	82.3	6	94	90.5	9.5
More than 15000	1.7	98.3	91	9	93.1	6.9	2.1	97.9	1.7	98.3	16.3	83.7	3	97	89.3	10.7
Sites																
Constructions	1.5	98.5	94	6	92.9	7.1	2.5	97.5	2.5	97.5	16	84	4.8	95.2	90.2	9.8
Urban	2.4	97.6	95.9	4.1	91.8	8.2	1.7	98.3	1.4	98.6	16.2	83.8	3.1	96.9	92.1	7.9
Caste																
General	5.6	94.4	93.1	6.9	93.1	6.9	2.8	97.2	1.4	98.6	20.8	79.2	2.8	97.2	88.9	11.1



Themes	Prenatal						Exclusive Breastfeeding								Vaccination	
Indicators	Prenatal visit was beneficial		Pre-natal visit was difficult		Exclusive breast-feeding was difficult		Providing nutritious food for your child's growth and development is essential		Providing a variety of food for young children is necessary		Limit sugary foods and processed snacks		Confident in making healthy food for your child		Age-appropriate vaccine was difficult	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
SC	1	99	92.9	7.1	90.8	9.2	2.4	97.6	0.7	99.3	16.3	83.7	2.7	97.3	91.5	8.5
ST	0	100	97.6	2.4	85.7	14.3	2.4	97.6	2.4	97.6	31	69	0	100	90.5	9.5
OBC	2	98	96	4	94.3	5.8	2	98	3.3	96.8	13.5	86.5	6	94	90.8	9.3
Religion																
Hindu	2	98	94.3	5.7	92	8	2.3	97.7	1.7	98.3	16.6	83.4	4.3	95.7	91.1	8.9
Muslim	1.3	98.7	96.8	3.2	94.2	5.8	1.9	98.1	3.9	96.1	14.3	85.7	3.9	96.1	89.6	10.4
Other (Christian & Sikh)	0	100	75	25	100	0	0	100	0	100	0	100	0	100	100	0
Years of stay in Delhi NCR																
less than a year	1	99	94	6	93.5	6.5	2	98	3	97	17.9	82.1	5.5	94.5	89.1	10.9
1-2 years	0.9	99.1	95.4	4.6	89.8	10.2	4.6	95.4	2.8	97.2	16.7	83.3	3.7	96.3	88.9	11.1
2 to 3 years	3.6	96.4	92.1	7.9	93.6	6.4	1.4	98.6	1.4	98.6	14.3	85.7	2.1	97.9	92.1	7.9
3 and above	1.9	98.1	95.8	4.2	92.2	7.8	1.9	98.1	1.7	98.3	15.5	84.5	4.4	95.6	92	8

Table 8: Eating patterns in past 24 hours

Food categories	Breakfast	Lunch	Dinner
Vegetables & Fruits	0.32	0.33	2.89
Protein-Rich Foods	1.62	17.42	14.82
Protein-rich Non-Veg (Eggs, Meat, Chicken)	0.43	9.42	2.05
Cereals & Grains	20.15	44.69	29.52
Dairy products	13.69	25.85	38.55
Beverages (Tea)	5.60	1.75	7.23
Ultra processed food (biscuits, chips, outside fried food)	58.08	0.44	4.46
Skipped Meal	0.11	0.11	0.48
Total	100.00	100.00	100.00





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As per MC Child Safeguarding Policy, we have consent from the parents of all the children whose photographs have appeared in this publication.