

# ASSESSING THE PREVALENCE OF RISK FACTORS, INCLUDING DIETARY HABITS AND ANTHROPOMETRIC INDICATORS, ASSOCIATED WITH MALNUTRITION AMONG PEDIATRIC POPULATION AGED 6-60 MONTHS

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## ABSTRACT

**Background:** In the global context, malnutrition among children under the age of 5 persists as a critical health issue with severe consequences, including elevated rates of illness and mortality. Despite economic growth, India continues to grapple with high rates of severe wasting, underweight, and stunting among children, as evidenced by data from the National Family Health Survey. The intricate link between poverty and childhood malnutrition underscores the need for comprehensive interventions addressing socio-economic, environmental, dietary, and healthcare-related factors. Recent studies have highlighted the importance of dietary diversity in child feeding practices and its association with proper growth and nutritional outcomes. Understanding the multifaceted determinants of malnutrition is crucial for developing effective intervention strategies tailored to local contexts and improving child nutrition outcomes.

**Objective:** The primary objective of this study is to comprehensively identify and evaluate the prevalence of diverse risk factors contributing to malnutrition among children under 5 years old. These risk factors encompass various dimensions, including dietary habits, anthropometric indicators, socioeconomic status, maternal and child health conditions, food security, and environmental factors.

The secondary goal of this research is to translate the findings into actionable recommendations for policymakers and healthcare professionals. Drawing upon evidence-based insights gleaned from the study, these recommendations will be tailored to address the specific needs and challenges identified within the community. By offering targeted interventions and strategies, the aim is to empower policymakers and healthcare practitioners to devise effective measures aimed at reducing the prevalence of malnutrition among children under 5 years of age.

**Methodology:** The study conducted was cross-sectional observational study carried out in Mumbra (Town in Thane district). Data of 100 children were collected. The children were selected through purposive sampling and according to the inclusion and exclusion criteria. The data of children was collected after consents of the parents/caregivers of the children through personal interviews with the help of a questionnaire. The questionnaire consisted of socioeconomic status of children, anthropometric measurements like height, weight and MUAC, dietary habit like daily dietary intake, dietary diversity score, and feeding history, food security, Child health status, environmental factors and maternal health.

**Result:** The study analyzed demographic characteristics, nutritional status, socioeconomic factors, and health-related indicators among 100 children aged 6-60 months. The findings revealed a concerning prevalence of malnutrition, with 33% stunted, 37% underweight, and 65% experiencing weight-for-height malnutrition i.e. Moderate and severe acute malnutrition. Socioeconomic data indicated a predominance of lower-income households, with 78% classified as upper lower class. Food security emerged as a significant concern, with 44% facing occasional or frequent food unavailability due to financial constraints. Dietary practices showed deficiencies in dietary variety and nutrient-rich food consumption. Breastfeeding rates were high, but early introduction of weaning foods was suboptimal. Maternal health issues, such as repetitive pregnancies and hyperemesis gravidarum, underscored the need for improved family planning and prenatal care. Overall, the data emphasized the multifaceted nature of malnutrition and highlighted the necessity for comprehensive interventions targeting dietary diversity, food security, breastfeeding practices, and health and sanitation improvements to promote child well-being.

**Conclusion:** This study provides a comprehensive understanding of malnutrition among children aged 6-60 months, revealing the complex interplay of various factors contributing to its prevalence. The findings highlight the urgent need for intervention, particularly concerning food insecurity and suboptimal dietary practices. While positive indicators were identified, such as good health and hygiene practices, challenges such as repetitive pregnancies and hyperemesis gravidarum among mothers persist. Comprehensive interventions targeting dietary diversity, food security, breastfeeding practices, maternal and child health services, and environmental conditions are essential for addressing malnutrition effectively. By addressing these factors holistically, policymakers and healthcare professionals can work towards reducing the prevalence of malnutrition and improving child well-being in the community.

**Keyword:** Malnutrition, Pediatric Population, Dietary habit, Anthropometric measurements, Socio-economic Status, Food security, Child Health Status, Maternal Health, Environmental Factors.

## 1. INTRODUCTION

Malnutrition occurs when there is an inadequate, excessive, or imbalanced intake of energy and/or nutrients. (1) Malnutrition among children under age of 5 remains a critical global health issue with severe short and long term consequences. In this age group, it is linked to elevated rates of illness and death. Furthermore, it compromises the immune systems of children, making them more susceptible to different infections such as pneumonia, tuberculosis, and diarrhea, ultimately intensifying the rates of child mortality (2). Malnutrition encompasses various forms of undernutrition, including wasting, stunting, and underweight, each carrying profound implications for children's health and well-being.

Despite India's economic growth and development, the incidence of severe wasting among children is on the rise. The second National Family Health Survey (NFHS)-2 conducted from 1998 to 1999 revealed that 6.7% of children aged 0 to 35 months were severely wasted. By 2006, the NFHS-3 showed an increase, with 7.9% of children under 60 months of age suffering from severe wasting. NFHS-3 data also indicates that India accounts for nearly 57 million undernourished children, which constitutes one-third of the global total. Shockingly, 5 million children in India die annually due to direct or indirect effects of malnutrition, equating to one child death every 10 seconds. Additionally, NFHS-3 highlighted severe underweight prevalence at 16% and severe stunting at 24% among Indian children. (3)

Malnutrition can often be treated effectively. Hence, it's crucial to promptly identify, prevent, and treat malnutrition. (4) Several studies have shown that childhood malnutrition is closely linked to poverty. However, the connection between poverty and childhood malnutrition is intricate. Even with a high household income, children may still experience poor nutrition if their households lack adequate care, dietary quality, and access to healthcare. (5)

In recent years, numerous studies have explored the multifaceted determinants contributing to the high prevalence of malnutrition among children aged 6 to 60 months. These risk factors encompass a broad range of socio-economic, environmental, dietary, and healthcare-related variables, operating at individual, household, community, and societal levels. Factors such as inadequate dietary diversity, poor feeding practices, food insecurity, and limited access to

healthcare services, inadequate sanitation, and hygiene practices are among the key contributors to the burden of malnutrition in this population.

Dietary diversity, defined as the range of food groups consumed during the past 24 hour, has been recognized as a valuable indicator. In child feeding, nutrient-rich foods from varied diets play a crucial role in meeting dietary needs and supporting proper growth in early childhood. Moreover, a varied diet comprising foods from all food groups is essential for children to fulfill their requirements for essential nutrients. (6)

The independent association between dietary diversity and child anthropometry, considering potential confounding and mediating factors such as socioeconomic status, household wealth, low birth weight, and child health, is crucial for identifying priorities for nutrition-related interventions. (7)

Identifying and understanding the risk factors associated with malnutrition in this age group is essential for effective intervention strategies and policy formulation aimed at improving child nutrition outcomes. Moreover, given the diverse socio-economic and cultural contexts within which malnutrition manifests, research should think about these little details in the situation to make interventions tailored to local needs.

## 2. METHODOLOGY

**2.1- Setting /Site-** The study was conducted in Mumbra (Town in Thane district).

**2.2- Study Design-** The study conducted was a Cross-sectional Observational Study.

**2.3- Study Duration-** The study was for 6 months. The Ethical clearance was obtained from the Institutional Ethical Committee prior to data collection.

**2.4- Study Participants-** Malnourished Pediatric population aged 6-60 months of Mumbra.

**2.5- Sample Size-** The sample size for this study consisted of 100 participants, selected according to the inclusion criteria established for the research.

**2.6- Sampling Procedure-** The sampling procedure utilized for this study was purposive sampling, ensuring intentional selection of participants based on specific characteristics relevant to the research objectives.

### 2.7- Selection Criteria

Inclusion Criteria	Exclusion Criteria
Malnourished Children between the ages of 6-60 months.	Children outside the age range of 6-60 months.
Both genders (male and female).	Children who are not malnourished.
	Children with known genetic disorders or medical conditions affecting nutrition or growth.

### 2.8- Development of Tools

The following tools and materials were used to carry out the study:

#### 1. Anthropometric Measurements

- **Height-** Height was measured using a measuring tape.
- **Weight-** Weight was assessed using a digital Weighing scale.
- **MUAC-** MUAC (Mid Upper arm Circumference) was assessed using MUAC Tape.
- **IAP Growth charts (App)** was used for assessing the Z- Score and type of Malnutrition (i.e. Height-for-age, Weight-for-age and Weight-for-height).

## 2. Socio-Economic Status

- **Kuppuswamy Socioeconomic scale** was used for assessing Socio-Economic status of the Children.
- The Kuppuswamy Socioeconomic Scale holds significant usage in India, particularly in urban settings, as a tool for assessing the socioeconomic status (SES) of families.
- Originally formulated by Kuppuswamy in 1976, the socioeconomic scale has undergone modifications over time to align with evolving societal and economic dynamics. This scale encompasses three primary parameters:
  - **Occupation** of the head of the family.
  - **Education** of the head of the family.
  - **Total income** of the family, from all possible sources within the household.
- Each parameter is subdivided into specific categories, with scores assigned accordingly. The cumulative score spans from 3 to 29, categorizing families into five distinct groups: upper class, upper middle class, lower middle class, upper lower class, and lower socioeconomic class.
- Inflation and changes in the Consumer Price Index (CPI) necessitate regular updates to the income thresholds in the Kuppuswamy scale. In 2023, an updated Modified Kuppuswamy SES was introduced to reflect these adjustments.

## 3. Food Security

- This Tool was developed to assess the Frequency of food inadequacy, Affordability of balanced meals, Meal size reduction or skipping due to financial constraints and Child hunger due to financial constraints.

## 4. Dietary Habits

- **Daily Dietary Intake:** The frequency of meals consumed per day, indicating the number of times individuals eat within a given timeframe.
- **Weaning Food:** To determine if the child began consuming weaning foods from 6 months of age and its frequency of consumption per day.
- **Dietary Diversity Score (DDS):** To assess the diversity in the diet of the children. Dietary diversity is the consumption of variety of foods and food groups during a certain period (within 24 hours). The Dietary Diversity Score (DDS) is a simple and practical measure frequently employed in numerous studies to evaluate the nutritional quality of populations across various age groups.
- **Feeding History:** Colostrum feeding history, Breastfeeding status of children, duration of Breastfeeding and Artificial milk feeding status of children was assessed.

## 5. Child Health Status

- Birth History status of Children: Full term or Preterm.
- Delivery pattern in Children: Full term Normal Delivery or Lower Segment Caesarean section.
- Birth weight of Children : <2.5 kg or >2.5 kg.
- Delivery place of Children: Private Hospital, Government Hospital or home.
- History of diarrhea in Children: Yes/No
- History of Infectious Disease in children: Yes/No

## 6. Environmental Factor

- Source of water: Tap water/ Others
- Presence of hygienic latrine at home: Yes/No

## 7. Maternal Health

- Repetitive pregnancy of mother of child: Yes/No
- Maternal Hyperemesis in pregnancy: Yes/No

## 2.9- Method of Data Collection

1. The study was carried out in Mumbra (Town in Thane district).
2. Malnourished children aged 6-60 months as per the inclusion criteria was included in the study.
3. All the Parents or Caregivers of the Children were given Consent Forms, and a Patient Information sheet and explained about the study, subject of the study, objectives of the study, location, benefits etc.
4. The participants of the study was assessed using questionnaire. Questionnaire includes all the parameters about dietary habit and anthropometric measurements, socioeconomic status, maternal and child health, food security and environmental factors.
5. All the data that was collected were coded and analyzed using SPSS.
6. The Result and outcome were discussed to arrive at a conclusion.
7. The final report was prepared.

## 2.10- Method of data collection relevant to the objective

The data was collected through personal interviews of the parents/caregivers of the subject with the help of questionnaire. The questionnaire consisted of socioeconomic status of children, anthropometric measurements like height, weight and MUAC, dietary habit like daily dietary intake, dietary diversity score, and feeding history, food security, Child health status, environmental factors and maternal health.

## 2.11- Data Analysis plan and methods

### Statistical Analysis

SPSS software tool was used to statistically analyze the data obtained.

### General Considerations

- Data collections were done as per the study specific data requirements.
- Data were shared as .xlsx file format (Microsoft Excel Version 2007 or above). Alternate data formats shall be a .csv file. Data received were checked for completeness, errors, and discrepancies. Data analyses were done using windows based statistical program Stata version 13.1 (Stata Corp, USA).
- The data of all Subjects which satisfy the inclusion and exclusion criteria were included for analysis.
- The statistical analysis was reported using summary tables, listings, and figures (TLFs).

### Description of Demographics

The summary of demographic data was presented:

- Age – descriptive statistics
- Gender – n (%)
- Educations n (%)
- Occupations n (%)
- Monthly income n (%)
- Socio economic status n (%)
- In general, for categorical variables, the number and percentage of subjects within each category (with the category for missing data as needed) of the parameter was presented. For continuous variables, the number of subjects, mean and standard deviation (SD) values were presented.
- Individual subject data was provided in the listings. Unless otherwise noted, tabulations of categorical data were present to those categories appearing in the data.

### Handling Missing Values

Missing data was treated as missing, and no imputation was done.

### Description of Demographics

- Effect of other factors like type of malnutrition, Height-for-Age malnutrition, Weight-for-Age malnutrition, and Weight-for-Height malnutrition the chi-square test is used to test whether two categorical variables are related to each other and the comparison between groups were done by analysis of variance (ANOVA).

### 3. RESULT AND DISCUSSION

#### CHILD’S PROFILE

**Table 3.1: Demography of children (n=100)**

	<b>N</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Min.</b>	<b>Max.</b>
Age (yrs.)	100	41.60	48.00	17.16	7	60
Weight (kg.)	100	11.73	12.00	2.47	5	16
Height (cm.)	100	93.53	98.00	13.85	64	114
MUAC (cm.)	100	14.01	14.00	1.15	10	17
Dietary diversity score	100	4.77	5.00	1.43	2	9

*N: No of children MUAC: Mid-upper-arm circumference; Min: Minimum. Max: Maximum; SD: Standard deviation*

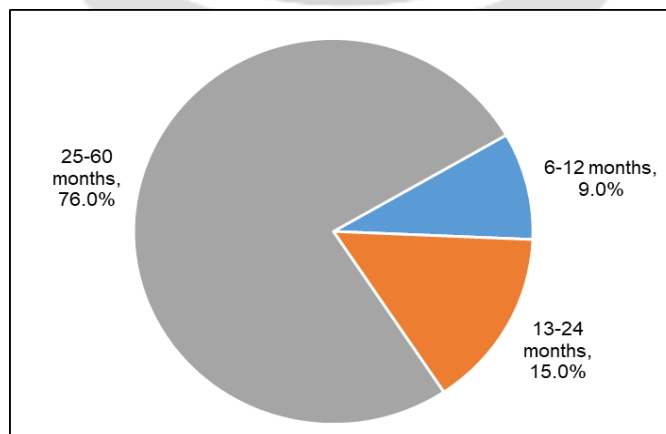
Table 3.1 provides an overview of the demographic characteristics of the sample of 100 children. It includes measures such as age, weight, height, mid-upper-arm circumference (MUAC), and dietary diversity score.

The average age of the children is 41.60 months, with a median age of 48.00 months. The standard deviation (SD) is 17.16 months, indicating a notable variation in ages within the sample, ranging from 7 to 60 months. The average weight of the children is 11.73 kg, with a median of 12.00 kg. The weights range from 5 kg to 16 kg, with a standard deviation of 2.47 kg. The average height of the children is 93.53 cm, with a median of 98.00 cm. Heights vary from 64 cm to 114 cm, with a standard deviation of 13.85 cm. The average mid-upper-arm circumference is 14.01 cm, with a median of 14.00 cm. MUAC ranges from 10 cm to 17 cm, with a standard deviation of 1.15 cm. The average dietary diversity score is 4.77, with a median of 5.00. Scores range from 2 to 9, with a standard deviation of 1.43. This comprehensive dataset offers insights into the anthropometric measurements and dietary habits of the children, providing valuable information for understanding their nutritional status and informing potential interventions.

**Table 3.2: Age group of children (n=100)**

	<b>No.</b>	<b>%</b>
<b>Age (Yrs.)</b>		
• 6- 12 months	9	9.0%
• 13- 24 months	15	15.0%
• 25 – 60 months	76	76.0%
<b>Total</b>	<b>100</b>	

*No.: No of count*



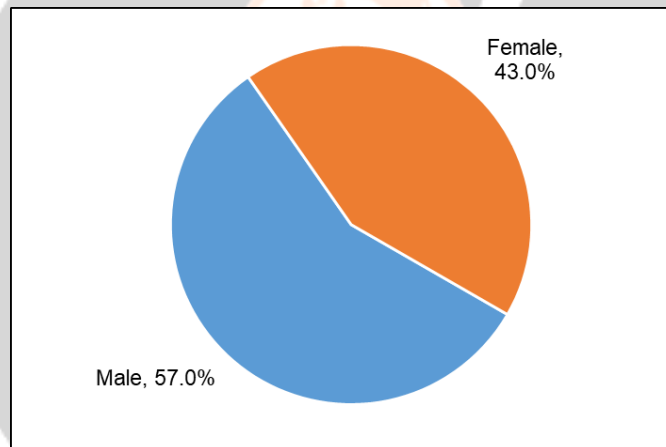
**Chart-1: Age group of children (n=100)**

Table 3.2 and Chart 1 presents the distribution of children across different age groups in the sample of 100. The age groups are categorized as follows: 6-12 months, 13-24 months, and 25-60 months. Among the children, 9% fall into the 6-12 months category, 15% fall into the 13-24 months category, and the majority, comprising 76% of the sample, are aged between 25 and 60 months. This breakdown provides valuable insight into the age composition of the sample, aiding in understanding developmental stages and potentially informing age-specific interventions or assessments.

**Table 3.3: Gender distribution children (n=100)**

	No.	%
<b>Gender</b>		
• Male	57	57.0%
• Female	43	43.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart-2: Gender wise distribution of children (n=100)**

Table 3.3 and Chart 2 displays the gender distribution among the sample of 100 children. It indicates that 57% of the children are male, while 43% are female. This breakdown offers insights into the gender composition of the sample, which can be essential for understanding potential gender-specific health or nutritional needs among children.

**SECTION 1: KUPPUSWAMY SOCIOECONOMIC SCALE****Table 3.4: Education of head of family (n=100)**

	<i>No.</i>	<i>%</i>
• Illiterate	7	7.0%
• Primary school	19	19.0%
• Middle school	37	37.0%
• High School Certificate	19	19.0%
• Intermediate or diploma	5	5.0%
• Graduate	7	7.0%
• Profession or Honours	6	6.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count

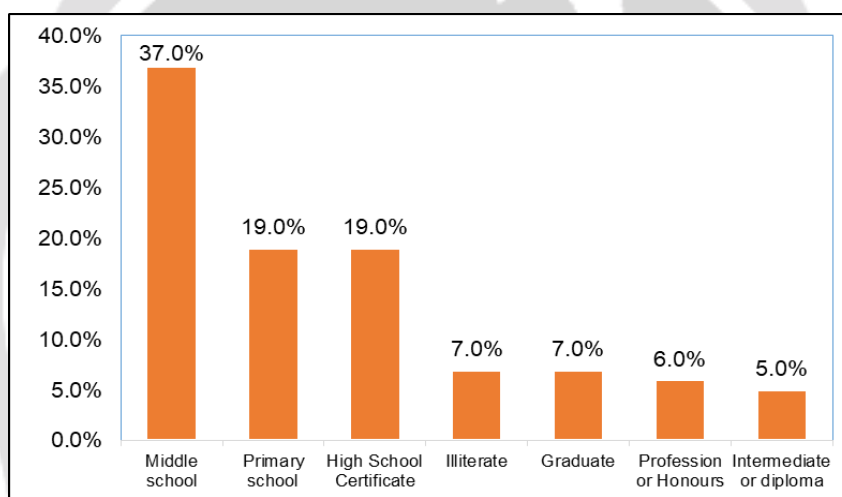
**Chart-3: Education of head of family (n=100)**

Table 3.4 and Chart 3 outlines the educational attainment of the heads of families within our sample of 100 using the Kuppuswamy Socioeconomic Scale:

7% of the heads of families are unable to read or write i.e. Illiterate, 19% have completed primary school education, 37% have attained education up to the middle school level, and 19% have completed high school education, 5% have obtained an intermediate level or diploma, 7% have achieved a bachelor's degree and 6% have pursued professional degrees or obtained honors.

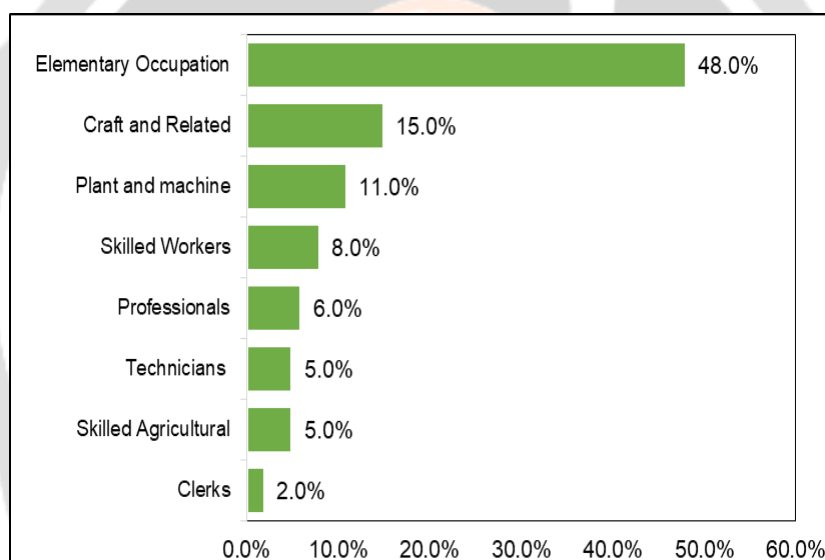
This table provides valuable insight into the educational background of the heads of families, which is a crucial component in understanding the socioeconomic status and potential influences on health and nutritional outcomes within the community.



**Table 3.5: Occupation of head of family (n=100)**

	<i>No.</i>	<i>%</i>
<b>Occupation</b>		
• Elementary Occupation	48	48.0%
• Craft and Related	15	15.0%
• Plant and machine	11	11.0%
• Skilled Workers	8	8.0%
• Professionals	6	6.0%
• Skilled Agricultural	5	5.0%
• Technicians	5	5.0%
• Clerks	2	2.0%
• Unemployed	0	0.0%
• Legislators, Senior officers and Managers	0	0.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-4:** Occupation of head of family (n=100)

Table 3.5 and Chart 4 presents the occupations held by the heads of families within a sample of 100 individuals. These occupations are classified into different categories using the Kuppuswamy Socioeconomic Scale:

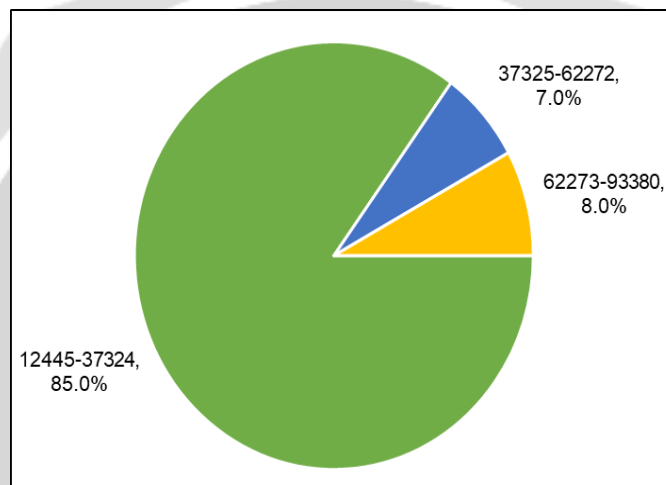
The category accounts for 48% of the sample, indicating individuals engaged in elementary jobs, 15% of the heads of families are involved in craft-related occupations, 11% are employed in roles related to plant and machine operation, 8% of individuals are classified as skilled workers., 6% are professionals in their respective fields, 5% are engaged in skilled agricultural work, Another 5% hold positions as technicians, 2% are employed as clerks. None of the heads of families in the sample are currently without employment. Similarly, none of the heads of families hold positions as legislators, senior officers, or managers.

This breakdown provides insight into the diverse occupational backgrounds of family leaders within the community.

**Table 3.6: Total Monthly Income of head of family (n=100)**

	No.	%
<b>Total Monthly Income</b>		
• 12445-37324	85	85.0%
• 37325-62272	7	7.0%
• 62273-93380	8	8.0%
• 124489- 249043	0	0.0%
• 93381-124488	0	0.0%
• >= 249044	0	0.0%
• <= 12444	0	0.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart-5:** Total Monthly Income of head of family (n=100)

Table 3.6 and Chart 5 presents the total monthly income of the heads of families within a sample of 100 individuals, categorized into different income brackets according to Kuppuswamy Socioeconomic Scale:

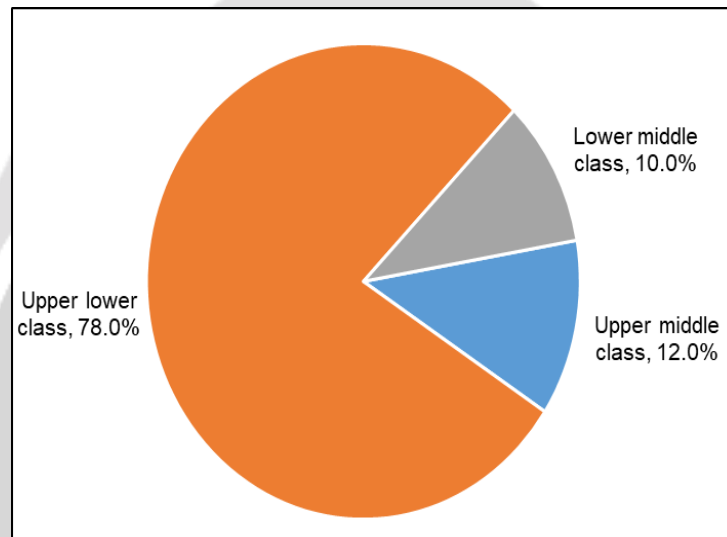
The distribution of monthly incomes among the heads of families in the sample reveals that the majority, 85%, fall within the income range of 12,445 to 37,324 INR. A smaller segment, comprising 7% of the sample, has monthly incomes between 37,325 and 62,272 INR. Additionally, 8% of individuals earn within the range of 62,273 to 93,380 INR. Notably, none of the heads of families reported monthly incomes in the brackets of less than 12,445 INR, between 93,381 and 124,488 INR, between 124,489 and 249,043 INR, or exceeding 249,044 INR. This indicates that the vast majority of the sample earn within the lower income ranges, with no representation in the highest or lowest income brackets.

This breakdown provides insight into the distribution of monthly incomes among family leaders within the community, with the majority falling within the lower income brackets.

**Table 3.7: Kuppuswamy’s Socio-economic status scale (n=100)**

	No.	%
<b>Socio-economic status scale</b>		
• Upper middle class	12	12.0%
• Upper lower class	78	78.0%
• Lower middle class	10	10.0%
• Upper class	0	0.0%
• Lower class	0	0.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart-6:** Kuppuswamy’s Socio-economic status scale (n=100)

Table 3.7 and Chart 6 outlines the distribution of Kuppuswamy's Socio-economic status scale among a sample of 100 individuals. The socio-economic status scale is categorized as follows:

12% of the sample belongs to Upper middle class. The majority, comprising 78% of the sample, belongs to the upper lower class. 10% of individuals are classified as belonging to the lower middle class. None of the individuals in the sample are categorized as belonging to the upper class or lower class.

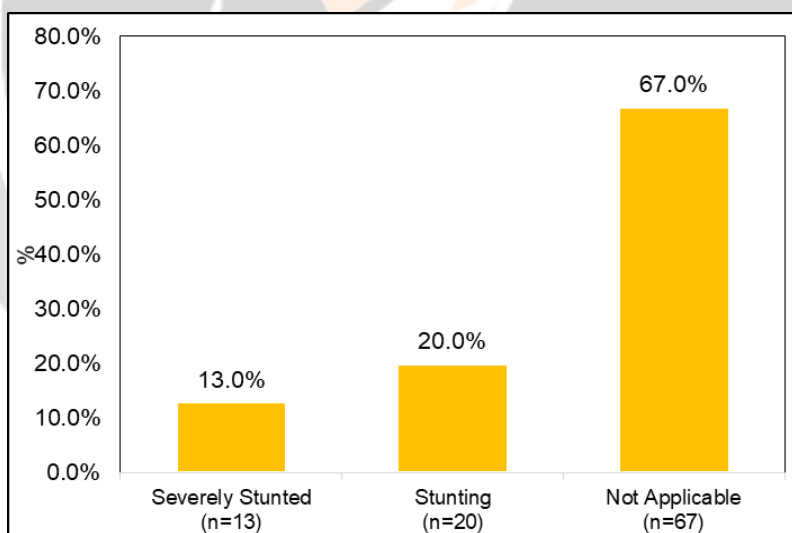
This breakdown provides an overview of the socio-economic status distribution within the sample, with a significant proportion falling into the upper lower class category.

**SECTION 2: ANTHROPOMETRY MEASUREMENTS**

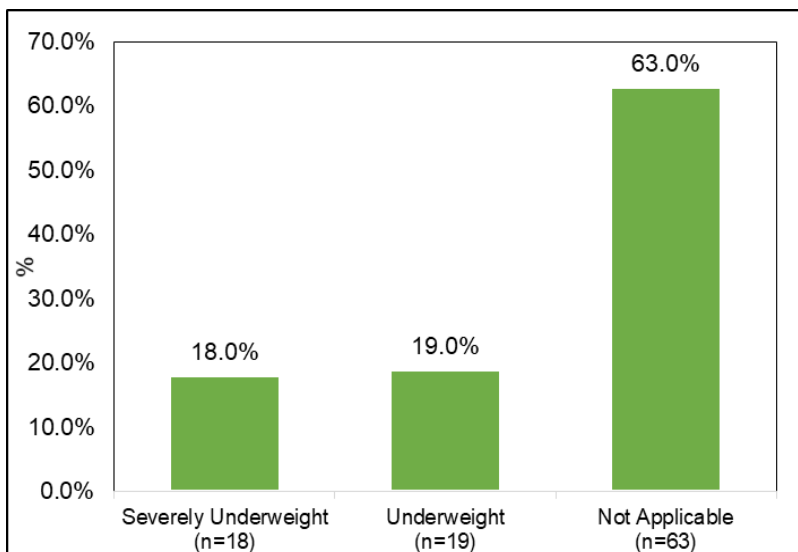
**Table 3.8: Malnutrition in children (n=100)**

	<i>No.</i>	<i>% (n=100)</i>
<b>Height-for-age malnutrition</b>		
• Stunting	20	20.0%
• Severely Stunted	13	13.0%
• Total malnourished	33	33.0%
<b>Weight-for-age malnutrition</b>		
• Underweight	19	19.0%
• Severely Underweight	18	18.0%
• Total malnourished	37	37.0%
<b>Weight-for-Height malnutrition</b>		
• Moderate Acute Malnutrition	48	48.0%
• Severe Acute Malnutrition	17	17.0%
• Total malnourished	65	65.0%
<b>Overall type of Malnutrition</b>		
• Moderate malnutrition (Score -2)	66	66.0%
• Severe malnutrition (Score -3)	34	34.0%

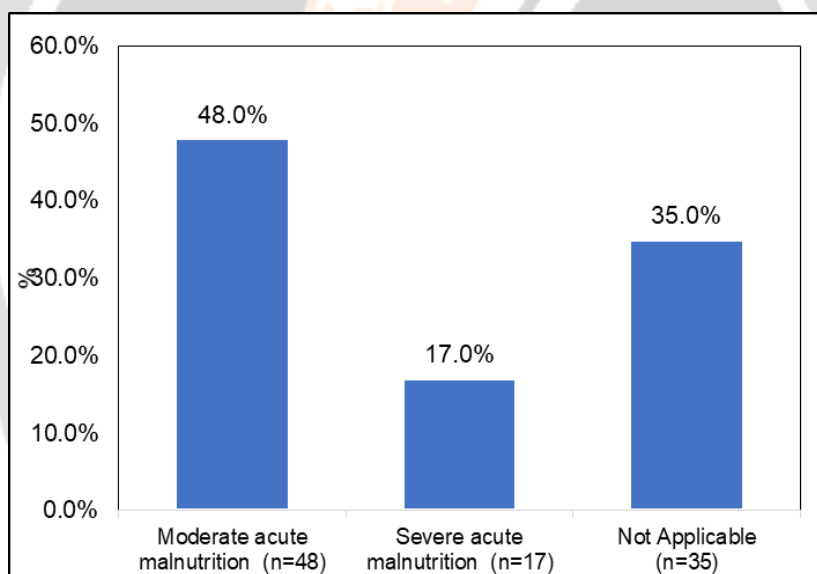
*No.:* No of children



**Chart-7:** Height-for-age of children (n=100)



**Chart-8:** Weight-for-age of children (n=100)



**Chart-9:** Weight-for-Height of children (n=100)

Table 3.8 presents the prevalence of malnutrition among a sample of 100 children, categorized by different indicators:

**Height-for-age malnutrition: (Table 3.8 and Chart 7)**

20% of children are classified as stunted, indicating below-average height for their age. 13% of children are severely stunted, signifying more severe height deficiency. Overall, 33% of children in the sample are affected by height-for-age malnutrition.

**Weight-for-age malnutrition: (Table 3.8 and Chart 8)**

19% of children are underweight, indicating low weight for their age. 18% of children are severely underweight, indicating more severe weight deficiency. Overall, 37% of children in the sample are affected by weight-for-age malnutrition.

**Weight-for-Height malnutrition: (Table 3.8 and Chart 9)**

48% of children experience moderate acute malnutrition, indicating they have low weight in relation to their height. 17% of children experience severe acute malnutrition, signifying a more severe weight deficiency. Overall, 65% of children in the sample are affected by weight-for-height malnutrition.

**Overall type of Malnutrition: (Table 3.8)**

66% of children are affected by moderate malnutrition based on scoring criteria (Score -2). 34% of children are affected by severe malnutrition based on scoring criteria (Score -3).

These findings underscore the significant prevalence of malnutrition among the children in the sample, highlighting the need for targeted interventions to address nutritional deficiencies and improve child health outcomes.

**Table 3.9: Malnutrition severity in children (n=100)**

		Moderate malnutrition (Score -2)			Severe malnutrition (Score -3)	
		N	No.	%	No.	%
<b>Age (months)</b>	6-12 months	9	7	77.8%	2	22.2%
	13-24 months	15	7	46.7%	8	53.3%
	25-60 months	76	52	68.4%	24	31.6%
<b>Gender</b>	Male	57	34	59.6%	23	40.4%
	Female	43	32	74.4%	11	25.6%
<b>Education of head of family</b>	Illiterate	7	3	42.9%	4	57.1%
	Primary school or literate	19	15	78.9%	4	21.1%
	Middle school completion	37	26	70.3%	11	29.7%
	High School Certificate	19	11	57.9%	8	42.1%
	Intermediate or diploma	5	2	40.0%	3	60.0%
	Graduate	7	6	85.7%	1	14.3%
<b>Occupation of head of the family</b>	Profession or Honours	6	3	50.0%	3	50.0%
	Unemployed	0	0	0.0%	0	0.0%
	Elementary Occupation	48	31	64.6%	17	35.4%
	Plant and machine	11	10	90.9%	1	9.1%
	Craft and Related	15	11	73.3%	4	26.7%
	Skilled Agricultural	5	3	60.0%	2	40.0%
	Skilled Workers	8	3	37.5%	5	62.5%
	Clerks	2	0	0.0%	2	100.0%
	Technicians	5	5	100.0%	0	0.0%
	Professionals	6	3	50.0%	3	50.0%
<b>Monthly Income (score)</b>	Legislators, Senior officers	0	0	0.0%	0	0.0%
	≤12444 INR	0	0	0.0%	0	0.0%
	12445-37324 INR	85	57	67.1%	28	32.9%
	37325-62272 INR	7	4	57.1%	3	42.9%
	62273-93380 INR	8	5	62.5%	3	37.5%

		N	Moderate malnutrition (Score -2)		Severe malnutrition (Score -3)	
			No.	%	No.	%
<b>Socio-economic status</b>	Upper middle class	12	8	66.7%	4	33.3%
	Upper lower class	78	54	69.2%	24	30.8%
	Lower middle class	10	4	40.0%	6	60.0%
<b>MUAC</b>	<11.5 cm	2	1	50.0%	1	50.0%
	11.5 to 12.5 cm	4	3	75.0%	1	25.0%
	>12.5 cm	94	62	66.0%	32	34.0%
<b>The last food that we bought just didn't last and we didn't have money to get more</b>	Don't know	8	4	50.0%	4	50.0%
	Never true	44	25	56.8%	19	43.2%
	Sometimes true	25	19	76.0%	6	24.0%
	Often true	23	18	78.3%	5	21.7%
<b>We couldn't afford to eat balanced meals</b>	Don't know	5	5	100.0%	0	0.0%
	Never true	40	23	57.5%	17	42.5%
	Sometimes true	26	17	65.4%	9	34.6%
	Often true	29	21	72.4%	8	27.6%
<b>Children in your household ever cut the size of the meals or skip meals because there wasn't enough money for food?</b>	Yes	2	2	100.0%	0	0.0%
	No	80	53	66.3%	27	33.8%
	Don't know	18	11	61.1%	7	38.9%
<b>In the last 30 days, was your child hungry but didn't eat because there wasn't enough money for food?</b>	Yes	6	5	83.3%	1	16.7%
	No	82	54	65.9%	28	34.1%
	Don't know	12	7	58.3%	5	41.7%
<b>Dietary Intake (meals/day)</b>	3 times	61	42	68.9%	19	31.1%
	<3 times	25	18	72.0%	7	28.0%
	>3 times	14	6	42.9%	8	57.1%
<b>Have you started giving your child weaning foods from 6 months of age?</b>	Yes	40	29	72.5%	11	27.5%
	No	60	37	61.7%	23	38.3%
<b>Complementary feeding/ day (Weaning Foods)</b>	<3 times	71	49	69.0%	22	31.0%
	>3 times	29	17	58.6%	12	41.4%
<b>Dietary Diversity</b>	Cereals and Millets	85	59	69.4%	26	30.6%
	Pulses and dals	86	54	62.8%	32	37.2%
	Legumes	39	27	69.2%	12	30.8%
	Green leafy vegetable	16	11	68.8%	5	31.3%
	Root and tubers	9	5	55.6%	4	44.4%
	Other Vegetables	40	24	60.0%	16	40.0%
	Fruits	27	20	74.1%	7	25.9%
	Nuts and Oilseeds	1	1	100.0%	0	0.0%
	Milk and milk products	72	48	66.7%	24	33.3%
	Egg and flesh foods	15	11	73.3%	4	26.7%
	Fats and Oil	9	5	55.6%	4	44.4%
Sugar	38	27	71.1%	11	28.9%	
<b>Dietary Diversity Score</b>	Low	46	31	67.4%	15	32.6%
	Medium	51	33	64.7%	18	35.3%
	High	3	2	66.7%	1	33.3%
	Total	100	66	66.0%	34	34.0%
<b>Has Colostrum been given to the child?</b>	Yes	85	56	65.9%	29	34.1%
	No	15	10	66.7%	5	33.3%
<b>Is your Child currently on breastfeed?</b>	Yes	9	6	60.0%	3	30.0%
	No	91	60	66.0%	31	34.0%
<b>Duration of Breastfeeding (If answer is No to the previous question)</b>	Till 1 year	42	30	71.4%	12	28.6%
	Till 2 years	30	21	70.0%	9	30.0%
	<= 6 Months	19	9	47.4%	10	52.6%
<b>Is your child currently on artificial milk?</b>	Yes	5	3	60.0%	2	40.0%

		Moderate malnutrition (Score -2)			Severe malnutrition (Score -3)	
		N	No.	%	No.	%
	No	95	63	66.3%	32	33.7%
<b>Birth History</b>	Full term	98	65	66.3%	33	33.7%
	Preterm	2	1	50.0%	1	50.0%
<b>Delivery</b>	LSCS	17	10	58.8%	7	41.2%
	Full term Normal delivery	83	56	67.5%	27	32.5%
<b>Birth weight of Child</b>	<2.5 kg	47	32	68.1%	15	31.9%
	>2.5 kg	53	34	64.2%	19	35.8%
<b>Place of Delivery</b>	Private hospital	22	14	63.6%	8	36.4%
	Government Hospital	66	45	68.2%	21	31.8%
	Home	12	7	58.3%	5	41.7%
<b>Suffer from Diarrhoea Frequently</b>	Yes	10	5	50.0%	5	50.0%
	No	90	61	67.8%	29	32.2%
<b>Infectious disease in previous month</b>	Yes	25	18	72.0%	7	28.0%
	No	75	48	64.0%	27	36.0%
<b>Source of Water</b>	Tap water	83	53	63.9%	30	36.1%
	Others	17	13	76.5%	4	23.5%
<b>Hygienic latrine at home</b>	Yes	87	62	71.3%	25	28.7%
	No	13	4	30.8%	9	69.2%
<b>Repetitive Pregnancy</b>	Yes	17	13	76.5%	4	23.5%
	No	83	53	63.9%	30	36.1%
<b>Maternal hyperemesis</b>	Yes	13	7	53.8%	6	46.2%
	No	87	59	67.8%	28	32.2%

*N: no of total children; No.: No of count; LSCS: Lower Segment Caesarean Section*

This table provides a detailed breakdown of various demographic, socioeconomic, and health-related factors in relation to the prevalence of moderate and severe malnutrition among children across different age groups.

1. The table shows the prevalence of malnutrition across different age groups (6-12 months, 13-24 months, and 25-60 months) and genders (male and female). Notably, severe malnutrition appears to be more prevalent in younger age groups.
2. There's a correlation between the education level and the prevalence of malnutrition, with higher levels of education generally associated with lower rates of malnutrition. However, there are exceptions, such as individuals with an intermediate or diploma education level. The occupation of the head of the family also shows varying degrees of malnutrition prevalence across different occupational categories.
3. Higher income and upper socio-economic status seem to correlate with lower rates of malnutrition, though not uniformly across all income and socio-economic brackets.
4. Factors related to dietary intake and diversity, such as the frequency of meals, weaning practices, and dietary diversity score, also show correlations with malnutrition prevalence. For example, children who consume weaning foods more than three times a day have lower rates of malnutrition compared to those who consume them less frequently.
5. Breastfeeding practices, including the duration of breastfeeding and current breastfeeding status, show correlations with malnutrition prevalence. Additionally, the use of artificial milk is associated with slightly higher rates of malnutrition.
6. Factors such as birth weight, delivery method, and place of delivery also seem to influence the prevalence of malnutrition, with lower birth weights and certain delivery methods showing slightly higher rates of malnutrition.



7. Health-related factors such as the presence of infectious diseases, diarrhea frequency, maternal hyperemesis, and access to hygienic facilities like clean water and latrines also appear to correlate with malnutrition prevalence.

Overall, the table underscores the multifaceted nature of malnutrition, influenced by a complex interplay of demographic, socioeconomic, dietary, health, and hygiene factors. These findings could inform targeted interventions aimed at reducing malnutrition prevalence among children.

**Table 3.10: Type of malnutrition in children (n=100)**

		Height-for-Age		Weight-for-Age		Weight-for-Height		p	
		N	No.	%	No.	%	No.		%
<b>Age (months)</b>	6-12 months	9	7	77.8%	2	22.2%	2	22.2%	<0.05
	13-24 months	15	9	60.0%	9	60.0%	8	53.3%	
	25-60 months	76	17	22.4%	26	34.2%	55	72.4%	
<b>Gender</b>	Male	57	22	38.6%	18	31.6%	36	63.2%	>0.05
	Female	43	11	25.6%	19	44.2%	29	67.4%	
<b>Education of head of family</b>	Illiterate	7	2	28.6%	4	57.1%	4	57.1%	>0.05
	Primary school	19	5	26.3%	7	36.8%	13	68.4%	
	Middle school	37	14	37.8%	12	32.4%	23	62.2%	
	High School Certificate	19	5	26.3%	7	36.8%	14	73.7%	
	Intermediate or diploma	5	2	40.0%	1	20.0%	3	60.0%	
	Graduate	7	2	28.6%	2	28.6%	5	71.4%	
	Profession or Honours	6	3	50.0%	4	66.7%	3	50.0%	
<b>Occupation of head of the family</b>	Unemployed	0	0	-	0	-	0	-	>0.05
	Elementary Occupation	48	15	31.3%	19	39.6%	30	62.5%	
	Plant and machine	11	3	27.3%	2	18.2%	8	72.7%	
	Craft and Related	15	4	26.7%	4	26.7%	10	66.7%	
	Skilled Agricultural	5	3	60.0%	1	20.0%	2	40.0%	
	Skilled Workers	8	3	37.5%	4	50.0%	7	87.5%	
	Clerks	2	0	0.0%	2	100.0%	2	100.0%	
	Technicians	5	2	40.0%	1	20.0%	3	60.0%	
	Professionals	6	3	50.0%	4	66.7%	3	50.0%	
Legislators, Senior Officers	0	0	-	0	-	0	-		
<b>Monthly Income (INR)</b>	≤12444	0	0	-	0	-	0	-	>0.05
	12445-37324	85	27	31.8%	30	35.3%	55	64.7%	
	37325-62272	7	2	28.6%	3	42.9%	6	85.7%	
	62273-93380	8	4	50.0%	4	50.0%	4	50.0%	
<b>Socio-economic status</b>	Upper middle class	12	5	41.7%	6	50.0%	7	58.3%	-
	Upper lower class	78	26	33.3%	26	33.3%	49	62.8%	
	Lower middle class	10	2	20.0%	5	50.0%	9	90.0%	
<b>MUAC Categories</b>	<11.5 cm	4	2	100.0%	1	50.0%	1	50.0%	>0.05
	11.5 to 12.5 cm	6	4	100.0%	1	25.0%	1	25.0%	
	>12.5 cm	125	27	28.7%	35	37.2%	63	67.0%	
<b>The last food that we bought just didn't last and we didn't have money to get more</b>	Don't know	10	5	62.5%	2	25.0%	3	37.5%	-
	Never true	63	15	34.1%	19	43.2%	29	65.9%	
	Sometimes true	33	8	32.0%	8	32.0%	17	68.0%	
	Often true	29	5	21.7%	8	34.8%	16	69.6%	
<b>We couldn't afford to eat balanced meals</b>	Don't know	5	4	80.0%	0	0.0%	1	20.0%	>0.05
	Never true	57	14	35.0%	17	42.5%	26	65.0%	

		Height-for-Age			Weight-for-Age		Weight-for-Height		p
		N	No.	%	No.	%	No.	%	
	Sometimes true	34	8	30.8%	9	34.6%	17	65.4%	
	Often true	39	7	24.1%	11	37.9%	21	72.4%	
<b>Children in your household ever cut the size of the meals or skip meals because there wasn't enough money for food?</b>	Yes	2	0	0.0%	1	50.0%	1	50.0%	-
	No	110	25	31.3%	30	37.5%	55	68.8%	
	Don't know	23	8	44.4%	6	33.3%	9	50.0%	
<b>In the last 30 days, was your child hungry but didn't eat because there wasn't enough money for food?</b>	Yes	6	3	50.0%	1	16.7%	2	33.3%	-
	No	113	25	30.5%	31	37.8%	57	69.5%	
	Don't know	16	5	41.7%	5	41.7%	6	50.0%	
<b>Dietary Intake (meals/day)</b>	3 times	83	19	31.1%	24	39.3%	40	65.6%	-
	<3 times	31	8	32.0%	7	28.0%	16	64.0%	
	>3 times	21	6	42.9%	6	42.9%	9	64.3%	
<b>Weaning Foods from 6 months of age?</b>	Yes	54	17	42.5%	14	35.0%	23	57.5%	-
	No	81	16	26.7%	23	38.3%	42	70.0%	
<b>Complementary feedings</b>	<3 times	95	20	28.2%	25	35.2%	50	70.4%	-
	>3 times	40	13	44.8%	12	41.4%	15	51.7%	
	Cereals and Millets	112	28	32.9%	29	34.1%	55	64.7%	-
	Pulses and dals	118	28	32.6%	33	38.4%	57	66.3%	
	Legumes	55	8	20.5%	17	43.6%	30	76.9%	
	Green leafy vegetable	20	6	37.5%	5	31.3%	9	56.3%	
	Root and tubers	15	4	44.4%	5	55.6%	6	66.7%	
	Other Vegetables	56	13	32.5%	16	40.0%	27	67.5%	
	Fruits	34	8	29.6%	7	25.9%	19	70.4%	
<b>Nuts and Oilseeds</b>	Yes	1	1	100.0%	0	0.0%	0	0.0%	>0.05
	No	134	32	32.3%	37	37.4%	65	65.7%	
<b>Milk and milk products</b>	Yes	96	22	30.6%	27	37.5%	47	65.3%	-
	No	39	11	39.3%	10	35.7%	18	64.3%	
<b>Egg and flesh foods</b>	Yes	19	4	26.7%	3	20.0%	12	80.0%	-
	No	116	29	34.1%	34	40.0%	53	62.4%	
<b>Fats and Oil</b>	Yes	15	3	33.3%	5	55.6%	7	77.8%	-
	No	120	30	33.0%	32	35.2%	58	63.7%	
<b>Sugar</b>	Yes	50	11	28.9%	11	28.9%	28	73.7%	-
	No	85	22	35.5%	26	41.9%	37	59.7%	
<b>Dietary Diversity Score</b>	Low	60	18	39.1%	17	37.0%	25	54.3%	-
	Medium	71	14	27.5%	19	37.3%	38	74.5%	
	High	4	1	33.3%	1	33.3%	2	66.7%	
<b>Colostrum been given to the child?</b>	Yes	116	27	31.8%	31	36.5%	58	68.2%	-
	No	19	6	40.0%	6	40.0%	7	46.7%	
<b>Currently on Breastfeed</b>	Yes	13	8	88.8%	4	44.4%	1	11.1%	-
	No	122	25	27.4%	33	36.2%	64	70.3%	
<b>Duration of Breastfeeding (If answer is No to the previous question)</b>	Till 1 year	54	13	31.0%	16	38.1%	25	59.5%	-
	Till 2 year	41	5	16.7%	11	36.7%	25	83.3%	
	<= 6 Months	27	7	36.8%	6	31.6%	14	73.7%	
<b>Currently on artificial Milk</b>	Yes	7	3	60.0%	2	40.0%	2	40.0%	-
	No	128	30	31.6%	35	36.8%	63	66.3%	
<b>If yes, state the reason</b>	As per doctor's advice	7	3	60.0%	2	40.0%	2	40.0%	-

		Height-for-Age			Weight-for-Age		Weight-for-Height		p
		N	No.	%	No.	%	No.	%	
	NA	128	30	31.6%	35	36.8%	63	66.3%	
<b>Birth History</b>	Full term	98	31	31.6%	36	36.7%	65	66.3%	>0.05
	Preterm	2	2	100.0%	1	50.0%	0	0.0%	
<b>Delivery</b>	LSCS	17	7	41.2%	9	52.9%	11	64.7%	-
	Full term Normal delivery	83	26	31.3%	28	33.7%	54	65.1%	
<b>Birth weight of Child</b>	<2.5 kg	47	15	31.9%	14	29.8%	31	66.0%	>0.05
	>2.5 kg	53	18	34.0%	23	43.4%	34	64.2%	
<b>Place of Delivery</b>	Private hospital	22	7	31.8%	10	45.5%	15	68.2%	>0.05
	Government Hospital	66	21	31.8%	23	34.8%	44	66.7%	
	Home	12	5	41.7%	4	33.3%	6	50.0%	
<b>Suffer from Diarrhea Frequently</b>	Yes	10	2	20.0%	5	50.0%	9	90.0%	>0.05
	No	90	31	34.4%	32	35.6%	56	62.2%	
<b>Infectious disease in previous month</b>	Yes	25	7	28.0%	11	44.0%	19	76.0%	>0.05
	No	75	26	34.7%	26	34.7%	46	61.3%	
<b>Source of Water</b>	Tap water	83	27	32.5%	32	38.6%	53	63.9%	>0.05
	Others	17	6	35.3%	5	29.4%	12	70.6%	
<b>Hygienic latrine at home</b>	Yes	87	27	31.0%	33	37.9%	58	66.7%	>0.05
	No	13	6	46.2%	4	30.8%	7	53.8%	
<b>Repetitive Pregnancy</b>	Yes	17	7	41.2%	7	41.2%	11	64.7%	>0.05
	No	83	26	31.3%	30	36.1%	54	65.1%	
<b>Maternal hyperemesis</b>	Yes	13	5	38.5%	6	46.2%	7	53.8%	>0.05
	No	87	28	32.2%	31	35.6%	58	66.7%	

N: no of total children; No.: No of count; LSCS: Lower Segment Caesarean Section

This table provides a comprehensive analysis of different types of malnutrition among children, considering various demographic, socio-economic, and dietary factors.

1. The prevalence of different types of malnutrition varies across age groups. For example, height-for-age malnutrition is more prevalent among children aged 25-60 months compared to younger age groups. There's no significant difference in malnutrition prevalence between genders.
2. There's no significant association between the education level or occupation of the head of the family and the prevalence of different types of malnutrition.
3. Although there's no significant association with monthly income, lower-middle-class families seem to have higher rates of weight-for-height malnutrition.
4. There's a trend where higher levels of household food insecurity, indicated by the frequency of running out of food and affordability of balanced meals, are associated with higher rates of weight-for-age and weight-for-height malnutrition.
5. Certain dietary factors, such as the frequency of meals, consumption of weaning foods, and dietary diversity, are associated with different types of malnutrition. For instance, children who consume complementary feedings more than three times a day tend to have lower rates of height-for-age malnutrition.
6. There's no significant association between breastfeeding practices and different types of malnutrition. However, children currently on artificial milk have a higher prevalence of weight-for-height malnutrition.
7. There's no significant association between birth-related factors and different types of malnutrition, except for a slightly higher prevalence of height-for-age malnutrition among preterm births.

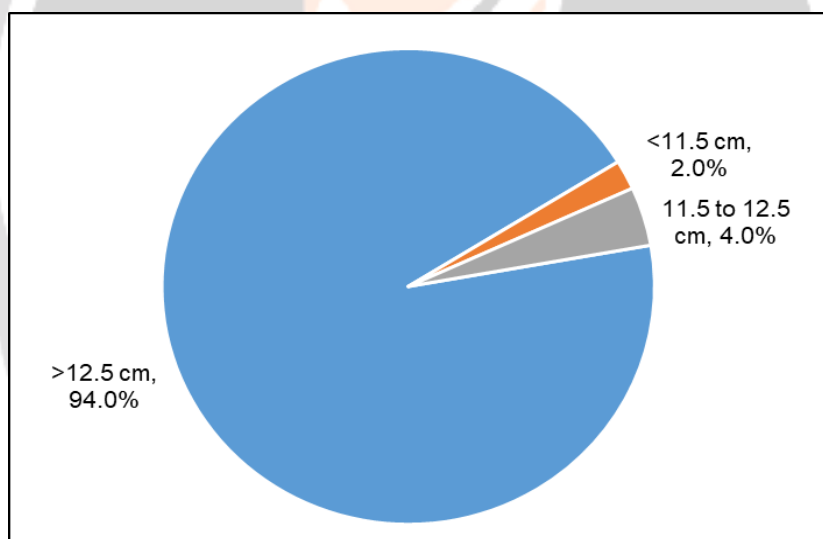
8. Factors such as the presence of diarrhea and infectious diseases do not show a significant association with different types of malnutrition.

Overall, this table highlights the complex interplay of various factors contributing to different types of malnutrition among children, providing valuable insights for targeted interventions and policy formulation to address malnutrition effectively.

**Table 3.11: Mid-upper-arm circumference (MUAC) of children’s (n=100)**

	No.	%
• >12.5	94	94.0%
• <11.5	2	2.0%
• 11.5 to 12.5	4	4.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart-10:** Mid-upper-arm circumference (MUAC) of children’s (n=100)

Table 3.11 and Chart 10 presents the distribution of Mid-upper-arm circumference (MUAC) among a sample of 100 children, categorized into different ranges:

94% of children have a MUAC greater than 12.5 cm. Only 2% of children have a MUAC less than 11.5 cm. 4% of children fall within the range of 11.5 to 12.5 cm.

This breakdown provides insight into the MUAC distribution among the children, indicating that the majority have MUAC measurements above 12.5 cm, which is typically considered indicative of adequate nutritional status.

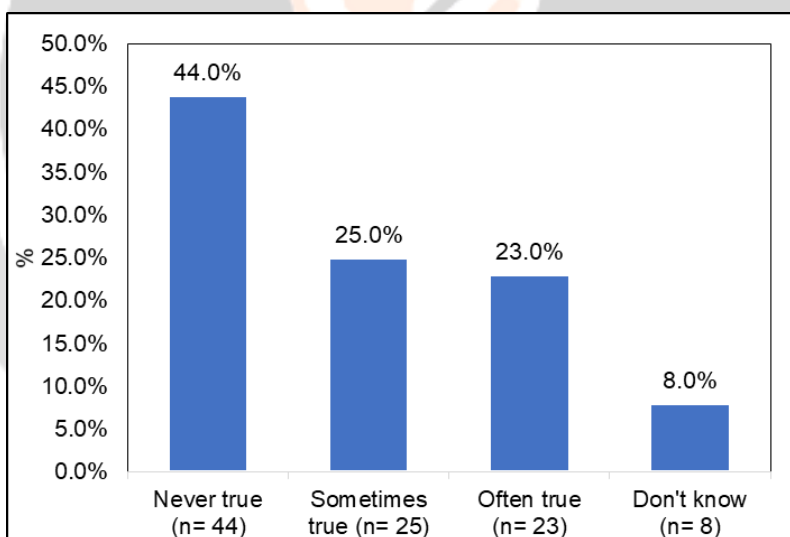
**SECTION 3: FOOD SECURITY**

**Q.1) “The last food that we bought just didn’t last and we didn’t have money to get more”?**

**Table 3.12: Unavailability of food due to money (n= 100)**

	<i>No.</i>	<i>%</i>
• Never true	44	44.0%
• Sometimes true	25	25.0%
• Often true	23	23.0%
• Don’t know	8	8.0%
<b>Total</b>	<b>100</b>	

*No.: No of count*



**Chart-11: Unavailability of food due to money (n=100)**

Table 3.12 and Chart 11 illustrates the frequency of food unavailability due to financial constraints among a sample of 100 individuals:

44% of respondents report that they never experience food unavailability because of financial limitations, 25% of respondents indicate that this situation occasionally occurs for them, 23% of respondents state that they frequently encounter food unavailability due to financial constraints whereas 8% of respondents express uncertainty regarding this matter.

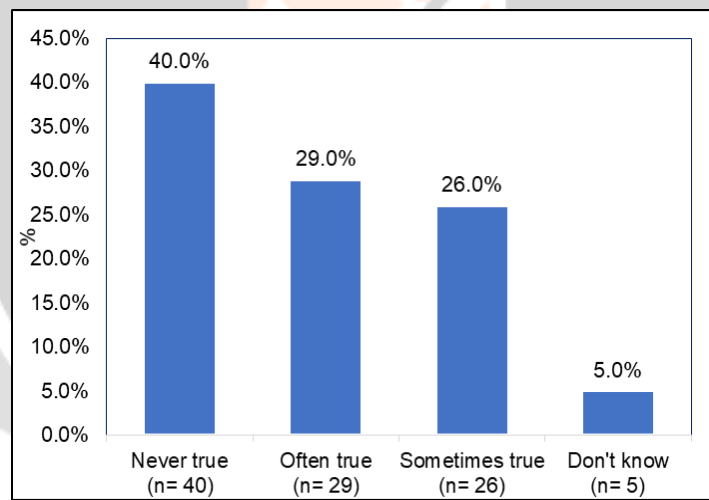
This table provides insights into how frequently individuals in the sample face challenges accessing food due to financial constraints.

**Q.2) “We couldn’t afford to eat balanced meals”.**

**Table 3.13: Unable to afford balanced meals (n=100)**

	<i>No.</i>	<i>%</i>
• Never true	40	40.0%
• Often true	29	29.0%
• Sometimes true	26	26.0%
• Don't know	5	5.0%
<b>Total</b>	<b>100</b>	

*No.: No of count*



**Chart-12: Unable to afford balanced meals (n=100)**

Table 3.13 and Chart 12 outlines the frequency of being unable to afford balanced meals among a sample of 100 individuals:

40% of respondents state that they never experience the inability to afford balanced meals, 29% of respondent’s report that this situation frequently occurs for them, 26% of respondents indicate that they occasionally face difficulty affording balanced meals whereas 5% of respondents express uncertainty regarding this matter.

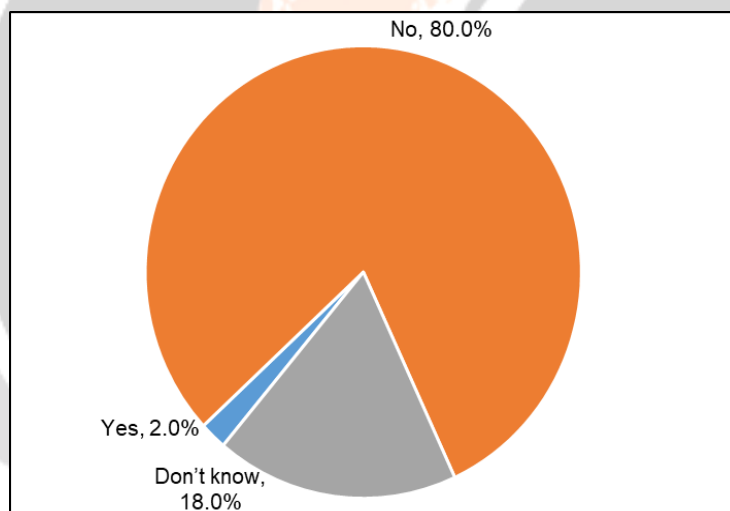
This table offers insights into how often individuals in the sample struggle to afford balanced meals, reflecting challenges related to financial constraints and access to nutritious food options.

**Q3) In the last 30 days, did you and children in your household ever cut the size of the meals or skip meals because there wasn't enough money for food?**

**Table 3.14: Insufficient meals due to not enough money (n=100)**

	<i>No.</i>	<i>%</i>
• Yes	2	2.0%
• No	80	80.0%
• Don't know	18	18.0%
<b>Total</b>	<b>100</b>	
<b>If yes, no. of days</b>	<i>No.</i>	<i>%</i>
• 7 Days	1	1.0%
• 15 Days	1	1.0%
• NA	98	98.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-13:** Insufficient meals due to not enough money (n=100)

Table 3.14 and Chart 13 presents data on the insufficiency of meals due to financial constraints among a sample of 100 individuals: 2% of respondents acknowledge cutting the size of meals or skipping meals for themselves and their children because of financial constraints. Whereas, the majority, comprising 80% of respondents, indicate that they did not reduce meal sizes or skip meals due to lack of money for food and 18% of respondents express uncertainty about whether they reduced meal sizes or skipped meals due to financial constraints.

Among those who answered "Yes" to experiencing insufficient meals, the breakdown of the number of days affected is as follows: (Table 3.14)

- 1% report experiencing insufficient meals for 7 days.
- 1% report experiencing insufficient meals for 15 days.
- 98% of respondents are not applicable for this question as they do not face this issue or are uncertain about whether they experience insufficient meals due to financial constraints.

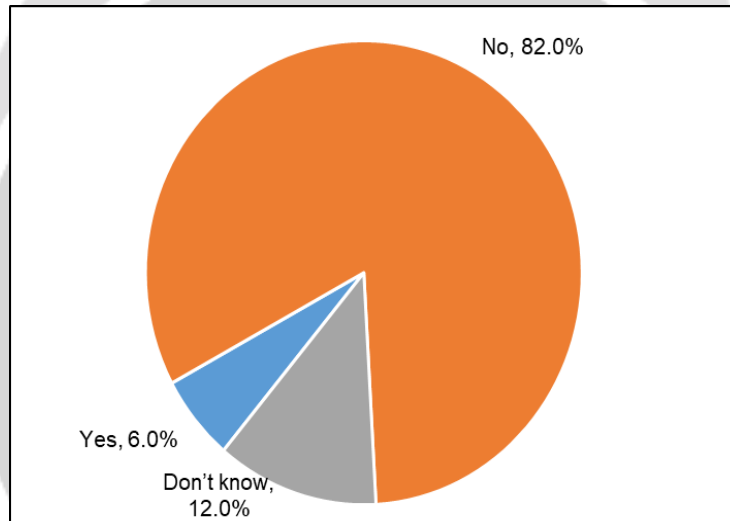
This table provides insights into the prevalence of insufficient meals due to financial constraints among individuals in the sample and the frequency of such occurrences.

**Q4) In the last 30 days, was your child hungry but didn't eat because there wasn't enough money for food?**

**Table 3.15: Insufficient money to feed children in last 30 days (n=100)**

	<i>No.</i>	<i>%</i>
• Yes	6	6.0%
• No	82	82.0%
• Don't know	12	12.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-14:** Insufficient money to feed children in last 30 days (n=100)

Table 3.15 and Chart 14 summarizes responses from a sample of 100 individuals:

6% of respondents indicate that their children experienced hunger but couldn't eat due to insufficient money for food. The majority, comprising 82% of respondents, report that their children did not experience this situation. 12% of respondents express uncertainty regarding whether their children faced hunger due to insufficient funds for food in the last 30 days.

This table offers insights into the prevalence of child hunger attributed to financial constraints among individuals in the sample over the specified time frame.



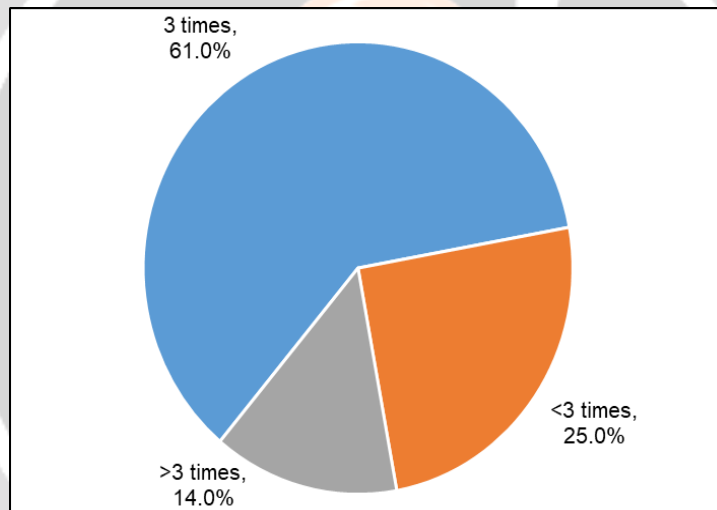
**SECTION 4: DIETARY HABIT**

**Q1) Dietary Intake (meals)/ day.**

**Table 3.16: Dietary intake per day (n=100)**

	<i>No.</i>	<i>%</i>
• 3 times	61	61.0%
• <3 times	25	25.0%
• >3 times	14	14.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-15:** Dietary intake per day (n=100)

Table 3.16 and Chart 15 outlines the frequency of dietary intake per day among a sample of 100 individuals:

61% of respondents report consuming meals three times a day, 25% of respondents indicate consuming meals less than three times a day, 14% of respondents report consuming meals more than three times a day.

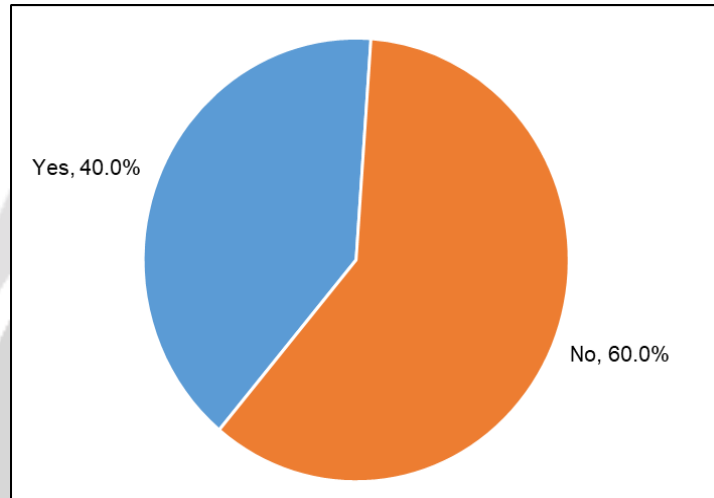
This table provides insights into the dietary habits of individuals within the sample, indicating the frequency of meal consumption per day.

**Q2) Have you started giving your child weaning foods from 6 months of age?**

**Table 3.17: Children having weaning food from 6 months of age (n=100)**

	<i>No.</i>	<i>%</i>
• Yes	40	40.0%
• No	60	60.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-16:** Children having weaning food from 6 months of age (n=100)

Table 3.17 and Chart 16 displays the proportion of children who have been consuming weaning food since the age of 6 months within a sample of 100:

40% of children have been consuming weaning food since they were 6 months old. The majority, accounting for 60% of children, have not been consuming weaning food since this age.

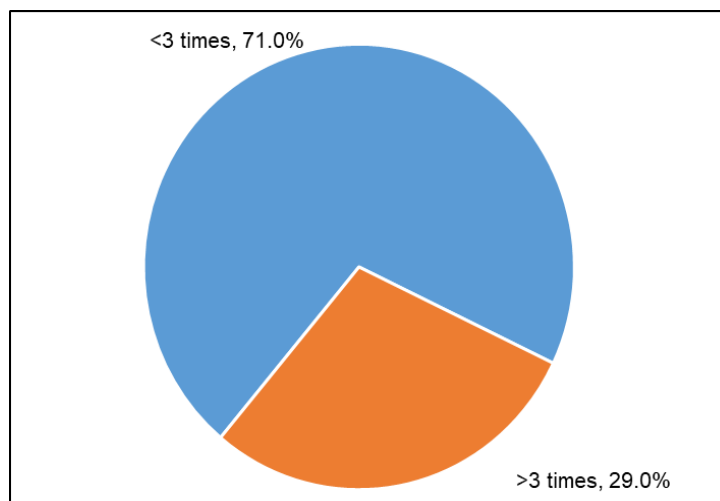
This table provides insights into the prevalence of introducing weaning food to children at the age of 6 months within the sample.

**Q3) Complementary feeding/ day (Weaning Foods)?**

**Table 3.18: Complementary feeding/ day of children (n= 100)**

	<i>No.</i>	<i>%</i>
• <3 times	71	71.0%
• >3 times	29	29.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-17:** Complementary feeding/ day of children (n= 100)

Table 3.18 and Chart 17 presents data on the frequency of complementary feeding per day among a sample of 100 children: 71% of children receive complementary feeding less than three times a day. Whereas, 29% of children receive complementary feeding more than three times a day.

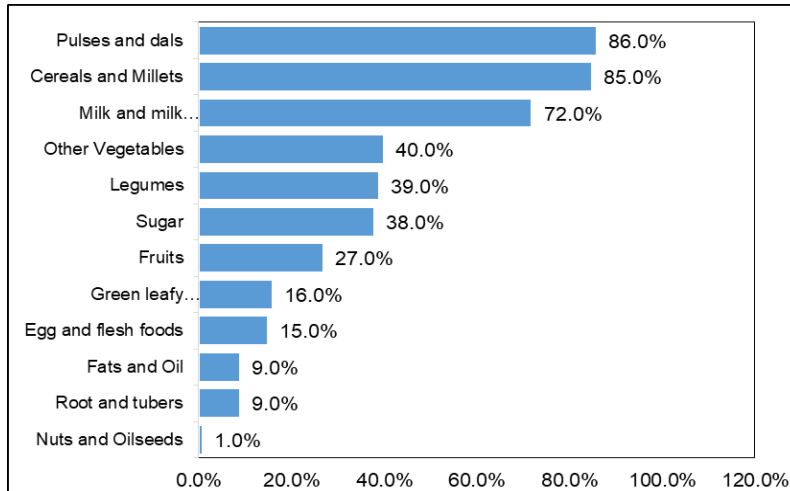
This table provides insights into the frequency of complementary feeding practices among children within the sample.

#### Q4) Dietary Diversity Score (DDS)?

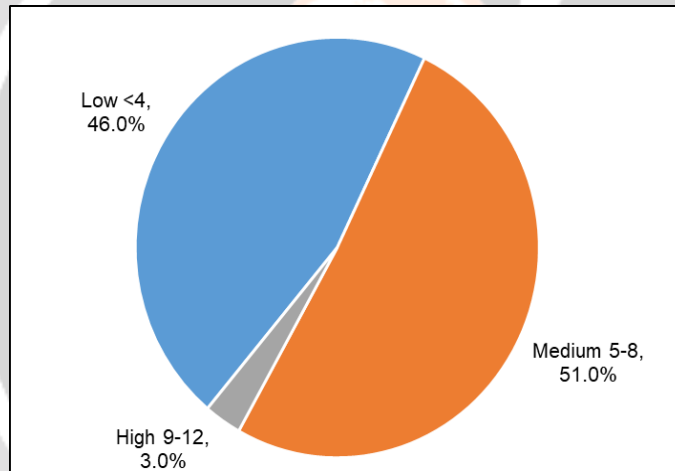
**Table 3.19: Dietary Diversity Score of children (n= 100)**

	No.	%
<b>Dietary Diversity Score</b>		
• Low <4	46	46.0%
• Medium 5-8	51	51.0%
• High 9-12	3	3.0%
<b>Total</b>	<b>100</b>	
• Pulses and dals	86	86.0%
• Cereals and Millets	85	85.0%
• Milk and milk products	72	72.0%
• Other Vegetables	40	40.0%
• Legumes	39	39.0%
• Sugar	38	38.0%
• Fruits	27	27.0%
• Green leafy vegetable	16	16.0%
• Egg and flesh foods	15	15.0%
• Root and tubers	9	9.0%
• Fats and Oil	9	9.0%
• Nuts and Oilseeds	1	1.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart-18:** Dietary Diversity Score of children (n= 100)



**Chart-19:** % of dietary diversity score of children (n= 100)

Table 3.19 and Chart 19 presents the distribution of dietary diversity scores among 100 children, with 46% classified as having a low score (<4), 51% with a medium score (5-8), and only 3% with a high score (9-12).

Table 3.19 and Chart 18 provides insight into the dietary diversity of 100 children, indicating the percentage of children consuming various food groups. The most commonly consumed food groups include pulses and dals (86%), cereals and millets (85%), and milk and milk products (72%). However, consumption of fruits (27%), green leafy vegetables (16%), and egg and flesh foods (15%) appears to be comparatively lower. Furthermore, a smaller proportion of children consume other vegetables (40%), legumes (39%), and sugar (38%). Root and tubers and fats and oil are consumed by only 9% each, while the consumption of nuts and oilseeds is notably low at 1%.

This distribution underscores a need for interventions promoting a more diverse diet among children, ensuring adequate intake of essential nutrients for optimal growth and development. Efforts to increase the consumption of fruits, vegetables, and protein-rich foods like eggs and flesh foods could contribute to improving the overall nutritional status of these children.

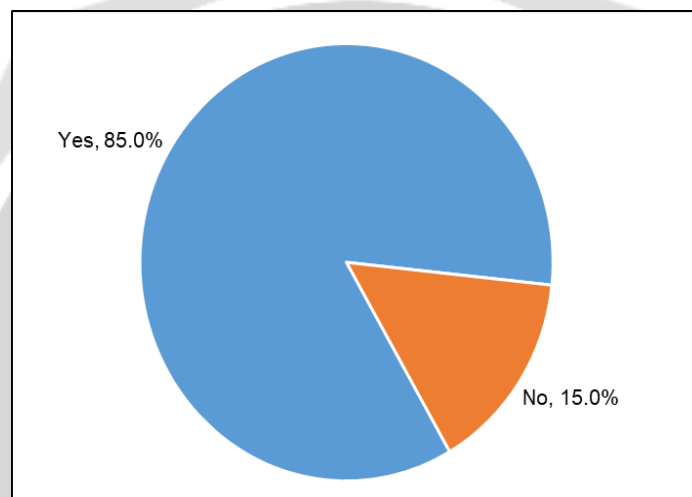
**Q5) Feeding History**

**a) Has colostrum been given to the child?**

**Table 3.20: Colostrum feeding history of children (n= 100)**

	<i>No.</i>	<i>%</i>
• Yes	85	85.0%
• No	15	15.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart-20:** Colostrum feeding history of children (n= 100)

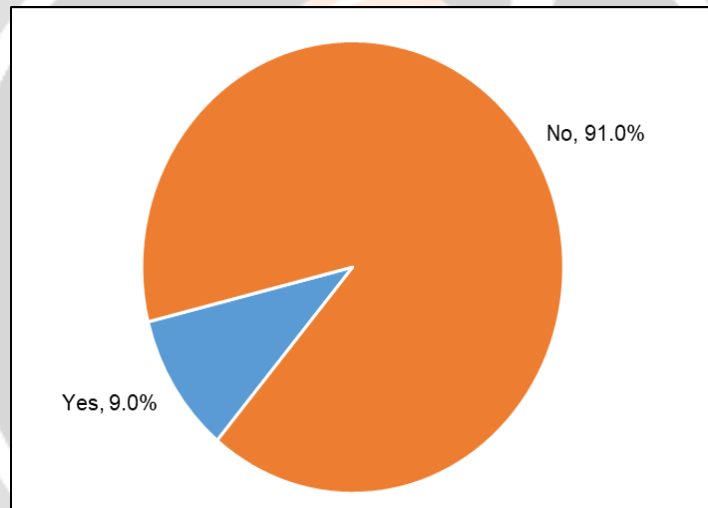
Table 3.20 and Chart 20 illustrates the colostrum feeding history of 100 children, revealing that 85% of them were fed colostrum, while 15% were not. This indicates a relatively high rate of colostrum feeding among the studied population. Colostrum, the initial breast milk produced by the mother after childbirth, is rich in essential nutrients and antibodies crucial for the newborn's health and immune system development. The high percentage of children who received colostrum suggests a positive trend in early feeding practices within the community, potentially contributing to the overall well-being and resilience of the children against infections and diseases.

**b) Is your child currently on breastfeed?**

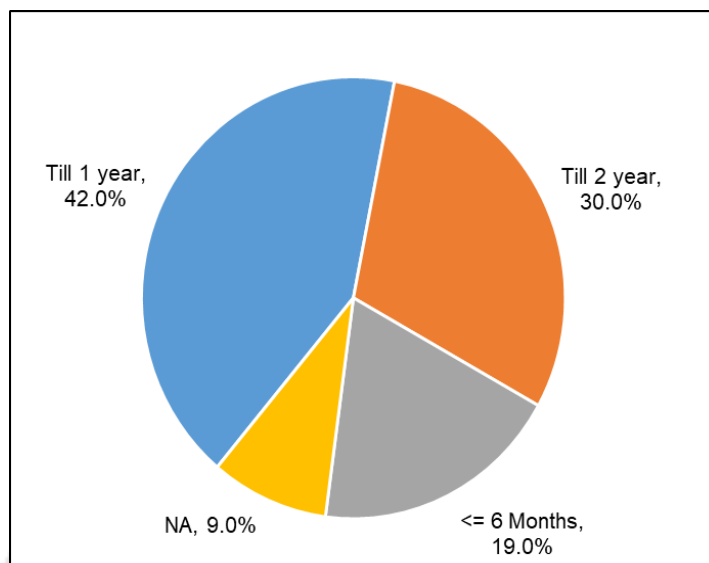
**Table 3.21: Breastfeeding Status of children (n= 100)**

	<i>No.</i>	<i>%</i>
• Yes	9	9.0%
• No	91	91.0%
<b>Total</b>	<b>100</b>	
<i>Duration of Breastfeeding (If No)</i>		
• Till 1 year	42	42.0%
• Till 2 years	30	30.0%
• <= 6 Months	19	19.0%
• NA	9	9.0%
<b>Total</b>	<b>100</b>	

*No.: No of count*



**Chart-21: Breastfeeding Status of children (n= 100)**



**Chart 1:** Duration of breastfeeding in Children (n= 100)

Table 3.21 and Chart 21 provides insights into the breastfeeding status of children among a sample of 100 children. Among them, 9% reported that their child is currently on breastfeed, while the majority, constituting 91%, indicated that their child is not.

Table 3.21 and Chart 22 provides insight for those whose children are not currently breastfeeding, the duration of breastfeeding varied: 42% breastfed their child until 1 year of age, 30% breastfed until 2 years of age, and 19% breastfed for less than or equal to 6 months. Additionally, 9% of children are not applicable for this question as they are currently on breastfeed.

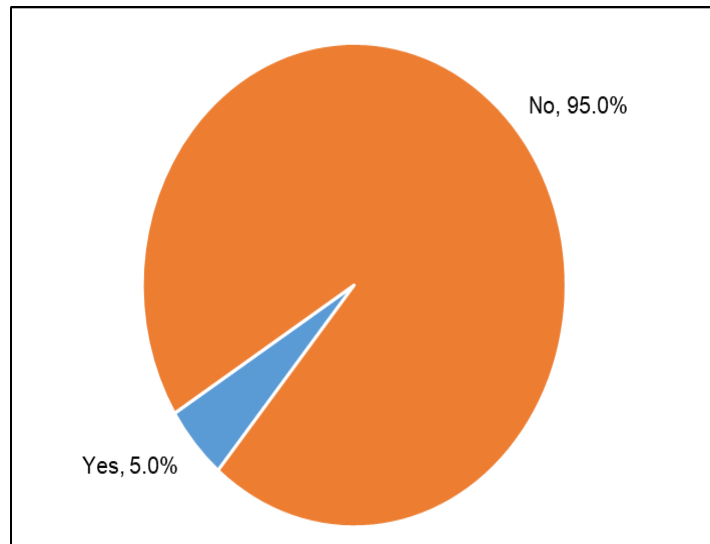
These findings underscore the prevalence of breastfeeding cessation among the surveyed population and highlight the variability in the duration of breastfeeding among those who stopped. It also suggests a potential need for interventions to support and promote sustained breastfeeding practices, considering its numerous health benefits for both the child and the mother.

**c) Is your child currently on artificial milk?**

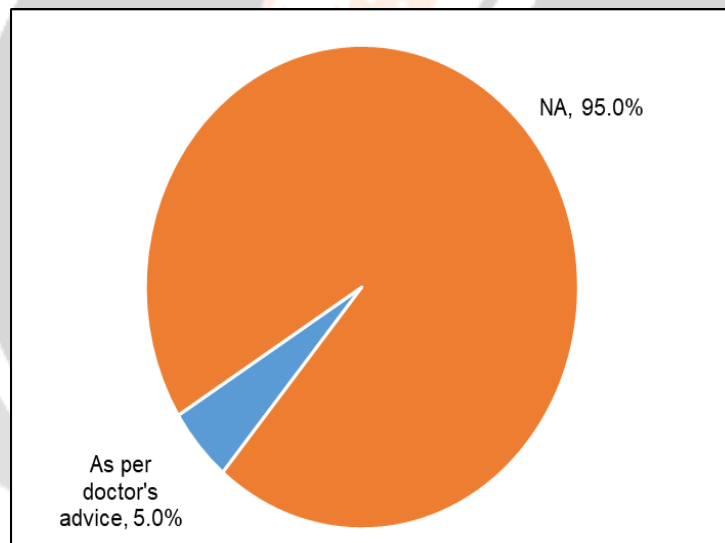
**Table 3.22: Artificial milk feeding status of children (n= 100)**

	No.	%
• Yes	5	5.0%
• No	95	95.0%
<b>Total</b>	<b>100</b>	
<b>If yes, state the reason</b>		
• As per doctor's advice	5	5.0%
• NA	95	95.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart 2:** Artificial milk feeding status of children (n= 100)



**Chart 3:** Reason for artificial milk feeding in children (n= 100)

Table 3.22 and Chart 23 presents data on the artificial milk feeding status of 100 children, revealing that 5% of them were fed artificial milk, while the majority (95%) were not.

Table 3.22 and Chart 24 data states that among those who were fed artificial milk, the reason for doing so was reported as per doctor's advice for all cases. However, the majority of respondents (95%) are not applicable for this question as they are not fed by artificial milk.

This data suggests a relatively low prevalence of artificial milk feeding among the studied population, with medical advice being the primary determinant for those who opted for it.



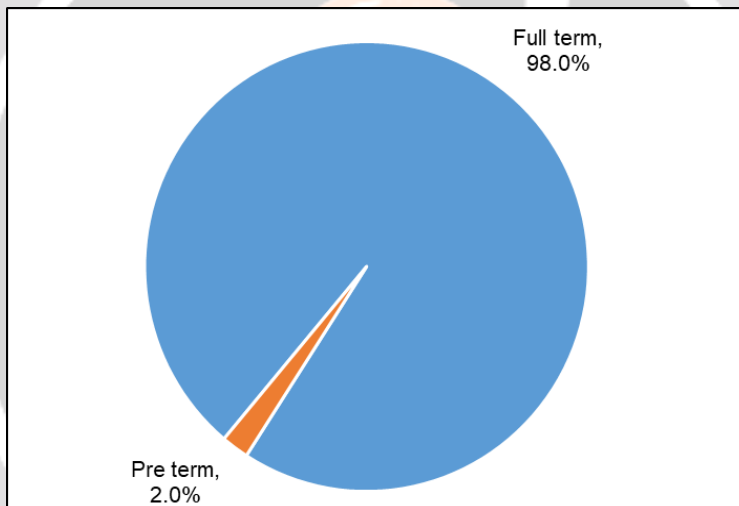
**SECTION 5: CHILD HEALTH STATUS**

**Q1) Birth history status:**

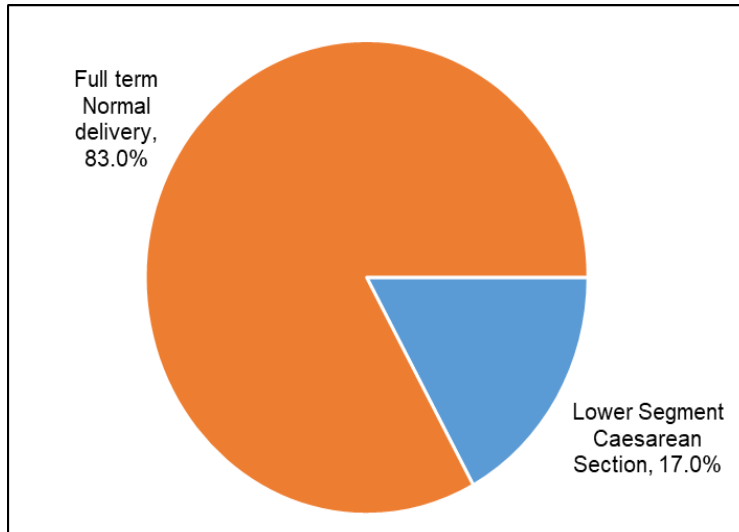
**Table 3.23: Birth history status of children (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Birth history</b>		
• Full term	98	98.0%
• Preterm	2	2.0%
<b>Total</b>	<b>100</b>	
<b>Delivery pattern</b>		
• Lower Segment Caesarean Section	17	17.0%
• Full term Normal delivery	83	83.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart 4: Birth history status of children (n= 100)**



**Chart 5:** Delivery pattern in children (n= 100)

Table 3.23 and Chart 25 provides insights into the birth history status of 100 children. It indicates that the majority (98%) of children were born full term, while a small percentage (2%) were born preterm.

Table 3.23 and Chart 26 states regarding the delivery pattern, 17% of the children were delivered via lower segment caesarean section (LSCS), while the majority (83%) were born through full-term normal delivery.

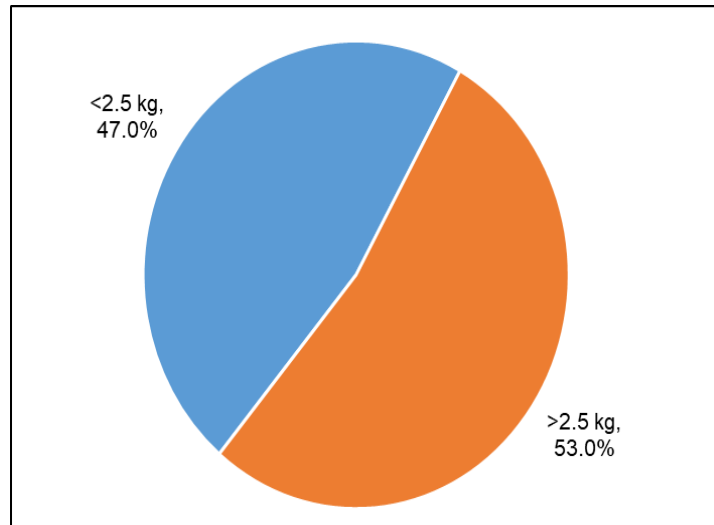
These findings suggest a predominantly favorable birth history among the studied population, with a high proportion of full-term births and normal delivery, albeit with a notable proportion undergoing LSCS. Understanding birth history status is crucial for assessing potential risk factors and informing strategies for maternal and child health care.

**Q2) Birth weight of child:**

**Table 3.24: Birth weight status of children (n= 100)**

	No.	%
<b>Birth weight</b>		
• <2.5 kg	47	47.0%
• >2.5 kg	53	53.0%
<b>Total</b>	<b>100</b>	

No.: No of count



**Chart 6:** Birth weight status of children (n= 100)

Table 3.24 and Chart 27 presents data on the birth weight status of 100 children. It shows that 47% of the children had a birth weight of less than 2.5 kg, while 53% had a birth weight greater than 2.5 kg. This distribution suggests a relatively balanced distribution of birth weights among the studied population, with a slight majority of children being born with a birth weight above 2.5 kg.

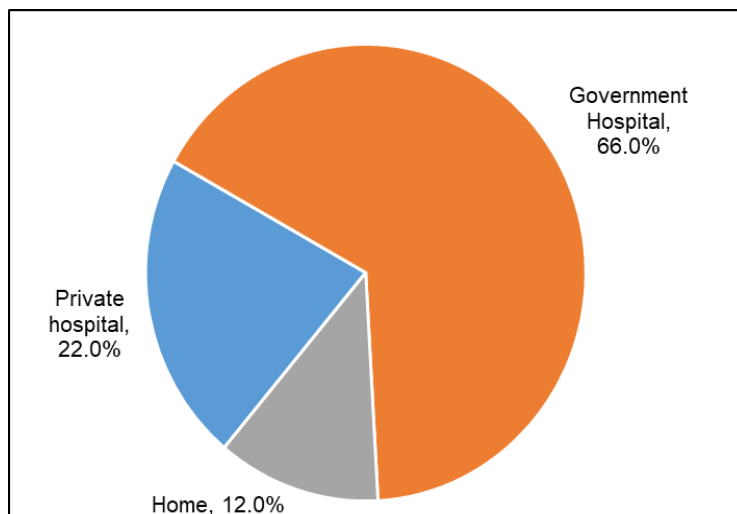
Birth weight is an important indicator of newborn health and development, and monitoring it is crucial for identifying infants at risk of health complications and ensuring appropriate care and interventions.

**Q3) Place of delivery:**

**Table 3.25: Delivery place of children (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Delivery place</b>		
• Private hospital	22	22.0%
• Government Hospital	66	66.0%
• Home	12	12.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart 7:** Delivery place of children (n= 100)

Table 3.25 and Chart 28 illustrates the delivery places of 100 children. It reveals that the majority of deliveries, accounting for 66%, took place in government hospitals, followed by 22% in private hospitals, and 12% at home.

These findings indicate a significant reliance on government healthcare facilities for childbirth among the surveyed population, potentially reflecting accessibility, affordability, or trust in the quality of care provided by government hospitals. However, a notable proportion of deliveries also occurred in private hospitals, suggesting varying preferences or access to healthcare services among the respondents. Additionally, a small percentage of deliveries occurred at home, highlighting the continued practice of home births in the community.

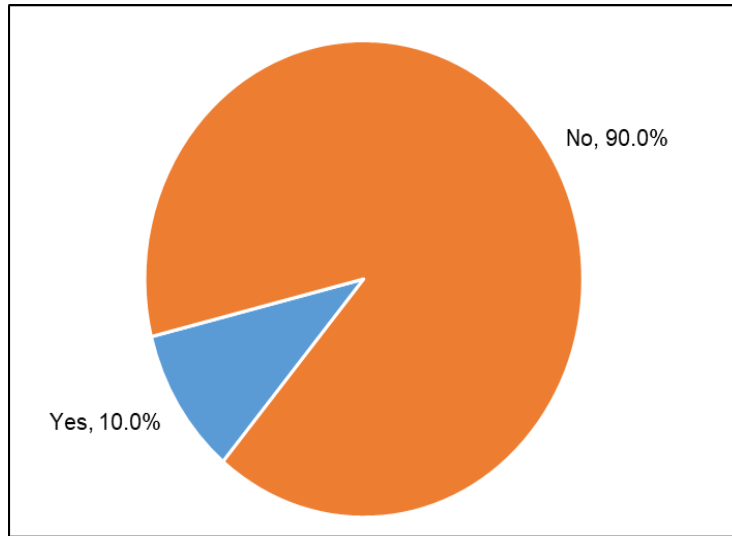
Understanding the distribution of delivery places is essential for assessing healthcare utilization patterns and informing strategies to improve maternal and child health services.

**Q4) Does child suffer from diarrhea frequently?**

**Table 3.26: History of diarrhea in children (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Diarrhea status</b>		
• Yes	10	10.0%
• No	90	90.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart 8:** History of diarrhea in children (n= 100)

Table 3.26 and Chart 29 indicates the frequency of diarrhea among children in the sample. Out of 100 children, 10% experience diarrhea frequently, while the majority, comprising 90%, do not.

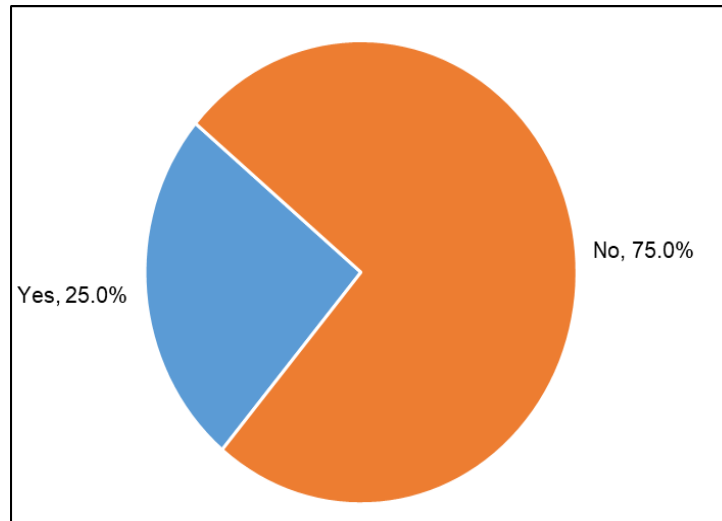
This data suggests that while a portion of children does suffer from diarrhea, it is not a prevalent issue among the majority of the surveyed population. Understanding the prevalence of diarrhea is crucial for implementing appropriate interventions to prevent and manage this common childhood illness, which can have significant implications for child health and well-being.

**Q5) Infectious disease in previous month?**

**Table 3.27: History of infectious disease in children (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Infectious disease status</b>		
• Yes	25	25.0%
• No	75	75.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart 9:** History of infectious disease in children (n= 100)

Table 3.27 and Chart 30 provides insights into the occurrence of infectious diseases among children within the previous month. Out of 100 children surveyed, 25% experienced an infectious disease, while 75% did not.

This data suggests that a significant portion of the surveyed children had encountered infectious illnesses within the past month. Understanding the prevalence of infectious diseases is crucial for implementing preventive measures and providing timely medical interventions to mitigate their impact on child health and well-being.

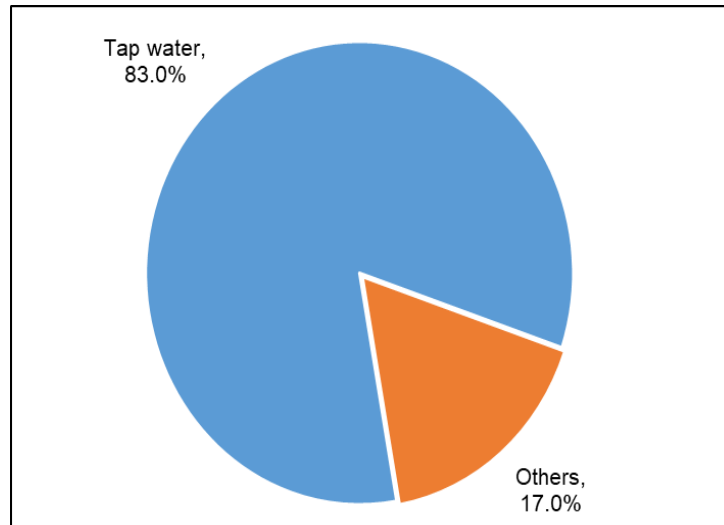
**SECTION 6: ENVIRONMENTAL FACTOR**

**Q1) Source of water:**

**Table 3.28: Source of water consumed by children (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Source of water</b>		
• Tap water	83	83.0%
• Others	17	17.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart 10:** Source of water consumed by children (n= 100)

Table 3.28 and Chart 31 presents data on the sources of water consumed by 100 children. It indicates that the majority, accounting for 83%, consume tap water, while 17% use other sources of water.

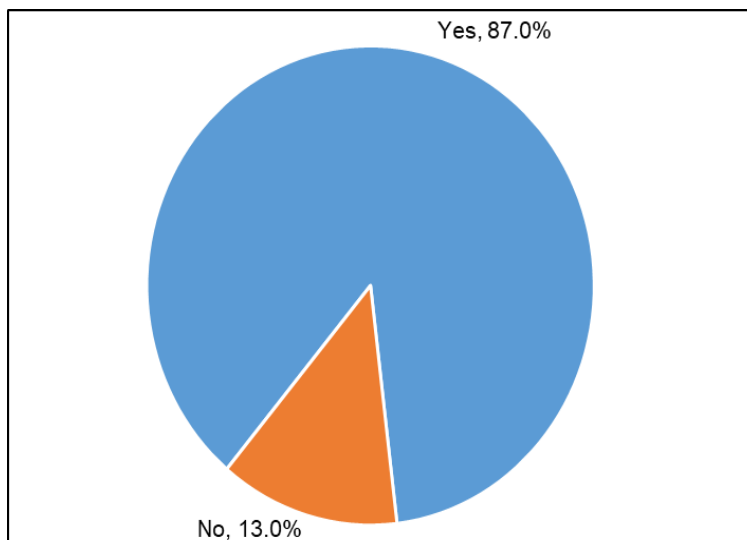
Understanding the sources of water consumed is crucial for assessing potential risks to child health and informing interventions to ensure access to safe and clean drinking water for all children.

**Q2) Presence of hygienic latrine at home:**

**Table 3.29: Presence of hygienic latrine status at home (n= 100)**

	No.	%
<b>Hygienic latrine status</b>		
• Yes	87	87.0%
• No	13	13.0%
<b>Total</b>	<b>100</b>	

*No.: No of count*



**Chart 11:** Presence of hygienic latrine status at home (n= 100)

Table 3.29 and Chart 32 provides insights into the presence of hygienic latrines in the homes of 100 Children. It indicates that 87% of the surveyed households have hygienic latrines, while 13% do not.

Access to hygienic sanitation facilities is crucial for maintaining public health and preventing the spread of diseases, particularly diarrheal diseases and infections transmitted through fecal-oral routes.

The high percentage of households with hygienic latrines suggests a positive trend in sanitation infrastructure within the community, potentially contributing to improved hygiene practices and overall public health outcomes. However, efforts may be needed to address the needs of households without access to such facilities to ensure equitable access to safe sanitation for all members of the community.

## SECTION 7: MATERNAL HEALTH

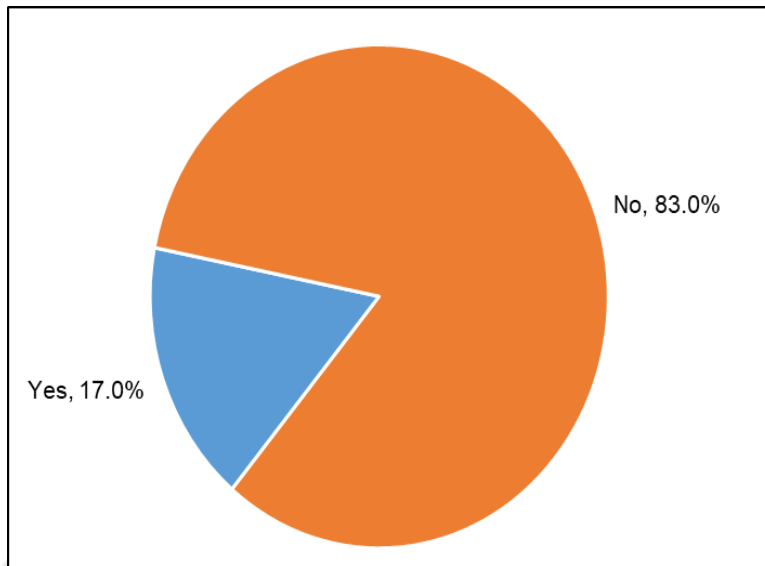
### Q1) Repetitive pregnancy:

**Table 3.30: Repetitive pregnancy status (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Repetitive pregnancy</b>		
• Yes	17	17.0%
• No	83	83.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count





**Chart 12:** Repetitive pregnancy status (n= 100)

Table 3.30 and Chart 33 presents data on repetitive pregnancy among 100 mothers of the children. It shows that 17% of the mothers experienced repetitive pregnancies, while the majority, comprising 83%, did not.

Repetitive pregnancies, particularly when they occur in quick succession, can pose risks to maternal and child health, including increased likelihood of maternal and neonatal complications.

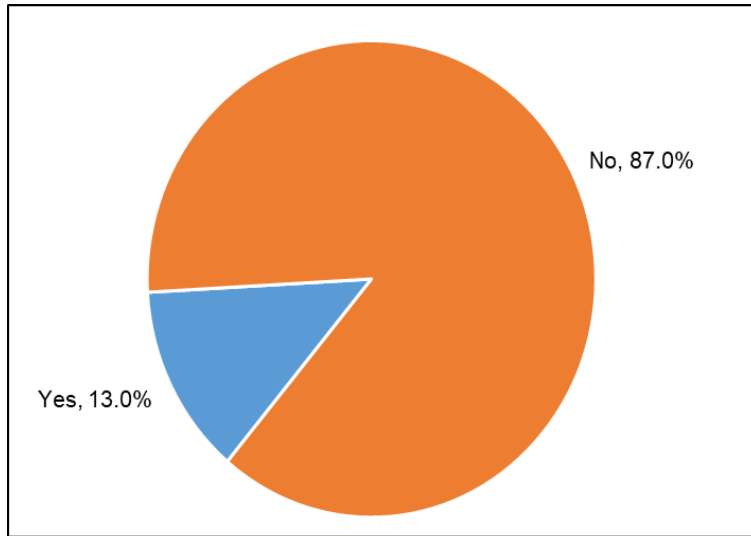
Understanding the prevalence of repetitive pregnancies is essential for implementing interventions aimed at promoting family planning, maternal health, and child well-being.

**Q2) Maternal hyperemesis in pregnancy:**

**Table 3.31: Maternal hyperemesis status in pregnancy (n= 100)**

	<i>No.</i>	<i>%</i>
<b>Hyperemesis status</b>		
• Yes	13	13.0%
• No	87	87.0%
<b>Total</b>	<b>100</b>	

*No.:* No of count



**Chart 13:** Maternal hyperemesis status in pregnancy (n= 100)

Table 3.31 and Chart 34 presents data on maternal hyperemesis during pregnancy among 100 mothers of children. It indicates that 13% of the mothers experienced hyperemesis during pregnancy, while the majority, accounting for 87%, did not.

Hyperemesis gravidarum is a severe form of nausea and vomiting during pregnancy that can lead to dehydration and weight loss. Understanding the prevalence of hyperemesis is important for identifying women at risk and providing appropriate medical care and support during pregnancy.

#### 4. CONCLUSIONS

In summary, the findings of this study provide a comprehensive understanding of the multifaceted nature of malnutrition among children aged 6-60 months in Mumbra, Thane district. The data revealed a complex interplay of various factors, including dietary habits, socioeconomic status, maternal and child health, food security, and environmental conditions, all of which contribute to the prevalence of malnutrition. The prevalence rates of stunting, underweight, moderate and severe acute malnutrition underscore the severity of the issue and highlight the urgent need for intervention.

One of the significant challenges identified is food insecurity, with a notable percentage of families facing frequent or occasional food unavailability due to financial constraints. Additionally, the study uncovered suboptimal dietary practices, including low dietary diversity and inadequate consumption of nutrient-rich foods like fruits, vegetables and protein-rich foods. Breastfeeding practices, while generally positive, also revealed areas for improvement, particularly in terms of duration and exclusivity.

Despite these challenges, the study also identified several positive indicators, such as relatively good health and hygiene practices among households and positive maternal health behaviors. However, the prevalence of repetitive pregnancies and hyperemesis gravidarum among mothers highlights the need for enhanced maternal care and family planning services.

In conclusion, the findings underscore the necessity of implementing comprehensive interventions addressing the various determinants of malnutrition. These interventions should focus on improving dietary diversity, ensuring food security, promoting optimal breastfeeding practices, enhancing maternal and child health services, and improving environmental conditions. By addressing these factors holistically, policymakers and healthcare professionals can work towards reducing the prevalence of malnutrition and improving the overall well-being of children in the community.

#### 5. ACKNOWLEDGEMENT

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On a personal note, I would like to thank my family, especially my parents, for their unconditional love and support. Their belief in me has been a constant source of motivation. Lastly, I would like to express my heartfelt appreciation to all the participants and individuals who contributed to this research in various ways. Your cooperation and support were crucial to the completion of this thesis.

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