PARENTAL FEEDING STYLES AND DIETARY QUALITY OF COMPLEMENTARY FOODS AMONG 6-24 MONTHS CHILDREN IN URBAN BLOCK OF VADODARA

April 2025

Heer Desai

B.Sc. (F.C.Sc) (Dietetics)

PARENTAL FEEDING STYLES AND DIETARY QUALITY OF COMPLEMENTARY FOODS AMONG 6-24 MONTHS CHILDREN IN URBAN BLOCK OF VADODARA

A dissertation in partial fulfilment of the requirement for the

Degree of Master of Science

Family and Community Sciences
Foods and Nutrition

(PUBLIC HEALTH NUTRITION)

By

Heer Desai

Department of Foods and Nutrition

Faculty of Family and Community Sciences

The Maharaja Sayajirao University of Baroda

Vadodara, Gujarat, India

APRIL 2025

CERTIFICATE

This is to certify that the research work present in this thesis has been carried out solely by Ms. Heer Desai, under the guidance of Dr. Shweta Patel in pursuit of degree of Master of Science (Family and Community Sciences) with major in Foods and Nutrition (Public Health Nutrition) and this is her original work.

Dr. Shweta Patel
(Research Guide)

I/c Head, Department of Foods and Nutrition
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda
Vadodara, Gujarat, India

Dated: 08/04/2025

ACKNOWLEDGEMENTS

With immense gratitude and reverence, I first and foremost extend my heartfelt thanks to the supreme, whose divine blessings, guidance, and infinite grace have provided me with the strength, resilience, and wisdom to embark upon this scholarly journey and see it through to completion.

This dissertation would not have been possible without the unwavering support, mentorship, and encouragement of my esteemed guide, ***Dr. Shweta Patel****. Throughout this journey, she has been more than just a mentor—she has been my teacher, motivator, role model, and an unfailing pillar of support. Her invaluable insights, thoughtful guidance, and profound dedication to academia have not only refined my research but have also inspired me to pursue excellence with passion and determination. Her meticulous attention to detail, keen observations, and unique way of working have been truly enlightening. Words cannot fully express my gratitude for her belief in my abilities and her continuous encouragement, which have been instrumental in shaping both my research and my personal growth.*

I also extend deep gratitude to ***Dr. Shruti Kantawala*** *for her vast knowledge and inspiring guidance through the complexities of this dissertation. Her problem-solving skills, patience, and unwavering support were invaluable in overcoming challenges and refining my work. I deeply appreciate the autonomy and creative freedom provided by both Dr. Patel and Dr. Kantawala, which broadened my perspective and helped me evolve as a researcher and individual.*

I would like to extend my sincere appreciation to ***Prof. Mini Sheth****, former I/c Head of the Department of Foods and Nutrition, for providing the necessary facilities to carry out my research. I would also like to sincerely thank* ***Prof. Anjali Pahad****, Dean of the Faculty of Family and Community Sciences, for her continuous support, which greatly facilitated our research work.*

In addition, I would like to express my sincere gratitude to all the ***parents and children*** *who generously gave their time and consent to participate in this study. Their willingness to share experiences and insights was invaluable and this greatly contributed to the success of this research.*

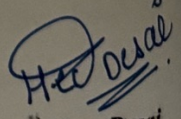
Furthermore, I would like to express my deepest gratitude to my classmates and co-thesis partners, ***Nidhi and Sarthi****, Over the past six months, we have shared an incredible journey—one filled with challenges, learning, and countless cherished memories. Their unwavering support, teamwork, and understanding have made this research journey not only easier but also immensely fulfilling. Collaborating with them has not only helped us navigate complex problems but has also taught me the importance of patience, adaptability, and valuing different perspectives.*

I am extremely thankful to ***my parents,*** *who have been my pillars of strength throughout this journey. Their support, constant prayers, and encouragement have guided me through every challenge, helping me stay focused and determined. Whenever I found myself stuck or disheartened, their motivation and positive attitude uplifted me, reminding me to persevere and work diligently toward my goals. Their love and belief in me have been the foundation of my success, and for that, I am forever grateful.*

A very special mention goes to ***my grandmother****, who has been my greatest source of comfort and love throughout this journey. Her presence by my side gave me a sense of security and peace, allowing me to concentrate fully on my work without any worries.*

I am also deeply indebted to ***my friends****, who have stood by me through thick and thin. Their constant presence, encouragement, and ability to listen to my endless concerns have been invaluable. Whether it was offering words of reassurance, pushing me to do better, or simply being there to share a moment of laughter, their support has made this journey far more bearable and meaningful. I am incredibly grateful to have friends who believed in me, motivated me, and reminded me of my potential when I needed it the most.*

This journey has been one of immense learning and personal growth, and I am truly fortunate to have had the guidance, support, and encouragement of such remarkable individuals. To each and every one who has contributed to these endeavours in ways both big and small, I extend my heartfelt gratitude.



-Heer Desai

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BAZ- Body Mass Index for Age Z Score

CF-Complementary Feeding

CNNS- Comprehensive National Nutrition Survey

DBM- Double Burden of Malnutrition

DDS- Dietary Diversity Score

DQQ- Diet Quality Questionnaire

EBF- Exclusive Breastfeeding

EBI- Early Initiation of Breastfeeding

FFQ- Food Frequency Questionnaire

FPSQ- Feeding Practices and Structure Questionnaire

HAZ- Height for Age Z Score

IECHR- Institutional Ethics Committee for Human Research

IMR- Infant Mortality Rate

IYCF- Infant and Young Child Feeding

KAP- Knowledge, Attitude and Practices

LMICs- Low- And Middle-Income Countries

MAD- Minimum Acceptable Diet

MDD- Minimum Dietary Diversity

MMF- Minimum Meal Frequency

NFHS- National Family Health Survey

SAM- Severe Acute Malnutrition

SES- Socio-Economic Status

TBM- Triple Burden of Malnutrition

UNICEF- United Nations Children's Fund

WAZ- Weight for Age Z scores

WHO- World Health Organization

WHZ- Weight for Height Z scores

ABSTRACT

Childhood is an important phase of life. Optimal child feeding and caring practices are crucial for laying a strong foundation of life. Suboptimal Infant and Young Child Feeding (IYCF) practices significantly elevate the risk of malnutrition in young children. Parental feeding style influences the food choices, eating habits as well as nutritional status of children. Researches in parental feeding style is needed to understand the prevalent practices. In view of this, current study was conducted in Urban Vadodara to assess the parental feeding styles and dietary quality of complementary foods among 6-24 months children. The study was conducted through community based cross sectional study using snowball technique on 262 parents. Data on socio-economic status, anthropometric data, KAP of parents on complementary feeding, dietary quality through DQQ & FFQ and parental feeding styles were collected using Epi-collect5 v 86.2.1 software.

The findings revealed significant differences in IYCF knowledge between mothers and fathers. A higher proportion of mothers (66.0%) correctly identified the appropriate time for complementary feeding initiation (after 6 months) compared to fathers (43.9%). Fathers were primarily involved in food purchasing (90.5%), while mothers predominantly handled food selection (56.5%), feeding (96.6%), and meal preparation (95.8%). Notably, most mothers (91.6%) reported regularly feeding their child themselves, compared to only 20.2% of fathers.

Exclusive breastfeeding for 6 months was more prevalent in males (74.1%) than females (66.1%). Continued breastfeeding at 12-24 months was slightly higher in females (39.5%) than males (32.2%). Bottle feeding was highly prevalent in both genders (males: 67.4%, females: 65.4%). The frequency of complementary feeding was mostly three to four times a day for the majority of children. Cereals (94.7%) and pulses (84.4%) were the most commonly consumed food groups. Minimum Dietary Diversity (MDD) was met by 42% of participants, and the Minimum Acceptable Diet (MAD) was met by 31.7% and Minimum Meal Frequency MMF was met by 70.2%.

Analysis of parental feeding styles revealed that indulgent (29.8%) and authoritarian (29.4%) styles were most common among mothers, while authoritarian (38.5%) and indulgent (35.9%) styles were most prevalent among fathers. Authoritarian feeding style in mothers significantly increased with the child's age, while indulgent style decreased. A similar trend was observed for fathers.

The relationship between parental feeding styles and children's anthropometric status among mothers showed the highest percentage of children with normal height-for-age was observed in the authoritarian feeding style group (70.1%), while the authoritative group had the lowest (58.5%). Stunting was most frequently observed among children of authoritative mothers (28.3%) and severe stunting was more prevalent in the authoritarian group (16.9%). Underweight prevalence was slightly higher among children with authoritative mothers (20.8%). Risk of overweight was higher among children with uninvolved mothers (14.8%)

Regarding father feeding styles, the highest percentage of children with normal height-for-age was in the authoritarian group (69.3%), and the lowest in the uninvolved group (51.6%). Overall stunting was most prevalent among children with uninvolved fathers (35.5%). Underweight prevalence was slightly higher among children of authoritative fathers (19.4%). The highest proportion of overweight children was observed in the uninvolved group (6.5%), while risk of overweight was most common in the indulgent style (12.8%).

Thus these findings suggest that parental feeding styles play a major role in the nutritional status of children and also highlight the need for improvement in knowledge and practices related to complementary feeding among fathers.

INTRODUCTION

Childhood is an important phase as these are the formative years of life, when a child not only learns new skills but the foundation of lifelong health is also laid in this phase. Providing adequate nutrition and building appropriate eating behaviours during this phase is very crucial. Childhood malnutrition is a major developmental challenge faced by the world, not only due to the high prevalence but also due to the disease burden and increased risk of mortality related to it. Malnutrition is a result of imbalanced nutrient intake as compared to the requirements suggested by the recommended dietary allowances (RDAs). It is further categorised into Undernutrition (resulting from low intake) and Overnutrition (resulting due to high intake). Various forms of malnutrition include underweight, stunting, wasting, overweight-obesity as well as micronutrients i.e. mineral and vitamins deficiency. Malnutrition is a serious problem responsible for approximately half (45%) of all the deaths taking place under five worldwide, with nearly two-thirds of these deaths due to inadequate nutrient intake. Currently, more than 33.33% of malnourished children reside in India. According to data from the National Family Health Survey-5 (NFHS-5 2019-20), the percentage of children who are overweight and suffer from severe malnutrition has slightly increased as compared to NFHS 4 (2015-16) (Sharma et al., 2024). Children under five who are overweight, stunted, or wasted have respective prevalence of 5.7%, 22.0%, and 6.7% worldwide. Africa and Asia are home to the majority of undernourished children (UNICEF, WHO, & The World Bank, 2021). In Southeast Asia, malnutrition is also a serious issue, where about 27.4% of Southeast Asian children under five are stunted, 8.2% are wasted, and 7.5% are overweight, according to the data reported by UNICEF (Herman et al., 2023).

Feeding and child care practices are identified as important determinants of malnutrition among young children. Inadequate nutritional intake, along with compromised hygiene and health care practices during this phase, can lead to malnutrition and childhood illnesses. Inadequate Infant and young child feeding (IYCF) practices are a major reason for malnutrition among researchers. The recommended IYCF practices include early initiation of breastfeeding (EIBF), exclusive breastfeeding (EBF), and initiation of complementary feeding at 6 months of age and continued breastfeeding up to 24 months of age of the child. In addition to this, ensuring minimum dietary diversity (MDD) and minimum meal frequency (MMF) to ensure minimum adequate diet (MAD) is recommended to ensure

diverse nutritional outcomes in this age group. The World Health Organization defined minimum dietary diversity (MDD) as the consumption of four or more food groups from the eight food groups for higher dietary quality and to meet daily energy and nutrient requirements of the eight recommended food groups for children aged 6–23 months. The eight food groups are: 1. breast milk; 2. grains, roots, tubers and plantains; 3. pulses (beans, peas, lentils), nuts and seeds; 4. dairy products (milk, infant formula, yogurt, cheese); 5. flesh foods (meat, fish, poultry, organ meats); 6. eggs; 7. vitamin-A rich fruits and vegetables; and 8. other fruits and vegetables (WHO) .

An effective IYCF intervention enhances the nutritional status of children and reduces the rate of undernutrition significantly at population level. In developing countries, fewer than 25% of children aged 6 to 23 months eat food adequate to meet the demands for nutritional diversity, standardized feeding frequency, and minimum recommended diet (Demilew et al., 2017). Scientific evidence indicates that early initiation of breastfeeding reduces neonatal mortality. Through six months, EBF can prevent as much as 13% of the estimated mortality rate for children under five years. Moreover, breastfeeding promotes healthy mother-child bond, which can aid in a child's emotional and psychological development (Oot et al., 2018).

Appropriate breastfeeding practices have long-term benefits by preventing obesity in childhood and reducing the risk of different chronic diseases, including diabetes, cardiovascular disease, and asthma, in adulthood. Although breastfeeding provides the child with optimal nutrition and protection against infection, age-appropriate complementary feeding can reduce the disease burden caused by stunting to a great extent. The first 1,000 days in every child's life are very important and are regarded as a window of opportunity for survival and development. According to the NFHS-5 (2019-21) survey, the introduction of CF in children aged 6 to 8 months is on the rise. Additionally, the earlier NFHS 4, 3, and 2 surveys showed an increasing trend in well-timed complementary feeding, indicating a slow transition to better feeding practices as shown in Table 1.1.

Key findings related to IYCF practices in India from the Comprehensive National Nutrition Survey (CNNS, 2016-18) include: EBF was observed in 58% of infants under six months of age, whereas 57% of children ages 0–24 months were breastfed within an hour of birth. At one year of age, 83% of children aged 12-15 months continued to breastfeed, while 53% of infants aged 6-8 months began complementary feeding. In terms of minimum acceptable

Table 1. 1 TRENDS OF MAJOR INDICATORS OF IYCF PRACTICES IN INDIA

Indicator (%)	NFHS-2 (1998-99)	NFHS-3 (2005-06)	NFHS-4 (2015-16)	NFHS-5 (2019-21)
Initiation of breastfeeding within 1 hour of birth	15.8	24.5	24.5	41.8
Exclusive breastfeeding (zero to six months)	41.2	46.4	54.9	63.7
Complementary feeding (six to nine months)	35	56.7	42.7	45.9

(Source: Sharma et al., 2024)

diet, minimum dietary diversity, and meal frequency, 42% of children between the ages of 6 and 23 months were provided MMF, 21% were fed a diet with MDD but only 6% were provided a diet that met MAD. UNICEF has also reported that only 16.4% young children in India are fed complementary foods that meet dietary diversity (Figure 1.1).

The WHO complementary feeding guidelines suggest that infants should begin to receive complementary foods at completion 6 months of age together with breastmilk. At first, they should receive complementary foods 2-3 times a day between 6-8 months and 3-4 times a day between 9-11 months and 12-24 months. The age of 6-23 months is also a crucial time for cognitive and physical growth. The brain grows at one of the highest rates in life during this time, so the timing and amount of all the essential nutrients can have beneficial impacts (Lutter et al., 2021). During the first two years of life, proper nutrition is essential. Young children, therefore, require a range of nutrient-dense meals, including cereals, pulses, legumes, fruits, vegetables, meat, and fish in addition to breastfeeding, in order to ensure development. Therefore, the complementary foods must be:

Timely – that is, they are introduced at the time when the demand for energy and nutrients is more than can be met through exclusive breastfeeding.

Sufficient – in the sense that they supply enough energy, protein and micronutrients to satisfy a child's increasing nutritional requirements.

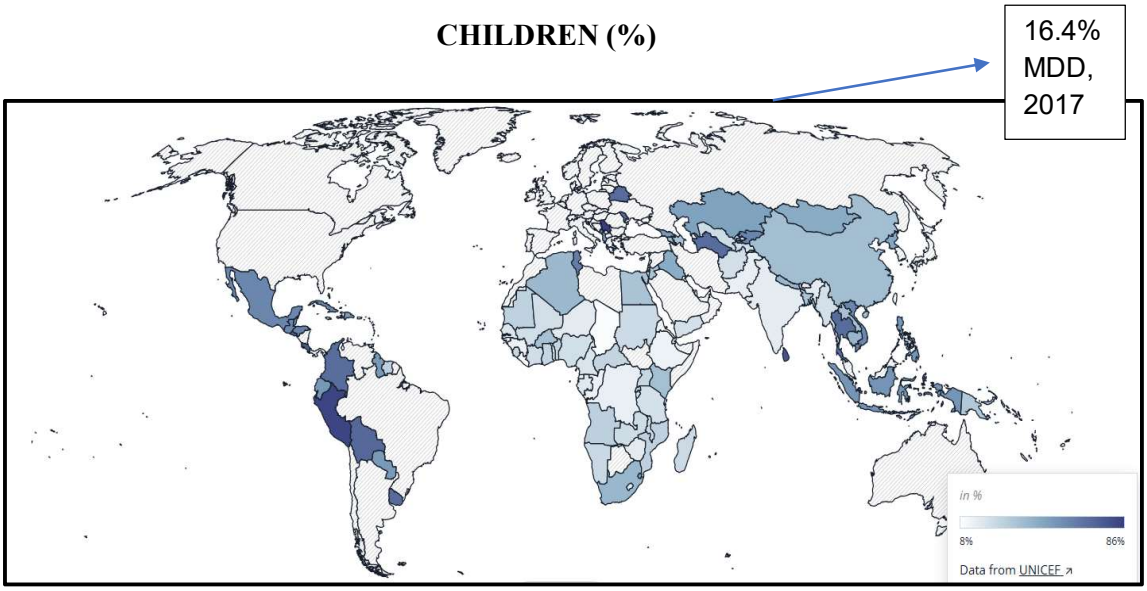
Safe – i.e., hygienically stored and prepared, and fed with clean hands using clean utensils and not bottles and teats.

Properly fed – that is, they are offered in accordance with a child's cues of satiety and appetite, and that feeding and meal frequency is appropriate for age (WHO-2003, 2005).

According to National Family Health Survey round 4 (NFHS-4) less than 10% of children in India obtained a sufficient diet, and less than 50% of children under the age of two received solid or semi-solid food and breastfeeding. (Jeyakumar et al., 2023, (Walters et al., 2019).

In India, the prevalence and contributing variables of complementary feeding methods vary greatly by area. There is a significant disparity in the frequency of introducing solid, semi-solid, or soft foods (complementary foods) to infants between the ages of 6 and 8 months;

Figure 1. 1 MINIMUM DIETARY DIVERSITY FOR INFANTS AND YOUNG CHILDREN (%)



(Source: Food Systems Countdown Initiative Data)

the southern state of India has the highest rate (61%) while the Central and Northern regions have the lowest (38%). Likewise, the South had the highest minimum dietary diversity (MDD) rate at 33%, while the Central region had the lowest at 12%. There were significant regional differences in the minimum acceptable diet (MAD) and minimum meal frequency (MMF) (Dhami et al., 2019).Yet another study revealed that forty-two percent indicated that CF was started on time. 14.9%, 76.5%, and 16.4% of respondents, respectively, met the minimum acceptable diet (MAD), minimum meal frequency (MMF), and Diet Diversity Score of less than 4. This indicates that there is a need to enforce awareness on the importance of the timely initiation of complementary foods. Dietary diversity has long been recognized as a key component of diet quality, as reported by Verger et al., 2021). One of the main causes of illness worldwide is poor nutritional quality. All phases of life require a healthy diet, but children have particular dietary requirements. Childhood is a time of fast development and growth. Additionally, this is the time when lifelong eating habits and preferences are formed. Infants and children eat most of their meals with their parents and other caregivers. As they get older, they are exposed to factors such as school food environment, advertisements, interactions with other children, etc, that have a huge impact on the preferences of food selection. Hence, food categories consumed by children aged 6 to 23 months, dietary diversity is an important factor in determining infant and young child feeding behaviors. Both the quantity and quality of food consumed are linked to malnutrition. In low-income nations, 156 million children under the age of five suffer from stunting and other types of malnutrition. Due to a shortage of reasonably priced, nutrient-dense food options, child malnutrition is more common in lower-income nations. (Chaudhary et al., 2018)

There are two factors that directly and indirectly affect children's nutritional health. One indirect aspect influencing nutritional status is parenting style as reported by Kemenkes et al. (2017) (Febrinda Nadhila et al., 2023)**.** Due to the onset of development failure, the 12–24 month age range is critical and necessitates more care (Kemenkes, 2016) and so children who struggle with growth and development could be more susceptible to other health problems. Numerous studies have demonstrated the link between poor nutritional status in children and low quality of life, cardiac problems, and delayed cognitive development. Parents are the major caregivers for their children and have a significant influence on their food consumption, which might affect the child's nutritional health. Thus, parental feeding style is important (Ningning & Wenguang, 2023).

The broader interactions between parents and children in all food-related contexts are referred to as parental feeding styles. Parents have an impact on their children's food intake through their interactions with their toddlers and the foods they provide. Researchers have indicated a connection between the feeding practices followed by parents and the nutrient intake along with body weight of their children. Poorer eating outcomes (such as consuming more unhealthy foods) were frequently linked to restrictive parenting techniques. It was discovered that positive parental styles were favourably correlated with the eating habits of their children. For instance, it was reported in a study by Febrinda Nadhila et al. (2023) that children's consumption of fruits and vegetables was positively correlated with parental modelling of healthy eating habits, and that children's consumption of unhealthy snacks was negatively correlated with more subtle control. The two fundamental characteristics of demandingness and responsiveness can be combined to determine feeding styles. Demandingness is the degree to which a parent pushes their child to eat in general, and the term "responsiveness" describes how parents support their children's eating, i.e., in a child-centered manner.

Baumrind's taxonomy of parenting styles generally distinguishes three types of parenting: Authoritative, Permissive, and Authoritarian or Uninvolved parenting is sometimes referred to as a fourth parenting style. (Van Der Horst & Sleddens, 2017), (Lopez et al., 2018).

Authoritative (responsive & demanding) – Associated with healthier eating habits.
Authoritarian (demanding, less responsive) – Linked to pressure to eat & food restriction.
Permissive (responsive, less demanding) – Less monitoring of a child's diet.
Uninvolved (low responsiveness & demandingness) – Minimal parental guidance in eating behavior.

Hence, Parental feeding styles play a pivotal role in shaping the nutritional and developmental outcomes of children below two years of age. These feeding styles, characterized by varying levels of responsiveness and control, influence how infants and toddlers interact with food during l early stages of growth. Responsive feeding, which aligns with a child’s hunger and satiety cues, is associated with healthier growth patterns and reduced risks of obesity. In contrast, pressuring or restrictive feeding practices can disrupt self-regulation, leading to adverse outcomes such as stunting or excessive weight gain. Complementary feeding practices, introduced around six months, are particularly

influenced by parental approaches, emphasizing the importance of balanced and attentive feeding strategies. Understanding these styles is essential for promoting optimal nutrition and fostering healthy eating behaviors in young children. (Kim-Herrera et al., 2021; Thompson et al., 2013)

Rationale

The younger children are completely dependent on caregivers for their nutritional needs. It is well documented that IYCN practices are a major factor affecting the nutritional status of young children. Feeding and parenting are closely connected, with parents' feeding practices influencing how children eat. This dynamic interplay, shaped by both genetics and the early feeding environment, sets the stage for lifelong eating habits and overall health. With time the urban areas have shown changes in lifestyle, availability of foods, family composition and dynamics, support systems, reliance on various sources of information including the modern media suc as social media and other social factors may have a great impact on parental feeding styles in urban areas. Hence there is a need to study the Parental Feeding Practices prevalent in Gujarat and understand their influence of IYCF practices and nutritional status among young children. In view of this, present study was conducted with an aim, to study the feeding styles followed by parents of children aged 6-24 months in Urban Vadodara.

REVIEW OF LITERATURE

Childhood is an important phase of life. As per the reports by the World Population Division of the United Nations (2024), children under 5 constituted 7.97% of the total population (114,664,656 out of 1,438,069,596) in India in the year 2023. The census (2011) India data show that out of a total of 121.09 crore population, 16.45 crore are children below 6 years of age which is 13.6% of the total population. Thus, early childhood is a demographically important phase. It is also an important age group due to the growth and development taking place in the younger children. (World Population Prospects, 2024)

Especially, early childhood is a critical phase as not only it is demographically significant but also because of the foundational growth and development that occur during this period. The first two years of life are particularly vital, as provides an opportunity for foundation for physical, cognitive, and social development. This phase of rapid growth highlights the importance of focusing on the initial stages of life, especially the first 1,000 days - from conception to a child's second birthday - which represent a unique window of opportunity for ensuring optimal health and development. During this period, proper nutrition and care play a pivotal role in shaping lifelong outcomes, including brain development, immunity, and overall well-being.

The First 1000 Days: A Critical Window for Growth and Development

A human being's first 1,000 days starting from conception to two years of age, is most important phase for the development of their body, brain, metabolism, and immune system. (Likhar & Patil, 2022)

The foundation for the best possible health and development throughout life is laid in this period. Adequate nutrition and care throughout the 1000-days period affect not only the child’s probability of survival but also improve their capacity to develop, learn, and come out of poverty, contributing to long-term positive growth (UNICEF-2017).

The 1,000 days are both full of potential and full of vulnerability in a child's life. The potential of a child to grow, learn, and flourish is greatly determined by how the mothers and children

are nourished and cared for during this time. This is the phase of life which gives an opportunity to lay a strong foundation of physical growth, neurological and brain development, cognitive development as well as contributes to social development and is an opportunity to build life-long healthy habits.

Physical Growth during First 1000 days- Early Childhood

Children experience rapid growth, with significant increases in height and weight during the first two years of life. Physical development during the first two years of life is marked by rapid growth and significant biological changes. This period includes critical windows of development during which various systems and organs mature. While most physical systems develop in utero, the brain, liver, and immune system continue after the birth of a child. Brain development, or neuroplasticity, is particularly notable during this time, as it undergoes substantial structural and functional changes in response to environmental stimuli. These adaptive changes during the first 1000 days can have lifelong consequences for physical health and overall wellbeing. (Hoffman et al., 2019).

Various aspects of first 1000 days that affects a child's growth and development:

Brain and Cognitive Development

The growing brain of a child develops and matures during the first 1,000 days. The brains of children can form 1,000 new neural connections every second during this period. It represents a critical period for brain development, characterized by unprecedented structural and functional growth. During this time, the brain undergoes rapid neurogenesis, synaptic pruning, and myelination, processes that establish lifelong cognitive, motor, and socio-emotional capacities. (Building Brains - 1,000 Days, n.d.) (Bal & Karyakram, 2018)

Social Development

Social development during the first 1,000 days of life is a foundational process that shapes a child's ability to form relationships, communicate, and navigate their social environment. Early bonding with caregivers, particularly through responsive and nurturing care, fosters secure attachment, which is critical for emotional regulation and social competence.

Breastfeeding and close physical contact not only support physical health but also strengthen the emotional bond between parents and children.

Life-long habits

Beyond nutrition, this period is also crucial for the development of various health practices. Additionally, responsive caregiving during this time fosters emotional regulation and social skills, laying the groundwork for positive interpersonal relationships throughout life. Environmental factors, including parental guidance and exposure to enriching experiences, further shape cognitive and behavioural habits. Conversely, poor nutrition or adverse experiences during this critical phase can lead to long-term health risks such as stunting, chronic diseases, or maladaptive behaviors. he habits formed during the first 1,000 days have profound implications for physical health, cognitive development, and social well-being, underscoring the importance of targeted interventions to optimize this critical developmental period. (Del Bono et al., 2025; Sihuay-Torres et al., 2023)

Importance of Nutrition in First 1000 days

Optimal nutrition during the first 1000 days is critical for establishing lifelong health trajectories.(Likhar & Patil, 2022).This period of rapid growth and development is characterized by increased vulnerability to nutritional deficiencies, which can have irreversible effects on organ development, particularly the developing brain. (Beluska-Turkan et al., 2019)Adequate nutrition during this phase, encompassing essential macro- and micronutrients, supports fundamental processes such as cellular proliferation and growth as well as brain and neurological development. Conversely, undernutrition or malnutrition during this sensitive window can impair cognitive function, immune response, and metabolic regulation, predisposing individuals to increased risks of both short-term morbidity and chronic non-communicable diseases in later life.(Ms et al., 2017).

It is important to ensure adequate nutrition in the first 1000 days of life to support optimal outcomes, as it is a critical period for growth and development. During this time, the rapid development of the brain and body necessitates nutrient-dense foods rich in essential macronutrients like proteins and healthy fats, alongside micronutrients such as iron, zinc,

iodine, folate, choline, vitamin A, vitamin D, vitamin B6, and vitamin B12. These nutrients are vital for neurodevelopmental processes like myelination and synapse formation, as well as cellular growth and immune function. Exclusive breastfeeding is recommended for the first six months due to its optimal nutrient composition and protective health benefits. After six months, complementary foods are recommended to be introduced to meet increasing nutrient demands that human milk alone cannot fulfil. These foods must be rich all the essential nutrients while avoiding added sugars and excessive sodium to ensure nutrient adequacy for the growing child (Hamner et al., 2022)

For children receiving complementary foods, dietary patterns should focus on inclusion of nutrient-dense options such as fruits, vegetables, whole grains, pulses, nuts, milk and milk products as well as meat, fish and poultry. Responsive feeding practices - where caregivers create nurturing feeding environments while recognizing hunger and satiety cues – are equally essential for fostering healthy eating habits. Repeated exposure to diverse tastes and textures can improve acceptance of nutrient-rich foods like vegetables. Additionally, minimizing exposure to dietary contaminants such as lead or arsenic is crucial since these elements can interfere with nutrient absorption and development (Hamner et al., 2022)

Diets of children during early childhood are very important as poor diet can lead to deficiencies in essential nutrients and vitamins. These deficiencies not only affect health and well-being during childhood but also pose a high risk of poor health status in the future. Hence, it is important to focus on the problem of malnutrition in younger age groups for effective interventions.

Understanding Malnutrition: Types, Causes and Consequences

Malnutrition is a condition arising due to the consumption of foods that are either too high or too low in calories, carbs, vitamins, proteins, or minerals. It is characterised by a over or a low consumption of vital nutrients, causing either undernutrition or overnutrition. For children to flourish, develop, learn, play, and engage, they must eat a healthy diet. Inadequate, excessive, or unbalanced energy and/or nutritional consumption are all considered forms of malnutrition. Two major categories of conditions are included in the term malnutrition: "undernutrition” and “overnutrition”.

Undernutrition includes wasting (low weight for age), stunting (low height for age) and underweight (low weight for age), and or micronutrient deficiencies or insufficiencies. Definitions of various forms of malnutrition given by UNICEF-WHO-The World Bank Joint child malnutrition estimates are (*Malnutrition in Children*, n.d.):

Wasting- Wasting refers to low weight-for-height, indicating that a child is too thin for their height. This condition is typically a result of acute malnutrition. Children who are wasted are typically more than two standard deviations below the WHO growth standards for weight relative to height, often due to insufficient food intake or severe illness.

Stunting- Stunting refers to impaired growth and development in children, characterized by a height-for-age measurement that is more than two standard deviations below the World Health Organization (WHO) growth standards. It is often a result of chronic malnutrition and can lead to long-term health consequences

Underweight- Underweight is characterized by low weight-for-age, that indicates a child's weight is below the expected range for their age, specifically more than two standard deviations below the WHO growth standards for weight-for-age. This condition can result from either stunting or wasting.

Micronutrient Malnutrition- Micronutrient malnutrition occurs when there is a deficiency in essential vitamins and minerals, leading to health issues such as anaemia or scurvy. It is often referred to as "hidden hunger," occurs when individuals do not consume sufficient vitamins and minerals, despite adequate caloric intake. This deficiency can lead to various health issues, including anaemia and impaired cognitive development. (Oluwole et al., 2018)

Overnutrition among children include obesity and overweight. Its outcomes include non-communicable diseases linked to diet (e.g., diabetes, cancer, heart disease, and stroke) (WHO).

Overweight- Overweight is defined as excess weight-for-height for age, which exceeds two standard deviations above the WHO growth standards. This condition is increasingly recognized as a significant public health issue, particularly in the context of rising obesity rates globally.

Obesity- The World Health Organization defines obesity in children under five as weight-for-height exceeding three standard deviations above the median.

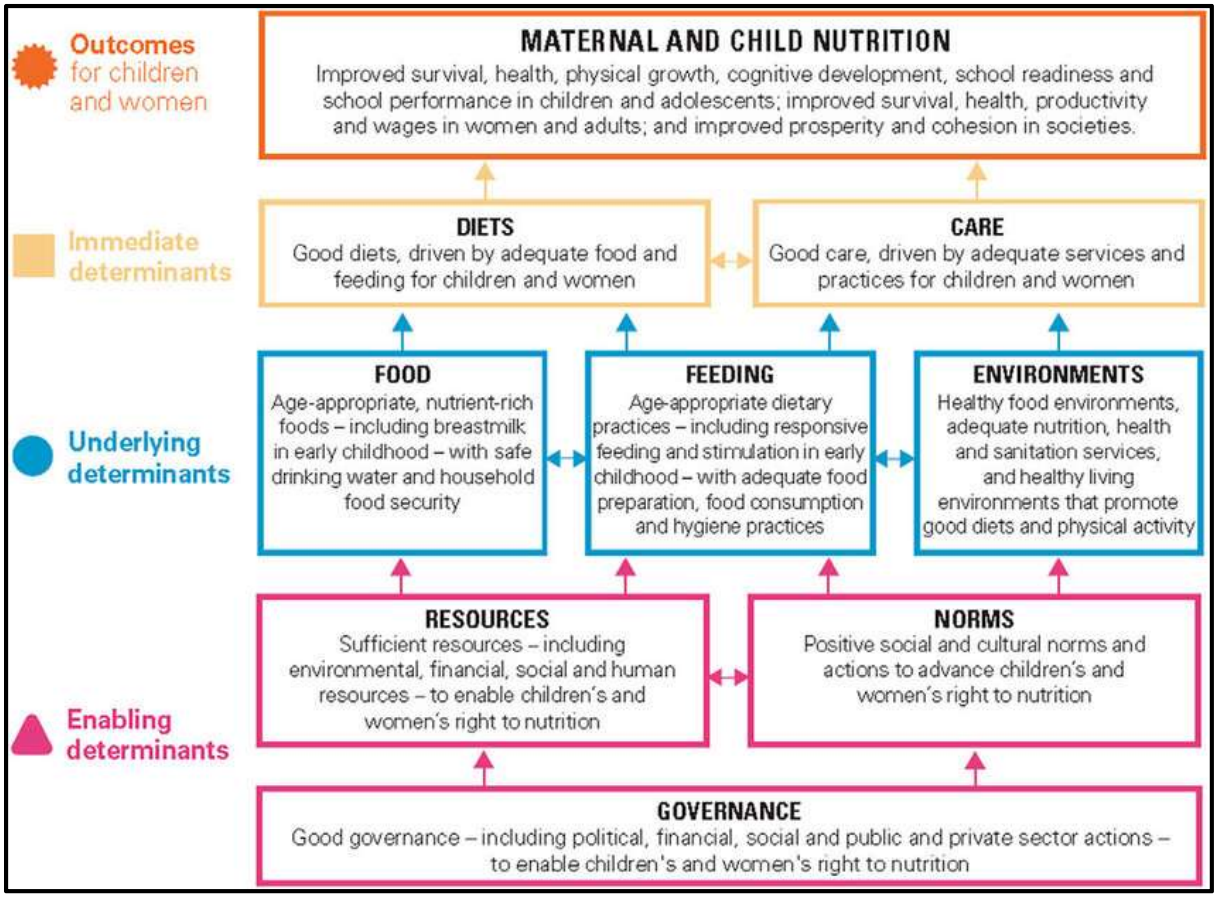
Causes of Childhood Malnutrition

UNICEF has given a conceptual framework of malnutrition to explain the causes, their relationship and to indicate that malnutrition is a cumulative effect of those factors. The revised framework (UNICEF, 2020) is given in (Figure 2.1).

This framework indicates that childhood malnutrition arises due to a combined effect of interconnected factors. The immediate factors affecting childhood nutritional status are child feeding and health care practices. Childhood malnutrition occurs due to an imbalance between a child's nutritional needs and their intake. This can result due to insufficient food consumption, lacking either in quantity or the necessary nutrients crucial for growth and development. Furthermore, infectious diseases play a significant role. Infections hinder the body's ability to absorb and utilize nutrients effectively, while simultaneously increasing the body's demand for them. This interplay is critical, as malnutrition weakens the immune system, paradoxically increasing susceptibility to infections and perpetuating a cycle of poor nutritional status.

However, childhood malnutrition is not solely a product of these immediate factors. Underlying causes create the conditions in which malnutrition thrives. Household food insecurity, a consequence of poverty and limited resources, restricts consistent access to adequate, safe, and nutritious food. Inadequate care practices, often resulting from a lack of knowledge or support, contribute to poor feeding habits and a failure to meet a child's nutritional requirements. Additionally, limited access to essential health services, including maternal care and childhood immunizations, and unsanitary environments exacerbate the risk of both infection and malnutrition. These underlying issues are often shaped by broader social determinants of health, such as poverty and environmental disadvantages, which disproportionately affect vulnerable populations.(UNICEF Conceptual Framework | UNICEF, 2020

FIGURE 2. 1 THE CONCEPTUAL FRAMEWORK ON THE DETERMINANTS OF MATERNAL ND CHILD NUTRITION GIVEN BY UNICEF



Source: UNICEF (2020)

Consequences of Childhood Malnutrition- Effect on Health and Wellbeing

Childhood malnutrition is a major factor impairing cognitive and physical development of children. It also raises the risk of concomitant infections. Especially, acute malnutrition is shown to result in higher rates of morbidity, mortality, and disability.(Govender et al., 2021)

Childhood malnutrition, including both undernutrition and overnutrition, significantly impacts health and well-being, with consequences that persist into adulthood. Undernutrition during the critical developmental period of the first 1000 days of life disrupts physical growth, cognitive development, and immune function. Severe acute malnutrition (SAM) among young children has been shown to impair brain development leading to long-term deficits in cognition and academic performance (Hamner et al., 2022; Mwene-Batu et al., 2020)Children who experience stunting or wasting are at higher risk of chronic diseases such as diabetes and hypertension later in life. Malnourished children often struggle with concentration and memory, which can hinder their educational attainment and future socioeconomic status (The Effects of Childhood Malnutrition | World Vision UK)

Overnutrition during early stages of life also poses risks, particularly in the form of childhood obesity. Excessive intake of energy-dense foods high in sugars and fats can lead to metabolic disorders, elevated blood pressure, and increased susceptibility to depression in adulthood (Gallagher et al., 2023 Fang & Zhu, 2022).

Additionally, malnutrition (undernutrition or overnutrition) can worsen the inequalities by perpetuating cycles of poverty. Children who suffer from malnutrition often experience poor educational outcomes and face reduced productivity as adults due to poor physical and cognitive development (Mwene-Batu et al., 2020; Thompson et al., 2013). This cycle contributes to intergenerational poverty, particularly in low-income countries where food insecurity is prevalent.

Childhood malnutrition during the first 1000 days of life significantly increases morbidity and mortality rates, particularly in low- and middle-income countries. Severe acute malnutrition (SAM) is a major contributor to under-five deaths globally, accounting for nearly half of all mortality in this age group. Malnourished children are more susceptible to common infections,

such as pneumonia and diarrhoea, due to weakened immune systems, and these infections tend to be more severe and prolonged, further increasing the risk of death. This link between malnutrition and mortality rates is reflected in the global statistics showing that around half of the under-five mortalities are related to childhood malnutrition (Hamner et al., 2022; WHO, 2024). The risk of mortality among children with SAM is up to 12 times higher than their well-nourished counterparts. (Hamner et al., 2022; Alemu et al., 2023).

Global Prevalence of Childhood Malnutrition

Childhood malnutrition is a problem that has a grave impact on the health and development of children as well as societies. It affects a large number of children across the globe, affecting their quality of life.

According to the UNICEF/WHO/World Bank Joint Malnutrition Estimates Expanded Databases (2023), 22.3% children under 5 years of age are stunted (HAZ<-2SD), 12.3% are underweight (WAZ<-2SD) and 6.8% are wasted (WHZ<-2SD) with 5.6% being overweight (WHZ>+2SD). Asia and Africa are home to a higher number of malnourished children. The prevalence of malnutrition in Asia is the highest, with a majority of malnourished children of the World (52%, 70%, and 48% of all stunted, wasted, and overweight, respectively) living in Asia (UNICEF/WHO/World Bank Joint Malnutrition Estimates Expanded Databases, 2023).

Research studies conducted in various parts of the World reflect that the burden of malnutrition among young children is a big problem, and the prevalence of underweight, stunting, and wasting has regional variations. Kenya had the highest rate of stunting at 46% followed by South Africa at 45.3%, but the lowest in the UAE and Bhutan at 15%. Underweight is highest in South Africa & Pakistan & lowest in Bhutan and Malawi. The most important indicator of acute malnutrition is highest in Indonesia (23%) and lowest in Kenya (2.5%) and Malawi (3.7%). In general, these studies portray the inequality of malnutrition in the world, with sub-Saharan Africa and South Asia reporting consistently high stunting and underweight, while countries like UAE and Bhutan report comparatively lower prevalence (Table 2.1)

TABLE 2. 1 GLOBAL PREVALENCE OF CHILDHOOD MALNUTRITION AS REPORTED BY VARIOUS RESEARCH STUDIES

Author and Year)	Place	Age Groups	Underweight (%)	Stunting (%)	Wasting (%)
Kimani-Murage, E. W.et al.,2015	Kenya	6-24 Months	11	46	2.5
Campbell, R. K.,et.al, 2018	Bhutan	6-23 Months	5	15	9
Ahmad, A.,et.al, 2018	Indonesia	6-24 Months	26	28	23
Khan, S. et al.,2019	Pakistan	<5 years	29.4	44.4	10.7
Walters, C. N. et.al, 2019	Malawi	0–23 Months	9.9	30.8	3.7
Anin et al., 2020	Ghana	6-23 Months	27	33.2	14.1
Modjadji P et al.,2020	South Africa	<5 Years	29	45.3	-
Cheikh I, et al.,2020	UAE	0-24 Months	-	15	8

Prevalence of Malnutrition in India

Malnutrition has been a significant concern for India, in the public health sector with persistent high rates of Underweight, Stunting and wasting among children below 5 years.

Prevalence of undernutrition in India as reported in the National Family and Health Survey (NFHS) 5, is 35.5% stunting, 32.1% underweight and 19.3% wasting. There has been a substantial decline in stunting prevalence over the NFHS rounds, from 52% in NFHS-1 to 35.5% in NFHS-5. This indicates a long-term improvement in the nutritional status of children related to chronic undernutrition. Underweight has shown a similar decrease from 53.4% in NFHS-1 to 32.1% in NFHS-5, reflecting an overall positive trend in child weight relative to age. However, wasting prevalence has not shown improvement showing no positive change in acute malnutrition. It decreased from NFHS-1 to NFHS-2, increased in NFHS-3, further increased in NFHS-4, and then decreased in NFHS-5 (Figure 2. 2).

Various research studies conducted on nutritional status of young children in different parts of India have shown a high prevalence of childhood undernutrition in these places (Table 2. 2). Highest prevalence of underweight was reported in a study conducted in Bangalore with 44.3% and lowest in Puducherry with 14.2%. Stunting was reported to be highest (42.8%) in Bangalore and lowest in Raipur (15%). Wasting was reported highest in Delhi with 43.7% prevalence. Thus, malnutrition is still a problem across India with high prevalence at many places.

Prevalence of Malnutrition in Gujarat

Studies on malnutrition in Gujarat show notably high prevalence of underweight, stunting, and wasting among children. Prevalence of underweight was reported to be as high as 42.7% in a study conducted in Ahmedabad (Solanki R, et al., 2014)**.** Stunting, an indicator of long-term malnutrition, was affecting almost half (49%) of the enrolled children in a study conducted in Junagadh (Ratnu A et al., 2013). Wasting or acute malnutrition, was also reported to be high in these studies. It was as high as 41.7% in Ahmedabad as reported by Rastogi S. et al. (2018) and Narmada 32.2% according to Rana R, et al. (2020). These studies clearly indicate that malnutrition is a major an issue across Gujarat (Table 2. 3).

FIGURE 2. 2 TRENDS OF MALNUTRITION IN PRESCHOOL CHILDREN IN INDIA- NFHS DATA

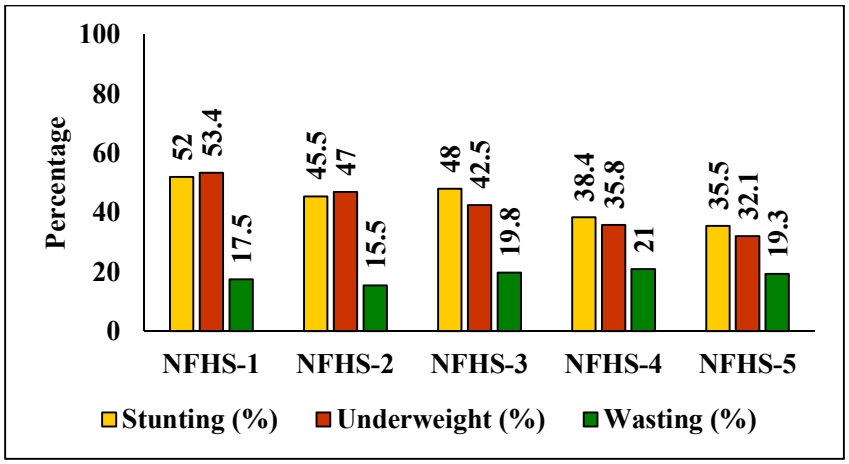


TABLE 2. 2 PREVALENCE OF CHILDHOOD MALNUTRITION AS REPORTED BY RESEARCH STUDIES CONDUCTED IN VARIOUS PARTS OF INDIA

Author and Year	Place	Age Groups	Underweight (%)	Stunting (%)	Wasting (%)
Mukhopadhyay et al., 2013	West Bangalore	6-23 Months	35.9	31.4	20
Meshram, I. I et.al., 2019	India	<3 years	38	41	22
Inbaraj, L. R. et.al., 2020	Bangalore	<2 years	44.3	42.8	9.5
Chhabra, P., et.al, 2021	East Delhi	6-23 Months	43.4	29.1	43.7
Jana, A.et.al., 2023	Pan India	0-24 Months	30	33	19
Prasad R, et al., 2023	Raipur	6-23 Months	30	15	25
Rajendran, G. et al., 2024	Puducherry	<3 years	14.2	16.4	13.3

FIGURE 2. 3 TRENDS OF MALNUTRITION IN PRESCHOOL CHILDREN IN GUJARAT- NFHS DATA

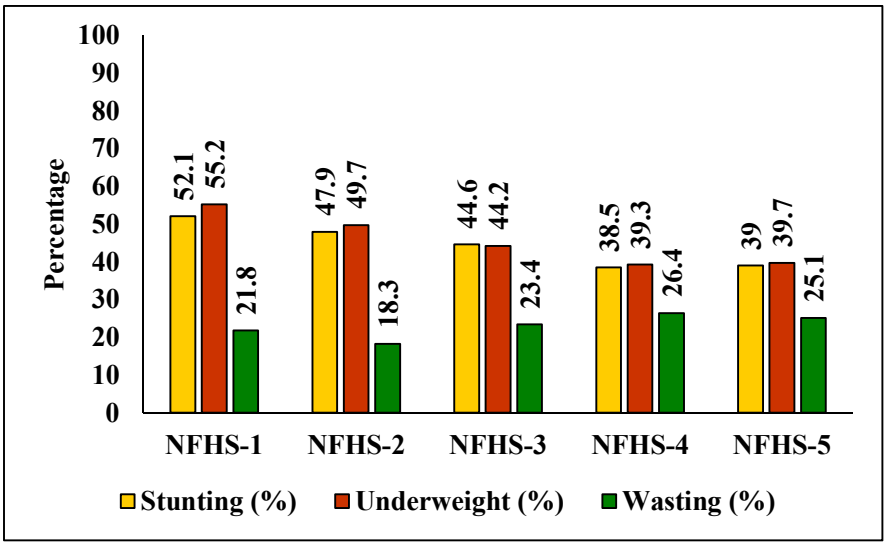


TABLE 2. 3 PREVALENCE OF CHILDHOOD MALNUTRITION AS REPORTED BY RESEARCH STUDIES CONDUCTED IN VARIOUS PARTS OF GUJARAT

Author and Year	Place	Age Group	Underweight (%)	Stunting (%)	Wasting (%)
Ratnu A et al., 2013	Junagadh	0-5 Years	26.4	49	10.7
Solanki R, et al., 2014	Ahmedabad	< 5 Years	42.7	50	15
Rastogi S. et al., 2018	Ahmedabad	< 5 Years	36.9	31.4	41.7
Vakilna RS et al., 2020	Surat	6-23 Months	38.1	39.2	20.4
Rana R, et al., 2020	Narmada District	< 2 Years	39.7	34.5	32.2
Kantawala S. and Shah E., 2020	Vadodara	6-23 Months	8.7	12.2	4.8
Saha S. et al., 2022	Dwarka	< 2 Years	17	32	14
Dhruv S and Mwango H, 2023	Urban Vadodara	0-59 Months	21.9	19.8	10.3
Senger V and Patel G, 2023	Urban Vadodara	<5 years	17.5	17.3	10.8
Sheth M and Seksaria S, 2015	Chikhli taluka	6-36 Months	43.0	50.9	25.3

Various departmental studies have also shown a high prevalence of stunting (50.9% 19.8%), underweight (43.0% to 21.9%) wasting (25.3% to 10.3%) it has reduced over time.

Prevalence of Childhood Malnutrition- A Comparison between Global, National, State and District Data for Vadodara

Malnutrition continues to be a public health problem with striking variation between global, national, state, and regional levels. The NFHS-5 report shows that prevalence of Malnutrition among children is much higher in India than the Global prevalence as reported in the Global Nutrition Report.

While less than one fourth of the children (22%) are stunted globally, the prevalence of stunting is 35.3% nationally, following 39% at the state level and 42.3% at the district level in Vadodara district. Thus, the prevalence of stunting in Vadodara is much higher than the National Prevalence. Data on wasting show that the prevalence of acute malnutrition is much higher in India, with one fifth (19.3%) of children having low weight for height as compared to only 6.7% prevalence of wasting at the Global level. Gujarat has a higher wasting prevalence (25.1%) than the National data, whereas the prevalence of wasting in Vadodara (20.1%) is comparable to India. Prevalence of underweight measured by low weight for age is the same in Vadodara (39.9%) and Gujarat (39.7%), which is slightly higher than in India (32.1%). Data on overweight among young children show that India, as well as Gujarat, has a lower prevalence of overweight (3.4% in India and 3.9% in Gujarat) than the Global prevalence (5.7%). However, it is noteworthy that the prevalence of overweight in Vadodara district (6.4%) is higher than not only the state level or national level prevalence but also the global prevalence. This highlights that the dual burden of malnutrition is a significant problem in Vadodara (Table 2. 4).

Thus, the prevalence of childhood malnutrition is very high. This puts children at a higher risk of malnutrition and its adverse effects, including the lifelong impact on health and well-being. This is a major challenge to human development. Thus, focusing on the causes of malnutrition so that they can be addressed to improve the nutritional status of children is important. As mentioned before, appropriate feeding practices for young children are a crucial aspect of childhood health.

TABLE 2. 4 A COMPARISON OF PREVALENCE OF CHILDHOOD MALNUTRITION AT GLOBAL, NATIONAL, STATE AND DISTRICT LEVEL

	Stunting (%)	Wasting (%)	Underweight (%)	Overweight (%)
Global (GNR, 2022)	22	6.7	–	5.7
India (NFHS-5)	35.5	19.3	32.1	3.4
Gujarat (NFHS-5)	39	25.1	39.7	3.9
Vadodara (NFHS-5)	42.3	20.1	39.9	6.4

Infant and Young Child Feeding Practices: Ensuring Adequate Nutrition in Early Childhood

Sufficient nutrition during infancy and early childhood is fundamental for children to achieve their full growth, health, and developmental potential. The first two years of life represent a critical window for preventing undernutrition and growth faltering through optimal feeding practices. Consequently, prioritizing the improvement of infant and young child feeding globally, particularly within the first two years, is essential.

The United Nations Children's Fund (UNICEF) and the World Health Organisation (WHO) have established a global strategy for the best infant and young child feeding (IYCF). According to this, the recommendations for IYCF include early initiation of breastfeeding, i.e., initiation of breastfeeding should begin within an hour of delivery, and exclusive breastfeeding for the first 6 months i.e. breast feeding should be continued exclusively for the first six months. Further the complementary foods should be introduced at the completion of 6 months. It should be ensured that complementary foods are safe, sufficient, and provide adequate nutrition. Along with complementary feeding, breastfeeding should continue for at least two years. To reduce undernutrition and its effects, it is crucial to enhance IYCF practices in accordance with this advice for both healthy and children who are sick/ill. (Demilew et al., 2017)

For optimal nutrition, the government of India has established National Guidelines on IYCF, emphasising early initiation of breastfeeding for the first six months of life. Infants must be consistently supplemented with nutritionally appropriate and safe complementary feeding after six months, as their dietary demands change, and they must continue to be breastfed for at least two years, if not longer. The National Guidelines on IYCF address a number of topics, such as social relationships, sanitary standards, caregiving techniques, and food habits. Support from the child, mother, home, community, and society at large is required for the implementation of these guidelines. Hence, parental involvement in complementary feeding plays a major role.

These recommended IYCF practices have been scientifically proven to be beneficial for the child’s health. Early breastfeeding initiation is reported to significantly reduce newborn mortality. Early initiation of breastfeeding can prevent up to 13% of the estimated mortality

rate for children under five till they are six months old. Breastfeeding also supports the child's emotional and psychological development, which promotes continuous, healthy relationships between mother and child. It has been found to directly improve brain growth. As stunting brought on by undernutrition at this stage is nearly irreversible, it is imperative to invest in nutrition during this time to ensure optimum linear growth. Stunting can be avoided by ensuring that children receive proper nutrition during the first 1,000 days of life to reach their full development potential. Effective complementary feeding practices are likely to lower rates of malnutrition and morbidity and avert 6% of deaths among children under five. (Sharma et al., 2024)

Undernutrition trends worldwide and in India suggest that the interval between conception and age 2 is the critical time frame for implementing nutrition-improving interventions. According to research on the efficacy of interventions, inadequate infant and young child feeding (IYCF) habits contribute significantly to malnutrition in many nations, and enhancing IYCF practices can have major positive effects (Bhutta et al., 2008; Menon et al., 2015).

Researches have shown that a lower risk of undernutrition (i.e., underweight, stunting, and/or wasting) is linked to proper complementary feeding. Many low- and middle-income countries (LMICs) continue to report greater prevalence of unsuitable IYCF despite the advantages of appropriate IYCF. Inappropriate IYCF practices have been linked to childhood malnutrition in India, which accounts for 83% of neonatal fatalities and almost 68% of deaths in children under five. An estimated 0.9 million deaths in children under five were attributed to inappropriate IYCF in 2016. (Dhami et al., 2021)

IYCF practices in young children are found to significantly influence the anthropometric indicators. A study by Chaudhary et al. (2018) has shown that the mean anthropometric indicators, i.e. WHZ, WAZ, and HAZ scores were higher for children who were breastfed, who were provided colostrum, and whose age-wise minimum meal frequency was appropriate when examining the relationship between IYCF practices and nutritional status. In addition, breastfeeding length was exclusively linked to the HAZ score, but early breastfeeding initiation was linked to higher WHZ and WAZ scores.

A South African study demonstrated a significant association between delayed complementary feeding initiation and the prevalence of stunting and underweight in children. Suboptimal feeding practices during the critical transition from exclusive breastfeeding to complementary food introduction were identified as a key etiological factor in these growth deficits. Specifically, inadequate provision of complementary foods at the recommended age fails to meet the heightened nutritional demands of infants, thereby intensifying linear growth impairment (stunting) and elevating the risk of overall malnutrition. (Modjadji et al., 2020)

Beyond Breastfeeding: The Role of Complementary Feeding in Nutrition in Early Childhood

The World Health Organization (WHO) defines complementary feeding as the process of providing foods and beverages, in addition to breast milk, when breast milk alone is no longer sufficient to meet an infant's nutritional requirements. While breastfeeding can continue beyond two years of age, the transition from exclusive breastfeeding to family foods, termed complementary feeding, typically occurs between six and twenty-four months. This period is critical for child development, as nutritional deficiencies and increased susceptibility to disease during this stage contribute significantly to elevated rates of undernutrition in children under five globally (WHO).

In a systematic review conducted by Harrison et al., 2023 reported that an infant's nutritional and energy requirements increase beyond what breast milk can supply by the time they are six months old. To satisfy these extra energy and nutritional requirements, newborns gradually move from breastfeeding alone to semi-solid, solid, or soft everyday family foods, also known as complementary foods, during the weaning process. This time frame, known as the complementary feeding (CF) period, usually lasts from six to twenty-four months. For infants to achieve their nutritional needs, complementary foods must be given on time, in sufficient amounts, safely, and appropriately; otherwise, growth faltering may occur.

Suboptimal CF during this critical window is associated with increased morbidity, mortality, delayed physical and cognitive development, and diminished human capital accumulation in later life. Factors contributing to suboptimal CF include inadequate food quality or quantity, poor feeding practices, and elevated infection rates. To address these issues, the World Health

Organization (WHO) published guidelines for CF in breastfed and non-breastfed infants in 2003 and 2005, respectively.

When feeding the child complementary foods, consider the following factors:

F= Frequency, A=Amount, T= Thickness, V=Variety, A=Active/responsive feeding, H=Hygiene (FATVAH). The FATVAH concept helps achieve the WHO guidelines for CF. (WHO, 2023)

Research indicates that the period between six and twenty-four months, characterized by the transition from exclusive breastfeeding to solid food consumption, represents a period of heightened vulnerability to malnutrition in infants and young children. Deviation from recommended complementary feeding practices, specifically delayed introduction, significantly increases the risk of malnutrition. Globally, a significant proportion, approximately two-thirds, of children within this age fail to receive adequate nutrition to support their rapid growth and neurological development. Suboptimal complementary feeding practices are a primary driver of early childhood malnutrition, leading to conditions such as kwashiorkor, marasmus, impaired cognitive development, reduced learning capacity, increased susceptibility to infections due to compromised immunity, weight loss, muscle atrophy, stunting, and, in severe cases, mortality.

Dietary patterns observed in India reveal that family food choices influence children's diets, which are often deficient in protein and essential micronutrients. Consequently, stunting and wasting remain prevalent, affecting approximately 38% and 21% of children under five years, respectively. (Ganesan et al., 2021)

Chhabra et al. (2021) in a study conducted in East Delhi, observed a differential age-related prevalence of anthropometric impairments. Stunting rates increased with age, whereas wasting was most prevalent in the 6-8 month age group and subsequently declined. Underweight was also more common in older children. These findings suggest a potential link between inadequate and delayed complementary feeding practices and the observed patterns of malnutrition.

Global Prevalence of Timely Introduction of Complementary Feeding

The global prevalence of timely initiation of complementary feeding at 6 months varies across, reflecting differences in cultural practices, nutrition policies, and accessibility of healthcare services. The highest rate was reported in UAE with 98% followed by Bhutan (75%) and Australia (73%). While in Australia, 21.6 in 2024 reported a significant decline in the initiation rate. Few of the countries show moderate adherence to suboptimal practices of Initiation of complementary feeding at 6 months. (Table 2.5)

A retrospective cohort study in Tanzania revealed that stunting was the predominant anthropometric deficit, with a significant proportion of children exhibiting stunting, underweight, and wasting within the first nine months of life. Notably, a substantial majority (91.2%) of children received soft, semi-solid, or solid foods before six months of age. Furthermore, 40.3% had inadequate meal frequency, and 74% demonstrated low dietary diversity. Early introduction of complementary foods, specifically at 0-1 month, was significantly associated with an elevated risk of both wasting and underweight. The highest prevalence of stunting, wasting, and underweight was observed among children introduced to complementary feeding before the recommended age of six months. This finding indicates a substantial variation in the prevalence of these anthropometric deficits across different ages at which complementary feeding was initiated (Masuke et al., 2021).

A cross-sectional study conducted in Nigeria revealed that only 25.0% of mothers adhered to the recommended six-month initiation of complementary feeding. Whereas a substantial majority (73.5%) introduced complementary foods before six months, while 1.5% delayed introduction beyond this period. Notably, 85.4% of infants aged 6-8 months were reported to have consumed solid, semi-solid, or soft foods, indicating a high rate of early complementary feeding introduction within this age group. The study also reported a prevalence of 33.3% underweight, 26.4% wasting, and 24.6% stunting among the infant population. Furthermore, the findings indicated a statistically significant association between the absence of timely complementary nutrient provision and an increased risk of wasting (Udoh & Amodu, 2016).

Abi Khalil et al. (2022) in a study conducted in Lebanon, documented that over 60% of mothers initiated complementary feeding before the recommended six months of age. Within this

TABLE 2. 5 PREVALENCE OF TIMELY INTRODUCTION OF COMPLEMENTARY FEEDING- GLOBAL RESEARCH STUDIES

Author and Year	Place	Timely introduction of complementary feeding (%)
Agedew E, et al., 2014	Ethiopia	49
Ogunlesi, T. A et al., 2015	Nigeria	41
Ahmad, A, e t al., 2018	Indonesia	50
Campbell, K.,et al., 2018	Bhutan	75
Owais, A. et al., 2019	Bangladesh	49
Anin et al., 2020	Ghana	66.4
Cheikh I, et al., 2020	UAE	98
Kim-Herrera E et al., 2021	Mexico	43.7
Momin N et al., 2022	Australia	73
Iyer A et al., 2024	Australia	21.6

group, 40% introduced solid foods, while 53.5% introduced sugary juices. Only 31% of mothers adhered to the World Health Organization (WHO) guidelines for complementary feeding initiation at six months. The early introduction of complementary foods, particularly sugary juices, can adversely affect infant nutrient intake and potentially increase the risk of developing non-communicable diseases in later life. Furthermore, improper handling and storage of complementary foods may expose infants to pathogenic microorganisms.

A cross-sectional survey by Ngo Um-Sap et al. (2014) reported that 75% of breastfeeding mothers initiated complementary feeding between four and six months of age in Yaoundé, Cameroon. Furthermore, approximately 50% of children's complementary feeds lacked fruits, vegetables, and animal products. The study demonstrated a positive correlation between children's nutritional status and their dietary diversity score.

Across diverse global settings, early introduction of complementary foods, deviating from the recommended six months, is common. This practice is strongly associated with increased rates of child malnutrition, including stunting and wasting, often compounded by low dietary diversity.

Prevalence of Complementary Feeding Practices in India

Studies indicate a substantial prevalence of suboptimal complementary feeding practices in India. Nationally, Dhami et al. (2019) reported that only 42.7% of infants aged 6-8 months received solid, semi-solid, or soft foods, with a mere 22% achieving minimum dietary diversity. Similarly, thenational prevalence of Minimum Acceptable Diet (MAD) was 9.6%, and Minimum Meal Frequency (MMF) was 35.9%. These findings suggest a strong association between inadequate complementary feeding and the high prevalence of stunting, wasting, and underweight in Indian children.

Conversely, recent data from the National Family Health Survey-5 (NFHS-5) reveals some positive trends. Specifically, improvements in the timely introduction of complementary foods for infants aged 6-8 months are observed, aligning with gradual improvements documented in earlier NFHS surveys. Furthermore, NFHS-5 highlights an increase in dietary diversity among children aged 6-23 months. Despite these positive trends, a downward trend in the early

introduction of semi-solid foods was noted in Kerala and Himachal Pradesh. Overall, while timely complementary feeding has improved, child undernutrition rates have concurrently increased by over 3%. Regional disparities in timely complementary feeding initiation at six months are evident. Notably, Assam and Raipur, followed by Madhya Pradesh and Chandigarh, exhibited higher rates, indicating positive change. Conversely, Odisha (51.5%) and Karnataka (35.6%) reported lower rates, highlighting persistent gaps in early feeding practices.

NFHS-5 (2019-21) data on feeding of young children indicate an improvement in the practice of early initiation of breastfeeding, with noticeable increases in the proportions of infants who were breastfed within one hour of birth over what was reported in earlier surveys.

The trends reported by previous NFHS surveys (4, 3, and 2) show a trend of improvement in breastfeeding initiation across India, indicating consistent improvements over time. NFHS-5 demonstrates a substantial increase in exclusive breastfeeding (EBF) during the first six months compared to NFHS-4. However, despite these positive trends, NFHS-5 reports a decline in early breastfeeding initiation in 12 states and Union Territories. Significant reductions were observed in Sikkim (33.5% decrease), Dadra and Nagar Haveli (24.1% decrease), and Assam (15.3% decrease). Conversely, Lakshadweep, Meghalaya, and Andhra Pradesh experienced notable increases. (NFHS 5)

A study conducted in Dehradun by (Saxena et al., 2022) showed that 47.5 percent of infants younger than six months were breastfed within the first hour of birth. Approximately 73.9% of infants were fed only breast milk for first 6 months after birth. About 20% of new-borns were bottle fed, and 22% were given pre-lacteals. Half of infants between the ages of 6 and 8 months had solid, semi-solid, or soft meals in addition to breast milk, while only 33.5% of children received the minimum acceptable diet.

A community-based cross-sectional study conducted in Raipur by Prasad et al. (2023) further underscores the importance of the first 1000 days of life. This study revealed inadequate feeding practices among children aged 6-23 months in urban Raipur, despite a relatively high proportion (87.1%) initiating complementary feeding within the recommended 6-8 month window. Specifically, 15% of children were stunted, 25% were wasted, and 30% were

underweight. Notably, 4.4% had not initiated complementary feeding, and 4.6% had started earlier than six months. The study concluded that complementary feeding indicators in this population were suboptimal, despite high initiation rates, reinforcing the need for interventions focused on quality and diversity of complementary feeds.

Studies on complementary feeding across various states in India are shown in Table 2.6. The prevalence rates of timely introduction of complementary in these studies exhibit a substantial regional variation. Assam and Raipur, both reported 87.1% in 2024 and 2023 respectively, demonstrating the highest adherence to recommended practices. Following closely, Madhya Pradesh showed an 84% rate in 2020, while Chandigarh reported 81.7% in 2016. Coastal South India documented a 77.5% rate in 2011. Nepal, showed 57.4% rate in 2018. Odisha reported a rate of 51.5% in 2019. National level studies for India showed 45.26% in 2022, and 42% in 2023. Karnataka showed a significantly lower rate of 35.6% in 2022. The lowest rate, 21%, was reported for India in 2021, highlighting a significant disparity compared to other regions.

Scenario of Complementary Feeding Practices in Gujarat State

Results of various studies conducted in different districts of Gujarat has shown complementary feeding initiation rates ranging from 50% to 90.1%. The prevalence at the state level indicates variation with the highest rate of timely introduction of complementary feeding in Vadodara with 90.1% followed by Surat (79.2%) and Ahmedabad with 67%, while another study in Vadodara had the lowest reported rates of 50%. In Gujarat, the NFHS-5 reports that 42% of children aged 6-23 months receive timely complementary feeding, which is slightly below the national average (Table 2.7)

Achieving Dietary Diversity: Ensuring a Balanced Diet for Young Children

The World Health Organization (WHO) has conceptualized minimum dietary diversity (MDD) as the intake of four or more food groups among the eight food groups for higher quality diet and fulfilling daily energy and nutrient needs of the eight recommended food groups among children 6–23 months (Keno et al., 2021)

TABLE 2. 6 PREVALENCE OF TIMELY INTRODUCTION OF COMPLEMENTARY FEEDING- RESEARCH STUDIES CONDUCTED IN INDIA

Author and Year	Place	Complementary Feeding Rate (%)
Rao S et al., 2011	Coastal South	77.5
Pradhan R, et al., 2016	Chandigarh	81.7
Acharya D et al., 2018	Nepal	57.4
Satapathy, et al., 2019	Odisha	51.5
Jain, S.et al., 2020	Madhya Pradesh	84
Bably, M. B et al., 2021	India	21
Khandelwal S et al., 2022	Karnataka	35.6
Ganesan S et al., 2022	India	45.26
Jeyakumar, A et al., 2023	India	42
Prasad R, et al., 2023	Raipur	87.1
A Yadav et al., 2024	Assam	87.1

TABLE 2. 7 PREVALENCE OF TIMELY INTRODUCTION OF COMPLEMENTARY FEEDING- RESEARCH STUDIES CONDUCTED IN GUJARAT

Author and Year	Place	Prevalence (%)
Chandwani et al., 2015	Dabhoda, Gujarat	59.8
Kantawala S., Shah E, 2020	Vadodara	50
Gandhi et al., 2023	Navsari	56.8
Savalia H. et al., 2023	Ahmedabad	67
Choraria N. et al., 2023	Surat	79.2
Kantawala S and Kataria I, 2024	Urban Vadodara	90.1

Dietary diversity is a critical determinant of feeding practices among children aged 6-23 months, directly impacting nutritional status. Both the quality and quantity of food intake are implicated in malnutrition. World Health Organization (WHO) guidelines identify inadequate food group consumption (less than five groups) and delayed introduction of dietary variety, particularly animal-source proteins, as primary barriers to achieving optimal nutritional diversity.

According to the WHO dietary diversity indicator, infants aged 6-23 months should consume foods from at least five of the following eight food groups: such as, staples, animal-source protein (meat/poultry/fish), fruits/vegetables with vitamin A, other fruits and vegetables, eggs, milk and milk products, legumes, and breastmilk. Introducing dietary diversity at six months is crucial, as breast milk alone becomes insufficient to meet the infant's increasing nutritional needs. Suitable complementary foods include vegetables, fruits, and pureed, mashed, or semi-solid preparations of cereals, protein foods, and meat (Ahmed et al., 2023).

Minimum acceptable diet (MAD) is a measure of infant and young infant child-feeding practice initiated by the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) and is the union of both the minimum frequency of meals and the minimum dietary diversity.

Minimum dietary diversity is used as a proxy for sufficient micronutrient density in food and is measured by children who had five or more of the eight food groups while **Minimum meal frequency** intake is a proxy for sufficiency in energy needs and is measured by ≥2 times consumption per day in children aged 6–8 months, ≥3 times per day for children aged 9–23 months, and ≥ 4 times per day in children who were not breastfed (Tekeba et al., 2024)

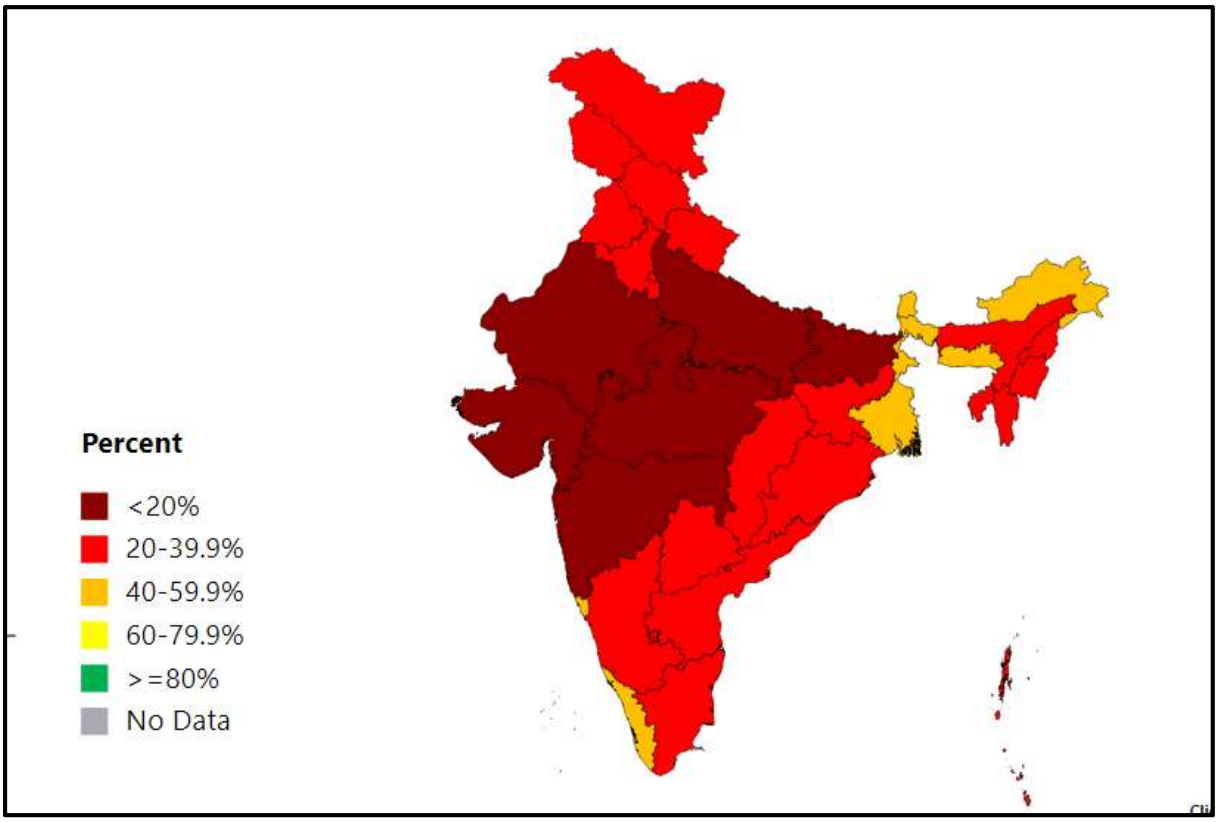
Masuke et al., 2021 identified insufficient consumption of high-quality foods as a primary determinant of undernutrition, emphasizing the significant influence of maternal nutrition on child nutritional status. It is reported that children failing to meet minimum dietary diversity (MDD) criteria face a 29% increased risk of stunting. Furthermore, inadequate meal frequency has beens associated with a nearly threefold increase in stunting risk, as well as a 93% and 89% increase in the risk of wasting and underweight, respectively, compared to children meeting minimum meal frequency requirements.

Supporting these findings, a secondary data analysis by Khamis et al. (2019) highlighted the critical transition at six months, when breast milk alone becomes insufficient to meet a child's nutritional needs, necessitating diversified food intake. Unfortunately, globally, less than a quarter of children aged 6-23 months met recommended MDD criteria. Specifically, only 26% of children consumed diets meeting the minimum threshold of four food groups, while a substantial 74% did not meet minimum dietary diversity. The analysis revealed that grains, roots, and tubers (91%) and vitamin A-rich fruits and vegetables (65%) were the most commonly consumed food groups. Conversely, consumption of eggs (7%), meat and fish (36%), milk and milk products (22%), legumes and nuts (35%), and other vegetables (21%) was significantly lower. Notably, the study demonstrated a strong inverse association between dietary diversity and the risk of stunting, wasting, and underweight. Both dietary diversity score and MDD analyses indicated that children consuming a wider variety of food groups were significantly less likely to experience undernutrition.

A cross-sectional study conducted in Ethiopia revealed that a substantial majority (83.9%) of children failed to meet the minimum dietary diversity (MDD) criteria. The study identified several significant predictors of dietary diversity scores, including child age, birth order, maternal and paternal education levels, family socioeconomic status, and paternal occupation. Specifically, children aged 12-24 months, those with parents possessing formal education, and first-born children demonstrated higher dietary diversity scores. Overall, nearly half of the study population exhibited suboptimal dietary diversity. Furthermore, the findings indicated a significant gender disparity, with girls receiving less diverse diets compared to boys. (Forsido et al., 2019)

Minimum Dietary Diversity is a major marker of diet quality for young children. The diets of young children in India lack diversity of food groups. Figure 2.4 shows the prevalence of Minimum Dietary Diversity in India as reported in the NFHS 5 report. Only one fourth (24.1%) children in India get complementary foods that meet minimum dietary diversity. The prevalence is even lower in Gujarat, with only 17.8% children receiving Minimum dietary diversity in their complementary foods. This makes Gujarat one of the poor performing states.

FIGURE 2. 4 MINIMUM DIETARY DIVERSITY IN 6-23 MONTHS OLDS, INDIA, NFHS5 2019-2021



Research studies conducted in different places all over India indicate low percentages of MDD and poor dietary diversity. The highest MDD was in West Bangalore 24.1% in 2013 and Odisha 19.4% in 2019, while lowest in Raipur 4.1% in 2023. These results highlight the importance of nutrition education, enhanced food availability, and dietary interventions to provide young children with a balanced and varied diet.

Table 2.8 presents a comparative analysis of Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD) across various Indian locations, revealing substantial variations. Karnataka, in 2022, reported the highest MMF at 94.4%, and MAD at 55%. Following Karnataka, Raipur, in 2023, showed the highest MMF at 69.8%, but the lowest MDD and MAD, at 4.1% and 2.4% respectively. West Bangalore, in 2013, demonstrated a relatively moderate MMF of 67% and MAD of 31.5%, with a MDD of 24.1%. East Delhi, in 2021, reported an MMF of 60.6% and a MAD of 9%, with an MDD of 15.1%. India, as a national average in 2023, showed an MMF of 76.5%, and a MAD of 14.9%, with a MDD of 16.4%. Odisha, in 2019 exhibited the lowest MDD, at 19.4%, MMF of 46% and MAD of 9.7%. Notably, clear trend of relatively higher MMF rates compared to significantly lower MDD and MAD rates across all locations, indicating a widespread challenge in achieving dietary diversity and overall acceptable diets, despite relatively consistent meal frequency.

Gujarat also faces a challenge in meeting optimum complementary feeding practices as dietary adequacy of complementary foods is often not met reflected in poor dietary diversity and rates of minimum adequate diet among children. Various studies conducted in Gujarat (Table 2.9) have shown that the rate of Minimum Dietary Diversity is unsatisfactory ranging from 23.8% (Kantawala. S. and Kalsariya. V., 2023) to 45% (Kantawala. S. and Kataria. I., 2024). Studies conducted by Gandhi. H. and Thakur. B. (2021) in Jamusar and Chandorkar. S. and Pathak. A. (2023) in Kalol have reported the rate of minimum adequate diet of 34% and 2.3% respectively. These studies reflect a highly compromised state of dietary adequacy in complementary feeding among young children in Gujarat.

Thus the review reflects that the complementary feeding practices need a great improvement in order to ensure a healthy life for young children. As children are dependent on the parents

TABLE 2. 8 PREVALENCE OF MDD, MMF AND MAD IN DIFFERENT STATES OF INDIA

Author and Year	Place	Age Group	MDD (%)	MMF (%)	MAD (%)
Mukhopadhyay et al, 2013	West Bangalore	6-23 Months	24.1%	67%	31.5%
Satapathy, et al 2019	Odisha	6-23 Months	19.4%	46%	9.7%
Chhabra, P., et al, 2021	East Delhi	6-23 Months	15.1%	60.6%	9%
Khandelwal S. ,et al 2022	Karnataka	< 2 year	—	94.4%	55%
Prasad R, et al 2023	Raipur	6-23 Months	4.1%	69.8%	2.4%
Jeyakumar, A., et al, 2023	India	6-24 Months	16.4%	76.5%	14.9%

TABLE 2. 9 PREVALENCE OF MDD, MMF AND MAD IN DIFFERENT PARTS OF GUJARAT (DEPARTMENTAL STUDIES)

Author and Year	Place	Age Group	MDD (%)	MAD (%)
Kantawala S and Kalsariya v, 2023	Urban Vadodara	6-72 months	23.8%	-
Gandhi H and Thakur B, 2021	Jamusar	6-23 months	51%	34%
Kantawala s. and Kataria I, 2024	Urban Vadodara	6-23 months	45%	-
Chandorkar S and Pathak A, 2023	Kalol	6-23 months	41.0%	2.3%

and caretakers for their need of food and care, knowledge and practices of parents are major contributors in the child feeding practices.

The Role of Parental Feeding Styles in Early Childhood Nutrition

A child's growth and development are significantly influenced by their diet. It is commonly recognized that age-appropriate eating enhances a child's health and lowers their risk of developing certain illnesses. The development of a positive attitude in children is significantly influenced by the environment in which they are raised. Research has consistently demonstrated the importance of a nurturing environment, where children feel safe and supported, for healthy emotional development. This is because children who feel safe are more likely to express and handle their emotions in a healthy way. An observational and cross-sectional study conducted at a health center in Surabaya, located in East Java in 2023, revealed that the 12–24-month age range is crucial and requires more care because growth failure starts to manifest during this time (Kemenkes, 2016). Preschool children who experience issues related to growth and development may be at risk for additional health issues. The way parents care for their children, including how they feed them, is referred to as their parenting style. A child's nutritional status and health may be impacted differently by different parenting styles. Parents are the major caregivers for their children and have a significant influence on their food consumption, which might serve as a major determinant of the child's nutritional status and health (Febrinda Nadhila et al., 2023).

Parenting style is an indicator of parental warmth and control over children's behaviour that takes into account parents' attitudes, beliefs, and behaviours (Baumrind, 1971). These parenting philosophies cover a broad spectrum of topics, such as education, playtime, bedtime, eating, physical activity, and bath time. Children's eating habits and general diets are mostly influenced by their parents and their parenting approaches. Thus, assessing parenting philosophies and food-related parenting techniques is crucial to comprehending children's food consumption and consequent risk of obesity and prevention of malnutrition (Lopez et al., 2018a). A review conducted by Vollmer & Mobley (2013) has documented that parenting style, as conceptualized by Diana Baumrind, represents a comprehensive parenting

environment encompassing specific behaviors and practices that significantly influence child development.

Feeding practices that encourage the child to eat autonomously and in response to physiological and developmental needs, which may encourage self-regulation in eating and support cognitive, emotional, and social development is defined as “Responsive Feeding”. In responsive feeding, the parent and the child engage in pleasant, reciprocal interactions that promote eating, help the child form preferences for wholesome foods and drinks, and eventually help the child eat on their own. In contrast, a lack of reciprocity or active feeding between the carer and the infant is a hallmark of non-responsive feeding. The health, development, and growth of the child are supported when caregivers encourage parents in creating responsive feeding habits (WHO, 2023).

A review paper published by Costa & Oliveira (2023) has shown that environmental and genetic factors combine to shape children's eating habits. Children's eating experiences and feeding environments are mostly shaped by their parents, who seem to have a major impact in their development. As the primary carers, parents have a significant influence on how their children eat and how they are fed. Due to exposure during pregnancy, this influence starts even before delivery and lasts throughout infancy when parents feed their children and engage with them during mealtimes. Children's eating habits have been linked to all of these factors. Parental child-feeding styles are shaped by a multifaceted interaction of determinants, including socioeconomic variables, e.g., family income and education, cultural heritage, personality traits, and psychological well-being.

Another Research conducted by Mahmood et al. (2021) reported that Parent-child interactions are primarily influenced by nutrition, particularly in the first year of life, when breastfeeding is the primary method of engagement. Children begin to learn how to feed themselves by the end of their first year of life, and they adjust to the family's eating habits and diet.

Three distinct parenting styles have been identified according to the Baumrind's taxonomy: permissive, authoritative, and authoritarian, characterized by varying levels of demandingness and responsiveness. Specifically, permissive styles exhibit low demandingness and high responsiveness, authoritative styles demonstrate both high demandingness and responsiveness,

and authoritarian styles are marked by high demandingness and low responsiveness (Collins et al., 2014). Building upon this framework**,** a recent analysis of empirical data reveals specific associations between these parenting styles and child feeding practices. An authoritarian parenting style was associated with increased restrictive feeding and a strong pressure on children to eat, whereas a permissive parenting style was correlated with reduced parental supervision of food intake. Conversely, the authoritative parenting style was linked to an enhanced parental supervision of the child's dietary intake (Vollmer, 2019).

A recent systematic review indicated that permissive parenting is associated with lower parental monitoring, while authoritarian parenting is characterized by greater food restriction and pressure to eat. In contrast, authoritative parenting is linked to more desirable parental monitoring of children's dietary intake. Furthermore, a review of studies on parental practices suggests that moderate restriction may be beneficial. Children of moderately restrictive parents tend to have lower caloric intake and higher fruit consumption, with reduced intake of snacks and sweets. Additionally, parental prompting and encouragement may support the development of healthier eating habits in children. (Febrinda Nadhila et al., 2023; Lopez et al., 2018)

Parental participation and role-modelling significantly influence the development of healthy food-related behaviors in young children. Specifically, restricting fast food consumption and controlling meal portion sizes correlate with improved dietary intake and nutritional status. Furthermore, minimizing distractions during meals, particularly television viewing, reduces overconsumption and prolongs eating episodes, thereby promoting healthier eating patterns (Van Der Horst & Sleddens, 2017)

A cross-sectional study conducted in Brazil by de Fátima César Silva et al. (2024) identified significant associations between maternal parenting styles and dietary patterns in young children. It was seen that children under 24 months of age with authoritarian mothers exhibited 8.7-fold increased odds of consuming ultra-processed foods and a 5.3-fold decreased odds of consuming vitamin A-rich foods, relative to those with indulgent mothers. In children over 24 months, authoritative parenting was associated with 2.3-fold decreased odds of consuming three main meals daily, a 2.0-fold increased odds of consuming sandwich cookies, candies,

and sweets, and a 2.5-fold increased odds of eating meals while watching television, compared to those with indulgent mothers. Furthermore, overweight children demonstrated 2.0-fold increased odds of having authoritarian mothers compared to underweight children.

Hence parental feeding styles shape children's eating habits and weight gain. These styles are categorized by how demanding and responsive parents are in feeding interactions. (Hughes et al., 2012; Jansen et al., 2014)

- **Authoritative feeding** involves setting clear rules while being responsive to the child's hunger and satiety cues. Parents who use this style provide structure and support the child's self-regulation of food intake.

- **Authoritarian feeding** is characterized by high control and low responsiveness. Parents are restrictive and less sensitive to the child's cues.

- **Indulgent feeding** involves low demandingness and high responsiveness. Parents are permissive and avoid setting limits.

- **Uninvolved feeding** is marked by low demandingness and low responsiveness.

Authoritative feeding style is considered the most optimal approach. Parents using this style set clear expectations and rules regarding eating (high demandingness), while also being attentive to the child's hunger and satiety cues, encouraging autonomy within set boundaries, and engaging in supportive mealtime interactions (high responsiveness). This balance enables parents to provide structure and guidance, while simultaneously fostering the child's ability to self-regulate their food intake (Hughes et al., 2005a; Rodenburg et al., 2012).

In contrast, the authoritarian feeding style, while also exhibiting high demandingness, lacks responsiveness**.** Parents using this style are very controlling and restrictive regarding their child's eating, often placing a strong emphasis on rules and obedience with little room for negotiation. At the same time, they are less sensitive to the child's hunger and satiety cues, potentially pressuring the child to eat even when they are not hungry. Consequently, this feeding style can lead to power struggles around food and may negatively impact the child's ability to self-regulate their intake. (Hughes et al., 2005b; Vollmer, 2019)

The indulgent feeding style prioritizes responsiveness over demandingness. Parents employing this style are responsive to the child's desires and may cater to their preferences, but they are permissive and make few demands on the child's eating, often avoiding setting limits on food choices or portion sizes. Consequently, this approach may lead to children having difficulty with self-regulation and an increased consumption of less nutritious foods. (Frankel et al., 2014; Hennessy et al., 2010)

Whereas the uninvolved feeding style represents the least effective approach, characterized by both low demandingness and low responsiveness. Parents who adopt this style are disengaged and uninvolved in their child's eating, providing little structure or guidance around mealtimes or food choices. Consequently, these parents are not attentive to the child's hunger and satiety cues and may not provide regular or nutritious meals. This feeding style is associated with the poorest outcomes for children's nutritional health and eating behaviors (Vollmer, 2019).

Various global studies reveal diverse parental feeding styles impacting child nutrition. In Ethiopia, positive feeding practices have been shown to improve infant growth. The US links responsive feeding to better nutritional outcomes. In India, uninvolved feeding is common, while Mexico stresses the importance of responding to fullness cues.

A study also conducted in Dakshina Kannada, India, reveal that while fathers' involvement in infant and young child feeding is generally low but the participation of fathers improve with higher education levels. Researches in Brazil show that parenting styles affect breastfeeding duration. Recent Ethiopian data also show that education improves paternal involvement, but dietary diversity remains a challenge (Table 2.10)

Thus, the literature underscores the important role of complementary feeding in establishing healthy dietary patterns during children's formative years. Parental feeding styles significantly influence this process, shaping children's food preferences, self-regulation, and overall nutritional status. Recognizing the long-term implications of early feeding experiences, it is imperative that future research and interventions prioritize the development of supportive parental feeding practices to optimize children's nutritional well-being. This requires more research-based evidence on the prevailing parental feeding styles in the Indian states.

TABLE 2. 10 PARENTAL FEEDING STYLES: GLOBAL AND NATIONAL STUDIES

Author Name, Year, Place	Major Findings
Wondafrash, M., et. al 2012 Ethiopia	Appropriate child feeding practices and behaviours of parents have a positive effect on growth of infants and young children.
Wan Dei Horst,K .,et al, 2017, United States	Caregivers who actively engage in responsive feeding practices and promote a balanced, involved approach to nutrition tend to foster more positive food-seeking behaviors in children & better nutritional outcomes.
Inbaraj, L. R. et. al, 2020 India	Almost half of the fathers fed their children once a day and engaged them during feeding by telling stories. The most common parental feeding style was uninvolved (36%) followed by authoritative (29.5%).
Kim.E.Y. et.al, 2021 Mexico	A responsive parental feeding style, which involves paying attention to babies' fullness cues, was linked to better feeding at 6 months. Whereas, pressuring children to eat led to poor growth outcomes. Encouraging parents to identify hunger signals can improve feeding practices.
Mahmood, L. et. al 2021	It highlights that parental child-feeding behaviors should receive more attention. Parental feeding practices found that role models can play a really important part in shaping children's eating habits.
Mithra P.,et.al, 2021, Dakshina Kannada	Fathers' involvement in IYCF was generally low in Dakshina Kannada, with higher education levels improving participation, but location and occupation had little impact. Fathers showed good awareness of the benefits of breastfeeding, recognizing hunger cues, and the role of Anganwadi services, with particular emphasis on the importance of breastfeeding duration for child nutrition.

Author Name, Year, Place	Major Findings
Ganesan, S., et.al, 2022 India	90.53% parents initiated complementary feeds at 6 months. However, only 45.26% of children were consuming an adequate quantity of complementary foods.
Marr, C. et al, 2022 United kindom	The study describes how caregivers influence a child's eating habits and the level of control they exert. Caregivers are typically categorized into four feeding styles: indulgent , uninvolved, authoritarian and authoritative.
Maximino et.al, 2023 Brazil	Parenting styles significantly influence breastfeeding duration. Children of authoritative, authoritarian, and indulgent parents had longer EBF durations, while uninvolved parenting was linked to lower breastfeeding rates. Interventions promoting responsive feeding practices could help improve breastfeeding outcomes and prevent feeding difficulties.
Costa & Oliveira, 2023 Switzerland	Parental influence on children's eating behaviours starts even before birth, with perinatal exposures. Throughout childhood, parents are the primary caretakers responsible for shaping their children's food environment and the interactions they have with their children during mealtimes plays a significant role in their nutritional status.
Shimelis et. al., 2024 Ethiopia	Education had a positive effect on paternal participation. The percentage of children aged 6–23 months who consumed at least 5 food items is 46.2%.

METHODOLOGY

Introduction Appropriate breastfeeding and complementary feeding practices helps in preventing under five mortalities by 19%. According to various studies growth faltering can begin as early as 3 months & till upto the age of 2 years. Even if adequate breastfeeding is practised there is a window of risk for children developing deficiencies if adequate dietary diversity, quantity and meal frequency after 6 months of age is not taken care of, hence risk of stunting and wasting increases (Chhabra et al., 2021). Several Research on caregiver feeding behaviour highlights the complex ways a caregiver influences the children's dietary habit (Marr et al., 2022). Therefore, to study parental involvement in child's nutrition is a key focus area.

Objectives

Broad objective:

1) To study the feeding styles followed by parents of children aged 6-24 months in Urban Vadodara.

Specific objective:

1) To assess the feeding practices followed by the parents among children of 6-24 Months.
2) To assess diet quality of complementary foods in children aged 6-24 months.
3) To assess the nutritional status of children 6-24 months.

Study Design

A community-based cross-sectional study was conducted in urban Vadodara to assess parental feeding styles and the dietary quality of complementary foods among children aged 6-24 month. Using purposive sampling, snowball sampling method was applied to recruit 262 households. This method was chosen to facilitate the identification of households with children meeting the study criteria through referrals within the community. The duration of the study was from November 2024 to January 2025.The study plan is indicated in Figure 3.1

Study Approval

The study titled "Parental Feeding Styles and Dietary Quality of Complementary Foods among Children Aged 6-24 Months in Urban Vadodara" as indicated in Annexure 1, was reviewed and approved by the Institutional Ethics Committee for Human Research (IECHR) (Ethical Clearance Number IECHR/FCSc/M.Sc.10/2024/31). The subjects were informed in detail about the study and written consent was also acquired from the subjects. (Annexure 3)

Sample Size

Based on the prevalence of minimum dietary diversity in children aged 6-23 months in Gujarat according to NFHS (2019-21), the sample size of the present study has been calculated by adopting the formula;

$n=Z^2\alpha/2 \times PQ/ \Sigma^2$

Where, P= Prevalence rate of MDD

= 17.8% = 0.178

Q = 1- P, = 0.822

α = level of Significance (type 1 error) Z2 /2 = 4Σ = Allowable error 5%

Then n= 4 × 0.178 × 0.822 / 0.0025 = **225**

10% non-response rate = 225 × 10/100 = 22.5

= 225+22.5 = 247.5

= **250**

Inclusion and Exclusion Criteria

Inclusion criteria

1) Children who have completed 6 months of age and are <2 years of age.
2) Both the father & mother of the child willing to participate in the study.
3) Respondents should be residing in Urban Vadodara.

Exclusion criteria

Children suffering from any medical complications.

Expected Outcomes

Primary outcome

Insights into various parental feeding styles/techniques

Secondary outcomes

1) Diet quality of the complementary feeds
2) Nutritional status of the children

Study Plan

The purpose of the study was to evaluate the association between the nutritional quality of complementary meals and the feeding practices of parents in urban Vadodara for children aged 6 to 24 months. Snowball sampling was used to enrol 250 children and their parents. To analyze feeding patterns, meal frequency, food diversity, and nutrient sufficiency, data were gathered using standardized questionnaires and dietary evaluations. Study plan is depicted in Figure 3.1.

Background Information

A structural questionnaire about religion, caste, education, and the occupation of both parents, as well as the kind of household and the number of family members, monthly income, bathroom facilities, was used to gather data on the socio-economic profile. The socioeconomic status was evaluated using the revised Kuppuswamy Classification, 2024

KAP on Complementary feeding information of parents

A semi-structured questionnaire was used to gather information on various aspects of feeding. It included questions about the types and timing of complementary foods introduced, age-appropriate feeding behaviours, the parent's role in feeding, the number of meals provided per day, and the methods used to feed the child. This approach helped capture detailed insights into the feeding practices and behaviours of caregivers, crucial for assessing the effectiveness of complementary feeding strategies.

FIGURE 3. 1 STUDY PLAN

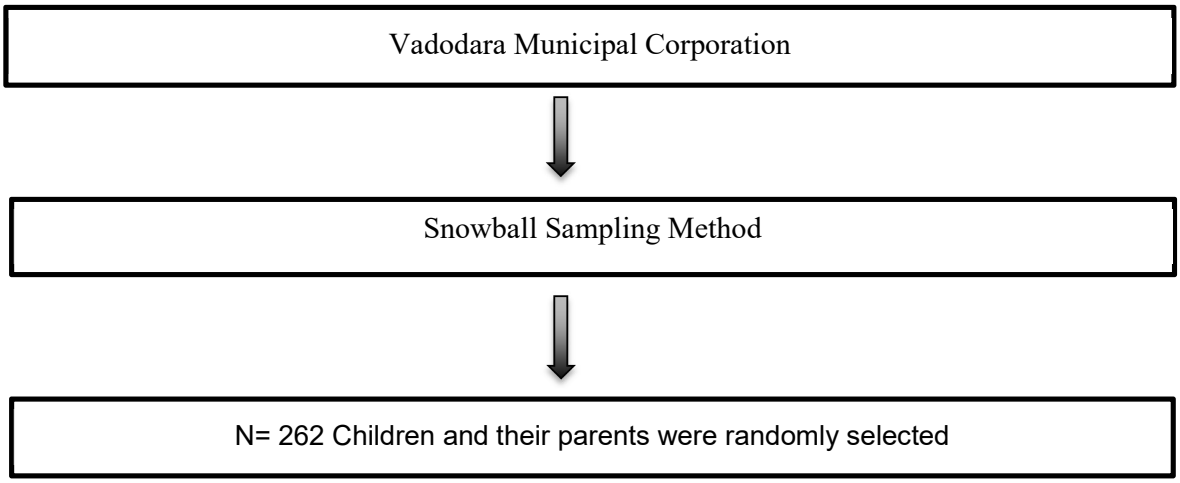


FIGURE 3. 2 TOOLS AND TECHNIQUES

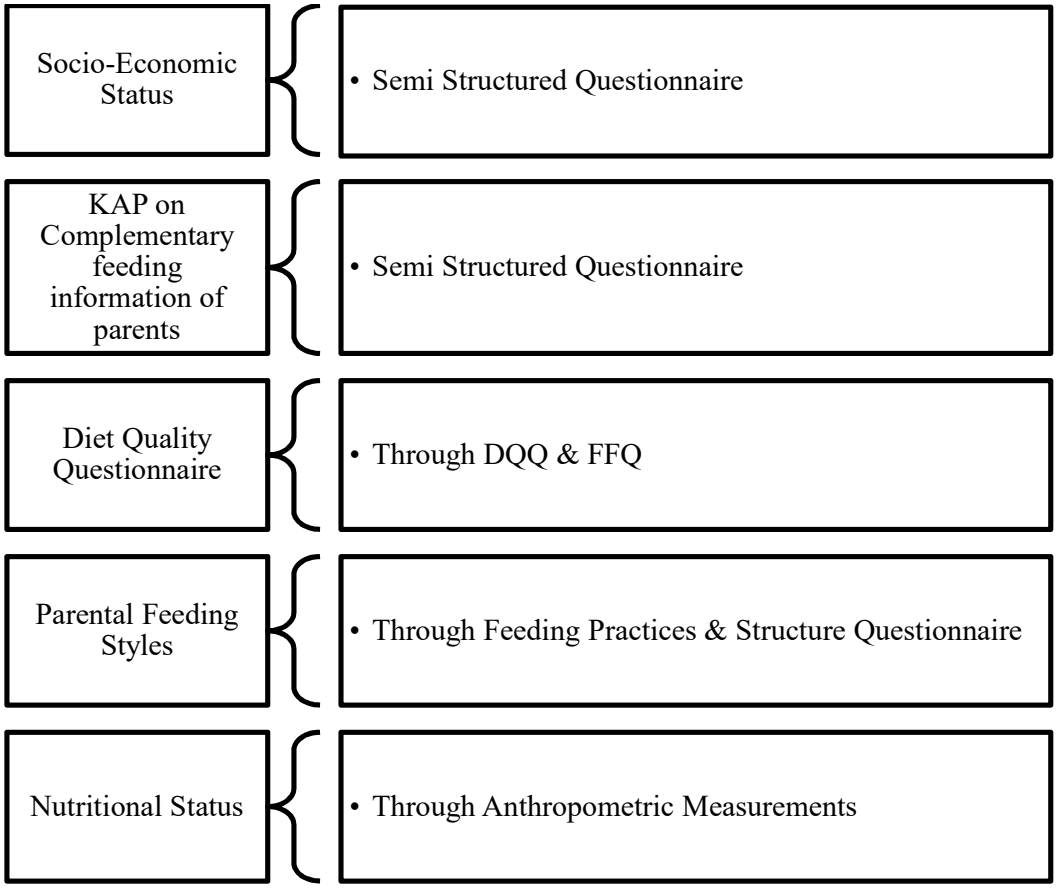


TABLE 3. 1 THE SCORING SYSTEM OF EDUCATION

Education	Score
Profession or Honors	7
Graduate	6
Intermediate or diploma	5
High school certificate	4
Middle school certificate	3
Primary school certificate	2
Illiterate	1

(Source: Mandal & Hossain, 2024)

TABLE 3. 2 THE SCORING SYSTEM FOR OCCUPATION

Occupation	Score
Legislators, Senior Officials and Managers	10
Professionals	9
Technicians and Associate Professionals	8
Clerks	7
Skilled Workers and Shop and Market Sales Workers	6
Craft and Related Trade Workers	5
Skilled Agricultural and Fishery Workers	4
Elementary Occupation	3
Plant and Machine Operators and Assemblers	2
Unemployed	1

(Source: Mandal & Hossain, 2024)

TABLE 3. 3 TOTAL MONTHLY INCOME AND SCORE

Monthly Family Income	Score
2,13,814 and above	12
1,06,850-2,13,813	10
80,110-1,06,849	6
53,361-80,109	4
31,978-53,360	3
10,703-31,977	2
≤10,702	1

(Source: Mandal & Hossain, 2024)

TABLE 3. 4 KUPPUSWAMMY SOCIO-ECONOMIC CLASS

Score	Socioeconomic class
26-29	Upper Class (1)
16-25	Upper middle class (2)
11-15	Lower middle class (3)
5-10	Upper lower class (4)
<5	Lower (5)

(Source: Mandal & Hossain, 2024)

Assessment of Dietary Quality

Diet Quality Questionnaire (DQQ):

The Diet Quality Questionnaire (DQQ) is an internationally standardized tool developed by the Global Diet Quality Project to assess diet quality efficiently at the population level. It is a rapid and feasible instrument designed for monitoring dietary patterns in the general population. In this study, the DQQ was utilized to evaluate the children's diets, focusing on the types of foods consumed and overall dietary quality.

Food Frequency Questionnaire (FFQ):

A Food Frequency Questionnaire (FFQ) was created using the NOVA classification system for processed foods in order to assess the prevalence of ultra-processed food consumption in children between the ages of six months and two years. The FFQ includes frequently consumed products in this category and documents the frequency of consumption of ultra-processed foods. The prevalence of ultra-processed foods in the children's meals and dietary patterns were both thoroughly shown by this method.

Four classifications were found:

Grp 1: Foods with Minimal Processing
Grp 2: Sugar, Salt, Fats, and Oils
Grp 3: Foods that are processed
Grp 4: Highly Processed Foods

Parental Feeding Styles

The Feeding Practices and Structure Questionnaire (FPSQ) was used as a tool to evaluate early feeding practices. The FPSQ uses a 5-point Likert scale (e.g., never to always). It is designed to measure non-responsive feeding behaviors and the structure of the mealtime environment. This tool enabled the assessment of different parental feeding styles, including authoritative, authoritarian, permissive, and responsive styles, providing insights into how these behaviors influence children’s eating habits and nutritional outcomes (Jansen et al., 2014)

Calculating score of demandingness and responsiveness

Demandingness talks about how much parents encourage their child to eat whereas responsiveness reflects how parents respond to their child's eating cues and needs. The items that reflect the child's need and preferences during feeding indicate child-centered items similarly the items that reflect the parent's control and expectations during feeding indicate parent-centered items (Hughes et al., 2011).

Demandingness was calculated with the average score across all items and responsiveness is a ratio of average of child-centered items scores over the total scores. The median for the mother and father was calculated for both demandingness and responsiveness and categorized the parents into high and low categories. Based on the low and high categories of demandingness and responsiveness the median values were calculated as shown in Table 3.5.

Based on feeding styles, the participants were categorized into feeding styles based on their scores on demandingness and responsiveness. There are mainly 4 Feeding styles for which the combination of demandingness and responsiveness scores can be used to classify feeding styles, such as

1. Authoritative (high demandingness, high responsiveness)
2. Authoritarian (high demandingness, low responsiveness)
3. Indulgent (low demandingness, high responsiveness)
4. Uninvolved (low demandingness, low responsiveness)

Anthropometric Assessment:

Anthropometry refers to the systematic measurement and analysis of the physical dimensions, proportions, and composition of the human body.

- **Height/Length:** To assess growth and development.
- **Weight:** To evaluate overall body mass.

The main purpose of anthropometry in children is to evaluate their general health, growth, and nutritional status. It helps detect obesity, development delays, and malnutrition and offers important information about whether a child is developing normally. To conduct the

TABLE 3. 5 MEDIAN VALUES FOR MOTHER AND FATHER FOR DEMANDINGNESS & RESPONSIVENESS

	Mother	Father
Median Value		
Demandingness	2.02	1.71
Responsiveness	1.31	1.97

anthropometric assessment of children, weight and height measurements were taken using standard methods.

Weight: A digital infant weight scale was used to determine the baby's weight. The precision of this electronic scale was 100g. The kids were instructed to lie down in the middle of the scale pan on their backs. A number of measures were taken to guarantee precise measurements, such as setting the weighing scale on a level surface, making sure the scale read "ZERO" before weighing, asking subjects to wear as little clothing as possible, taking off shoes and other accessories, tying the pockets, and recording the weight after the digital had stabilized. To the closest hundred grams, weight measurements were recorded in kilograms.

Height: An infantometer was used to measure the subjects' heights up until the age of two. On the infantometer, the mother or father was instructed to place the baby on their back, compressing their hair with their head against the fixed headboard. The child's eye stayed fixed toward the ceiling as the head was swiftly moved so that an imaginary vertical line drawn from the ear canal to the lower edge of the eye socket was parallel to the board. The legs were intended to touch the movable footboard while remaining straight. The mother was told to hold the head in this posture while taking the measurement. For accurate measurements, the child was told to dress appropriately, take off their shoes, keep their hands and legs straight, and requested them to open any high ponytails and other suggested hairstyles. The height was measured in centimeters, as close as possible to millimetres

Anthropometric Indicators:

Three key indicators—weight-for-height, height-for-age, and weight-for-age—were used to evaluate the nutritional status of children based on anthropometric measurements. These indicators were compared against the WHO Growth Standards (2006) to provide standardized assessments. Z-score cut-off values for each indicator were applied to categorize children into different nutritional status groups, such as normal, stunted, wasted, or underweight, enabling a comprehensive understanding of their growth and health Table 3.6.

TABLE 3. 6 CLASSIFICATION OF NUTRITIONAL STATUS

Weight for age Z score (WAZ)	
-1 SD to + 1 Sd	Normal
≤ -1 SD to < -2 SD	Mild Underweight
≤ -2 SD to < - 3 SD	Moderately underweight
≤ -3 SD	Severely underweight
Weight for height Z score (WHZ)	
-1 SD to + 1 Sd	Normal
≤ -1 SD to < -2 SD	Mild wasted
≤ -2 SD to < - 3 SD	Moderately wasted
≤ -3 SD	Severely Wasted
Height for age Z score (HAZ)	
-1 SD to + 1 Sd	Normal
≤ -1 SD to < -2 SD	Mild stunted
≤ -2 SD to < - 3 SD	Moderately stunted
≤ -3 SD	Severely stunted

(Source: Radhakrishnan & Nagaraja, 2023)

Statistical Analysis

After gathering, cleaning, and validating, the data was put through the proper statistical analysis. SPSS version 22 was used to calculate the frequency distribution, percentages, mean, standard deviation, and T-test for each parameter. WHO Anthro software was used to assess anthropometric data (V.3.2.2). The results have either been displayed graphically or in tabular form.

RESULTS

Childhood undernutrition is a major developmental challenge faced by the world today. Child feeding and caretaking practices are major determinants of the nutritional and health status during early childhood. Parents and caretakers play an important role in not only providing the correct nutrition and care to children but also in encouraging healthy eating behaviours among them. Research studies have shown that the pattern of feeding and providing care followed by parents has a great influence on these factors. Parental feeding style constitutes the characteristic attitudes and behaviors exhibited by caregivers during child feeding interactions, influencing the child's dietary intake and eating behaviors. This cross-sectional research was carried out to study the parental feeding style followed by parents of children in 6-24 months age group in urban Vadodara. Results of the study are presented in this chapter.

Demographic Details:

The demographic details of families of the enrolled subjects included data on gender, age, birth order and socio-economic status. The gender distribution of the study participants in two age groups—6–12 months and 12–24 months—is shown in Table 4.1.Of the children between the ages of 6 and 12 months, 36 (28.3%) were female, and 46 (34.1%) There were 89 (65.9%) males and 91 (71.7%) females in the 12–24-month group. The age range of 12 to 24 months had a higher proportion of girls compared to males.

Table 4.2 shows the birth order of the child as per gender category. Majority (56.9%) of the enrolled children were first-borns. Among them, a higher percentage were females (62.2%) compared to males (51.9%). Second-born children accounted for 38.5% of the total, with a relatively balanced distribution between females (36.2%) and males (40.7%). Only 4.6% children were third-born children, with significantly fewer females (1.6%) compared to males (7.4%).

The demographic details of families of the enrolled subjects were studied using Socio-Economic Status (SES) to understand their family backgrounds. Table 4.3 provides information on the demographic characteristics of the subjects. The majority of the subjects were Hindu (96.6%), followed by Muslims (2.3%). There was a negligible proportion (0.4%)

TABLE 4. 1 AGE AND GENDERWISE DISTRIBUTION OF THE ENROLLED

Gender of the child	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
6-12 months	36	28.3	46	34.1	82	31.3	0.998	0.318
12-24 months	91	71.7	89	65.9	180	68.7		

TABLE 4. 2 BIRTH ORDER OF THE CHILD

Birth order of the child	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
1	79	62.2	70	51.9	149	56.9	6.441	0.040
2	46	36.2	55	40.7	101	38.5		
3	2	1.6	10	7.4	12	4.6		

TABLE 4. 3 SOCIO-ECONOMIC CHARACTERISTICS ACROSS GENDERS

	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
	n	%	n	%	n	%		
Religion								
Hindu	125	98.4	129	95.6	254	96.6	4.490	0.213
Muslim	1	0.8	5	3.7	6	2.3		
Sikh	1	0.8	0	0.0	1	0.4		
Jain	0	0.0	1	0.7	1	0.4		
Caste								
SC	39	30.7	35	25.9	74	28.2	3.439	0.179
OBC	12	9.4	23	17	35	13.4		
General	76	59.8	77	57.0	153	58.4		
Type of family								
Nuclear	51	40.2	51	37.8	102	38.9	4.084	0.130
Joint	67	52.8	81	60.0	148	56.5		
Extended	9	7.1	3	2.2	12	4.6		
Total number of family member								
<4	57	44.9	56	41.5	113	43.1	0.750	0.684
5-8	62	48.8	67	49.6	129	49.2		
>9	8	6.3	12	8.9	20	7.6		
Toilet facility available in the household								
Yes	127	100.0	134	99.3	261	99.6	0.944	0.331
No	0	0.0	1	0.7	1	0.4		
Age of mother								
<20	1	0.8	3	2.2	4	1.5	0.928	0.819
20-30	75	59.1	80	59.3	155	59.2		
30-40	50	39.4	51	37.8	101	38.5		
40-50	1	0.8	1	0.7	2	0.8		
Age of father								
<20	1	0.8	1	0.7	2	0.8	0.378	0.945
20-30	44	34.6	44	32.6	88	33.6		
30-40	78	61.4	84	62.2	162	61.8		
40-50	4	3.1	6	4.4	10	3.8		

of subjects following Jainism and Sikhism. In terms of caste, 76% of subjects belonged to the General Category, followed by Scheduled Caste (28.2%), and OBC were 13.4%. The majority of subjects lived in joint families (56.5%) followed by nuclear families (38.9%), and only 4.6% of subjects lived in extended families. Most of the families had 5-8 family members (49.1%) and similarly, 43.1% lived with family members less or equal to 4 members, while only 9.6% lived with more than 9 family members. Almost all (99.6%) of the participants had a toilet facility, while only 0.4% had no toilet facility.

The majority of the mothers belonged to the 20-30 years of age category, followed by 38.5% belonging to the 30-40 years of age category, and only 1.5% of mothers belonged to less than 20 years while least mothers (0.8%) belonged to 40-50 years of age category. The majority of the fathers belonged to the 30-40 years of age category, followed by 33.6% belonging to years of the age category of 20-30 years and only 3.8% belonged to 40-50 years while only a few of the fathers (0.8%) belonged to less than 20 years of age category. The educational and occupational details of mothers and fathers are shown in Table 4.4 and Table 4.5, provides insights into the demographic characteristics of families of female and male children. These findings show that 19.1% of mothers as well as fathers had an honors degree, whereas nearly one-third i.e. 37.8% and 31.7% of the fathers and mothers, had a graduate degree. A small number of mothers (4.2%) and fathers (1.5%) were illiterate. Data on occupation showed that the majority (78.2%) of the mothers were unemployed, whereas none of the fathers were unemployed. Only 12.2% of mothers were professionals, followed by those having an elementary occupation (5.7%) while the majority of fathers (34%) were professionals, followed by 20.6% of fathers who were skilled workers and Shop and Market Sales Workers. Only 0.8% were Skilled Agricultural and Fishery Workers.

Majority (82.1) of the households have no additional source of income while 6.9% receive pension followed by 5.7% have house/shop rent as their additional income followed by 4.2% agriculture and least in business with 1.1%.

Kuppuswamy classification for socio-economic status was used to classify the families for their socio-economic status. The distribution of monthly income ranges categorized by gender is shown in Table In terms of income ranges, majority (46.6%) of the families had

TABLE 4. 4 EDUCATION AND OCCUPATION OF MOTHER BY GENDER CLASSIFICATION

	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
	n	%	n	%	n	%		
Educational Qualification of Mother								
Profession or Honors	23	18.1	27	20.0	50	19.1	9.196	0.163
Graduate	45	35.4	38	28.1	83	31.7		
Intermediate or Diploma	8	6.3	9	6.7	17	6.5		
High School Certificate	16	12.6	26	19.3	42	16.0		
Middle School Certificate	26	20.5	16	11.9	42	16.0		
Primary School Certificate	5	3.9	12	8.9	17	6.5		
Illiterate	4	3.1	7	5.2	11	4.2		
Occupation of Mother								
Legislators, Senior Officials and Managers	0	0.0	2	1.5	2	0.8	5.605	0.347
Professionals	16	12.6	16	11.9	32	12.2		
Technicians and Associate Professionals	1	0.8	2	1.5	3	1.1		
Skilled Workers and Shop and Market Sales Workers	2	1.6	3	2.2	5	1.9		
Elementary Occupation	4	3.1	11	8.1	15	5.7		
Unemployed	104	81.9	101	74.8	205	78.2		

TABLE 4. 5 EDUCATION AND OCCUPATION OF FATHER BY GENDER CLASSIFICATION

	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
	n	%	n	%	n	%		
Educational Qualification of Father								
Profession or Honors	21	16.5	29	21.5	50	19.1	9.588	0.143
Graduate	58	45.7	41	30.4	99	37.8		
Intermediate or Diploma	13	10.2	16	11.9	29	11.1		
High School Certificate	14	11.0	16	11.9	30	11.5		
Middle School Certificate	10	7.9	23	17.0	33	12.6		
Primary School Certificate	9	7.1	8	5.9	17	6.5		
Illiterate	2	1.6	2	1.5	4	1.5		
Occupation of Father								
Legislators, Senior Officials and Managers	22	17.3	25	18.5	47	17.9	7.923	0.244
Professionals	50	39.4	39	28.9	89	34.0		
Technicians and Associate Professionals	13	10.2	14	10.4	27	10.3		
Skilled Workers and Shop and Market Sales Workers	21	16.5	33	24.4	54	20.6		
Craft and Related Trade Workers	1	0.8	4	3.0	5	1.9		
Skilled Agricultural and Fishery Workers	2	1.6	0	0.0	2	0.8		
Elementary Occupation	18	14.2	20	14.8	38	14.5		
Any Other Income Source of Household								
Agriculture	4	3.1	7	5.2	11	4.2	2.428	0.658
House/Shop rent	8	6.3	7	5.2	15	5.7		
None	102	80.3	113	83.7	215	82.1		
Other business	2	1.6	1	0.7	3	1.1		
Pension	11	8.7	7	5.2	18	6.9		

TABLE 4. 6 INCOME CLASSIFICATION OF HOUSEHOLD ACROSS GENDERS

Income Classification		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
		n	%	n	%	n	%		
Monthly Income range as per Kuppuswami 2024	2,13,814 and above	7	5.5	6	4.4	13	5.0	2.220	0.898
	1,06,850-2,13,813	6	4.7	8	5.9	14	5.3		
	80,110-1,06,849	7	5.5	11	8.1	18	6.9		
	53,361-80,109	10	7.9	9	6.7	19	7.3		
	31,978-53,360	29	22.8	24	17.8	53	20.2		
	10,703-31,977	58	45.7	64	47.4	122	46.6		
	≤10,702	10	7.9	13	9.6	23	8.8		

TABLE 4. 7 MEAN INCOME OF HOUSEHOLDS ACROSS GENDERS

	Female		Male		Total	
	Mean	SD	Mean	SD	Mean	SD
Kuppuswamy Category Scores	16	6	16	6	16	6

Table 4. 8 KUPPUSWAMY CLASSIFICATION OF HOUSEHOLD ACROSS GENDERS

Income Classification	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
Upper Class	10	7.9	12	8.9	22	8.4	9.679	0.046*
Upper middle class	69	54.3	54	40.0	123	46.9		
Lower middle class	24	18.9	44	32.6	68	26.0		
Upper lower class	24	18.9	23	17.0	47	17.9		
Lower	0	0.0	2	1.5	2	0.8		

***P= <0.05**

monthly family income of Rs. 10,703-31,977, followed by 20.2% families having monthly family income of Rs. 31,978-53,360. Only a small percentage of families fell in the lowest and highest income categories, with 8.8% of families having income less than ≤10,702 whereas 5.0% of families having income more than 2,13,814 Rs. (Table 4.6)

Families were given scores for education, occupation, and income, and a combined score was calculated for each family. Table 4.7 presents the Kuppuswamy category scores for both females and males, along with the mean and standard deviation for each group. The mean Kuppuswamy score was 16±6 for both males and females. This suggests that the average socioeconomic status (as measured by the Kuppuswamy scale) was comparable across genders in enrolled subjects.

Socio-Economic Status categories as per Kuppuswami classification, among households categorized by gender, are shown in Table 4.8. According to the Kuppuswami classification, around one-fourth (26.0%) of the female children and male children belonged to the lower middle-class families. There was a statistical difference in the distribution of families across the income categories as per Kuppuswamy categories with a higher percentage of females (54.3%) as compared to males (40.0%) in upper middle class and vice-a-versa in lower middles class where percentage of males was higher (32.6%) as compared to females (18.9%) as indicated by chi-square value ($p = 0.046$). This suggests that the income distribution across Kuppuswami categories was not similar for both genders in the studied population.

Source of water used for drinking, cooking, washing

Table 4. 9 presents data on water usage, storage and treatment practices, with responses categorized by gender. In terms of water sources, the majority of the families of both females (56.7%) and males (49.6%) had piped water in their dwellings, while 51.9% of the total population relied on public taps. A smaller percentage of families were getting the water from tube wells or boreholes (14.9%) and hand pumps (4.2%). For water storage, most respondents (55%) used earthen pots, followed by RO tanks (43.9%) and metal pots (37%). When taking water for drinking, the majority (80.2%) used taps, while 35.9% used glasses. Regarding water treatment, 34% of respondents treated their water, mainly by boiling it or adding bleach/chlorine (37.4%).

TABLE 4. 9 MAIN SOURCE OF WATER USED FOR DRINKING, COOKING, WASHING

	Female (N= 127)		Male (N= 132)		Total (N= 262)	
	n	%	n	%	n	%
Piped water into dwelling	72	56.7	67	49.6	139	53.1
Piped into yard or plot	0	0.0	5	3.7	5	1.9
Public tap/standpipe	67	52.8	69	51.1	136	51.9
Tube well/borehole	14	11.0	25	18.5	39	14.9
Bottled water	2	1.6	2	1.5	4	1.5
Hand pump	4	3.1	7	5.2	11	4.2
What container is used to store drinking water*						
Earthen Pot	68	53.5	76	56.3	144	55.0
Metal pot	46	36.2	51	37.8	97	37.0
RO tank	60	47.2	55	40.7	115	43.9
Plastic Container	36	28.3	39	28.9	75	28.6
What is used for taking out the water*						
Glass	37	29.1	57	42.2	94	35.9
Tap	109	85.8	101	74.8	210	80.2
Doyo	1	0.8	3	2.2	4	1.5
Do you treat your water in any way to make it safe to drink	39	30.7	50	37.0	89	34.0
What do you usually do to the water to make it safer to drink*						
Boil it Add bleach/chlorine	48	37.8	50	37.0	98	37.4
Strain it through a cloth	3	2.4	3	2.2	6	2.3
Use a water filter (ceramic, sand, composite, etc.)	0	0.0	1	0.7	1	0.4
Let it stand and settle	0	0.0	1	0.7	1	0.4
Alum	0	0.0	1	0.7	1	0.4
If you know that the water you are going to use for cooking or drinking is not safe, what should you do*						
Boil it/ Add bleach/chlorine	126	99.2	133	98.5	259	98.9
Strain it through a cloth	29	22.8	33	24.4	62	23.7
Use a water filter (ceramic, sand, composite, etc)	1	0.8	2	1.5	3	1.1
Let it stand and settle	0	0.0	1	0.7	1	0.4

***Multiple Response**

Additionally, nearly all respondents (98.9%) opined that boiling or adding bleach/chlorine is the safest method to make water safe for drinking or cooking. These findings highlight the community's reliance on various water sources and storage methods, along with good awareness of water safety measures.

The knowledge of mothers and fathers regarding complementary feeding practices is shown in Table 4.10**.** A significantly higher proportion of mothers (66.0%) correctly identified the appropriate age for introducing complementary food compared to fathers (43.9%) ($p < 0.001$). A higher percentage of fathers (55.0%) believed that complementary foods should be introduced at 6 months compared to mothers (31.7%). When asked about the ideal consistency of food for a 7-month-old child, more number of mothers showed (58.8%) a preference for liquid form compared to fathers (47.7%), while higher number of fathers had a preference for semi-solid consistency (51.5%) compared to mothers (40.5%). This difference was statistically significant ($p=0.049$). There was a statistically significant difference ($p=0.03$) in the perceived age for a child to start self-feeding. Majority of fathers (72.5%) believed that children should start eating independently after 2 years of age compared to mothers (61.8%). Whereas more mothers (37.0%) thought that children should begin self-feeding after 1 year compared to fathers (26.3%). Both mothers and fathers reported of feeding complementary food during breakfast (84.7% and 83.6%), lunch (97.3% and 95.4%), and dinner (95.4% and 95.8%). Majority of both mothers (92.7%) and fathers (93.5%) agreed that breast milk should be continued alongside complementary food ($p = 0.729$). When asked about which food items should be fed to the child, both mothers and fathers showed high agreement on feeding cereals, roots, and tubers (95.8%), legumes and nuts (94.3% mothers, 95.0% fathers), vitamin A-rich fruits (98.9% mothers, 97.7% fathers), and dairy products (93.9%). However, more number of fathers recommended eggs (37.0%) compared to mothers (33.2%), while mothers were slightly more likely to recommend flesh foods (16.4%) compared to fathers (11.5%), although these differences were not statistically significant. Other fruits and vegetables were highly recommended by both groups (99.6% mothers, 98.1% fathers), and the continuation of breast milk was acknowledged by 69.5% of both mothers and fathers.

TABLE 4. 10 KAP OF PARENTS ON COMPLEMENTARY FEEDING PRACTICES

Category	Mothers (N=262)		Fathers (N=262)		Chi Square	P Value
	n	%	n	%		
From what age should a child be given complementary food?						
After the completion of 6 months	173	66.0	115	43.9	31.07	0.000***
At 6 months	83	31.7	144	55.0		
Less than 6 months	6	2.3	2	0.8		
After 9 months	0	0	1	0.4		
What consistency of food should be given to a 7-month-old child?						
Liquid Form	154	58.8	125	47.7	7.837	0.049*
Semi solid	106	40.5	135	51.5		
Solid	2	0.8	1	0.4		
All of them	0	0	1	0.4		
From what age a child should be eating food by him/herself?						
8-10 months	3	1.1	3	1.1	6.95	0.03
After 1 year	97	37.0	69	26.3		
After 2 years	162	61.8	190	72.5		
How many times a child is fed complementary feed in a day?						
Breakfast	222	84.7	219	83.6	2.878	0.578
Brunch	13	5.0	7	2.7		
Lunch	255	97.3	250	95.4		
Snack	153	58.4	131	50.0		
Dinner	250	95.4	251	95.8		
How many times do we have to give complementary feed in a day?						
Breakfast	243	92.7	230	87.8	0.311	0.989
Brunch	14	5.3	13	5.0		
Lunch	259	98.9	256	97.7		
Snack	172	65.6	159	60.7		
Dinner	258	98.5	253	96.6		

Breast milk should be continued along with complementary food.						
Yes	243	92.7	245	93.5	0.119	0.729
No	19	7.3	17	6.5		
Which food items should be fed to the child.*						
Breastmilk	182	69.5	182	69.5	2.895	0.894
Cereals, root and tubers	251	95.8	251	95.8		
Legumes and Nuts	247	94.3	249	95.0		
Vit-A Rich fruits	259	98.9	256	97.7		
Dairy Products	246	93.9	246	93.9		
Egg	87	33.2	97	37.0		
Other fruits and Vegetables	261	99.6	257	98.1		
Flesh Foods	43	16.4	30	11.5		

***Multiple Response *P= <0.05, ** P=<0.01, *** P=<0.001**

Table 4.11 presents the knowledge of mothers and fathers regarding age-appropriate feeding behaviors. Regarding feeding a 3-month-old orphaned child, a significantly higher proportion of mothers (76.0%) recognized the appropriateness of using a cup over a bottle compared to fathers (67.2%) ($p < 0.001$). When asked about encouraging self-feeding in a 10-month-old, a higher percentage of mothers (43.9%) indicated that they would give the child their own bowl and spoon to eat alone compared to fathers (34.7%). Similarly, a significantly higher proportion of mothers (74.8%) understood the importance of talking to a 10-month-old child during meals compared to fathers (59.9%). Conversely, fathers (35.9%) were significantly more likely than mothers (22.5%) to believe in keeping a 12-month-old child from touching their food and plate. Majority of mothers (95.8%) recognized the importance of showing affection to a 15-month-old child while feeding, indicating that the child is loved, a view shared by a high proportion of fathers (86.3%). More fathers (17.9%) than mothers (9.9%) said that they would spoon-feed and hold a cup for a 24-month-old, not allowing the child to touch the spoon.

Participation of mothers and fathers in complementary feeding practices and other child care activities is shown in Table 4.12. Regarding participation in complementary feeding, fathers reported significantly higher involvement in purchasing food items (90.5%) compared to mothers (55.3%) ($p < 0.001$). Conversely, mothers showed significantly greater involvement in selecting food items (56.5% vs. 31.7%), feeding (96.6% vs. 22.9%), and meal preparation (95.8% vs. 12.2%) compared to fathers. When asked if they feed the child, a large majority of mothers (91.6%) reported doing so, significantly more than fathers (20.2%). More fathers said that they feed the child sometimes (29.8%) compared to mothers (7.6%), and a substantial proportion of fathers (50.0%) reported not feeding the child at all, while this was rare among mothers (0.8%). The methods used during feeding also differed significantly between parents ($p < 0.001$). Mothers were more likely to use distractions like watching TV (39.3%), giving toys (42.0%), and giving mobile phones (25.6%) compared to fathers (23.3%, 22.5%, and 6.9%, respectively). Fathers were more likely to report using none of these distractions (56.1%) compared to mothers (25.2%). A significant difference was observed in the use of separate feeding utensils for the child ($p = 0.02$). A higher percentage of mothers (88.2%) reported using a separate bowl, plate, and cup for the child compared to fathers (81.3%). The frequency of having meals with the child also varied significantly between parents. A higher number of mothers reported having meals with their child daily (18.3%) than fathers (4.6%).

TABLE 4. 11 AGE-APPROPRIATE FEEDING PRACTICES OF PARENTS ON COMPLEMENTARY FEEDING

Age-appropriate feeding behaviours	Mothers (N=262)		Fathers (N=262)		Chi Square	P Value
	n	%	n	%		
Feeding milk to a 3-month-old who has lost his mother with cup rather than a bottle	199	76.0	176	67.2	22.05	0.000***
Giving a 10-month child own bowl and spoon to eat alone	115	43.9	91	34.7		
Talking to a 10-month-old child during a meal	196	74.8	157	59.9		
Keeping a 12-month-old child from touching her food and plate	59	22.5	94	35.9		
Showing affection to a 15-month-old child while feeding, showing that he/she is loved	251	95.8	226	86.3		
Spoon feeding and holding a cup for a 24-month-old, not allowing child to touch Spoon	26	9.9	47	17.9		

***P=<0.001**

TABLE 4. 12 ROLE OF PARENTS OF IN COMPLEMENTARY FEEDING

Category	Mothers (N=262)		Fathers (N=262)		Chi Square	P Value
	n	%	n	%		
How do you participate in complementary feeding*						
Purchasing	145	55.3	237	90.5	229.6	0.000*
Selecting Food item	148	56.5	83	31.7		
In feeding	253	96.6	60	22.9		
Meal preparation	251	95.8	32	12.2		
Do you feed the child						
Yes	240	91.6	53	20.2	278.8	0.000*
Sometimes	20	7.6	78	29.8		
No	2	0.8	131	50.0		
How do you feed the child*						
Watching TV	103	39.3	61	23.3	82.11	0.000*
Telling stories	34	13.0	19	7.3		
Giving Toys	110	42.0	59	22.5		
Giving books	6	2.3	4	1.5		
Giving Mobile	67	25.6	18	6.9		
None of them	66	25.2	147	56.1		
Does child use a separate bowl plate cup for feeding						
Yes	231	88.2	213	81.3	4.78	0.02*
No	31	11.8	49	18.7%		
How often do you have meals with your child						
A few times a week	77	29.4	65	24.8	64.41	0.000***
Daily	48	18.3	12	4.6		
Most days of the week	24	9.2	22	8.4		
Never	79	30.2	56	21.4		
Rarely	34	13.0	107	40.8		
How did child receive the food yesterday						
The child was fed by me	217	82.8	7	2.7	345.8	0.000***
The child ate by him/herself	11	4.2	34	13.0		
The child was fed by someone else	34	13.0	221	84.4		
Do you wash your child's hands before feeding						
No	117	44.7	170	64.9	26.07	0.000***
Sometimes	69	26.3	57	21.8		
Yes	76	29.0	35	13.4		

Do you wash your child's hands after feeding						
No	15	5.7	125	47.7	142.7	0.000***
Sometimes	23	8.8	41	15.6		
Yes	224	85.5	96	36.6		
Do you change your child's nappy						
No	2	0.8	41	15.6	168.3	0.000***
Sometimes	7	2.7	103	39.3		
Yes	253	96.6	118	45.0		
Do you make your child visit the hospital						
No	6	2.3	23	8.8	47.15	0.000***
Sometimes	12	4.6	56	21.4		
Yes	244	93.1	183	69.8		
If yes, when do you make your child visit the hospital						
Both times	191	72.9	189	72.1	8.2	0.04*
For immunization	8	3.1	5	1.9		
No	1	0.4	10	3.8		
Suffering from illness	62	23.7	58	22.1		
How would you rate your involvement in your child's feeding practices						
Moderately involved	20	7.6	114	43.5	145.9	0.000*
Quite involved	63	24.0	11	4.2		
Slightly involved	3	1.1	28	10.7		
Very involved	176	67.2	96	36.6		

***P= <0.05, ** P=<0.01, *** P=<0.001**

When asked how the child received food the previous day, a significantly higher percentage of mothers (82.8%) reported feeding the child themselves, while a much larger proportion of fathers (84.4%) reported the child being fed by someone else (likely the mother). More fathers reported that their children eat by themselves (13.0%) compared to mothers (4.2%).

Hand washing practices before and after feeding showed significant differences ($p < 0.001$) between mothers and fathers. A higher percentage of fathers (64.9%) reported not washing the child's hands before feeding compared to mothers (44.7%). Whereas a much larger proportion of mothers (85.5%) reported washing the child's hands after feeding compared to fathers (36.6%). Similarly, fathers were significantly less likely to change the child's nappy ($p < 0.001$) and less likely to take the child to the hospital ($p < 0.001$) compared to mothers. Regarding the frequency of hospital visits, among those who did take the child to the hospital, both mothers (72.9%) and fathers (72.1%) reported doing so both for immunization and illness. There was a highly significant difference in the self-rated involvement in the child's feeding practices ($p < 0.001$). A much larger proportion of mothers (67.2%) rated their involvement as very involved compared to fathers (36.6%). While, fathers were more likely to rate their involvement as moderately involved (43.5%) compared to mothers (7.6%).

Communication and support between parents regarding child nutrition and feeding practices is shown in Table 4.13. There was a statistically significant difference in the frequency with which mothers and fathers discuss their child's nutrition and feeding practices ($p = 0.034$). Mothers (24.0%) reported daily discussions more than fathers (15.3%). Fathers (30.9%) reported discussing sometimes more than mothers (21.8%), while weekly discussions were similar between mothers (29.8%) and fathers (33.6%). No statistically significant difference was found in the provision of emotional and practical support to their partner in matters related to child feeding and nutrition. A majority of both mothers (56.5%) and fathers (57.3%) reported providing support regularly. A highly significant difference was observed in attending parenting or nutrition education programs that influenced their knowledge about child feeding practices ($p < 0.001$). Mothers (12.6%) were significantly more likely to have attended such programs compared to fathers (3.4%). However, a large majority of both mothers (87.4%) and fathers (96.6%) reported not attending these programs.

TABLE 4. 13 COMMUNICATION AND SUPPORT PROVIDED BY PARENTS FOR CHILDREN

Category	Mothers (N=262)		Fathers (N=262)		Chi square	P Value
	n	%	n	%		
How often do you discuss your child's nutrition and feeding practices with your Partner						
Daily	63	24.0	40	15.3	11.99	0.034*
Monthly	28	10.7	21	8.0		
Never	14	5.3	16	6.1		
Rarely	22	8.4	16	6.1		
Sometimes	57	21.8	81	30.9		
Weekly	78	29.8	88	33.6		
Do you provide emotional and practical support to your partner in matters related to child feeding and nutrition						
No, not at all	4	1.5	4	1.5	1.992	0.574
Occasionally	37	14.1	27	10.3		
Sometimes	73	27.9	81	30.9		
Yes, regularly	148	56.5	150	57.3		
Have you attended any parenting or nutrition education programs that have influenced your knowledge about cold feeding practices						
Yes	33	12.6	9	3.4	14.91	0.000***
No	229	87.4%	253	96.6%		

***P= <0.05, ** P=<0.01, *** P=<0.001**

Perception of mothers and fathers regarding the influence of cultural or societal norms on their involvement in their child's nutrition is shown in Table 4.14**.** A statistically significant difference was observed in whether parents felt that the cultural or societal norms affected their ability to be involved in their child's nutrition (p=0.005). A higher percentage of mothers (6.9%) reported facing such norms compared to fathers (1.9%). Among those who reported facing cultural or societal norms, the reasons cited were further explored. Cultural Myths were reported as an influencing factor by 4.2% of mothers and 1.9% of fathers (p = 0.094). Giving food immediately after birth was a cultural practices mentioned by 0.4% of mothers and no fathers. Issues with family members were reported by 1.5% of mothers and 0.4% of fathers. Being a working mothers being a factor was reported by 1.5% of mothers and no fathers.

The roles of mothers, fathers, grandparents, and other family members in providing financial support and purchasing food for children is shown in Table 4.15. Regarding spending money for food for children, a highly significant difference was found among the family members (p<0.001). Fathers were the primary contributors, with 97.3% reporting spending money. Mothers (56.1%) and other family members (14.9%) showed considerably lower involvement, while grandparents reported the least involvement (14.1%) in contributing financially for purchase of foods. In terms of purchasing food for children, a highly significant difference was also observed (p<0.001). Mothers reported the highest involvement in purchasing food (67.6%), followed by fathers (50.4%). Grandparents (35.1%) and other family members (12.2%) had lower involvement in food purchasing.

Roles of mothers, fathers, grandparents, other family members, in preparing food for the children is shown in Table 4.16. A highly significant difference was found in who prepares food for the child (p<0.001). Majority (96.6%) of the mothers said that they were responsible for food preparation for children. Grandparents also played a notable role, with 27.9% involvement. Other family members were involved in 10.3% of cases. Fathers had minimal involvement in food preparation (1.1%), and in a small percentage of cases (1.1%), no one was reported as preparing food (this likely indicates the mother was solely responsible).

Roles of mothers, fathers, grandparents, other family members in providing advice/reminders on feeding times, teaching self-feeding, and washing the child's hands before eating is shown in Table 4.17. Regarding giving advice or reminders to the mother about child's feeding times,

TABLE 4. 14 SOCIETAL NORMS FACED BY PARENTS IN COMPLEMENTARY FEEDING

Category	Mothers (N=262)		Fathers (N=262)		Chi-square	p-value
	n	%	n	%		
Do you face any cultural or society norms that affect your ability to be involved in your child's nutrition						
Yes	18	6.9	5	1.9	7.685	0.005**
No	244	93.1%	257	98.1%		
Reason for facing any cultural or society norms that affect your ability to be involved in your child's nutrition						
Cultural Myths	11	4.2	5	1.9	6.389	0.094
Giving food immediately after born	1	0.4	0	0		
Issues with family members	4	1.5	1	0.4		
Working Moms	4	1.5	0	0		

***P= <0.05, ** P=<0.01, *** P=<0.001**

TABLE 4. 15 SUPPORT DOMIANS FOR FINANCIAL SUPPORT

Category	Mother		Father		Grandparents		Other family member		Chi-square (p-value)	
	n	%	n	%	n	%	n	%		
Spending money for food for children										
Yes	147	56.1	255	97.3	37	14.1	39	14.9	498.5	0.000***
No	115	43.9	7	2.7	225	85.9	223	85.1		
Purchasing food for children										
Yes	177	67.6	132	50.4	92	35.1	32	12.2	126.2	0.000***
No	85	32.4	130	49.6	170	64.9	230	87.8		

*****P=<0.001**

TABLE 4. 16 SUPPORT DOMAIN FOR PREPARATION OF FOOD

	Mother		Father		Grandparents		Other family member		None		Chi-square	
	n	%	n	%	n	%	n	%	n	%		
Preparing food for child												
Yes	253	96.6	3	1.1	73	27.9	27	10.3	3	1.1	850.1	0.000***
No	9	3.4	259	98.9	189	72.1	235	89.7	259	98.9		

***P=<0.001**

TABLE 4. 17 SUPPORT DOMAINS FOR CHILD FEEDING

	Mother		Father		Grandparents		Other family member		None		Chi-square	p-Value
	n	%	n	%	n	%	n	%	n	%		
Gives Advice/reminds the mother on child feeding time												
Yes	27	10.3	2	0.8	22	8.4	79	30.2	85	32.4	498.5	0.000***
No	235	89.7	260	99.2	240	91.6	183	69.8	177	67.6		
Teaches the child to eat by him/herself												
Yes	126	48.1	76	29.0	45	17.2	37	14.1	120	45.8	121.7	0.000***
No	136	51.9	186	71.0	217	82.8	225	85.9	142	54.2		
Washes the child's hands before the child eats												
Yes	128	48.9	18	6.9	31	11.8	24	9.2	29	11.1	224.3	0.000***
No	134	51.1	244	93.1	231	88.2	238	90.8	233	88.9		

***P=<0.001**

a highly significant difference was found ($p<0.001$). Other family members played the most prominent role in providing reminders (30.2%), followed by mothers themselves remembering the time for feeding (10.3%) and grandparents (8.4%). Fathers had a minimal involvement (0.8%), and a substantial proportion reported receiving no reminders (32.4%). A highly significant difference was observed ($p<0.001$) in involvement of family members in teaching the child to eat by themselves. Mothers were most actively involved in teaching the child to eat by themselves (48.1%), followed by fathers (29.0%) and grandparents (17.2%). Washing the child's hands before eating also showed a highly significant difference in responsibility ($p<0.001$). Mothers were the primary caregivers for this practice (48.9%), followed by grandparents (11.8%) and other family members (9.2%). Fathers had limited involvement (6.9%), and a notable percentage reported that the child's hands were not washed before eating by any of these members (11.1%).

The assistance provided by fathers, grandparents, and other family members in household chores to enable the mother to prepare food or feed the child is shown in Table 4.18. A highly significant difference was found in the help provided to mothers with other chores ($p < 0.001$). Grandparents were the most likely to assist, with 42.7% reporting they helped in this way. Other family members also provided assistance in 26.3% of cases. Fathers had minimal involvement, with only 1.1% reporting help with other chores. Notably, in 48.1% of cases, no such assistance was reported from these family members.

IYCF practices followed by parents

Table 4.19 illustrates the timing of introducing complementary foods categorized by gender. The results showed that majority (69.5%) of the mothers started giving complementary foods to their child at the completion of 6 months. However, 17.2% of them initiated complementary feeding before 6 months, followed by 13.0% who started after 7 months, and 0.4% reported that they had not yet started giving complementary foods to their child. It was observed that there was no remarkable difference between the males and females.

Table 4.20 shows the number complementary feeds given in a day. The highest frequency of feeding was found to be four times (34.4%) per day, followed by three times per day (30.9%), and twice a day (22.1%). Only 4.6% were fed once a day, and very few children (8%) were given five meals.

TABLE 4. 18 FAMILY SUPPORT FOR MOTHER

	Fathers		Grandparents		Other family members		None		Chi-square	P Value
	n	%	n	%	n	%	n	%		
Helps in other chores so that the mother can prepare food or feed the child										
Yes	3	1.1	112	42.7	69	26.3	126	48.1	167.9	0.000***
No	259	98.9	150	57.3	193	73.7	136	51.9		

***P=<0.001**

TABLE 4. 19 AGE OF INTRODUCTION OF COMPLEMENTARY FEEDING

Introduction of Complementary Feed	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
At Completion of 6 months	87	68.5	95	70.4	182	69.5	2.724	0.436
Before 6 months	25	19.7	20	14.8	45	17.2		
After 7 months	14	11.0	20	14.8	34	13.0		
Not started yet	1	0.8	0	0.0	1	0.4		

FIGURE 4. 1 INITIATION OF COMPLEMENTRY FOODS

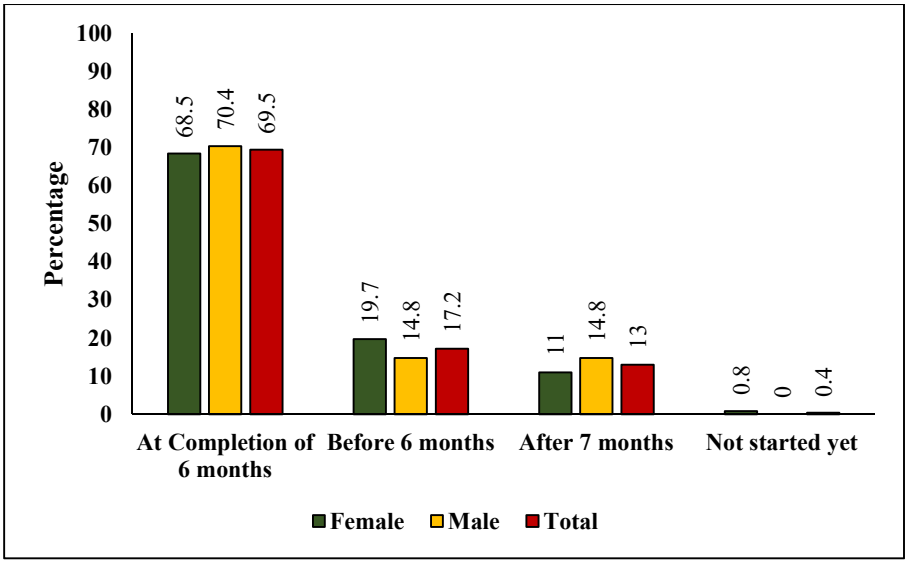


TABLE 4. 20 NUMBER OF COMPLEMENTARY FEED GIVEN IN A DAY

No. of feeds given in a day	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
1	12	9.4	0	0.0	12	4.6	14.533	0.006**
2	25	19.7	33	24.4	58	22.1		
3	40	31.5	41	30.4	81	30.9		
4	39	30.7	51	37.8	90	34.4		
5	11	8.7	10	7.4	21	8.0		

** P=<0.01

Data on the quantity of complementary foods fed to children per feed, categorized by gender is shown in Table 4.21. The data revealed that 49.2% of the children received 1/2 cup, 33.6% received 1/4th cup, 13.4% received 1 cup, and 3.8% received 1 tablespoon. While there were slight variations between genders, such as a slightly higher percentage of females (51.2%) than males (47.4%) received 1 cup. The chi-square test suggests that these differences were not statistically significant ($p > 0.05$).

Table 4.22 shows gender-wise data on the consistency of complementary foods provided to children. It was observed that 61.8% received complementary foods with a consistency described as medium, whereas 23.3% received complementary foods of thick consistency and 14.9% received complementary foods of thin consistency. However, no statistically significant gender-wise differences were observed in the consistency of complementary foods fed to children ($p = 0.767$).

Table 4.23 presents the reported hand hygiene practices of caregivers in relation to complementary feeding and food handling for young children, stratified by gender. Information was collected through an open ended question regarding when they wash their hands. The data revealed a disparity in hand washing practices across various stages of food preparation and child care. A significant proportion of respondents (74.0%) indicated washing hands before food preparation, suggesting a general awareness regarding hygiene in food handling and cooking. However, the reported frequency of hand washing before feeding the child was lower (58.0%). Furthermore, only 26.7% of respondents reported hand washing after feeding the child. The majority (88.5%) of participants mentioned washing hands after cleaning the child's feces, reflecting a strong awareness of the importance of the practice for preventing illnesses. Only 15.3% reported washing hands after cooking, which contradicts the initial high rate of pre-cooking hand washing and indicates a potential misunderstanding of the importance of hand hygiene throughout the entire food preparation process.

Table 4.24 presents responses to various hygiene and food storage practices followed by parents. A majority (62.6%) of the parents said that they do not store cooked foods, while 31.7% stored them for 2-3 hours, and only a small percentage (5.3%) kept them for more than 4 hours or over a day. Regarding vegetable preparation, most respondents (82.4%) cut vegetables after washing, while 17.6% do so before washing. Handwashing practices are

TABLE 4. 21 QUANTITY OF COMPLEMENTARY FOODS FED TO THE CHILD AT ONE TIME

Quantity of complementary foods	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
1 tbsp	4	3.1	6	4.4	10	3.8	0.603	0.896
1/4th cup	42	33.1	46	34.1	88	33.6		
½ cup	65	51.2	64	47.4	129	49.2		
1 cup	16	12.6	19	14.1	35	13.4		

TABLE 4. 22 CONSISTENCY OF COMPLEMENTARY FOODS FED TO THE CHILD ACCORDING TO GENDER

Consistency of complementary food	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
Thin	18	14.2	21	15.6	39	14.9	0.530	0.767
Medium	77	60.6	85	63.0	162	61.8		
Thick	32	25.2	29	21.5	61	23.3		

TABLE 4. 23 HANDWASHING PRACTICES FOLLOWED BY PARENTS

	Female (N= 127)		Male (N= 132)		Total (N= 262)	
	n	%	n	%	n	%
Washing Before cooking	100	78.7	94	69.6	194	74.0
After cooking	19	15.0	21	15.6	40	15.3
Before feeding the child	75	59.1	77	57.0	152	58.0
After feeding the child	36	28.3	34	25.2	70	26.7
After cleaning the child's feces	107	84.3	125	92.6	232	88.5

highly appropriate, with almost all respondents (99.2%) washing their hands under running water. In terms of water collection and treatment, the majority (91.2%) clean water collection items using water, whereas 6.5% use soap to wash the containers. Furthermore, 83.2% store water in clean, covered containers, while 16.4% store it in containers that are either covered or clean. Overall, these findings emphasize the significance of hygiene and proper food and water handling in the surveyed group.

Table 4.25 presents data on the addition of fats, oils, and sugar, as well as the time taken for feeding. The majority (70.6%) of respondents add extra fats, oils, sugar, or jaggery to complementary foods after preparation.

When asked regarding feeding duration, half of the respondents (50%) said they it takes 15 minutes to feed their children, while 38.2% reported around 30 minutes time for feeding their child. A smaller percentage said that they require 45 minutes (8.4%), and only 3.4% took up to an hour for feeding their child.

Consumption frequency of foods high in fat, sugar and salt

Data on the consumption of frequency of various ultra-processed foods among respondents is presented in Table 4.26. Majority of the respondents (88.9%) never gave infant formula to their children, indicating low consumption of this ultra-processed food item among children. However, a small percentage (8.8%) were reported to be receiving infant formula daily. Majority (65.3%) reported that they never fed *Ceralac* or cereals where as 21.4% said that they feed *Ceralac* daily. Consumption of bread varied among children with the more than half (53.1%) of the children never being fed bread. Occasional consumption of bread was reported among 15.3% children and 7.6% were consuming it once a month and consuming bread once every 10-15 days. Daily or frequent consumption was reported by a negligible percentage of respondents. More than 35.1% mothers reported feeding biscuits to their childred daily, followed by 17.9% feeding thrice a week and 9.5% giving them 4-5 times a week, where as 22.1% reported never giving biscuits. Most of (93.1%) the motehrs reported that they never gave Cornflakes/chocos followed by occasional feeding and very negligible of them reported not consuming cornflakes/ chocos. Respondents revealed that 33.1% children consumed sev mamra daily followed by 26.7% of them are consuming thrice week where as 22.5% of them

TABLE 4. 24 FOOD HYGIENE- STORAGE AND HANDLING OF COMPLEMENTARY FOODS FOR CHILDREN

		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
		n	%	n	%	n	%		
For how long do you store cooked complementary foods	For 2-3 hours	34	26.8	49	36.3	83	31.7	4.638	0.200
	More than 1 day	1	0.8	0	0.0	1	0.4		
	More than 4 hours	9	7.1	5	3.7	14	5.3		
	Not storing	83	65.4	81	60.0	164	62.6		
When do you cut your vegetables	After washing	102	80.3	114	84.4	216	82.4	0.771	0.380
	Before washing	25	19.7	21	15.6	46	17.6		
Could you please describe step by step how you wash your hands	Under running water appropriate practise	127	100.0	133	98.5	260	99.2	1.896	0.169
	With someone pouring a little clean water from a jug onto one's hands appropriate practise	0	0.0	2	1.5	2	0.8		
How do you treat the item you use to collect water	No treatment	3	2.4	3	2.2	6	2.3	0.020	0.990
	Use of water	116	91.3	123	91.1	239	91.2		
	Use of water and soap (Clean container)	8	6.3	9	6.7	17	6.5		
Could you describe how you store water	Clean and covered container	111	87.4	107	79.3	218	83.2	3.646	0.162
	Clean container or jar	0	0.0	1	0.7	1	0.4		
	Covered container or jar	16	12.6	27	20.0	43	16.4		

TABLE 4. 25 CHILD CARE PRACTICES ACCORDING TO GENDER

	Female (N= 127)		Male (N= 132)		Total (N= 262)	
	n	**%**	**n**	**%**	**n**	**%**
Adding extra fats, oils, sugar and jaggery after preparing complementary foods	93	73.2	92	68.1	185	70.6
How much time do you take to feed the child						
1 hour	4	3.1	5	3.7	9	3.4
15 minutes	60	47.2	71	52.6	131	50.0
30 minutes	54	42.5	46	34.1	100	38.2
45 minutes	9	7.1	13	9.6	22	8.4

TABLE 4. 26 FOOD FREQUENCY QUESSTIONNAIRE: ULTRA PROCESSED FOODS CONSUPTION

		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
		n	%	n	%	n	%		
Ultra-Processed foods									
Infant formula	Daily	13	10.2	10	7.4	23	8.8	6.363	0.174
	Never	113	89.0	120	88.9	233	88.9		
	Occasionally	0	0.0	4	3.0	4	1.5		
	Once in 15 days	1	0.8	0	0.0	1	0.4		
	Thrice a week	0	0.0	1	0.7	1	0.4		
Cereal / Ceralac	4-5 times a week	0	0.0	1	0.7	1	0.4	6.203	0.401
	Daily	25	19.7	31	23.0	56	21.4		
	Never	88	69.3	83	61.5	171	65.3		
	Occasionally	3	2.4	7	5.2	10	3.8		
	Once a week	0	0.0	3	2.2	3	1.1		
	Once in 15 days	1	0.8	1	0.7	2	0.8		
	Thrice a week	10	7.9	9	6.7	19	7.3		
Bread/Buns	Daily	0	0.0	1	0.7	1	0.4	8.539	0.287
	Never	66	52.0	73	54.1	139	53.1		
	Occasionally	21	16.5	19	14.1	40	15.3		
	Once a week	10	7.9	15	11.1	25	9.5		
	Once in 10 days	4	3.1	9	6.7	13	5.0		
	Once in 15 days	14	11.0	6	4.4	20	7.6		
	Once in a month	9	7.1	11	8.1	20	7.6		
	Thrice a week	3	2.4	1	0.7	4	1.5		
Biscuits	4-5 times a week	12	9.4	13	9.6	25	9.5	2.600	0.957
	Daily	42	33.1	50	37.0	92	35.1		
	Never	27	21.3	31	23.0	58	22.1		
	Occasionally	8	6.3	5	3.7	13	5.0		
	Once a week	9	7.1	7	5.2	16	6.1		
	Once in 10 days	2	1.6	1	0.7	3	1.1		
	Once in 15 days	2	1.6	1	0.7	3	1.1		
	Once in a month	2	1.6	3	2.2	5	1.9		
	Thrice a week	23	18.1	24	17.8	47	17.9		

Cornflakes /Chocos	4-5 times a week	0	0.0	1	0.7	1	0.4	7.379	0.391
	Daily	1	0.8	1	0.7	2	0.8		
	Never	121	95.3	123	91.1	244	93.1		
	Occasionally	3	2.4	7	5.2	10	3.8		
	Once a week	1	0.8	0	0.0	1	0.4		
	Once in 10 days	1	0.8	0	0.0	1	0.4		
	Once in a month	0	0.0	1	0.7	1	0.4		
	Thrice a week	0	0.0	2	1.5	2	0.8		
Sev mamra or papad poha	4-5 times a week	7	5.5	11	8.1	18	6.9	5.739	0.571
	Daily	42	33.1	40	29.6	82	31.3		
	Never	30	23.6	29	21.5	59	22.5		
	Occasionally	3	2.4	10	7.4	13	5.0		
	Once a week	8	6.3	5	3.7	13	5.0		
	Once in 10 days	2	1.6	2	1.5	4	1.5		
	Once in 15 days	2	1.6	1	0.7	3	1.1		
	Thrice a week	33	26.0	37	27.4	70	26.7		
Instant Noodles or Maggie	4-5 times a week	1	0.8	0	0.0	1	0.4	6.278	0.508
	Never	95	74.8	110	81.5	205	78.2		
	Occasionally	7	5.5	8	5.9	15	5.7		
	Once a week	5	3.9	2	1.5	7	2.7		
	Once in 10 days	2	1.6	1	0.7	3	1.1		
	Once in 15 days	10	7.9	5	3.7	15	5.7		
	Once in a month	7	5.5	8	5.9	15	5.7		
	Thrice a week	0	0.0	1	0.7	1	0.4		

Reported their children never consumed. In terms of consuming instant noodles or Maggie majority (78.2%) of the respondents never gave Maggie where as 5.7% gave occasionally and only 0.4% thrice week.

Table 4.27 presents the frequency of consumption of various high-fat foods among males and females, along with their respective percentage distributions shown. The most common frequency of consumption of sev is thrice a week, with 30.2% of children consuming it. However, a significant number of children never consumes sev (32.1%). Occasional and rare consumption (once a week, once in 10/15 days, or once a month) remains relatively low. Regarding chips/Kurkure, more than half of the respondents (52.3%) reported that they never fed these to their children. Among those who consume these items, 13.0% consume them once a week. The consumption of Chodafadi or Mathiya followed a similar trend, with 63.0% of respondents never consuming these snacks. Occasional consumption was reported among 22.5% subjects. A notable difference is observed in the consumption of papdi or gathiya, which is higher compared to other food products. Daily consumption was reported by 16.0% of the subjects, whereas 28.2% never consumed it. On the other hand, Namkeen or Chavanu was the least consumed snack among children, with 78.6% never consuming it. Only 1.9% consume it once a week, followed by 2.7% consuming it once in 15 days, making it the least preferred among the high-fat foods studied.

Consumption of foods high in sugar is shown in Table 4.28. The majority of participants never consumed cream rolls or buns (90.1%), with very few reporting daily or occasional consumption. Ice cream consumption varied, with 42.0% never consuming it, while 16.0% consumed it once a week, and 14.1% occasionally. Data on feeding baked goods such as cakes or pastries, 57.3% of respondents were never fed these food items, while 38.5% were given these occasionally. Regular intake of these foods was very rare, with minimal weekly or monthly consumption. Homemade sweets like Sukhadi were more frequently fed to children compared to other sweets, with 32.4% consuming them daily and 14.5% thrice a week. Only 12.6% never consumed them, indicating a preference for traditional sweets over store-bought alternatives. In contrast, ready-to-eat sweets like Shrikhand had a lower consumption rate, with 66.0% never consuming these food items. Occasional intake was reported among 28.6% of the children, and very few consumed them frequently. Cookies, khari, or toast are mostly not fed

TABLE 4. 27 FOOD FREQUENCY QUESSTIONNAIRE: FOODS HIGH IN FAT

		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
		n	%	n	%	n	%		
Sev	4-5 times a week	9	7.1	15	11.1	24	9.2	9.122	0.332
	Daily	14	11.0	11	8.1	25	9.5		
	Never	36	28.3	48	35.6	84	32.1		
	Occasionally	6	4.7	6	4.4	12	4.6		
	Once a week	15	11.8	10	7.4	25	9.5		
	Once in 10 days	4	3.1	1	0.7	5	1.9		
	Once in 15 days	4	3.1	2	1.5	6	2.3		
	Once in a month	2	1.6	0	0.0	2	0.8		
	Thrice a week	37	29.1	42	31.1	79	30.2		
Chips /Kurkure	4-5 times a week	1	0.8	4	3.0	5	1.9	6.590	0.581
	Daily	4	3.1	8	5.9	12	4.6		
	Never	67	52.8	70	51.9	137	52.3		
	Occasionally	11	8.7	11	8.1	22	8.4		
	Once a week	18	14.2	16	11.9	34	13.0		
	Once in 10 days	5	3.9	4	3.0	9	3.4		
	Once in 15 days	6	4.7	4	3.0	10	3.8		
	Once in a month	0	0.0	3	2.2	3	1.1		
	Thrice a week	15	11.8	15	11.1	30	11.5		
Chodafadi or mathiya	4-5 times a week	0	0.0	2	1.5	2	0.8	4.694	0.697
	Never	78	61.4	87	64.4	165	63.0		
	Occasionally	32	25.2	27	20.0	59	22.5		
	Once a week	5	3.9	5	3.7	10	3.8		
	Once in 10 days	3	2.4	3	2.2	6	2.3		
	Once in 15 days	6	4.7	4	3.0	10	3.8		
	Once in a month	1	0.8	2	1.5	3	1.1		

	Thrice a week	2	1.6	5	3.7	7	2.7		
Papdi or Gathiya	4-5 times a week	12	9.4	23	17.0	35	13.4	17.253	0.028
	Daily	19	15.0	23	17.0	42	16.0		
	Never	41	32.3	33	24.4	74	28.2		
	Occasionally	3	2.4	9	6.7	12	4.6		
	Once a week	11	8.7	12	8.9	23	8.8		
	Once in 10 days	6	4.7	3	2.2	9	3.4		
	Once in 15 days	1	0.8	6	4.4	7	2.7		
	Once in a month	5	3.9	0	0.0	5	1.9		
	Thrice a week	29	22.8	26	19.3	55	21.0		
Namkeen or chavanu	4-5 times a week	0	0.0	1	0.7	1	0.4	6.941	0.435
	Never	99	78.0	107	79.3	206	78.6		
	Occasionally	12	9.4	7	5.2	19	7.3		
	Once a week	6	4.7	4	3.0%	10	3.8		
	Once in 10 days	2	1.6	3	2.2	5	1.9		
	Once in 15 days	2	1.6	5	3.7	7	2.7		
	Once in a month	2	1.6	6	4.4	8	3.1		
	Thrice a week	4	3.1	2	1.5	6	2.3		

TABLE 4. 28 FOOD FREQUENCY QUESSTIONNAIRE: FOODS HIGH IN SUGAR

		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
		n	%	n	%	n	%		
Cream roll or Bun	Daily	1	0.8	1	0.7	2	0.8	13.654	0.58
	Never	116	91.3	120	88.9	236	90.1		
	Occasionally	4	3.1	7	5.2	11	4.2		
	Once a week	0	0.0	5	3.7	5	1.9		
	Once in 10 days	4	3.1	0	0.0	4	1.5		
	Once in 15 days	0	0.0	2	1.5	2	0.8		
	Once in a month	1	0.8	0	0.0	1	0.4		
	Thrice a week	1	0.8	0	0.0	1	0.4		
Ice cream	Daily	2	1.6	0	0.0	2	0.8	6.792	0.451
	Never	49	38.6	61	45.2	110	42.0		
	Occasionally	17	13.4	20	14.8	37	14.1		
	Once a week	20	15.7	22	16.3	42	16.0		
	Once in 10 days	12	9.4	8	5.9	20	7.6		
	Once in 15 days	13	10.2	10	7.4	23	8.8		
	Once in a month	13	10.2	10	7.4	23	8.8		
	Thrice a week	1	0.8	4	3.0	5	1.9		
Cakes or pastry	Never	71	55.9	79	58.5	150	57.3	6.102	0.296
	Occasionally	53	41.7	48	35.6	101	38.5		
	Once a week	0	0.0	1	0.7	1	0.4		
	Once in 10 days	1	0.8	0	0.0	1	0.4		
	Once in 15 days	2	1.6	4	3.0	6	2.3		
	Once in a month	0	0.0	3	2.2	3	1.1		
Homemade sweets like Sukhdi	4-5 times a week	6	4.7	4	3.0	10	3.8		
	Daily	43	33.9	42	31.1	85	32.4 %	4.470	0.812
	Never	15	11.8	18	13.3	33	12.6		
	Occasionally	10	7.9	13	9.6	23	8.8		

	Once a week	12	9.4	17	12.6	29	11.1		
	Once in 10 days	9	7.1	9	6.7	18	6.9		
	Once in 15 days	10	7.9	14	10.4	24	9.2		
	Once in a month	2	1.6	0	0.0	2	0.8		
	Thrice a week	20	15.7	18	13.3	38	14.5		
Ready to eat sweets like Shrikhand	Daily	0	0.0	1	0.7	1	0.4	4.807	0.569
	Never	79	62.2	94	69.6	173	66.0		
	Occasionally	42	33.1	33	24.4	75	28.6		
	Once in 10 days	2	1.6	1	0.7	3	1.1		
	Once in 15 days	3	2.4	3	2.2	6	2.3		
	Once in a month	0	0.0	1	0.7	1	0.4		
	Thrice a week	1	0.8	2	1.5	3	1.1		
Cookies or Khari or toast	4-5 times a week	2	1.6	1	0.7	3	1.1	8.213	0.314
	Daily	15	11.8	24	17.8	39	14.9		
	Never	84	66.1	83	61.5	167	63.7		
	Occasionally	4	3.1	8	5.9	12	4.6		
	Once a week	7	5.5	9	6.7	16	6.1		
	Once in 10 days	2	1.6	3	2.2	5	1.9		
	Once in 15 days	4	3.1	0	0.0	4	1.5		
	Thrice a week	9	7.1	7	5.2	16	6.1		
Chocolates or candies	4-5 times a week	2	1.6	1	0.7	3	1.1	5.713	0.679
	Daily	28	22.0	27	20.0	55	21.0		
	Never	56	44.1	62	45.9	118	45.0		
	Occasionally	15	11.8	11	8.1	26	9.9		
	Once a week	10	7.9	16	11.9	26	9.9		
	Once in 10 days	3	2.4	2	1.5	5	1.9		
	Once in 15 days	4	3.1	2	1.5	6	2.3		

	Once in a month	0	0.0	2	1.5	2	0.8		
	Thrice a week	9	7.1	12	8.9	21	8.0		
Health drinks like bornvita or Horlicks	Daily	4	3.1	14	10.4	18	6.9	7.318	0.198
	Never	114	89.8	114	84.4	228	87.0		
	Occasionally	6	4.7	6	4.4	12	4.6		
	Once a week	1	0.8	0	0.0	1	0.4		
	Once in 10 days	1	0.8	0	0.0	1	0.4		
	Thrice a week	1	0.8	1	0.7	2	0.8		

to the children, with 63.7% never consuming them, while 14.9% consumed them daily, and 6.1% consumed them once a week. Consumption of chocolates or candies was reported to be higher than most of the other snacks, with 21.0% consuming them daily and 8.0% thrice a week, though 45.0% were never given chocolate or candies. Health drinks like Bournvita or Horlicks were also not commonly fed to the children, with 87.0% never consuming them, while 6.9% consumed them daily.

Trends in the consumption of foods high in salt is shown in Table 4.29. 'Bhungla' a fried snack was never consumed by 43.9% children, while 14.1% had it thrice a week. Frequent consumption (4-5 times a week) was reported among 7.3% children, and 6.1% consumed it daily, indicating moderate preference for this snack. Instant soup was rarely fed, with almost all (99.2%) the children were never fed these packed instant foods. Sauces and ketchups were also not widely consumed, as 77.9% were never fed these, while 6.5% consumed these thrice a week, and 2.3% consume them daily. Occasional consumption (once in 10/15 days or once a month) was minimal. Papad consumption varied, with 50.0% never consuming it, while 16.0% consumed it thrice a week, and 5.0% consumed it daily. Occasional intake (9.5% once a week, 7.6% occasionally) was relatively common, indicating papad was more popular than many other processed foods. Pickle consumption was reported to be very low, with 97.7% never consuming it, and only a small fraction (0.8%) consuming it occasionally or once a week.

The data in Table 4. 30 the shows the distribution of infant feeding practices (IBF and EBF) by gender. Data on early initiation of breast feeding (IBF) showed that, majority of the children both females (33.9%) and males (42.2%) were breastfed after 2 days. Early initiation of breastfeeding was reported among 28.3% females and 23% males who were given mother's milk immediately after birth and 21.0% received breastfeeding within 1 hour. Most respondents (58.3% females and 60.7% males) were breastfed exclusively for 2 days whereas more than one fourth (37.8%) of children were not breastfed for 2 days. Other children were given other liquids than breast milk in the first two days after birth. A total of 59.5% children were exclusively breastfed for 6 months with a higher percentage of males (74.1%) excluvely breastfed for 6 months as compared to females (66.1%). However the chi-square results indicate no statistically significant gender differences in these feeding practices.

TABLE 4. 29 FOOD FREQUENCY QUESSTIONNAIRE: FOODS HIGH IN SALT

		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
		n	%	n	%	n	%		
Bhungla	4-5 times a week	10	7.9	9	6.7	19	7.3	8.263	0.408
	Daily	9	7.1	7	5.2	16	6.1		
	Never	58	45.7	57	42.2	115	43.9		
	Occasionally	5	3.9	4	3.0	9	3.4		
	Once a week	11	8.7	15	11.1	26	9.9		
	Once in 10 days	7	5.5	12	8.9	19	7.3		
	Once in 15 days	11	8.7	6	4.4	17	6.5		
	Once in a month	0	0.0	4	3.0	4	1.5		
	Thrice a week	16	12.6	21	15.6	37	14.1		
Instant soup	Never	126	99.2	134	99.3	260	99.2	0.002	0.965
	Occasionally	1	0.8	1	0.7	2	0.8		
sauces	4-5 times a week	1	0.8	0	0.0	1	0.4		
	Daily	4	3.1	2	1.5	6	2.3		
	Never	100	78.7	104	77.0	204	77.9		
	Occasionally	5	3.9	7	5.2	12	4.6		
	Once a week	1	0.8	7	5.2	8	3.1		
	Once in 10 days	3	2.4	3	2.2	6	2.3	8.687	0.369
	Once in 15 days	5	3.9	2	1.5	7	2.7		
	Once in a month	0	0.0	1	0.7	1	0.4		
	Thrice a week	8	6.3	9	6.7	17	6.5		
Papad	4-5 times a week	2	1.6	2	1.5	4	1.5	9.102	0.334
	Daily	7	5.5	6	4.4	13	5.0		
	Never	57	44.9	74	54.8	131	50.0		
	Occasionally	7	5.5	13	9.6	20	7.6		
	Once a week	12	9.4	13	9.6	25	9.5		
	Once in 10 days	6	4.7	5	3.7	11	4.2		

	Once in 15 days	3	2.4	3	2.2	6	2.3		
	Once in a month	8	6.3	2	1.5	10	3.8		
	Thrice a week	25	19.7	17	12.6	42	16.0		
Pickle	Never	122	96.1	134	99.3	256	97.7	4.322	0.229
	Occasionally	2	1.6	0	0.0	2	0.8		
	Once a week	2	1.6	0	0.0	2	0.8		
	Thrice a week	1	0.8	1	0.7	2	0.8		

TABLE 4. 30 INITIATION OF BREASTFEEDING AFTER BIRTH BY GENDER CLASSIFICATION

		Female		Male		Total		Chi Square	P Value
		n	%	n	%	n	%		
IBF	Immediately	36	28.3	31	23.0	67	25.6	2.109	0.550
	Within 1 hour	28	22.0	27	20.0	55	21.0		
	Within 24 hours	20	15.7	20	14.8	40	15.3		
	After 2 days	43	33.9	57	42.2	100	38.2		
EBF for 2 days	Don't know	2	1.6	5	3.7	7	2.7	1.544	0.462
	No	51	40.2	48	35.6	99	37.8		
	Yes	74	58.3	82	60.7	156	59.5		
EBF for 6 months	1	84	66.1	100	74.1	184	70.2	1.969	0.161
	2	43	33.9	35	25.9	78	29.8		

TABLE 4. 31 BREASTFEEDING PRACTICES

		Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P Value
		n	%	n	%	n	%		
Currently Bf	No	62	48.8	62	45.9	124	47.3	0.220	0.639
	Yes	65	51.2	73	54.1	138	52.7		
Bottle Feeding	No	83	65.4	91	67.4	174	66.4	0.124	0.725
	Yes	44	34.6	44	32.6	88	33.6		
		Female		Male		Total		Chi Square	P Value
		n= 91		n= 89		n=180			
Continued BF for 12-24 months	No	55	60.4	55	61.7	110	61.1	0.034	0.851
	Yes	36	39.5	34	38.2	70	38.8		

IYCF Practices using Diet Quality Questionnaire

The data on infant feeding practices regarding continued breastfeeding, current breastfeeding, and bottle feeding by gender is shown in Table 4.31. The majority of both females (60.4%) and males (61.7%) were not continued to be breastfed up to 2 years. Nearly 40% of females (39.5%) and males (38.2%) were given continued breastfeeding till 12-24 months. When asked whether the children are currently breastfed, mothers more than fifty percent (51.2%) of females and (54.1%) of males reported that they were currently being breastfed, with a slight genderwise difference in the percentage of non-breastfeeding responses (48.8% for females, 45.9% for males). Majority of the subjects- 65.4% of females and 67.4% of males were not fed using feeding bottles. No statistically significant genderwise differences in these feeding practices were reported in these practices.

The data in Table 4.32 shows the consumption of various food groups across both genders. A significant proportion of caregivers fed their children a variety of food groups, with cereals being the most commonly fed food group being fed to 94.7% of children. This was followed by pulses (84.4%) and other vegetables (61.1%).

Whole grains based products were consumed by 73.7% of children, while millets were less commonly fed, with 24.8% of children reported to be fed millets. Roots and tubers were consumed by 36.3% of children, while nuts and oil seeds were consumed by 49.6%. Nearly half of the children (48.1%) of children were dairy products, and flesh foods (meat, fish, poultry, organ meats) have a much lower consumption rate, with only 6.9% of children consuming them. Dark green leafy vegetables were consumed by 18.3% of children, vitamin-A rich fruits by 6.5%, and citrus fruits by 19.1%. The consumption of vitamin-A rich vegetables was slightly higher among children at 20.2%.

The consumption of various food groups across two age groups (6-12 months and 12-24 months) of children categorised by age is shown in Table 4.33. For cereals a significant increase in consumption was observed from 6-12 months (14.6%) to 12-24 months (98.9%) these differences were found to be statistically significant ($p=0.000$), indicating a strong association between age and cereal consumption. Similar to cereals, whole grains see a significant increase

TABLE 4. 32 VARIOUS FOODS CONSUMED BY CHILDREN CATEGORISED BY GENDER

Food Group	Female		Male		Total	
	n	%	n	%	n	%
Cereals	119	93.7	129	95.6	248	94.7
Whole grains	94	74.0	99	73.3	193	73 .7
Millets	30	23.6	35	25.9	65	24.8
Roots and tubers	49	38.6	46	34.1	95	36.3
Pulses	105	82.7	116	85.9	221	84.4
Nuts and Oil seeds	66	52.0	64	47.4	130	49.6
Dairy Products	68	53.5	58	43.0	126	48.1
Flesh foods, meat, fish, poultry, organ meats	7	5.5	11	8.1	18	6.9
Eggs	13	10.2	17	12.6	30	11.5
Dark green leafy vegetables	22	17.3	26	19.3	48	18.3
Vitamin-A rich fruits	9	7.1	8	5.9	17	6.5
Citrus fruits	23	18.1	27	20.0	50	19.1
Vitamin-A rich vegetables	29	22.8	24	17.8	53	20.2
Other vegetables	81	63.8	79	58.5	160	61.1

TABLE 4. 33 AGEWISE CONSUMPTION VARIOUS FOODS BY CHILDREN

		6 - 12 months		12-24 months		Total		Chi Square	P value
		n	%	n	%	n	%		
Cereals	0	12	14.6	2	1.1	14	5.3	20.368	0.000***
	1	70	85.4	178	98.9	248	94.7		
Whole Grains	0	34	41.5	35	19.4	69	26.3	14.079	0.000***
	1	48	58.5	145	80.6	193	73.7		
Millets	0	59	72.0	138	76.7	197	75.2	0.672	0.413
	1	23	28.0	42	23.3	65	24.8		
Roots and Tubers	0	67	81.7	100	55.6	167	63.7	16.671	0.000***
	1	15	18.3	80	44.4	95	36.3		
Pulses	0	19	23.2	22	12.2	41	15.6	5.116	0.024**
	1	63	76.8	158	87.8	221	84.4		
Nuts and Oilseeds	0	37	45.1	95	52.8	132	50.4	1.321	0.250
	1	45	54.9	85	47.2	130	49.6		
Dairy Products	0	50	61.0	86	47.8	136	51.9	3.931	0.047**
	1	32	39.0	94	52.2	126	48.1		
Flesh Foods, meat, fish, poultry, organ meats	0	82	100.0	162	90.0	244	93.1	8.805	0.003**
	1	0	0.0	18	10.0	18	6.9		
Eggs	0	76	92.7	156	86.7	232	88.5	2.011	0.156
	1	6	7.3	24	13.3	30	11.5		
Dark green leafy vegetables	0	76	92.7	138	76.7	214	81.7	9.657	0.002**
	1	6	7.3	42	23.3	48	18.3		
Vitamin A rich fruits	0	77	93.9	168	93.3	245	93.5	0.030	0. .862
	1	5	6.1	12	6.7	17	6.5		
Citrus	0	68	82.9	144	80.0	212	80.9	0.313	0.576
	1	14	17.1	36	20.0	50	19.1		
Vitamin A rich vegetables	0	69	84.1	140	77.8	209	79.8	1.416	0.234
	1	13	15.9	40	22.2	53	20.2		
Other vegetables	0	51	62.2	51	28.3	102	38.9	27.170	0.000***
	1	31	37.8	129	71.7	160	61.1		
Other fruits	0	41	50.0	70	38.9	111	42.4	2.848	0.091
	1	41	50.0	110	61.1	151	57.6		

(0= Consuming, 1=Not Consuming) *P= <0.05, ** P=<0.01, *** P=<0.001

in consumption from 6-12 months (41.5%) to 12-24 months (80.6%), with 73.7% of children consuming them overall. (p=0.000).

Consumption of roots and tubers, pulses, dairy, and flesh foods also varied significantly by age ($p<0.05$). While millet, eggs, and vitamin-A rich fruits and vegetables showed no significant difference ($p>0.05$), other vegetables and fruits had a notable increase in consumption at 12-24 months ($p<0.001$). The results highlighted important dietary shifts with age, especially in staple and nutrient-rich foods.

The number of food groups consumed by females and males is shown in Table 4.34. The majority of respondents consumed 5 food groups, representing 24.4% of both females and males. Consumption of 4 food groups was reported among 21.0% children, followed by 7 food groups (15.3%). Fewer respondents consumed 6 (12.6%), 3 (10.7%), or 8 food groups (4.6%). The consumption of 1, 2, or 9 food groups was relatively low, with only 3.1% of the total consuming 1 food group and 2.7% consuming 9. The chi-square result ($p = 0.327$) suggests no significant gender difference in the number of food groups consumed.

The number of food groups consumed by infants in the 6-12 months and 12-24 months age groups is shown in Table 4.35. A significant shift in food consumption is observed as age increases, with a notable difference in the number of food groups consumed ($p<0.001$). In the 6-12 months group, the most common consumption was of 3 food groups (20.7%) and 5 food groups (22.0%). Whereas more number of the older children belonging to the 12-24 months age group had consumed 5 food groups (25.6%) and 7 food groups (17.2%). The consumption of 4 food groups increased significantly in the 12-24 months group (22.2%). Fewer infants consumed 1, 2, or 9 food groups, with 1 food group being more common in the 6-12 months age group.

The data in Table 4.36 shows the consumption of various food groups among females and males. Overall, "Other fruits and vegetables" showed the highest consumption rate (83.6%), followed by "any one fruit" (69.5%) and "any one vegetable" (65.3%). "other fruits" showed moderate consumption (57.6%), while "vitamin A rich fruits and vegetables" had the lowest consumption rate (33.2%). Females consistently reported higher consumption percentages than males across all food groups, suggesting potential gender-based differences in dietary habits.

TABLE 4. 34 TOTAL FOOD GROUPS CONSUMED BY CHILDREN CATEGORISED BY GENDER

Number of Food Groups	Female		Male		Total		Chi Square	P Value
	n	%	n	%	n	%		
1	5	3.9	3	2.2	8	3.1	9.185	0.327
2	4	3.1	11	8.1	15	5.7		
3	13	10.2	15	11.1	28	10.7		
4	27	21.3	28	20.7	55	21.0		
5	31	24.4	33	24.4	64	24.4		
6	12	9.4	21	15.6	33	12.6		
7	25	19.7	15	11.1	40	15.3		
8	7	5.5	5	3.7	12	4.6		
9	3	2.4	4	3.0	7	2.7		

TABLE 4. 35 TOTAL FOOD GROUPS CONSUMED BY CHILDREN CATEGORISED BY AGE

Number of Food Groups	6 - 12 months		12-24 months		Total		Chi Square	P Value
	n	%	n	%	n	%		
1	6	7.3	2	1.1	8	3.1	38.304	0.000***
2	10	12.2	5	2.8	15	5.7		
3	17	20.7	11	6.1	28	10.7		
4	15	18.3	40	22.2	55	21.0		
5	18	22.0	46	25.6	64	24.4		
6	6	7.3	27	15.0	33	12.6		
7	9	11.0	31	17.2	40	15.3		
8	0	0.0	12	6.7	12	4.6		
9	1	1.2	6	3.3	7	2.7		

***** P=<0.001**

TABLE 4. 36 CONSUMPTION OF FRUITS AND VEGETABLES CATEGORISED BY GENDER

Food Group	Female		Male		Total	
	n	%	n	%	n	%
Other fruits	76	59.8	75	55.6	151	57.6
Vitamin A rich fruits and vegetables	46	36.2	41	30.4	87	33.2
Other fruits and vegetables	112	88.2	107	79.3	219	83.6
Any one vegetable	90	70.9	81	60.0	171	65.3
Any one fruit	93	73.2	89	65.9	182	69.5

TABLE 4. 37 CONSUMPTION OF FRUITS AND VEGETABLES CATEGORISED BY AGE

		6 - 12 months		12-24 months		Total		Chi square	P Value
		n	%	n	%	n	%		
Vitamin-A rich fruits and vegetables	No	64	78.0	111	61.7	175	66.8	6.817	0.009**
	Yes	18	22.0	69	38.3	87	33.2		
Other fruits and vegetables	No	27	32.9	16	8.9	43	16.4	23.728	0.000***
	Yes	55	67.1	164	91.1	219	83.6		
Any one vegetable	No	49	59.8	42	23.3	91	34.7	32.968	0.000***
	Yes	33	40.2	138	76.7	171	65.3		
Any one fruit	No	32	39.0	48	26.7	80	30.5	4.056	0.044***
	Yes	50	61.0	132	73.3	182	69.5		

P= <0.05, ** P=<0.01, *** P=<0.001

The consumption of fruits and vegetables by children in two age groups: 6-12 months and 12-24 months, is shown in Table 4.37. Majority (78.0%) of children in the 6- 12-month age group consumed Vitamin-A-rich fruits and vegetables foods, while 61.7% in the 12–24-month age group reported consuming Vitamin-A-rich fruits and vegetables. A significant difference was found between the two age groups ($p<0.05$). One third (32.9%) of children in the 6-12-month group consumed other fruits and vegetables, while only 8.9% reported consuming these foods in the 12-24 months age group with a statistically significant difference ($p=0.000$). Similarly, 59.8% of children in the 6-12-months group consumed any one vegetable, compared to only 23.3% in the 12-24 months group with a significant difference ($p=0.000$). Younger children belonging to 6-12 months age group consumed any one fruit more (39.0%) than the 12-24 months group (26.7%). The difference was found to be statistically significant ($p<0.05$)

The data on the consumption of food groups according to DQQ indicators categorised by gender is shown in Table 4.38. A majority of participants (52.7%) were given breast milk. Most of the children (95.4%) consumed cereals and cereal-based foods followed 90.5% of participants who consumed pulses and nuts & oilseeds. Nearly fifty percent (48.1%) consumed dairy products, while only 6.9% reported consuming meat and flesh foods. Eggs were consumed by 11.5% of the participants. Vitamin A-rich fruits and vegetables were consumed by 33.2%, and 83.6% of the participants consumed other fruits and vegetables. These figures highlight a strong prevalence of cereal and pulse-based consumption, with a moderate intake of dairy products, eggs, and vitamin A-rich foods.

The data on the consumption of food groups according to DQQ indicators categorised by age is shown in Table 4.39. A significantly higher percentage of infants in the 6-12 months group consumed breast milk (82.9%) compared to those in the 12-24 months group (38.9%). Similarly, cereals and cereal-based foods were consumed by 99.4% of the 12-24 months group, while 86.6% of the 6-12 months old children consumed them. Other major differences were noted in consumption of dairy products (52.2% in 12-24 months vs 39.0% in 6-12 months), and vitamin A-rich fruits and vegetables (38.3% in 12-24 months vs 22.0% in 6-12 months). However, no significant difference was found in the consumption of pulses, nuts, and oilseeds, and eggs between the two groups. Additionally, the consumption of other fruits and vegetables was higher in the 12-24 months group (91.1%) compared to the 6-12 months group (67.1%).

TABLE 4. 38 CONSUMPTION OF FOOD GROUPS ACCORDING TO DQQ INDICATORS CATEGORISED BY GENDER

DQQ Indicators	Female		Male		Total	
	n	%	n	%	n	%
Breast milk	65	51.2	73	54.1	138	52.7
Cereals and cereal based food	119	93.7	131	97.0	250	95.4
Pulses and nuts & oilseeds	113	89.0	124	91.9	237	90.5
Dairy Products	68	53.5	58	43.0	126	48.1
Meat and flesh foods	7	5.5	11	8.1	18	6.9
Eggs	13	10.2	17	12.6	30	11.5
Vitamin -A rich fruits and vegetables	46	36.2	41	30.4	87	33.2
Other fruits and vegetables	112	88.2	107	79.3	219	83.6

TABLE 4. 39 CONSUMPTION OF FOOD GROUPS ACCORDING TO DQQ INDICATORS CATEGORISED BY AGE

		6 - 12 months		12-24 months		Total		Chi Square	P Value
		n	%	n	%	n	%		
Breastmilk	0	14	17.1	110	61.1	124	47.3	43.827	0.000***
	1	68	82.9	70	38.9	138	52.7		
Cereals and cereal based food	0	11	13.4	1	0.6	12	4.6	21.315	0.000***
	1	71	86.6	179	99.4	250	95.4		
Pulses, nut and oilseeds	0	12	14.6	13	7.2	25	9.5	3.586	0.058
	1	70	85.4	167	92.8	237	90.5		
Dairy Products	0	50	61.0	86	47.8	136	51.9	3.931	0.047**
	1	32	39.0	94	52.2	126	48.1		
Meat and flesh foods	0	82	100.0	162	90.0	244	93.1	8.805	0.003**
	1	0	0.0	18	10.0	18	6.9		
Eggs	0	76	92.7	156	86.7	232	88.5	2.011	0.156
	1	6	7.3	24	13.3	30	11.5		
Vitamin A rich fruits and vegetables	0	64	78.0	111	61.7	175	66.8	6.817	0.009***
	1	18	22.0	69	38.3	87	33.2		
Other fruits and vegetables	0	27	32.9	16	8.9	43	16.4	23.728	0.000***
	1	55	67.1	164	91.1	219	83.6		

(0= Consuming, 1=Not Consuming) *P= <0.05, ** P=<0.01, *** P=<0.001

The data in Table 4.40 shows the distribution of dietary diversity scores based on the number of food groups consumed. A majority of participants reported consuming between 4 and 5 food groups, accounting for 64.5% of the total responses (32.8% for 4 food groups and 31.7% for 5 food groups). Only a few participants reported consuming 6 food groups (8.8%), while the consumption of 7 (1.1%) or 8 (0.4%) food groups was rare. A small portion of participants consumed only 2 food groups (7.3%), and 3 food groups were consumed by 17.9% of participants. No genderwise difference was found in the dietary diversity scores.

The data in Table 4.41 shows the distribution of dietary diversity scores based on the number of food groups consumed for the two age groups: 6-12 months and 12-24 months. For the 6-12 months age group, the most common dietary diversity score was 5 food groups (34.1%), followed by 3 food groups (24.4%) and 4 food groups (24.4%). A smaller proportion of participants consumed 6 food groups (3.7%), with no participants consuming 7 or 8 food groups. For the 12-24 months age group, 36.7% of participants consumed 4 food groups, and 30.6% consumed 5 food groups. A small percentage (15.0%) consumed 3 food groups, and 11.1% consumed 6 food groups. Only a few of the participants consumed 7 (1.7%) or 8 (0.6%) food groups. These difference between the younger and older age groups were found to be statistically significant ($p<0.01$). This suggests that dietary diversity increases with age, particularly in the 12-24 months group, which has a higher proportion of participants consuming 4 and 5 food groups.

The data on three dietary indicators: Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD) across the participants in Table 4.42. The data revealed that a majority of participants (58%) did not meet the minimum dietary diversity criteria, while only 42% met the MDD criteria. There was no significant difference between males and females in terms of meeting the criteria for MDD. Data on number of , meals fed to the children on a daily basis showed that 70.2% of the participants met the minimum meal frequency according to their age. However, the majority (68.3%) of the participants did not meet the minimum acceptable diet criteria. Only 31.7% of children were fed minimum acceptable diet for their age. Gender-wise data showed that a slightly higher number of girls met the minimum dietary diversity than boys, but more boys met the minimum

TABLE 4. 40 TOTAL DDS ACCORDING TO DQQ INDICATORS CATEGORISED BY GENDER

Total Dietary Diversity Score	Female		Male		Total		Chi square	P value
	n	%	n	%	n	%		
2	9	7.1	10	7.4	19	7.3		
3	24	18.9	23	17.0	47	17.9		
4	38	29.9	48	35.6	86	32.8		
5	39	30.7	44	32.6	83	31.7	3.717	0.715
6	14	11.0	9	6.7	23	8.8		
7	2	1.6	1	0.7	3	1.1		
8	1	0.8	0	0.0	1	0.4		

TABLE 4. 41 TOTAL DDS ACCORDING TO DQQ INDICATORS CATEGORISED BY AGE

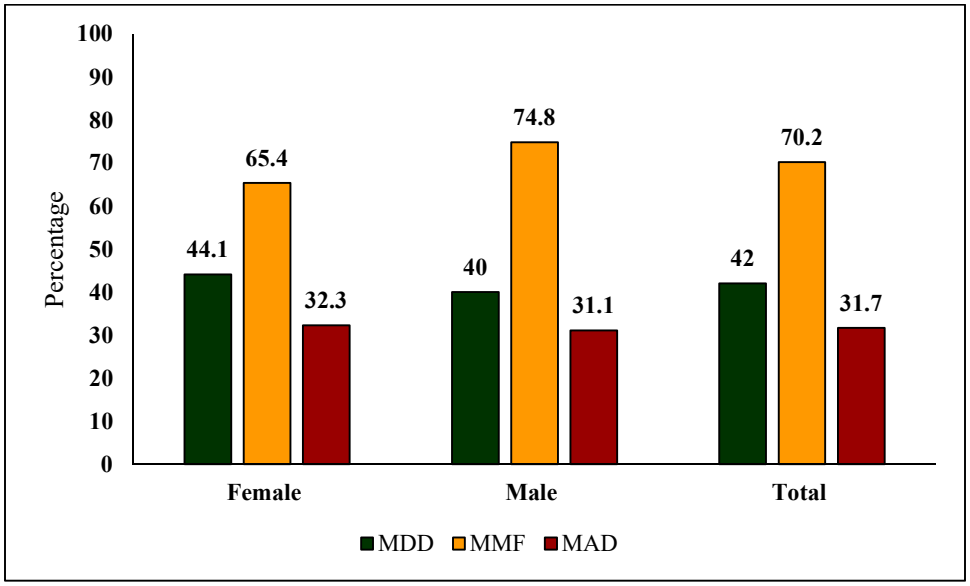
Total Dietary Diversity Score	6 - 12 months		12-24 months		Total		Chi square	P value
	n	%	n	%	n	%		
2	11	13.4	8	4.4	19	7.3		
3	20	24.4	27	15.0	47	17.9		
4	20	24.4	66	36.7	86	32.8		
5	28	34.1	55	30.6	83	31.7	17.222	0.008***
6	3	3.7	20	11.	23	8.8		
7	0	0.0	3	1.7	3	1.1		
8	0	0.0	1	0.6	1	0.4		

***** P=<0.001**

TABLE 4. 42 MDD, MMF AND MAD OF CHILDREN CATEGORISED BY GENDER

		Female		Male		Total		Chi Square	P value
		n	%	n	%	n	%		
MDD	No	71	55.9	81	60.0	152	58.0	0.450	0.502
	Yes	56	44.1	54	40.0	110	42.0		
MMF	No	44	34.6	34	25.2	78	29.8	2.801	0.094
	Yes	83	65.4	101	74.8	184	70.2		
MAD	No	86	67.7	93	68.9	179	68.3	0.042	0.838
	Yes	41	32.3	42	31.1	83	31.7		

FIGURE 4. 2 MDD, MMF AND MAD OF CHILDREN CATEGORISED BY GENDER



meal frequency than girls. The proportion of children meeting minimum adequate diet were comparable in boys and girls.

The data in Table 4.43 shows the distribution of three dietary indicators: Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD) across two age groups (6-12 months and 12-24 months). For MDD majority (58%) of participants did not meet the minimum dietary diversity requirements, while 42% did. While 70.2% of participants met the minimum meal frequency requirement, while 29.8% did not. There is a significant difference between the age groups (p-value = 0.014), with a higher proportion of 6-12 months participants meeting the meal frequency compared to the 12-24 months group. Where as 68.3% of participants did not meet the minimum acceptable diet criteria, while 31.7% did. The chi-square test result (p-value = 0.780) indicates no significant difference between the two age groups in terms of meeting the MAD criteria.

The data in Table 4.44 reveals insights into participants' food consumption patterns. Egg and/or flesh food consumption, which includes both processed and unprocessed meats and eggs, showed that only 16% of participants consumed such foods. In contrast, sweet beverage consumption, includes sweetened milk, tea or coffee, and other beverages, was notably higher, with 66% of participants reporting consumption. A significant portion, 73.3%, consumed unhealthy foods, while 67.2% indulged in sweet foods, which included both ready-made and homemade sweets. Regarding savory and fried snack consumption, which covers items like namkeen, chavanu, and other similar snacks, 40.1% of participants consumed them. Zero vegetable or fruit consumption was reported by 68.7% of participants and animal source food consumption, including dairy products like milk, curd, cheese, and paneer, was recorded at 56.5%.

The data shows consumption patterns among participants in two age groups: 6-12 months and 12-24 months in Table 4.45 and Figure 4.3. A significant difference was observed, with only 7.3% of participants in the 6-12 months group consuming eggs or flesh foods, compared to 20% in the 12-24 months group. As for sweet beverage consumption, there was a marked increase in sweet beverage consumption from 48.8% in the 6-12 months group to 73.9% in the 12-24 months group, with a chi-square value of 15.834 (p = 0.000), showing a highly significant difference. Similarly, there was a significant difference in the consumption of

TABLE 4. 43 MDD, MMF AND MAD OF CHILDREN CATEGORISED BY AGE

		6 - 12 months		12-24 months		Total		Chi Square	P Value
		n	%	n	%	n	%		
MDD	No	51	62.2	101	56.1	152	58.0	0.856	0.355
	Yes	31	37.8	79	43.9	110	42.0		
MMF	No	16	19.5	62	34.4	78	29.8	6.008	0.014*
	Yes	66	80.5	118	65.6	184	70.2		
MAD	No	57	69.5	122	67.8	179	68.3	0.078	0.780
	Yes	25	30.5	58	32.2	83	31.7		

***P= <0.05**

FIGURE 4. 3 MDD, MMF AND MAD OF CHILDREN CATEGORISED BY AGE

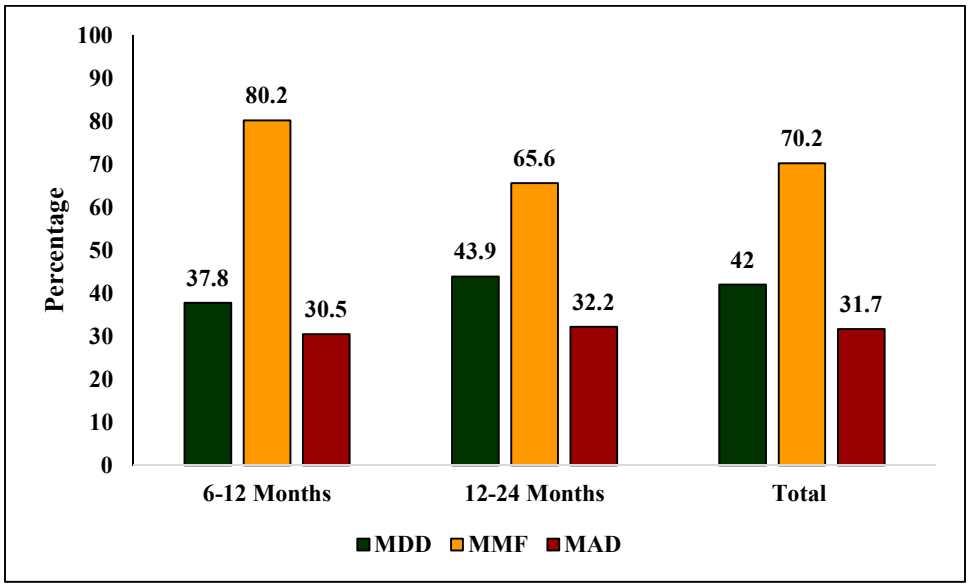


TABLE 4. 44 IYCF INDICATORS FOR CHILDREN UNDER 2 YEARS CATEGORISED BY GENDER

	Female		Male		Total	
	n	%	n	%	n	%
Egg and or flesh food consumption	17	13.4	25	18.5	42	16.0
Sweet beverage consumption	80	63.0	93	68.9	173	66.0
Unhealthy food consumption	93	73.2	99	73.3	192	73.3
Sweet food consumption	85	66.9	91	67.4	176	67.2
Savory and fried snack consumption	52	40.9	53	39.3	105	40.1
Zero vegetable or fruit consumption	82	64.6	98	72.6	180	68.7
Animal source food consumption	75	59.1	73	54.1	148	56.5

TABLE 4. 45 IYCF INDICATORS FOR CHILDREN UNDER 2 YEARS CATEGORISED BY AGE

		6 - 12 months		12-24 months		Total		Chi Square	P Value
		n	%	n	%	n	%		
Egg and or flesh food consumption	No	76	92.7	144	80.0	220	84.0	6.732	0.009***
	Yes	6	7.3	36	20.0	42	16.0		
Sweet beverage consumption	No	42	51.2	47	26.1	89	34.0	15.834	0.000***
	Yes	40	48.8	133	73.9	173	66.0		
Unhealthy food consumption	No	46	56.1	24	13.3	70	26.7	52.620	0.000***
	Yes	36	43.9	156	86.7	192	73.3		
Sweet food consumption	No	49	59.8	37	20.6	86	32.8	39.261	0.000***
	Yes	33	40.2	143	79.4	176	67.2		
Savory and fried snack consumption	No	70	85.4	87	48.3	157	59.9	32.171	0.000***
	Yes	12	14.6	93	51.7	105	40.1		
Zero vegetable or fruit consumption	No	15	18.3	67	37.2	82	31.3	9.388	0.002**
	Yes	67	81.7	113	62.8	180	68.7		
Animal source food	No	46	56.1	68	37.8	114	43.5	7.692	0.006***
	Yes	36	43.9	112	62.2	148	56.5		

**** P=<0.01, ***P=< 0.001**

unhealthy foods, sweet foods, savory snacks, zero vegetable or fruit consumption and consumption of animal source food indicating statistically significant difference.

The data on participants' food consumption patterns is shown in Table 4.46. The data showed that only 1.5% of participants were to be fed sweet beverage including soft drinks. On the other hand, sweet consumption, including baked or grain-based sweets, was higher, with 57.6% of participants consuming such items. Additionally, 30.2% of participants were fed other types of sweets. Processed meat consumption was zero, with 100% of participants not consuming processed meat. While consumption of unprocessed red meat was much lower, with only 1.5% of participants eating it. Data on savory and fried snack consumption showed that 6.5% of participants consumed deep-fried food, while an equal percentage (6.5%) who consumed fast food and instant noodles with a slightly higher consumption in females (10.2%) as compared to 6.5% in males. Packaged ultra-processed salty snacks were consumed by 33.6% of participants.

The data on participants' food consumption patterns categorised by age is shown in Table 4.47. Regarding sweet beverage consumption, 2.2% of participants aged 12-24 months consumed soft drinks, while no participants in the 6-12 months category consumed them. In terms of sweet consumption, 67.8% of participants aged 12-24 months consumed baked or grain-based sweets, compared to 35.4% of those aged 6-12 months. Additionally, 38.3% of participants aged 12-24 months consumed other types of sweets, while only 12.2% of participants aged 6-12 months consumed them. Only 2.2% of participants in the 12-24 months category consumed unprocessed red meat, while no participants in the 6-12 months group consumed it. Regarding Savory and fried snack consumption, 8.9% of participants aged 12-24 months consumed deep-fried food, and 9.4% of the same group consumed fast food and instant noodles. Additionally, 42.8% of participants aged 12-24 months consumed packaged ultra-processed salty snacks. This data highlights a significant increase in the consumption of sweet foods, savory snacks, and processed items as participants age from 6-12 months to 12-24 months.

TABLE 4. 46 CONSUMPTION OF UNHEALTHY FOOD CATEGORISED BY GENDER

		Female		Male		Total		Chi Square	P Value
		n	%	n	%	n	%		
Sweet beverage consumption									
Soft drinks	0	125	98.4	133	98.5	258	98.5	0.004	0.951
	1	2	1.6	2	1.5	4	1.5		
Sweet consumption									
Baked or grain-based sweets	0	54	42.5	57	42.2	111	42.4	0.002	0.961
	1	73	57.5	78	57.8	151	57.6		
Other sweets	0	85	66.9	98	72.6	183	69.8	0.997	0.318
	1	42	33.1	37	27.4	79	30.2		
Processed meat consumption									
Processed meat	0	127	100.0	135	100.0	262	100.0	-	-
Unprocessed red meat	0	126	99.2	132	97.8	258	98.5	0.896	0.344
	1	1	0.8	3	2.2	4	1.5		
Savory and fried snack consumption									
Deep fried food	0	116	91.3	129	95.6	245	93.5	1.918	0.166
	1	11	8.7	6	4.4	17	6.5		
Fast food and Instant noodles	0	114	89.8	131	97.0	245	93.5	5.705	0.017**
	1	13	10.2	4	3.0	17	6.5		
Packaged ultra processed salty snacks	0	86	67.7	88	65.2	174	66.4	0.188	0.665
	1	41	32.3	47	34.8	88	33.6		

(0= Consuming, 1=Not Consuming) ** P=<0.01

TABLE 4. 47 CONSUMPTION OF UNHEALTHY FOOD CATEGORISED BY AGE

		6 - 12 months		12-24 months		Total		Chi Square	P Value
		n	%	n	%	n	%		
Sweet beverage consumption									
Soft drinks	0	82	100.0	176	97.8	258	98.5	1.850	0.174
	1	0	0.0	4	2.2	4	1.5		
Sweet Consumption									
Baked or grain based sweets	0	53	64.6	58	32.2	111	42.4	24.238	0.000***
	1	29	35.4	122	67.8	151	57.6		
Other sweets	0	72	87.8	111	61.7	183	69.8	18.275	0.000***
	1	10	12.2	69	38.3	79	30.2		
Processed Meat Consumption									
Processed meat	0	82	100.0	180	100.0%	262	100.0		
Unprocessed red meat	0	82	100.0	176	97.8%	258	98.5	1.850	0.174
	1	0	0.0	4	2.2%	4	1.5		
Savory and fried snack consumption									
Deep fried food	0	81	98.8	164	91.1	245	93.5	5.461	0.019*
	1	1	1.2	16	8.9	17	6.5		
Fast food and Instant noodles	0	82	100.0	163	90.6	245	93.5	8.282	0.004**
	1	0	0.0	17	9.4	17	6.5		
Packaged ultra processed salty snacks	0	71	86.6	103	57.2	174	66.4	21.775	0.000*
	1	11	13.4	77	42.8	88	33.6		

(0= Consuming, 1=Not Consuming) ** P=<0.01, ***P= <0.001

The data presented in Table 4.48 give insights into the NCD Protect and NCD Risk scores across participants, categorized by gender.

NCD Protect Score: The NCD Protect score reflects the consumption of food groups positively correlated with meeting global dietary recommendations. The data showed that only 1.1% of participants had a score of 0, while 5.7% had a score of 1 and 14.5% had a score of 2, suggesting moderate consumption of food groups in line with the recommendations. Almost one-fourth (24.4%) scored 3, and 21% had a score of 4, indicating a higher level of adherence to dietary guidelines. Additionally, 13% scored 5, followed by 10.3% with a score of 6, reflecting significant consumption of recommended food groups. Furthermore, 7.6% had a score of 7, and only 2.3% scored 8.

NCD Risk Score: The NCD Risk score reflects the consumption of food groups negatively correlated with meeting global dietary recommendations. More than one-fourth (26%) of participants had a score of 0, followed by 32.4% who had a score of 1. Almost one-fourth (24.8%) had a score of 2, followed by 13% who scored 3. Only 2.7% had a score of 4, and 1.1% scored 5

The data on NCD Protect and NCD Risk scores, categorized by the 6–12 months and 12–24 is presented in Table 4.49

For the **NCD Protect score**, the data shows a significant variation in recommended food consumption. A small proportion of participants (1.1%) scored 0, following that, 5.7% had a score of 1, while 14.5% scored 2. A notable portion (24.4%) scored 3, and 21% scored 4. Approximately 13% of participants had a score of 5, and 10.3% scored 6, demonstrating higher adherence. Lastly, 7.6% scored 7, and 2.3% scored 8, highlighting strong adherence to the recommendations. For the **NCD Risk score**, more than half of the participants in the 6–12 months age group (56.1%) scored 0, suggesting minimal consumption of foods that are negatively correlated with meeting dietary recommendations. In contrast, only 12.2% of participants in the 12–24 months period scored 0. Whereas 32.4% of children scored 1, and 24.8% scored 2. About 13% of participants scored 3, while a smaller percentage (2.7%) scored 4, and 1.1% scored 5. There was a statistically significant difference between the 2-age groups ($p<0.001$).

TABLE 4. 48 NCD PROTECT SCORE AND NCD- RISK SCORE CATEGORISED BY GENDER

		Female		Male		Total		Chi Square	P Value
		n	%	n	%	n	%		
NCD Protect score	0	2	1.6	1	0.7	3	1.1	7.993	0.440
	1	7	5.5	8	5.9	15	5.7		
	2	14	11.0	24	17.8	38	14.5		
	3	32	25.2	32	23.7	64	24.4		
	4	29	22.8	26	19.3	55	21.0		
	5	15	11.8	19	14.1	34	13.0		
	6	14	11.0	13	9.6	27	10.3		
	7	13	10.2	7	5.2	20	7.6		
	8	1	0.8	5	3.7	6	2.3		
NCD Risk score	0	33	26.0	35	25.9	68	26.0	2.515	0.774
	1	39	30.7	46	34.1	85	32.4		
	2	30	23.6	35	25.9	65	24.8		
	3	18	14.2	16	11.9	34	13.0		
	4	5	3.9	2	1.5	7	2.7		
	5	2	1.6	1	0.7	3	1.1		

TABLE 4. 49 NCD PROTECT SCORE AND NCD- RISK SCORE CATEGORISED BY AGE

		6 - 12 months		12-24 months		Total		Chi Square	P value
		n	%	n	%	n	%		
NCD Protect score	0	2	2.4	1	0.6	3	1.1%	28.282	0.000***
	1	11	13.4	4	2.2	15	5.7		
	2	16	19.5	22	12.2	38	14.5		
	3	18	22.0	46	25.6	64	24.4		
	4	21	25.6	34	18.9	55	21.0		
	5	5	6.1	29	16.1	34	13.0		
	6	5	6.1	22	12.2	27	10.3		
	7	2	2.4	18	10.0	20	7.6		
	8	2	2.4	4	2.2	6	2.3		
NCD Risk score	0	46	56.1	22	12.2	68	26.0	63.511	0.000***
	1	23	28.0	62	34.4	85	32.4		
	2	11	13.4	54	30.0	65	24.8		
	3	2	2.4	32	17.8	34	13.0		
	4	0	0.0	7	3.9	7	2.7		
	5	0	0.0	3	1.7	3	1.1		

PARENTAL FEEDING STYLES

The data on various feeding practices scored using mothers for milk feeding as well as semi-solids feeding version, with genderwise comparison is given in Table 4.50. As per the mother's milk feeding version, the average score for feeding on demand was relatively high (1.18), indicating that it was a common practice among mothers. This was slightly higher in male children than in female children. For parent-led, feeding the average scores were similar for both males and females children, whereas for persuasive feeding, the average score was lower than other styles, with males scoring slightly higher than females. A high score for using food to calm the child was reported in case of male children as compared to females.

The data collected using semi-solid feeding version showed that the average score for feeding on demand and family meal environment was higher. It was also higher for females as compared to males. While for parent led feeding, persuasive feeding, using food to calm and using non-food rewards had similar scores across both the gender.

Table 4.51 presents the mean scores and standard deviations (SD) for various maternal feeding styles, categorized by the age of the child (6-12 months and 12-24 months). The data revealed differences in feeding practices across the two age groups. According to the milk feeding version, "Feeding on Demand" exhibited the highest mean scores in both age groups, though slightly lower in the 12-24 month group than 6-12 moths age group was reported (4.10 vs. 3.30). "Parent-led feeding" and "Using food to calm" showed relatively low mean scores across both age ranges. In the semi-solid feeding version, "Family Meal Environment" showed a notable increase in mean score from 6-12 months to 12-24 months (2.46 vs. 3.60). "Feeding on Demand" also demonstrated high mean scores in the semi-solid feeding context. "Using non-food rewards" consistently showed the lowest mean scores, indicating that this feeding style was less commonly practiced. These findings suggest potential shifts in maternal feeding behaviors as children transition from infancy to toddlerhood, particularly with the introduction of semi-solid foods and the establishment of family meal environments.

TABLE 4. 50 MEAN SCORES FOR MOTHERS' FEEDING STYLE CATEGORISED BY GENDER

	Female		Male		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Milk feeding version						
Feeding on Demand	3.34	1.25	3.74	1.08	3.55	1.18
Parent led feeding	1.76	0.71	1.75	0.73	1.75	0.72
Persuasive feeding	1.39	0.53	1.51	0.57	1.45	0.55
Using food to calm	1.8	1.0	2.1	1.1	2.0	1.1
Semi solids feeding version						
Feeding on demand	3.46	0.80	3.23	0.86	3.34	0.84
Family Meal Environment	3.37	1.09	3.13	1.20	3.25	1.15
Parent led feeding	2.43	0.84	2.34	0.85	2.38	0.84
Persuasive feeding	2.26	0.82	2.20	0.74	2.23	0.78
Using Food to calm	1.35	0.61	1.36	0.59	1.35	0.60
Using non food rewards	1.12	0.34	1.10	0.31	1.11	0.33

TABLE 4. 51 MEAN SCORES FOR MOTHERS' FEEDING STYLE CATEGORISED BY AGE

	6 - 12 months		12-24 months		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Milk feeding						
Feeding on Demand	4.10	0.93	3.30	1.19	3.55	1.18
Parent led feeding	1.52	0.72	1.86	0.69	1.75	0.72
Persuasive feeding	1.70	0.57	1.34	0.51	1.45	0.55
Using food to calm	2.6	1.1	1.7	1.0	2.0	1.1
Semi solids feeding version						
Feeding on demand	3.23	0.87	3.39	0.83	3.34	0.84
Family Meal Environment	2.46	1.13	3.60	0.97	3.25	1.15
Parent led feeding	2.16	0.80	2.48	0.85	2.38	0.84
Persuasive feeding	2.10	0.77	2.29	0.78	2.23	0.78
Using Food to calm	1.14	0.42	1.45	0.64	1.35	0.60
Using non food rewards	1.00	0.02	1.16	0.38	1.11	0.33

The data in Table 4. 52 shows the different father's feeding practices using both milk feeding and semi-solid feeding version, comparing the mean scores across both genders. According to milk feeding, "Feeding on demand" demonstrated the highest mean scores across both male and female children, with minimal variation between genders (female: 3.06±0.27; male: 3.05±0.28). "Parent-led feeding" showed moderately high mean scores (female: 2.27±0.25; male: 2.30±0.26), while "Persuasive feeding" (female: 1.04±0.20; male: 1.05±0.28) and "Using food to calm" (female: 1.04±0.15; male: 1.03±0.13) exhibited substantially lower mean scores, suggesting less frequent utilization of these strategies. In the semi-solid feeding context, "Family meal environment" had the highest mean scores (female: 2.91±1.12; male: 2.73±1.25). "Feeding on demand" also showed relatively high mean scores (female: 2.73±0.61; male: 2.54±0.57). "Parent-led feeding" (female: 1.83±0.43; male: 1.89±0.41), "Persuasive feeding" (female: 1.53±0.68; male: 1.47±0.66), "Using food to calm" (female: 1.13±0.32; male: 1.09±0.25), and "Using non-food rewards" (female: 1.08±0.29; male: 1.05±0.25) all showed lower mean scores. Overall, the data suggests that fathers primarily employed "Feeding on demand" during milk feeding and emphasized "Family meal environment" during semi-solid feeding, with minimal gender-based differences observed.

The data in Table 4.53 shows the various feeding practices for Father Milk Feeding and Semi-Solid Feeding Version across two age groups, 6-12 months and 12-24 months. For milk feeding, "Feeding on demand" demonstrated the highest mean scores across both age groups, with minimal variation (6-12 months: 3.05±0.28; 12-24 months: 3.06±0.27). "Parent-led feeding" showed moderately high mean scores (6-12 months: 2.28±0.26; 12-24 months: 2.29±0.25), while "Persuasive feeding" (6-12 months: 1.00±0.00; 12-24 months: 1.07±0.29) and "Using food to calm" (6-12 months: 1.02±0.08; 12-24 months: 1.04±0.16) exhibited substantially lower mean scores. This indicated that these strategies were not commonly followed by the fathers. In the semi-solid feeding context, "Family meal environment" had the highest mean scores, with a notable increase from 6-12 months to 12-24 months (6-12 months: 2.33±1.14; 12-24 months: 3.03±1.15), indicating a greater emphasis on this style in older children. "Feeding on demand" also showed relatively high mean scores (6-12 months: 2.50±0.50; 12-24 months: 2.69±0.63). "Parent-led feeding" (6-12 months: 1.86±0.40;

TABLE 4. 52 MEAN SCORES OF FATHER'S FEEDING STYLE CATEGORISED BY GENDER

	Female		Male		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Milk feeding						
Feeding on demand	3.06	0.27	3.05	0.28	3.06	0.27
Parent led feeding	2.27	0.25	2.30	0.26	2.28	0.25
Persuasive feeding	1.04	0.20	1.05	0.28	1.05	0.25
Using food to calm	1.04	0.15	1.03	0.13	1.03	0.14
Semi solids feeding version						
Feeding on demand	2.73	0.61	2.54	0.57	2.63	0.60
Family Meal Environment	2.91	1.12	2.73	1.25	2.81	1.19
Parent led feeding	1.83	0.43	1.89	0.41	1.86	0.42
Persuasive feeding	1.53	0.68	1.47	0.66	1.50	0.67
Using food to calm	1.13	0.32	1.09	0.25	1.11	0.29
Using non food rewards	1.08	0.29	1.05	0.25	1.07	0.27

TABLE 4. 53 MEAN SCORES OF FATHER'S FEEDING STYLE CATEGORISED BY AGE

	6 - 12 months		12-24 months		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Father milk feeding						
Feeding on demand	3.05	0.28	3.06	0.27	3.06	0.27
Parent led feeding	2.28	0.26	2.29	0.25	2.28	0.25
Persuasive feeding	1.00	0.00	1.07	0.29	1.05	0.25
Using food to calm	1.02	0.08	1.04	0.16	1.03	0.14
Semi solids feeding version						
Feeding on demand	2.50	0.50	2.69	0.63	2.63	0.60
Family Meal Environment	2.33	1.14	3.03	1.15	2.81	1.19
Parent led feeding	1.86	0.40	1.86	0.43	1.86	0.42
Persuasive feeding	1.41	0.60	1.54	0.70	1.50	0.67
Using Food to calm	1.04	0.17	1.14	0.32	1.11	0.29
Using non food rewards	1.01	0.04	1.09	0.32	1.07	0.27

21- 24 months:1.86±0.43), "Persuasive feeding" (6-12 months: 1.41±0.60; 12-24 months: 1.54±0.70), "Using food to calm" (6-12 months: 1.04±0.17; 12-24 months: 1.14±0.32), and "Using non-food rewards" (6-12 months: 1.01±0.04; 12-24 months: 1.09±0.32) all displayed lower mean scores, implying that this style was less practices. Overall, the data suggests that fathers primarily employed "Feeding on demand" during milk feeding and emphasized "Family meal environment" during semi-solid feeding, with potential shifts in feeding styles observed as children age.

Table 4.54 presents the mean scores for parental demandingness and responsiveness across genders. The average scores for mother's demandingness were similar for females and males, with a mean of 2.07±0.30 for females and 2.08±0.31 for males. For Mother Responsiveness, while both females and males rate the mother's responsiveness relatively low, with means of 1.35±0.39 for females and 1.39±0.37 for males, the average score for male children was slightly higher than for females. Father Demandingness was rated slightly higher by females (1.76±0.20) compared to males (1.72±0.19). Father Responsiveness was rated higher by males (1.96±0.40) than by females (1.89±0.42), with a minimal difference in the mean scores.

Mean demandingness & responsiveness score of parents according to age is shown in Table 4.55. For maternal demandingness, the mean score for the 6-12 month group was 2.01±0.28, increasing to 2.42±0.37 for the 12-24 month group, with an overall mean of 2.08±0.30. This indicates a perceived increase in maternal demandingness with an increase in children's age. Maternal responsiveness showed a decrease from 1.47±0.37 in the 6-12 month group to 1.26±0.28 in the 12-24 month group, with an overall mean of 1.37±0.38. Similarly, paternal demandingness showed a significant increase from 1.65±0.15 in the 6-12 month group to 2.26±0.68 in the 12-24 month group, with an overall mean of 1.74±0.19. Conversely, paternal responsiveness decreased from 2.03±0.42 in the 6-12 month group to 1.47±0.64 in the 12-24 month group, with an overall mean of 1.92±0.41. It was observed that maternal and paternal demandingness increased with child age, while maternal and paternal responsiveness decreased.

Table 4.56 presents the distribution of maternal demandingness and responsiveness, categorized as "high" or "low," across mothers of female and male children. For maternal demandingness, 50.4% (n=64) of mothers of female children and 48.9% (n=66) of mothers of

TABLE 4. 54 MEAN DEMANDINGNESS & RESPONSSIVENESS SCORE OF PARENTS ACCORDING TO GENDER

	Female		Male		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Mother-Demandingness	2.07	0.30	2.08	0.31	2.08	0.30
Mother-Responsiveness	1.35	0.39	1.39	0.37	1.37	0.38
Father-Demandingness	1.76	0.20	1.72	0.19	1.74	0.19
Father-Responsiveness	1.89	0.42	1.96	0.40	1.92	0.41

TABLE 4. 55 MEAN DEMANDINGNESS & RESPONSSIVENESS SCORE OF PARENTS ACCORDING TO AGE

	6 - 12 months		12-24 months		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Mother Demandingness	2.01	0.28	2.42	0.37	2.08	0.30
Mother Responsiveness	1.47	0.37	1.26	0.28	1.37	0.38
Father Demandingness	1.65	0.15	2.26	0.68	1.74	0.19
Father Responsiveness	2.03	0.42	1.47	0.64	1.92	0.41

TABLE 4. 56 LEVEL OF DEMANDINGNESS & RESPONSSIVENESS OF PARENTS ACCORDING TO GENDER

CATEGORY		Female		Male		Total		Chi Square	P Value
		n	%	n	%	n	%		
Mother Demandingness	High demandingness	64	50.4	66	48.9	130	49.6	0.059	0.808
	Low demandingness	63	49.6	69	51.1	132	50.4		
Mother Responsiveness	High responsiveness	60	47.2	71	52.6	131	50.0	0.749	0.387
	Low responsiveness	67	52.8	64	47.4	131	50.0		
Father Demandingness	High demandingness	70	55.1	67	49.6	137	52.3	0.790	0.374
	Low demandingness	57	44.9	68	50.4	125	47.7		
Father Responsiveness	High responsiveness	57	44.9	73	54.1	130	49.6	2.212	0.137
	Low responsiveness	70	55.1	62	45.9	132	50.4		

male children were categorized as having "high" demandingness, while 49.6% (n=63) of mothers of female children and 51.1% (n=69) of mothers of male children were categorized as having "low" demandingness. Similarly, for maternal responsiveness, 47.2% (n=60) of mothers of female children and 52.6% (n=71) of mothers of male children were categorized as having "high" responsiveness, and 52.8% (n=67) of mothers of female children and 47.4% (n=64) of mothers of male children were categorized as having "low" responsiveness.

In terms of paternal demandingness, 55.1% (n=70) of mothers of female children and 49.6% (n=67) of mothers of male children were categorized as having "high" demandingness, and 44.9% (n=57) of mothers of female children and 50.4% (n=68) of mothers of male children were categorized as having "low" demandingness. For paternal responsiveness, 44.9% (n=57) of mothers of female children and 54.1% (n=73) of mothers of male children were categorized as having "high" responsiveness, and 55.1% (n=70) of mothers of female children and 45.9% (n=62) of mothers of male children were categorized as having "low" responsiveness.

Table 4.57 presents the distribution of parental demandingness and responsiveness, categorized as "high" or "low," across 6-12 months and 12-24 months age groups. For maternal demandingness, 41.5% of mothers of children aged 6-12 months were categorized as having "high" demandingness, compared to 53.3% of mothers of children aged 12-24 months. Conversely, 58.5% of mothers of children aged 6-12 months were categorized as having "low" demandingness, compared to 46.7% of mothers of children aged 12-24 months. For maternal responsiveness, 63.4% of mothers of children aged 6-12 months were categorized as having "high" responsiveness, compared to 43.9% of mothers of children aged 12-24 months. In contrast, 36.6% of mothers of children aged 6-12 months were categorized as having "low" responsiveness, compared to 56.1% of mothers of children aged 12-24 months.

In terms of paternal demandingness, 31.7% of fathers of children aged 6-12 months were categorized as having "high" demandingness, compared to 61.7% of fathers of children aged 12-24 months. Similarly**,** 68.3% of fathers of children aged 6-12 months were categorized as having "low" demandingness, compared to 38.3% of fathers of children aged 12-24 months. For paternal responsiveness, 64.6% of fathers of children aged 6-12 months were categorized as having "high" responsiveness, compared to 42.8% of fathers of children aged 12-24 months.

Conversely, 35.4% of fathers of children aged 6-12 months were categorized as having "low" responsiveness, compared to 57.2% of fathers of children aged 12-24 months.

The Chi-square tests revealed statistically significant differences between the two age groups for maternal responsiveness ($p<0.0$), paternal demandingness ($p<0.001$), and paternal responsiveness ($p<0.01$). These findings suggest that parental demandingness tends to increase with child age, while parental responsiveness tends to decrease.

TABLE 4. 57 LEVEL OF DEMANDINGNESS & RESPONSSIVENESS OF PARENTS ACCORDING TO AGE

		6 - 12 months		12-24 months		Total		Chi Square	P Value
		n	%	n	%	n	%		
Mother Demandingness	High demandingness	34	41.5	96	53.3	130	49.6	3.175	0.075 **
	Low demandingness	48	58.5	84	46.7	132	50.4		
Mother Responsiveness	High responsiveness	52	63.4	79	43.9	131	50.0	8.591	0.003 **
	Low responsiveness	30	36.6	101	56.1	131	50.0		
Father Demandingness	High demandingness	26	31.7	111	61.7	137	52.3	20.269	0.000 ***
	Low demandingness	56	68.3	69	38.3	125	47.7		
Father Responsiveness	High responsiveness	53	64.6	77	42.8	130	49.6	10.765	0.001 **
	Low responsiveness	29	35.4	103	57.2	132	50.4		

*** P=<0.05, **P= <0.01, ***P= <0.001**

The data in the Table 4.58 shows the parental feeding styles of both mothers and fathers across genders. A significant proportion (29.4%) of mothers were found to have an Indulgent Feeding Style, followed by the Authoritarian Feeding Style at 29.4%. Authoritative Feeding Style accounted for 20.2%, while Uninvolved Feeding Style was practice by 20.6% mothers. In terms of fathers' feeding styles, the most common style was the Indulgent Feeding Style, practices by 35.9% fathers, followed by Authoritarian Feeding Style at 38.5%. Authoritative Feeding Style was reported by 13.7%, while Uninvolved Feeding Style was less common, with only 11.8% fathers practicing this style. The data on parental feeding style for gender of children showed that, Indulgent Feeding Style was the most among mothers at 29.8%, with a higher proportion of mothers of males (32.6%) following this style compared to that of females (26.8%). The Authoritarian Feeding Style was slightly more common among mothers, with 29.9% of mothers of females compared to 28.9% that of males. Uninvolved Feeding Style was reported by 22.8% of mothers of females and 18.5% of males, while Uninvolved Feeding Style was at 20.6%. For father feeding styles, Indulgent Feeding Style was most commonly adopted (35.9%), followed by Authoritarian Feeding Style at 38.5%. Fathers of male children showed slightly higher levels of indulgence in feeding (38.5%) compared to fathers of female children (33.1%). The Uninvolved Feeding Style was similarly low across both genders (11.8%).

The data in Table 4.59 shows the parental feeding styles across two age groups (6-12 months and 12-24 months) for both mothers and fathers. The Authoritarian Feeding Style was more common in the mothers of 12-24 months group, where 33.9% of mothers adopt this style, compared to 19.5% in the 6-12 months group. This difference was statistically significant ($p<0.05$). The Indulgent Feeding Style was more common in the 6-12 months group, with 41.5% of mothers using this style, compared to 24.4% in the 12-24 months group. This difference was not statistically significant. The Uninvolved Feeding Style was more prevalent in the 12-24 months group (22.2%) than in the 6-12 months group (17.1%), but this difference was also not statistically significant.

In Fathers' Feeding Styles, the Authoritarian Feeding Style was significantly more common in the 12-24 months group, with 46.1% of fathers adopting this style, compared to 22.0% in the 6-12 months group. ($p<0.000$) The Indulgent Feeding Style is more commonly adopted by fathers in the 6-12 months group (54.9%) than in the 12-24 months group (27.2%), and this

TABLE 4. 58 PARENTAL FEEDING STYLES OF PARENTS ACCORDING TO GENDER

		Female		Male		Total	
		n	%	n	%	n	%
Mother Feeding styles	Authoritarian Feeding Style	38	29.9	39	28.9	77	29.4
	Authoritative Feeding Style	26	20.5	27	20.0	53	20.2
	Indulgent Feeding Style	34	26.8	44	32.6	78	29.8
	Uninvolved Feeding Style	29	22.8	25	18.5	54	20.6
Father Feeding styles	Authoritarian Feeding Style	55	43.3	46	34.1	101	38.5
	Authoritative Feeding Style	15	11.8	21	15.6	36	13.7
	Indulgent Feeding Style	42	33.1	52	38.5	94	35.9
	Uninvolved Feeding Style	15	11.8	16	11.9	31	11.8

TABLE 4. 59 PARENTAL FEEDING STYLES OF PARENTS ACCORDING TO AGE

		6 - 12 months		12-24 months		Total		Chi Square	P Value
		n	%	n	%	n	%		
Mother Feeding style	Authoritarian Feeding Style	16	19.5	61	33.9	77	29.4	10.343	0.016*
	Authoritative Feeding Style	18	22.0	35	19.4	53	20.2		
	Indulgent Feeding Style	34	41.5	44	24.4	78	29.8		
	Uninvolved Feeding Style	14	17.1	40	22.2	54	20.6		
Father Feeding style	Authoritarian Feeding Style	18	22.0	83	46.1	101	38.5	22.171	0.000***
	Authoritative Feeding Style	8	9.8	28	15.6	36	13.7		
	Indulgent Feeding Style	45	54.9	49	27.2	94	35.9		
	Uninvolved Feeding Style	11	13.4	20	11.1	31	11.8		

*** P=<0.05, **P= <0.01, ***P= <0.001**

difference was also statistically significant. The Uninvolved Feeding Style was relatively consistent across both age groups, with 13.4% in the 6-12 months group and 11.1% in the 12-24 months group.

Nutritional status assessment using anthropometry

The anthropometric assessment for nutritional status was done using weight, height and age of the children. The mean anthropometric measurements and indicators by gender is shown in Table 4.60. For weight, the mean was comparable in males (9.2 ± 1.7 kg) and females (9.1 ± 1.9 kg). The mean height was also similar between males (74.9 ± 7.0 cm) and females (75.1 ± 7.6 cm). However, there was a notable difference in the mean Weight-for-Age Z-score (WAZ), with males exhibiting a lower mean (-1.03 ± 1.24) compared to females (-0.66 ± 1.31). ($p<0.05$) For Height-for-Age Z-score (HAZ), males also had a lower mean (-1.38 ± 1.68) compared to females (-0.99 ± 1.60). The mean Weight-for-Height Z-score (WHZ) was slightly lower in males (-0.38 ± 1.33) compared to females (-0.18 ± 1.34). Similarly, the mean BMI-for-Age Z-score (BAZ) was slightly lower in males (-0.27 ± 1.42) compared to females (-0.08 ± 1.41). However, these differences were not statistically significant.

The mean anthropometric measurements and indicators (Weight, Height, WHZ, HAZ, and WAZ scores) for children in the 6-12 months and 12-24 months age groups is shown in Table 4.61. Significant differences were observed in both weight and height between the two age groups ($p < 0.001$). Indicating increase in these measurements with age due to growth. However, no statistically significant differences were found between the two age groups for Weight-for-Height Z-score (WHZ), Height-for-Age Z-score (HAZ), or Weight-for-Age Z-score (WAZ).

Prevalence of Malnutrition:

Children were classified for malnutrition using WHZ, HAZ and WAZ indices. Firstly, they were classified into normal (z-scores: ≥-2SD), undernutrition (z-scores: ≥-3SD and <-2SD) and severe undernutrition (z-scores: <-3SD) for all the three indicators. Further to categorise the children for severity of malnutrition they were categorised into normal (z-scores: ≥-1SD) mild (z-scores: >-1SD and ≤-2SD), moderate (z-scores: ≥-3SD and <-2SD) and severe (z-scores: <-3SD) categories of malnutrition for these three anthropometric indicators. WHZ was

TABLE 4. 60 MEAN ANTHROPOMETRIC MEASUREMENTS AND MEAN Z SCORES OF ANTHROPOMETRIC INDICATORS- GENDERWISE COMPARISON

Gender	Mean	SD	T-Test	P-Value
Weight (kg)				
Male	9.2	1.7	0.303	0.762
Female	9.1	1.9		
Total	9.2	1.8		
Height (cm)				
Male	74.9	7.0	242	0.809
Female	75.1	7.6		
Total	75.0	7.3		
WAZ				
Male	-1.03	1.24	2.369	0.019*
Female	-0.66	1.31		
Total	-0.85	1.28		
HAZ				
Male	-1.38	1.68	1.924	0.055
Female	-0.99	1.60		
Total	-1.19	1.65		
WHZ				
Male	-.38	1.33	1.239	0.216
Female	-0.18	1.34		
Total	-0.28	1.33		
BAZ				
Male	-.27	1.42	1.134	0.258
Female	-0.08	1.41		
Total	-0.18	1.41		

*** P=<0.05**

TABLE 4. 61 MEAN ANTHROPOMETRIC MEASUREMENTS AND MEAN Z SCORES OF ANTHROPOMETRIC INDICATORS- AGE WISE COMPARISON

	6-12 Months		12-24 Months		Total		T-Test	P Value
	Mean	SD	Mean	SD	Mean	SD		
Weight (kg)	7.76	1.47	9.79	1.58	9.15	1.81	9.84	0.000***
Height (cm)	67.9	5.1	78.3	5.7	75.0	7.3	14.064	0.000***
WHZ	-0.18	1.26	-0.33	1.37	-0.28	1.33	0.848	0.397
HAZ	-1.20	1.69	-1.18	1.63	-1.19	1.65	0.101	0.920
WAZ	-0.92	1.35	-0.82	1.25	-0.85	1.28	0.598	0.550

*****P= <0.001**

used to identify possible risk of overweight (z-scores: >+1SD and ≤+2SD), overweight (z-scores: >+2SD and ≤+3SD) and obesity (z-scores: >+2SD).

Insights into the distribution of wasting categories and severity among children across genders, are shown in Table 4.62. The data indicated that the majority of children in both genders fall under the normal category (74.8% of females and 74.1% of males). The prevalence of overweight was slightly higher in females (4.7%) compared to males (3.7%), while the possible risk of overweight was similar in both genders (10.2% for females and 10.4% for males). Severe wasting was more common in males (2.2%) than in females (0.0%), and the overall prevalence of wasting was 9.2%, with a slightly higher proportion in males (9.6%) than females (8.7%).

When considering wasting severity, the highest prevalence was observed in the normal category, with 55.9% of females and 55.6% of males falling under this classification. Mild wasting was present in 18.9% of females and 18.5% of males, while moderate wasting was observed in 8.7% of females and 9.6% of males. The prevalence of obesity remained low in both groups, with 1.6% of females and 0.0% of males affected. The proportion of children at possible risk of overweight was similar for both genders (10.2% for females and 10.4% for males), and severe wasting was more prevalent in males (2.2%) than females (0.0%). There was on statistical difference in the genderwise prevalence of wasting.

Insights into the distribution of stunting categories and severity among children, categorized by gender, are shown in Table 4.63. The majority (64.5%) of children were classified under the normal category. A higher proportion of severe stunting was observed in males (16.3%) compared to females (8.7%). The overall prevalence of stunting (z-scores: ≥-3SD and <-2SD) was 22.9%, with 24.4% of males and 21.3% of females affected. Regarding stunting severity, the mild stunting category was more prevalent in females (22.0%) than males (17.8%), while moderate stunting was slightly more common in males (24.4%) compared to females (21.3%). The proportion of children classified as normal for stunting was 48.0% in females and 41.5% in males. Severe stunting was observed in 7.9% of females and 16.3% of males, while severe stunting was rare overall, affecting only 0.4% of the children. These differences were not found to be statistically significant.

TABLE 4. 62 PREVALENCE OF WASTING AMONG CHILDREN ACCORDING TO GENDER

Indicator	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
Wasting Category								
Normal	95	74.8	100	74.1	195	74.	5.183	0.394
Obesity	2	1.6	0	0.0	2	0.8		
Overweight	6	4.7	5	3.7	11	4.2		
Possible risk of overweight	13	10.2	14	10.4	27	10.3		
Severe wasting	0	0.0	3	2.2	3	1.1		
Wasting	11	8.7	13	9.6	24	9.2		
Wasting Severity								
Mild wasting	24	18.9	25	18.5	49	18.7	5.185	0.520
Moderate wasting	11	8.7	13	9.6	24	9.2		
Normal	71	55.9	75	55.6	146	55.7		
Obesity	2	1.6	0	0.0	2	0.8		
Overweight	6	4.7	5	3.7	11	4.2		
Possible risk of overweight	13	10.2	14	10.4	27	10.3		
Severe Wasting	0	0.0	3	2.2	3	1.1		

TABLE 4. 63 PREVALENCE OF STUNTING AMONG CHILDREN ACCORDING TO GENDER

Indicator	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
Stunting Category								
Normal	89	70.1	80	59.3	169	64.5	4.506	0.105
Severe stunting	11	8.7	22	16.3	33	12.6		
Stunting	27	21.3	33	24.4	60	22.9		
Stunting Severity								
Mild Stunting	28	22.0	24	17.8	52	19.8	6.383	0.172
Moderate stunting	27	21.3	33	24.4	60	22.9		
Normal	61	48.0	56	41.5	117	44.7		
Severe stunting	10	7.9	22	16.3	32	12.2		
Severe Stunting	1	0.8	0	0.0	1	0.4		

Category and severity of underweight categorised by gender is shown in Table 4.64. Regarding underweight severity, the moderate underweight category was more prevalent in males (18.5%) than females (11.0%), while the proportion of children classified as normal was higher in females (86.6%) compared to males (77.0%), totalling 81.7% of all children. Severe underweight was observed in 2.4% of females and 4.4% of males, with a total prevalence of 3.4% across both groups. The overall prevalence of underweight was 14.9%, with 18.5% of males and 11.0% of females affected.

Malnutrition across age groups

Insights into the distribution of underweight, stunting, and wasting categories among children, categorized by age group, is shown in Table 4.65. For underweight, the majority (81.7%) of children, fall under normal category. The prevalence of severe underweight was low, with 3.7% in the younger (6–12 months) group and 3.3% in the older (12–24 months) group. The overall prevalence of underweight was 14.9%, with a slightly higher proportion in the 6–12 months group (17.1%) compared to the 12–24 months group (13.9%). For stunting, normal growth was observed in both groups (64.5%) of the total sample. Severe stunting was more prevalent in the older age group (13.9%) compared to the younger group (9.8%), with an overall prevalence of 12.6%. The combined prevalence of stunting was 22.9%, with 26.8% of the younger group and 21.1% of the older group affected. Regarding wasting, a higher proportion of children in the 6–12 months group were classified as normal (81.7%) compared to the 12–24 months group (71.1%). The prevalence of severe wasting was low, with 0.0% in the younger group and 1.7% in the older group. Possible risk of overweight was more common in the older group (11.7%) than in the younger group (7.3%), and the overall prevalence of wasting was 9.2%, with a higher proportion in the older group (11.1%) compared to the younger group (4.9%). Insights into the prevalence of severity of malnutrition among children, categorized by age group, is shown in Table 4.66. For underweight severity, the majority (81.7%) of children in both age groups were classified as normal, with 79.3% of the 6–12 months group and slightly more (82.8%) in the older group. The prevalence of moderate underweight was higher (17.1%) in the younger group as compared 13.9% in the older group. Severe underweight was relatively rare, with 3.7% in the younger group and 3.3% in the older group. For stunting severity, the highest (22.9%) prevalence was observed in the moderate stunting category, with 26.8% of the

TABLE 4. 64 PREVALENCE OF UNDERWEIGHT AMONG CHILDREN ACCORDING TO GENDER

Indicator	Female (N= 127)		Male (N= 132)		Total (N= 262)		Chi Square	P value
	n	%	n	%	n	%		
Underweight Category								
Normal	110	86.6	104	77.0	214	81.7	4.030	0.133
Severe Underweight	3	2.4	6	4.4	9	3.4		
Underweight	14	11.0	25	18.5	39	14.9		
Underweight Severity								
Moderate Underweight	14	11.0	25	18.5	39	14.9	4.030	0.133
Normal	110	86.6	104	77.0	214	81.7		
Severe Underweight	3	2.4	6	4.4	9	3.4		

TABLE 4. 65 PREVALENCE OF MALNUNTRITION CATEGORISED BY AGE

	6-12 Months		12-24 Months		Total		Chi Square	P Value
	n	%	n	%	n	%		
Underweight Category								
Normal	65	79.	149	82.8	214	81.7	0.486	0.784
Severe Underweight	3	3.7	6	3.3	9	3.4		
Underweight	14	17.1	25	13.9	39	14.9		
Stunting Category								
Normal	52	63.4	117	65.0	169	64.5	1.590	0.52
Severe stunting	8	9.8	25	13.9	33	12.6		
Stunting	22	26.8	38	21.1	60	22.9		
Wasting Category								
Normal	67	81.7	128	71.1	195	74.4	6.097	0.297
Obesity	1	1.2	1	0.6	2	0.8		
Overweight	4	4.9	7	3.9	11	4.2		
Possible risk of overweight	6	7.3	21	11.7	27	10.3		
Severe wasting	0	0.0	3	1.7	3	1.1		
Wasting	4	4.9	20	11.1	24	9.2		

TABLE 4. 66 PREVALENCE OF SEVERITY OF MALUNTRITION CATEGORISED BY AGE

	6-12 Months		12-24 Months		Total		Chi Square	P Value
	n	%	n	%	n	%		
Underweight Severity								
Moderate Underweight	14	17.1	25	13.9	39	14.9	0.486	0.784
Normal	65	79.3	149	82.8	214	81.7		
Severe Underweight	3	3.7	6	3.3	9	3.4		
Stunting Severity								
Mild Stunting	15	18.3	37	20.6	52	19.8	2.001	0.736
Moderate stunting	22	26.8	38	21.1	60	22.9		
Normal	37	45.1	80	44.4	117	44.7		
Severe stunting	8	9.8	24	13.3	32	12.2		
Severe Stunting	0	0.0	1	0.6	1	0.4		
Wasting Severity								
Mild wasting	18	22.0	31	17.2	49	18.7	6.269	0.394
Moderate wasting	4	4.9	20	11.1	24	9.2		
Normal	49	59.8	97	53.9	146	55.7		
Obesity	1	1.2	1	0.6	2	0.8		
Overweight	4	4.9	7	3.9	11	4.2		
Possible risk of overweight	6	7.3	21	11.7%	27	10.3%		
Severe Wasting	0	0.0	3	1.7%	3	1.1%		

younger group and 21.1% of the older group affected. Mild stunting was observed in 18.3% of the younger group and 20.6% of the older group. The proportion of children with normal growth was similar in both the age group. Severe stunting was more common in the older group (13.3%) compared to the younger group (9.8%), with an overall prevalence of 12.2%. Only 1 child in the older group was classified with severe stunting (0.6%).

Malnutrition across parental feeding styles

Insights into the relationship between mothers' feeding styles and the nutritional status of their children is shown in Table 4.67. The feeding styles were categorized as authoritarian, authoritative, indulgent, and uninvolved, and the nutritional status was assessed based on underweight, stunting, and wasting categories. For the underweight category, the majority of children in all feeding style groups were classified as normal, with 84.4% in the authoritarian group, followed by 83.3% in the uninvolved group, 82.1% in indulgent group with lowest (75.5%) in authoritative group. The prevalence of severe underweight was low across all groups, with the highest in the indulgent group (5.1%). The highest (20.8%) prevalence of underweight was observed in authoritative group where least (12.8%) was observed in indulgent group. Regarding stunting, the highest proportion of children with normal growth was observed in the authoritarian group (70.1%), while the authoritative group had the lowest (58.5%). Severe stunting was most prevalent in the authoritarian group (16.9%) and the least in the uninvolved group (7.4%). The prevalence of stunting was highest in the authoritative group (28.3%), followed by the uninvolved group (25.9%). For wasting, the prevalence of normal nutritional status was highest in the authoritarian group (77.9%), followed by the indulgent group (74.4%), uninvolved group (72.2%), and the authoritative group (71.7%). The prevalence of possible risk of overweight was highest in the uninvolved group (14.8%). Severe wasting was rare, with the highest prevalence in the indulgent group (2.6%).There was no significant differences between feeding styles nutritional status ($p > 0.05$).

Insights into the relationship between fathers' feeding styles and the nutritional status of their children is shown in Table 4.68. For the underweight category, the majority of children in all feeding style groups were classified as normal, with 83.2% in the authoritarian group followed by 81.9% in the indulgent group, and 80.6% in the uninvolved group and 77.8% authoritative group.

TABLE 4. 67 PARENTAL FEEDING STYLE OF MOTHER VS NUTRITIONAL STATUS

Mother Feeding Style										
	Authoritarian Feeding Style		Authoritative Feeding Style		Indulgent Feeding Style		Uninvolved Feeding Style		Chi square	P Value
	n	%	n	%	n	%	n	%		
Underweight Category										
Normal	65	84.4	40	75.5	64	82.1	45	83.3	3.646	0.724
Severe Underweight	1	1.3	2	3.8	4	5.1	2	3.7		
Underweight	11	14.3	11	20.8	10	12.8	7	13.0		
Stunting Category										
Normal	54	70.1	31	58.5	48	61.5	36	66.7	7.930	0.243
Severe stunting	13	16.9	7	13.2	9	11.5	4	7.4		
Stunting	10	13.0	15	28.3	21	26.9	14	25.9		
Wasting Category										
Normal	60	77.9	38	71.7	58	74.4	39	72.2	10.262	0.803
Obesity	0	0.0	1	1.9	1	1.3	0	0.0		
Overweight	4	5.2	4	7.5	2	2.6	1	1.9		
Possible risk of overweight	7	9.1	4	7.5	8	10.3	8	14.8		
Severe wasting	0	0.0	0	0.0	2	2.6	1	1.9		
Wasting	6	7.8	6	11.3	7	9.0	5	9.3		

FIGURE 4. 4 PARENTAL FEEDING STYLE OF MOTHER VS NUTRITIONAL STATUS

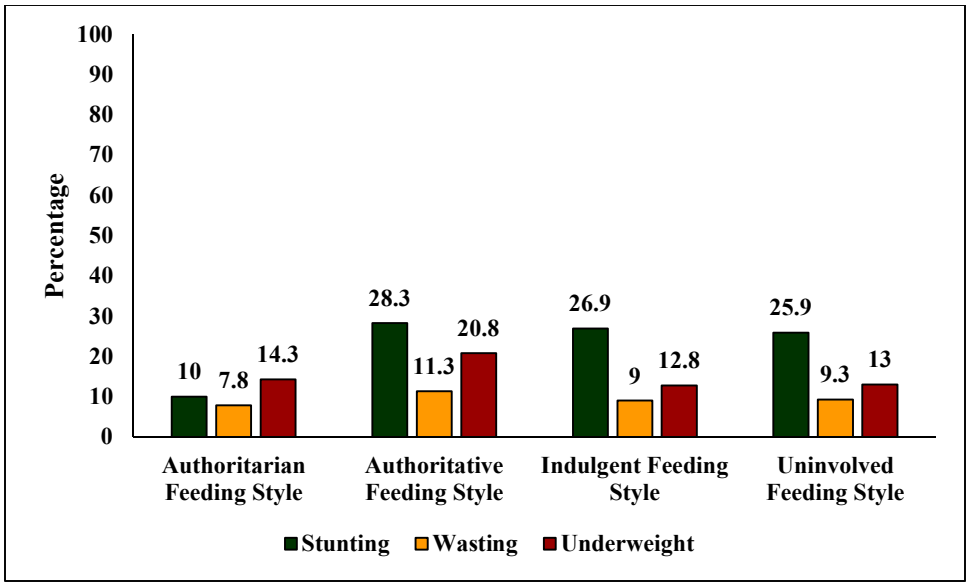
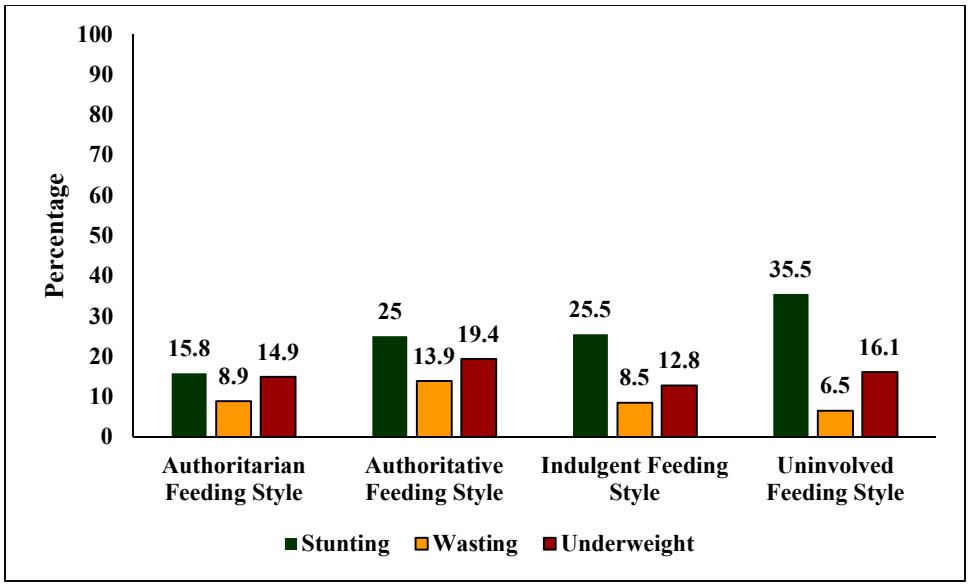


TABLE 4. 68 PARENTAL FEEDING STYLE OF FATHER VS NUTRITIONAL STATUS

	Father's Feeding style									
	Authoritarian Feeding Style		Authoritative Feeding Style		Indulgent Feeding Style		Uninvolved Feeding Style		Chi square	P Value
	n	%	n	%	n	%	n	%		
Underweight Category										
Normal	84	83.2	28	77.8	77	81.9	25	80.6	2.561	0.862
Severe Underweight	2	2.0	1	2.8	5	5.3	1	3.2		
Underweight	15	14.9	7	19.4	12	12.8	5	16.1		
Stunting Category										
Normal	70	69.3	22	61.1	61	64.9	16	51.6	7.060	0.315
Severe stunting	15	14.9	5	13.9	9	9.6	4	12.9		
Stunting	16	15.8	9	25.0	24	25.5	11	35.5		
Wasting Category										
Normal	77	76.2	24	66.7	68	72.3	26	83.9	11.3944	0.724
Obesity	0	0.0	0	0.0	2	2.1	0	0.0		
Overweight	3	3.0	2	5.6	4	4.3	2	6.5		
Possible risk of overweight	10	9.9	4	11.1	12	12.8	1	3.2		
Severe wasting	2	2.0	1	2.8	0	0.0	0	0.0		
Wasting	9	8.9	5	13.9	8	8.5	2	6.5		

FIGURE 4. 5 PARENTAL FEEDING STYLE OF FATHER VS NUTRITIONAL STATUS



The prevalence of severe underweight was low across all groups, with the highest in the indulgent group (5.3%). The overall prevalence of underweight was 14.9% in the authoritarian group, 19.4% in the authoritative group, 12.8% in the indulgent group, and 16.1% in the uninvolved group.

Regarding stunting, the highest proportion of children with normal growth was observed in the authoritarian group (69.3%), while the uninvolved group had the lowest (51.6%). Severe stunting was most prevalent in the authoritarian group (14.9%) and the least in the uninvolved group (12.9%). The prevalence of stunting was highest in the uninvolved group (35.5%), followed by the indulgent group (25.5%), the authoritative group (25.0%), and the authoritarian group (15.8%).

For wasting, the prevalence of normal nutritional status was highest in the uninvolved group (83.9%), followed by the authoritarian group (76.2%), the indulgent group (72.3%), and the authoritative group (66.7%). The prevalence of possible risk of overweight was highest in the uninvolved group (3.2%), suggesting a potential link between this feeding style and increased risk. Severe wasting was rare, with the highest prevalence in the indulgent group (2.8%). The chi-square tests for underweight, stunting, and wasting categories yielded p-values of 0.862, 0.315, and 0.724, respectively, indicating that the observed differences between feeding styles are not statistically significant ($p > 0.05$).

DISCUSSION

Inappropriate Infant and Young Child Feeding (IYCF) practices, especially delayed or inadequate complementary feeding, are significant contributors to malnutrition and growth faltering in early childhood. Delayed introduction of complementary foods beyond six months, or feeding complementary foods lacking adequate quantity, nutrient density, or feeding frequency, results in infants being deprived of essential nutrients crucial for their rapid growth and development. This can lead to micronutrient deficiencies, impaired physical growth, and increased vulnerability to infection. Moreover, parental feeding styles critically influence the development of children's dietary habits and subsequent nutritional status. Therefore, addressing suboptimal complementary feeding practices and fostering positive parental feeding styles are crucial interventions for preventing malnutrition and promoting healthy growth and development during the critical early years.

The finding of the present study show that handwashing was common before cooking (74%) and feeding (58%), but low after feeding (26.7%). Post-faecal cleaning handwashing was high (88.5%). Cooked food storage was minimal (62.6% no storage), and most mothers cut vegetables after washing (82.4%). Nearly all washed hands under running water (99.2%), and 83.2% stored water in clean containers. While 98.9% were aware of safe water treatment, only 34% practiced it. Common child care practices included adding fats/sugars to food (70.6%). Similar hygiene and water handling challenges have been reported in other urban Indian studies (Singh et al., 2021; Kumar & Patel, 2020; Rao & Gupta, 2019), along with the similar use of fats and sugars in CF (Verma et al., 2022)

Further the study showed that mothers predominantly used indulgent (29.8%) and authoritarian (29.4%) feeding styles, with indulgent being more common for male children and authoritarian for female children. Fathers also primarily used authoritarian (38.5%) and indulgent (35.9%) styles. Authoritarian feeding increased with child’s age, while indulgent and uninvolved feeding increased among mothers with age of the child. Demandingness was similar across genders, but slightly more fathers showed demanding parental feeding style. Responsiveness was low for both parents and decreased with age. These findings align with global studies showing the prevalence of authoritarian and indulgent feeding styles and the age-related shifts in parental feeding practices (Hughes et al., 2019; Loth et al., 2020).

While a significantly higher proportion of mothers (66.0%) correctly identified the completion of 6 months, less than half of the fathers (43.9%) held the same understanding. Interestingly, more fathers (55.0%) than mothers (31.7%) incorrectly believed that it should start at 6 months. This difference in basic knowledge could lead to variations in feeding practices, potentially impacting the child's nutritional intake and health outcomes. Similar studies in urban India have also reported gaps in parental knowledge regarding the timing of complementary feeding (Sharma et al., 2020; Verma et al.,). For instance, a study in Delhi found varied knowledge among parents about the appropriate age for introducing solids (Sharma et al., Year). Regarding age-appropriate feeding practices, mothers consistently demonstrated better awareness than fathers. For example, a significantly higher percentage of mothers (76.0%) knew that feeding a 3-month-old orphaned child with a cup is more appropriate than a bottle, compared to fathers (67.2%). Similarly, more mothers (43.9%) encouraged self-feeding in a 10-month-old compared to fathers (34.7%). Mothers also more often recognized the importance of talking to a 10-month-old during meals (74.8%) compared to fathers (59.9%). In terms of the role of parents, fathers were predominantly involved in purchasing food (90.5%), while mothers led in food selection (56.5%), feeding (96.6%), and meal preparation (95.8%).

Data on support domains showed that fathers were the primary financial contributors (97.3%), while mothers played a major role in food purchasing (67.6%). Mothers were predominantly responsible for food preparation (96.6%). Grandparents provided household support (42.7%). These findings align with studies showing mothers as primary caregivers and fathers as financial providers (Sharma et al., 2020; Patel & Kumar, 2021; Singh & Rao, 2019).

The majority (69.5%) of mothers in the present study initiated complementary feeding for their children at 6 months, while 17.2% started early and 13% started it late. Feeding frequency was 3-4 times daily, with portion sizes of 1/2 cup (49.2%) and 1/4 cup (33.6%). Medium consistency was most common (61.8%). Similar challenges regarding timing, portion sizes, and consistency were reported in other studies (Gupta et al., 2020; Kumar & Rao, 2021; Mishra & Singh, 2022).

The results of this study revealed that early breastfeeding initiation was lower in females (21%), and exclusive breastfeeding for 6 months was higher in males (74.1%). Cereal and pulses were the most consumed food groups (94.7% and 84.4%), while flesh foods were

consumed by the least number of children (6.9%). Dietary diversity was limited, with 58% not meeting MDD and 68.3% not meeting MAD. Unhealthy food consumption was high among the children (66% sweet beverages, 67.2% sweet foods). These findings are consistent with studies showing low dietary diversity and high unhealthy food intake (Singh et al., 2021; Kumar & Patel, 2020; Patel & Rao, 2019).

Infant formula and commercial cereals were rarely fed to the children as reported in the present study. Daily biscuit consumption was high (35.1%). Homemade sweets were also commonly fed to the children (32.4%), while chocolates/candies were consumed daily by 21%. These findings align with studies showing increased consumption of ultra-processed foods (Joshi et al., 2021; Reddy & Sharma, 2020; Patel & Singh, 2019; Kapoor et al. 2022).

The findings on anthropometric data shows that males showed higher rates of moderate and severe wasting, stunting, and underweight. Moderate underweight and stunting were more common in the 6-12-month age group, while severe stunting was higher in the 12-24-month age group.

Data on parental feeding styles reveal that authoritarian feeding was associated with higher normal growth, especially in stunting. Indulgent feeding was linked to higher severe underweight and wasting. Uninvolved feeding was associated with higher overall stunting in fathers and higher risk of overweight in both parents. These findings align with global studies emphasizing the importance of authoritative feeding and the negative impact of indulgent and uninvolved feeding (Hughes et al., 2020; Sleddens et al., 2021; Webber et al., 2019). It was also observed in a study conducted by Arlinghaus et al., 2018 that parental feeding styles significantly influence the overall dietary quality of children. Specifically, among low-income minority preschoolers, an authoritative feeding style was linked to the highest dietary quality compared to other feeding styles.

SUMMARY AND CONCLUSION

Complementary feeding practices are crucial for children under two years of age as they play a significant role in ensuring optimal growth and development. During this critical period, infants transition from exclusive breastfeeding to the introduction of solid foods, which provide essential nutrients that breast milk alone may not supply. Proper complementary feeding helps to prevent malnutrition, supports cognitive development, and enhances the immune system, thereby reducing the risk of infections. Furthermore, establishing healthy eating habits early on can influence dietary preferences and behaviors later in life, promoting long-term health and well-being. Therefore, Parental feeding styles play a crucial role in shaping the dietary habits and overall health of children under two years old. Understanding these styles is essential for promoting healthy growth and preventing obesity and other nutritional issues during this critical developmental period (Kim-Herrera et al., 2021). (Lo et al., 2015)

Parental feeding styles are broadly categorized into authoritative, authoritarian, indulgent, and uninvolved approaches, each characterized by varying levels of responsiveness and demandingness.

As there are not many studies on parental feeding styles in Gujarat, more evidence generation is needed on this. In view of this present study was carried out with broad objective to evaluate different parental feeding styles in complementary feeding practices for children between 6-24 months residing in Urban Vadodara. A total of 262 parent child duos were enrolled through snowball sampling. Data on socio-economic status, anthropometry, KAP of parents on complementary feeding, dietary quality, and parental feeding styles were collected using Epi-collect5 v 86.2.1 soft-ware. The major findings of the study are as follows:

Demographic Details: The study population predominantly consisted of children aged 12-24 months (68.7%) and first-born individuals (56.9%), with a notable gender difference observed within the first-born children (62.2% female vs. 51.9% male). The socio-demographic profile indicated a majority of the subjects were Hindu (96.6%) primarily from the General Category (76%) residing in joint families (56.5%) with 5-8 members (49.1%), where mothers were largely in the 20-30 years (39.5%) and 30-40 years (38.5%)

age groups, and fathers were similarly concentrated in the 20-30 years (33.6%) and 30-40 years (38.5%) age brackets.

Education and Occupation of mothers and fathers: The results revealed that a considerable proportion of both mothers (31.7% graduates, 19.1% honours) and fathers (37.8% graduates, 19.1% honours) possessed tertiary education, contrasting with a small percentage of illiteracy (mothers: 4.2%, fathers: 1.5%). While most mothers were unemployed (78.2%), fathers were primarily professionals (34%) or skilled/sales workers (20.6%), and a large majority of households reported no additional income beyond their primary source (82.1%).

Monthly Family Income (SES): Less than fifty percentage (46.6%) of families had a monthly income between Rs. 10,703 and Rs. 31,977, 20.2% of families had a monthly income between Rs. 31,978 and Rs. 53,360.

Socio-Economic Status (SES) Categories: According to the Kuppuswamy Classificaion, more than half of the (54.3%) of families with female children belonged to the upper middle-class and 40.0% of families with male children were in the upper middle-class and around one fourth (26.0%) of both female and male child families were in the lower middle-class family.

Sanitation and Hygiene Practices: A high proportion of respondents reported practicing handwashing before cooking (74.0%) and after cleaning a child's faeces (88.5%), while handwashing practices were considerably lower after feeding a child (26.7%) and surprisingly low after cooking (15.3%).

Storage and Handling of Complementary Foods for Children: The majority of respondents reported not storing cooked food for children (62.6%) or storing it for a short duration of 2-3 hours (31.7%). Positive food handling practices included washing vegetables before cutting (82.4%) and nearly universal handwashing under running water (99.2%), alongside commonly cleaning the drinking water storage vessel using running water (91.2%) and storing water in clean, covered containers (83.2%).

Main Source of Water Used for Drinking, Cooking, Washing and Storage & Handling of Complementary Foods for Children: The primary sources of drinking water were piped water in the dwellings (approximately 53%) and public taps (51.9%), with earthen pots being the most common storage method (55%). While a large majority accessed water

via taps (80.2%), only a third reported treating their water (34%), despite high awareness of safe water treatment methods (98.9%).

Child Care Practices According to Gender: Majority (70.6%) of respondents said that they add extra fats, oils, sugar, or jaggery to complementary foods after preparation. Half (50%) of respondents reported that they on an average take 15 minutes to feed their children followed by 38.2% taking around 30 minutes to feed their children.

KAP of Parents on Complementary Feeding Practices: Significant differences existed in mothers' and fathers' knowledge regarding complementary feeding initiation, with more mothers correctly identifying introduction after 6 months (66.0% vs. 43.9%) and fathers more often believing it should start at 6 months (55.0% vs. 31.7%). Mothers preferred liquid consistency for a 7-month-old (58.8%), while fathers preferred semi-solid (51.5%). Despite these differences, both groups largely agreed on the continuation of breastfeeding alongside complementary foods (over 92%) and demonstrated high knowledge of recommended food groups, with minor variations in the recommendation of eggs and flesh foods.

Age-Appropriate Feeding Practices of Parents on Complementary Feeding: Mothers generally showed better knowledge on age-appropriate feeding than fathers. Significantly more mothers (76.0%) knew cup feeding was better for young orphans than fathers (67.2%), and more encouraged self-feeding at 10 months (mothers: 43.9%, fathers: 34.7%). A larger percentage of mothers (74.8%) also understood the importance of talking during feeding (fathers: 59.9%). While agreement on showing love during feeding was high (mothers: 95.8%, fathers: 86.3%), mothers consistently demonstrated a stronger understanding of age-specific recommendations.

Role of Parents of in Complementary Feeding

Fathers predominantly handled food purchasing (90.5%), while mothers took primary responsibility for food selection (56.5%), feeding (96.6%), and meal preparation (95.8%). Mothers were significantly more involved in direct feeding (91.6% vs. 20.2% of fathers regularly), used separate utensils more often (88.2% vs. 81.3%), and were more diligent with handwashing practices before and after feeding, as well as nappy changing. Mothers also perceived themselves as more involved in child feeding practices compared to fathers.

Parents Communication and Support for Children: While both parents largely reported regular support for each other in child nutrition (around 57%), mothers engaged in daily discussions more often (24.0% vs. 15.3%) and were significantly more likely to have attended nutrition/parenting education classes (12.6% vs. 3.4%).

Societal Norms Faced by Parents in Complementary Feeding: More mothers reported facing societal norms (6.9%) and cultural myths (4.2%) affecting their child nutrition involvement compared to fathers (1.9% for both), with a small percentage of mothers citing immediate post-birth feeding (0.4%) or work limitations (1.5%) as influencing factors, none of which were reported by fathers.

Breastfeeding Practices: Results of the study indicated notable gender-based differences in infant feeding practices: males children had a higher prevalence in delayed early breastfeeding initiation (42.2% initiated after 2 days, compared to 21.0% of females within 1 hour) and exclusive breastfeeding for 6 months (74.1% in males vs. 66.1% in females). Conversely, a larger proportion of females were not exclusively breastfed in the initial two days (37.8% vs. 28.3% of males), yet they demonstrated greater continuation of breastfeeding into the 12-24 month period (39.5% vs. 32.2% in males). Despite this, males presented with slightly higher rates of current breastfeeding (54.1% vs. 51.2%) and bottle feeding (67.4% vs. 65.4%).

Complementary Feeding Practices: The most frequent complementary feeding practice was four times a day (34.4%), followed by three times (30.9%). The majority of children received 1/2 cup (49.2%) of complementary food, with medium consistency being the most common (61.8%). Minor gender variations were observed in the quantity of food received, where a slightly higher percentage of females (51.2%) than males (47.4%) received 1 cup.

Dietary Diversity and Quality: Cereals (94.7%) and pulses (84.4%) were the most commonly consumed food groups, contrasting sharply with low intake of flesh foods (6.9%) and vitamin-A rich fruits (6.5%). The majority of children consumed 4 (21.0%) or 5 (24.4%) food groups, with a significant increase in the number of food groups consumed with age ($p < 0.001$). Notably, consumption of vitamin-A rich fruits and vegetables was significantly higher in the 6-12 month group (78.0%) compared to the 12-24 month group (61.7%).

Consumption of Food Groups According to DQQ Indicators: Cereals and cereal-based foods (95.4%) and pulses, nuts, and oilseeds (90.5%) demonstrated high consumption rates among participants. Breast milk was consumed by slightly over half of the participants (52.7%), with a significantly higher prevalence in the 6-12 months age group (82.9%) compared to the 12-24 months group (38.9%). Other fruits and vegetables were also frequently consumed (83.6%), with higher consumption in the older age group (91.1% vs. 67.1%). Conversely, meat and flesh foods (6.9%) and eggs (11.5%) showed low overall consumption, although meat consumption was notably higher in the 6-12 months group.

Total Dietary Diversity Score according to DQQ Indicators Categorised by Gender: The majority of participants (64.5%) consumed between 4 and 5 food groups, with 32.8% consuming 4 and 31.7% consuming 5. Dietary diversity varied significantly between age groups ($p<0.01$); in the 6-12 months group, the most common consumption was 5 food groups (34.1%), while in the 12-24 months group, it was 4 food groups (36.7%). Notably, a smaller proportion consumed 6 or more food groups overall (10.3%).

MDD, MMF and MAD among Children: A substantial proportion of participants did not meet the Minimum Dietary Diversity (58%) and Minimum Acceptable Diet (68.3%) criteria, while a higher percentage (70.2%) met the Minimum Meal Frequency, with significant age-related differences observed for MMF.

Consumption of Unhealthy Food among Children: Sweet beverages (66%) and sweet foods (67.2%) were the most frequently consumed unhealthy items, while egg and/or flesh food consumption was notably low (16%). A significant majority (73.3%) consumed unhealthy foods, with non-consumption of vegetables or fruits being high (68.7%). Consumption of sweet beverages, sweet foods, and savoury/fried snacks increased with age, as did the consumption of animal source foods (from 43.9% to 56.5%).

NCD Protect Score and NCD- Risk Score: Adherence to dietary guidelines was generally low, with the majority of children scoring 0 (26%), 1 (32.4%), or 2 (24.8), while very few achieved the highest score of 8 (2.3%).

Consumption of Ultra-Processed Foods: Infant formula and cornflakes/chocos were rarely or never consumed by the vast majority of children. Daily consumption was notable for biscuits (35.1%) and sev mamra (33.1%). Bread and instant noodles/Maggie were largely avoided. Among high-fat foods, sev and papdi/gathiya had relatively higher

consumption, while chips/kurkure and chodafadi/mathiya were less common. Namkeen/chavanu was the least consumed. Homemade sweets like Sukhdi were frequently eaten, contrasting with the low consumption of cream rolls/buns, ready-to-eat sweets, and health drinks. Chocolates/candies saw daily consumption in 21% of children, though 45% never consumed them. High-salt foods like instant soup and pickle were rarely consumed. Bhungla and sauces had moderate consumption, while papad showed varied consumption patterns.

Support Domains- Support provided to mothers in child feeding and caring practices: Fathers predominantly provided financial support for children's food (97.3%), while mothers were most involved in purchasing it (67.6%). Mothers were overwhelmingly responsible for food preparation (96.6%). For child feeding, other family members often reminded about feeding times (30.2%), whereas mothers took the lead in teaching self-feeding (48.1%) and washing hands before eating (48.9%). Fathers had limited involvement in food preparation and feeding reminders but were more involved in teaching self-feeding than other aspects of feeding support.

Parental Feeding Style: Feeding on demand was the most common feeding style practiced by both parents. Mothers reported a mean of 3.46 for semi-solid feeding and 3.34 for milk feeding, while fathers reported means of 3.06 for milk feeding and 2.63 for semi-solids. Mothers used food to calm slightly more during milk feeding than semi-solids, whereas fathers reported low use. The use of non-food rewards was the lowest across all feeding styles for both mothers and fathers. Feeding on demand by mothers decreased 6–12 months to 12–24 months. Family meal environment scores, indicating greater involvement in shared meals, increased for mothers from 2.46 to 3.60 and for fathers from 2.33 to 3.03 as the child aged.

Mean Demandingness & Responsiveness Score of Parents: Mother’s demandingness was similar for both genders, while father’s demandingness was rated slightly higher for females than for males. Mother responsiveness was rated low by both genders, while father’s responsiveness was rated higher for males than for females. However, overall responsiveness scores remained relatively low for both parents. Age wise data showed that both mother’s and father’s demandingness increased with the child's age, while their responsiveness decreased.

Both mother and father exhibited increased demandingness as the child's age progressed from 6-12 months to 12-24 months. Specifically, mother's demandingness increased from 2.01 to 2.42, and father's demandingness showed a more substantial increase from 1.65 to 2.26. Conversely, responsiveness from both parents demonstrated a decline as the child aged. Mother responsiveness decreased from 2.03 to 1.47, and father responsiveness also experienced a significant drop over the same period. These trends suggest a shift in parenting styles, with parents becoming more demanding and less responsive as their children transition from infancy to toddlerhood.

Parental Feeding Styles of Parents: The gender wise data showed that mothers most commonly reported using an indulgent feeding style (29.8%), with more among mothers of male children. Authoritarian feeding was also prevalent among mothers (29.4%), slightly more in mothers of female children. For fathers, the authoritarian style was the most common (38.5%). Indulgent feeding was also frequent among fathers (35.9%), more for male children. Notably, authoritative feeding was less common among fathers (13.7%) compared to mothers. The uninvolved feeding style was the least reported for both parents, with similar rates across genders for fathers.

Data on parental feeding style According to Age revealed that mothers of older children (12-24 months) were significantly more likely to use an authoritarian feeding style compared to mothers of younger children (6-12 months). Conversely, mothers of younger children more often employed an indulgent feeding style. Authoritative and uninvolved styles showed less pronounced changes with the child's age. Fathers of older children also showed a significantly higher prevalence of the authoritarian feeding style. Similar to mothers, fathers of younger children were more likely to use an indulgent style. The authoritative style in fathers showed a slight increase with the child's age, while the uninvolved style remained relatively stable.

Nutritional Status according to Anthropometric Assessment: Over half of both female (55.9%) and male (55.6%) children had normal weight for height. Moderate wasting was slightly more prevalent in males (9.6%) than females (8.7%). Severe wasting was observed only in males (2.2%). Obesity was low, present in females (1.6%) but absent in males. The risk of overweight was similar for both genders, slightly higher in males (10.4%) than females (10.2%).

A higher proportion of females (48.0%) had normal height for age compared to males (41.5%). Moderate stunting was more common in males (24.4%) than females (21.3%). Severe stunting was notably higher in males (16.3%) compared to females (8.7%). Severe stunting overall affected a small fraction (0.4%). Mild stunting was more prevalent in females (22.0%) than males (17.8%). Data on underweight revealed that normal weight for age was more common in females (86.6%) than males (77.0%). Moderate underweight was more prevalent in males (18.5%) than females (11.0%). Severe underweight was also higher in males (4.4%) compared to females (2.4%). Moderate underweight was highest in the 6–12 months group (17.1%) and lowest in the 12–24 months group (13.9%). Severe underweight was also higher in the 6–12 months group (3.7%) than the 12–24 months group (3.3%). Moderate stunting was more prevalent in the 6–12 months group (26.8%) than the 12–24 months group (21.1%). Mild stunting was more common in the 12–24 months group (20.6%) compared to the 6–12 months group (18.3%). Severe stunting was higher in the 12–24 months group (13.3%) than the 6–12 months group (9.8%). Severe stunting overall was 0.6% and observed in the 12–24 months group.

Parental Feeding Style Vs. Nutritional Status: To understand whether the malnutrition rates differs among children with different parenting styles practiced by their mothers and fathers, undernutrition prevalence was analysed for different parenting styles.

Mothers' Feeding Style and Child Nutritional Status: The prevalence of severe underweight in children was generally low across maternal feeding styles, ranging from 1.3% (authoritarian) to 5.1% (indulgent). However, a slightly higher proportion of children with authoritative mothers (20.8%) presented with underweight compared to other parenting styles (12.8%-14.3%). The highest percentage of children exhibiting normative height-for-age was observed in the authoritarian parenting group (70.1%), while the authoritative group showed the lowest (58.5%). Severe stunting was more prevalent among children of authoritarian mothers (16.9%). Overall stunting was most frequently observed in children with authoritative mothers (28.3%), followed by indulgent (26.9%) and uninvolved (25.9%) mothers. Severe wasting was exclusively reported in children with indulgent (2.6%) and uninvolved (1.9%) mothers. The risk of overweight was elevated in children of uninvolved mothers (14.8%), followed by indulgent (10.3%), authoritarian (9.1%), and authoritative (7.5%) mothers. The prevalence of overweight was relatively low, with the highest proportion observed in the authoritative parenting group (7.5%). The

proportion of children exhibiting wasting was slightly higher in the authoritative group (11.3%) compared to other maternal feeding styles (7.8%-9.3%).

Fathers' Feeding Style and Child Nutritional Status: A substantial proportion of children across all paternal feeding styles had normal weight for age, with percentages ranging from 77.8% to 83.2%. The indulgent paternal feeding style was associated with the highest percentage of severely underweight children (5.3%). The prevalence of underweight was marginally higher among children of authoritative fathers (19.4%) compared to other paternal feeding styles (12.8%-16.1%). The highest percentage of children with normal height-for-age was observed in the authoritarian paternal feeding group (69.3%), while the uninvolved group presented the lowest (51.6%). The proportion of children with severe stunting was relatively consistent across all paternal feeding styles, ranging from 9.6% to 14.9%. Overall stunting was most prevalent among children with uninvolved fathers (35.5%), followed by those with indulgent (25.5%) and authoritative (25.0%) fathers. The majority of children had normal weight-for-height, particularly those with uninvolved fathers (83.9%). The highest proportion of overweight children was observed in the uninvolved paternal feeding group (6.5%), with other styles showing slightly lower percentages (3.0%-5.6%). The risk of overweight was most common in the indulgent paternal feeding style (12.8%), followed by authoritative (11.1%) and authoritarian (9.9%) styles, and was lowest in the uninvolved group (3.2%), whereas obesity was exclusively reported in the indulgent group (2.1%). Severe wasting was observed only among children of authoritarian (2.0%) and authoritative (2.8%) fathers, while overall wasting was most frequently observed in the authoritative group (13.9%), with the lowest occurrence in the uninvolved group (6.5%).

CONCLUSION

This study highlights the important role that parental feeding styles and complementary feeding practices play in shaping the nutritional status of children under 2 years in urban Vadodara. Results of the study showed that child feeding practices are still suboptimal, with a gap in correct knowledge and practices among parents. Mothers were the primary caregivers for children who had better knowledge of IYCF than fathers. Involvement of fathers in child feeding and caring practices was also found to be limited to providing financial with limited support provided to mothers by them. The study also showed that maternal authoritative feeding was associated with higher underweight and stunting, while

paternal uninvolved feeding correlated with increased stunting and overweight risk, suggesting distinct influences of parental feeding styles on child nutritional outcomes. Severe malnutrition indicators generally showed lower prevalence across most feeding styles for both parents, with some specific elevations observed in indulgent and authoritarian parenting. These results emphasised the need to generate more awareness among parents for better complementary feeding practice and a correct approach to child feeding. Active participation of fathers needs to be promoted in societies, as fathers' involvement in IYCF practices also plays a major role during the formative years of a child. Many parents still follow the less favourable parenting styles, which can be improved through awareness generation as well as by ensuring a supportive environment for the parents. There is very little evidence on parental feeding styles and their effect on nutritional status, especially in India. So, there is a need to conduct more similar studies from various parts of India to compare various findings.

REFERENCES

Abi Khalil, H., Hawi, M., & Hoteit, M. (2022). Feeding Patterns, Mother-Child Dietary Diversity and Prevalence of Malnutrition among Under-Five Children in Lebanon: A Cross-Sectional Study Based on Retrospective Recall. Frontiers in Nutrition, 9, 815000. https://doi.org/10.3389/FNUT.2022.815000

Ahmed, K. T., Karimuzzaman, M., Pinky, G. N., Dasgupta, D. P., Rahman, L., Hossain, M. M., & Rahman, A. (2023). Association of dietary diversity of 6–23 months aged children with prenatal and postnatal obstetric care: evidence from a nationwide cross-sectional study. Journal of Health, Population and Nutrition, 42(1), 1–10. https://doi.org/10.1186/S41043-023-00470-7/TABLES/5

Alemu, W., Argaw, D., Adimasu, M., & Ewunie, T. M. (2023). Predictors of mortality among severe acute malnourished children. A multi-center prospective follow-up study. Clinical Nutrition ESPEN, 53, 165–169. https://doi.org/10.1016/J.CLNESP.2022.12.014

Arlinghaus, K. R., Vollrath, K., Hernandez, D. C., Momin, S. R., O'Connor, T. M., Power, T. G., & Hughes, S. O. (2018). Authoritative parent feeding style is associated with better child dietary quality at dinner among low-income minority families. The American Journal of Clinical Nutrition, 108(4), 730–736. https://doi.org/10.1093/AJCN/NQY142

Bal, R., & Karyakram, S. (2018). Journey of The First 1000 Days Foundation for a Brighter Future.

Bansal, S. C., Odedra, R., Talati, K., Morgaonkar, V. A., Shinde, M., & Nimbalkar, S. M. (2021). Infant and young child feeding (IYCF) practices and their determinants in two Urban districts of India. Journal of Family Medicine and Primary Care, 10(8), 3137. https://doi.org/10.4103/JFMPC.JFMPC_184_21

Beluska-Turkan, K., Korczak, R., Hartell, B., Moskal, K., Maukonen, J., Alexander, D. E., Salem, N., Harkness, L., Ayad, W., Szaro, J., Zhang, K., & Siriwardhana, N. (2019). Nutritional Gaps and Supplementation in the First 1000 Days. Nutrients, 11(12), 2891. https://doi.org/10.3390/NU11122891

Bhutta, Z. A., Ahmed, T., Black, R. E., Cousens, S., Dewey, K., Giugliani, E., Haider, B. A., Kirkwood, B., Morris, S. S., Sachdev, H., & Shekar, M. (2008). What works? Interventions for maternal and child undernutrition and survival. The Lancet, 371(9610), 417–440. https://doi.org/10.1016/S0140-6736(07)61693-6/ATTACHMENT/D245037B-1437-4132-B719-B463D04F1CBF/MMC18.PDF

Building Brains - 1,000 Days. (n.d.). Retrieved April 1, 2025, from https://thousanddays.org/why-1000-days/building-brains/

Chaudhary, S. R., Govil, S., Lala, M. K., & Yagnik, H. B. (2018). Infant and Young Child Feeding Index and its association with nutritional status: A cross-sectional study of urban slums of Ahmedabad. Journal of Family & Community Medicine, 25(2), 88. https://doi.org/10.4103/JFCM.JFCM_82_17

Chhabra, P., Gupta, A., & Thakur, N. (2021). Complementary Feeding Practices and Nutritional Status of Children (6–23 months) in an Urban Resettlement Colony of East Delhi. Indian Journal of Community Medicine : Official Publication of Indian Association of Preventive & Social Medicine, 46(3), 528. https://doi.org/10.4103/IJCM.IJCM_1046_20

Collins, C., Duncanson, K., & Burrows, T. (2014). A systematic review investigating associations between parenting style and child feeding behaviours. Journal of Human Nutrition and Dietetics : The Official Journal of the British Dietetic Association, 27(6), 557–568. https://doi.org/10.1111/JHN.12192

Costa, A., & Oliveira, A. (2023). Parental Feeding Practices and Children's Eating Behaviours: An Overview of Their Complex Relationship. Healthcare, 11(3), 400. https://doi.org/10.3390/HEALTHCARE11030400

de Fátima César Silva, I., Ricardo Moreira, T., Souza Soares, M., Aparecida Fernandes Oliveira, R., Fialho de Sousa Campos, M. T., Feliciano Pereira, P., & Amaral Araújo, R. M. (2024). Association of parental eating styles and markers of food intake and nutritional status of Brazilian children. International Journal of Food Sciences and Nutrition, 75(8). https://doi.org/10.1080/09637486.2024.2415116

Del Bono, C., Candela, E., Parini, L., Zama, D., Pierantoni, L., Bodini, C. F., Dondi, A., & Lanari, M. (2025). The first 1000 days: the price of inequalities in high and middle-income countries. Pediatric Research. https://doi.org/10.1038/S41390-025-03880-X

Demilew, Y. M., Tafere, T. E., & Abitew, D. B. (2017). Infant and young child feeding practice among mothers with 0-24 months old children in Slum areas of Bahir Dar City, Ethiopia. International Breastfeeding Journal, 12(1), 1–9. https://doi.org/10.1186/S13006-017-0117-X/TABLES/5

Desai, R., Kapoor, N., & Verma, M. (2022). Reminder systems and maternal feeding practices in urban Indian households. Journal of Family Health, 12(3) 123-130.

Dhami, M. V., Ogbo, F. A., Akombi-inyang, B. J., Torome, R., & Agho, K. E. (2021). Understanding the Enablers and Barriers to Appropriate Infants and Young Child Feeding Practices in India: A Systematic Review. Nutrients, 13(3), 1–36. https://doi.org/10.3390/NU13030825

Dhami, M. V., Ogbo, F. A., Osuagwu, U. L., & Agho, K. E. (2019). Prevalence and factors associated with complementary feeding practices among children aged 6–23 months in India: a regional analysis. BMC Public Health, 19(1), 1034. https://doi.org/10.1186/S12889-019-7360-6

Febrinda Nadhila, L., Ningrum, A. G., Tri, M., & Sampurna, A. (2023). THE EFFECT OF PARENTING STYLE ON NUTRITIONAL STATUS OF TODDLERS IN SURABAYA. Indonesian Midwifery and Health Sciences Journal, 7(3), 267–275. https://doi.org/10.20473/IMHSJ.V7I3.2023.267-275

Feeding Styles and Their Association With Complementary Feeding Practices and Growth in Mexican Children. Frontiers in Pediatrics, 9, 786397. https://doi.org/10.3389/FPED.2021.786397/FULL

Forsido, S. F., Kiyak, N., Belachew, T., & Hensel, O. (2019). Complementary feeding practices, dietary diversity, and nutrient composition of complementary foods of children 6-24 months old in Jimma Zone, Southwest Ethiopia. Journal of Health, Population, and Nutrition, 38(1), 14. https://doi.org/10.1186/S41043-019-0172-6/TABLES/6

Frankel, L. A., O'Connor, T. M., Chen, T. A., Nicklas, T., Power, T. G., & Hughes, S. O. (2014). Parents' perceptions of preschool children's ability to regulate eating. Feeding style differences. Appetite, 76, 166–174. https://doi.org/10.1016/J.APPET.2014.01.077

Gallagher, C., Waidyatillake, N., Pirkis, J., Lambert, K., Cassim, R., Dharmage, S., & Erbas, B. (2023). The effects of weight change from childhood to adulthood on depression and anxiety risk in adulthood: A systematic review. Obesity Reviews, 24(7), e13566. https://doi.org/10.1111/OBR.13566

Govender, I., Rangiah, S., Kaswa, R., & Nzaumvila, D. (2021). Malnutrition in children under the age of 5 years in a primary health care setting. South African Family Practice, 63(1), 5337. https://doi.org/10.4102/SAFP.V63I1.5337

Gupta, S., Sharma, A., & Patel, M. (2020). Timing of complementary feeding initiation among urban mothers in Delhi. Indian Journal of Maternal and Child Health, 28(2), 112- 119.

Hamner, H. C., Nelson, J. M., Sharma, A. J., Jefferds, M. E. D., Dooyema, C., Flores-Ayala, R., Bremer, A. A., Vargas, A. J., Casavale, K. O., de Jesus, J. M., Stoody, E. E., Scanlon, K. S., &

Perrine, C. G. (2022). Improving Nutrition in the First 1000 Days in the United States: A Federal Perspective. American Journal of Public Health, 112, S817–S825. https://doi.org/10.2105/AJPH.2022.307028

Harrison, L., Padhani, Z., Salam, R., Oh, C., Rahim, K., Maqsood, M., Ali, A., Charbonneau, K., Keats, E. C., Lassi, Z. S., Imdad, A., Owais, A., Das, J., & Bhutta, Z. A. (2023). Dietary Strategies for Complementary Feeding between 6 and 24 Months of Age: The Evidence. Nutrients, 15(13), 3041. https://doi.org/10.3390/NU15133041/S1

Hennessy, E., Hughes, S. O., Goldberg, J. P., Hyatt, R. R., & Economos, C. D. (2010). Parent behavior and child weight status among a diverse group of underserved rural families. Appetite, 54(2), 369–377. https://doi.org/10.1016/j.appet.2010.01.004

Herman, H., Mansur, A. R., & Chang, Y. J. (2023). Factors associated with appropriate complementary feeding: A scoping review. Journal of Pediatric Nursing, 71, e75–e89. https://doi.org/10.1016/J.PEDN.2023.04.017

Hoffman, D., Arts, M., & Bégin, F. (2019). The “First 1,000 Days+” as Key Contributor to the Double Burden of Malnutrition. Annals of Nutrition and Metabolism, 75(2), 99–102. https://doi.org/10.1159/000503665

Hughes, S. O., Cross, M. B., Hennessy, E., Tovar, A., Economos, C. D., & Power, T. G. (2011). Caregiver’s Feeding Styles Questionnaire: Establishing Cutoff Points. Appetite, 58(1), 393. https://doi.org/10.1016/J.APPET.2011.11.011

Hughes, S. O., Power, T. G., Fisher, J. O., S. A. (2019). Parental feeding styles and child dietary intake: a meta-analysis. Journal of the Academy of Nutrition and Dietetics, 119(8), 1319-1336.

Hughes, S. O., Power, T. G., Orlet Fisher, J., Mueller, S., & Nicklas, T. A. (2005). Revisiting a neglected construct: parenting styles in a child-feeding context. Appetite, 44(1), 83–92. https://doi.org/10.1016/J.APPET.2004.08.007

Jansen, E., Mallan, K. M., Nicholson, J. M., & Daniels, L. A. (2014). The feeding practices and structure questionnaire: Construction and initial validation in a sample of Australian first-time mothers and their 2-year olds. International Journal of Behavioral Nutrition and Physical Activity, 11(1), 1–13. https://doi.org/10.1186/1479-5868-11-72/TABLES/4

Jeyakumar, A., Babar, P., Menon, P., Nair, R., Jungari, S., Medhekar, A., Prakshale, B., Shaikh, J., Chacko, M., Nikam, M., More, P., Nayel, S., Simelane, S., & Awale, S. (2023). Determinants of complementary feeding practices among children aged 6–24 months in urban slums of Pune,

Maharashtra, in India. Journal of Health, Population and Nutrition, 42(1). https://doi.org/10.1186/s41043-022-00342-6

Keno, S., Bikila, H., Shibiru, T., & Etafa, W. (2021). Dietary diversity and associated factors among children aged 6 to 23 months in Chelia District, Ethiopia. BMC Pediatrics, 21(1), 1–10. https://doi.org/10.1186/S12887-021-03040-0/TABLES/3

Key practice: Complementary feeding | UNICEF Uganda. (n.d.). Retrieved September 27, 2024, from https://www.unicef.org/uganda/key-practice-complementary-feeding

Khamis, A. G., Mwanri, A. W., Ntwenya, J. E., & Kreppel, K. (2019). The influence of dietary diversity on the nutritional status of children between 6 and 23 months of age in Tanzania. BMC Pediatrics, 19(1), 1–9. https://doi.org/10.1186/S12887-019-1897-5/TABLES/3

Kim-Herrera, E. Y., Ramírez-Silva, I., Rodríguez-Oliveros, G., Ortiz-Panozo, E., Sánchez-Estrada, M., Rivera-Pasquel, M., Pérez-Escamilla, R., & Rivera-Dommarco, J. A. (2021). Parental Feeding Styles and Their Association With Complementary Feeding Practices and Growth in Mexican Children. Frontiers in Pediatrics, 9, 786397. https://doi.org/10.3389/FPED.2021.786397/FULL

Kumar, A., Patel, S., & Desai, R. (2021). Maternal education and employment status as predictors of complementary feeding practices in urban Mumbai. Journal of Urban Health, 98(3), 412-420.

Kumar, R., & Rao, L. (2021). Feeding frequency and portion sizes of complementary foods in urban Bengaluru. Journal of Pediatric Nutrition, 15(4), 321-328.

Likhar, A., & Patil, M. S. (2022). Importance of Maternal Nutrition in the First 1,000 Days of Life and Its Effects on Child Development: A Narrative Review. Cureus, 14(10). https://doi.org/10.7759/CUREUS.30083

Lo, K., Cheung, C., Lee, A., Tam, W. W. S., & Keung, V. (2015). Associations between Parental Feeding Styles and Childhood Eating Habits: A Survey of Hong Kong Pre-School Children. PLoS ONE, 10(4), e0124753. https://doi.org/10.1371/JOURNAL.PONE.0124753

Lopez, N. V., Schembre, S., Belcher, B. R., O'Connor, S., Maher, J. P., Arbel, R., Margolin, G., & Dunton, G. F. (2018). Parenting styles, food-related parenting practices, and children's healthy eating: A mediation analysis to examine relationships between parenting and child diet. Appetite, 128, 205. https://doi.org/10.1016/J.APPET.2018.06.021

Lopez, N. V., Schembre, S., Belcher, B. R., O'Connor, S., Maher, J. P., Arbel, R., Margolin, G., & Dunton, G. F. (2018). Parenting styles, food-related parenting practices, and children's healthy

eating: A mediation analysis to examine relationships between parenting and child diet. Appetite, 128, 205. https://doi.org/10.1016/J.APPET.2018.06.021

Loth, K. A., MacLehose, R. F., & Neumark-Sztainer, D. (2020). Parental feeding styles and adolescent weight status: a meta-analysis. International Journal of Behavioral Nutrition and Physical Activity, 17(1), 1-18. Sleddens, E. F., Kremers, S. P., & Thijs, C. (2021). The relationship between parental feeding styles and childhood obesity: a systematic review. International Journal of Obesity, 45(1), 1-17.

Lutter, C. K., Grummer-Strawn, L., & Rogers, L. (2021). Complementary feeding of infants and young children 6 to 23 months of age. Nutrition Reviews, 79(8), 825–846. https://doi.org/10.1093/NUTRIT/NUAA143

Mahmood, L., Flores-Barrantes, P., Moreno, L. A., Manios, Y., & Gonzalez-Gil, E. M. (2021). The influence of parental dietary behaviors and practices on children's eating habits. Nutrients, 13(4). https://doi.org/10.3390/NU13041138/S1

Malnutrition in children. (n.d.). Retrieved April 1, 2025, from https://www.who.int/data/nutrition/nlis/info/malnutrition-in-children

Mandal, I., & Hossain, S. R. (2024). Update of modified Kuppuswamy scale for the year 2024. International Journal Of Community Medicine And Public Health, 11(7), 2945–2946. https://doi.org/10.18203/2394-6040.ijcmph20241863

Marr, C., Breeze, P., & Caton, S. J. (2022). A comparison between parent and grandparent dietary provision, feeding styles and feeding practices when caring for preschool-aged children. Appetite, 168. https://doi.org/10.1016/J.APPET.2021.105777

Masuke, R., Msuya, S. E., Mahande, J. M., Diarz, E. J., Stray-Pedersen, B., Jahanpour, O., & Mgongo, M. (2021). Effect of inappropriate complementary feeding practices on the nutritional status of children aged 6-24 months in urban Moshi, Northern Tanzania: Cohort study. PLoS ONE, 16(5), e0250562. https://doi.org/10.1371/JOURNAL.PONE.0250562

Menon, P., Bamezai, A., Subandoro, A., Ayoya, M. A., & Aguayo, V. (2015). Age-appropriate infant and young child feeding practices are associated with child nutrition in India: insights from nationally representative data. Maternal & Child Nutrition, 11(1), 73–87. https://doi.org/10.1111/MCN.12036

Mishra, P., & Singh, N. (2022). Consistency of complementary foods and its impact on infant feeding in urban Lucknow. Nutrition Research and Practice, 16(1), 45-52.

Modjadji, P., Molokwane, D., & Ukegbu, P. O. (2020). Dietary Diversity and Nutritional Status of Preschool Children in North West Province, South Africa: A Cross Sectional Study. Children 2020, Vol. 7, Page 174, 7(10), 174. https://doi.org/10.3390/CHILDREN7100174

Ms, T. M., Arefadib, N., Deery, A., & West, S. (2017). The First Thousand Days The First Thousand Days: An Evidence Paper Centre for Community Child Health. www.rch.org.au/ccch

Mwene-Batu, P., Bisimwa, G., Baguma, M., Chabwine, J., Bapolisi, A., Chimanuka, C., Molima, C., Dramaix, M., Kashama, N., Macq, J., & Donnen, P. (2020). Long-term effects of severe acute malnutrition during childhood on adult cognitive, academic and behavioural development in African fragile countries: The Lwiro cohort study in Democratic Republic of the Congo. PLoS ONE, 15(12), e0244486. https://doi.org/10.1371/JOURNAL.PONE.0244486

Ngo Um-Sap, S., Mbassi Awa, H., Hott, O., Tchendjou, P., Womga, A., Tanya, A., & Koki Ndombo, P. (2014). Pratique de la diversification alimentaire chez les enfants de 6 à 24 mois à Yaoundé : relation avec leur état nutritionnel. Archives de Pédiatrie, 21(1), 27–33. https://doi.org/10.1016/J.ARCPED.2013.10.015

Ningning, W., & Wenguang, C. (2023). Influence of family parenting style on the formation of eating behaviors and habits in preschool children: The mediating role of quality of life and nutritional knowledge. PLOS ONE, 18(7), e0288878. https://doi.org/10.1371/JOURNAL.PONE.0288878

Oluwole, O., Agboola, A., & Arowosola, T. (2018). Complementary Feeding: A Critical Approach for Prevention of Malnutrition in Infants and Young Children. Journal of Nutritional Disorders & Therapy, 08(01). https://doi.org/10.4172/2161-0509.1000225

Oot, L., Sethuraman, K., Ross, J., & Sommerfelt, A. E. (2018). The Effect of Late Breastfeeding Initiation on Neonatal Mortality: A Model in PROFILES for Country-Level Advocacy.

Patel, L., & Kumar, R. (2021). Grandparental support in child feeding practices in urban Ahmedabad. Indian Journal of Community Health, 33(1), 45-52.

Patel, R., Shah, D., & Mehta, K. (2021). Gender disparities in anthropometric status among infants in urban Ahmedabad. Journal of Pediatric Nutrition, 15(2), 123-130.

Prasad, R., Shukla, A., & Galhotra, A. (2023). Feeding practices and nutritional status of children (6-23 months) in an urban area of Raipur, Chhattisgarh, India. Journal of Family Medicine and Primary Care, 12(10), 2366. https://doi.org/10.4103/JFMPC.JFMPC_240_23

Radhakrishnan, M., & Nagaraja, S. B. (2023). Modified Kuppuswamy socioeconomic scale 2023: stratification and updates. International Journal Of Community Medicine And Public Health, 10(11), 4415–4418. https://doi.org/10.18203/2394-6040.IJCMPH20233487

Reddy, S., & Kumar, V. (2020). Age-specific prevalence of underweight and stunting among infants in urban Hyderabad. Indian Journal of Maternal and Child Health, 28(4), 312-319.

Rodenburg, G., Oenema, A., Kremers, S. P. J., & van de Mheen, D. (2012). Parental and child fruit consumption in the context of general parenting, parental education and ethnic background. Appetite, 58(1), 364–372. https://doi.org/10.1016/J.APPET.2011.11.001

Saxena, V., Verma, N., Mishra, A., & Jain, B. (2022). Assessment of Infant and Young Child Feeding (IYCF) practices in rural areas of Dehradun, Uttarakhand. Journal of Family Medicine and Primary Care, 11(7), 3740–3745. https://doi.org/10.4103/JFMPC.JFMPC_2502_21

Sharma, M., Gaidhane, A., & Choudhari, S. G. (2024). A Review of Infant and Young Child Feeding Practices and Their Challenges in India. Cureus. https://doi.org/10.7759/cureus.66499

Sharma, P., Gupta, A., & Singh, S. (2020). Gender roles in child feeding and caregiving in urban Jaipur. Journal of Women's Health, 29(4), 312-319.

Sharma, R., & Gupta, A. (2022). Impact of socio-economic factors on complementary feeding practices in low-income families in urban Jaipur. Indian Journal of Community Health, 34(1), 56-63.

Sihuay-Torres, K., Luna-Mazzola, I., Lara-Verastegui, R., & Rivera Félix, L. M. (2023). ORAL HEALTH PRACTICES DURING THE FIRST 1000 DAYS OF LIFE: LITERATURE REVIEW. Revista de La Facultad de Medicina Humana, 23(3), 148–155. https://doi.org/10.25176/RFMH.V23I3.4904

Singh, A., & Rao, K. (2019). Financial support and caregiving roles in urban Delhi families. Social Science & Medicine, 240, 112520.

Singh, A., & Sharma, P. (2019). Prevalence of severe stunting among infants in urban Delhi. Nutrition Research and Practice, 13(5), 401-408.

Singh, P., Verma, M., & Kapoor, N. (2020). Socio-economic determinants of complementary feeding practices among infants in urban Delhi. Nutrition and Health, 26(4), 312-320

Tekeba, B., Workneh, B. S., Zegeye, A. F., Gonete, A. T., Zeleke, G. A., & Tamir, T. T. (2024). Minimum acceptable diet use and its associated factors among children aged 6–23 in Ghana: a

mixed effect analysis using Ghana Demographic and Health Survey. Frontiers in Public Health, 12, 1402909. https://doi.org/10.3389/FPUBH.2024.1402909/FULL

The effects of childhood malnutrition | World Vision UK. (n.d.). Retrieved April 1, 2025, from https://www.worldvision.org.uk/about/blogs/effects-of-childhood-malnutrition/

Thompson, A. L., Adair, L. S., & Bentley, M. E. (2013). Pressuring and restrictive feeding styles influence infant feeding and size among a low-income African-American sample. Obesity (Silver Spring, Md.), 21(3), 562. https://doi.org/10.1002/OBY.20091

Udoh, E. E., & Amodu, O. K. (2016). Complementary feeding practices among mothers and nutritional status of infants in Akpabuyo Area, Cross River State Nigeria. SpringerPlus, 5(1), 2073. https://doi.org/10.1186/S40064-016-3751-7

UNICEF Conceptual Framework | UNICEF. (n.d.). Retrieved April 1, 2025, from https://www.unicef.org/documents/conceptual-framework-nutrition

Van Der Horst, K., & Sleddens, E. F. C. (2017). Parenting styles, feeding styles and food-related parenting practices in relation to toddlers' eating styles: A cluster-analytic approach. PLOS ONE, 12(5), e0178149. https://doi.org/10.1371/JOURNAL.PONE.0178149

Verger, E. O., Le Port, A., Borderon, A., Bourbon, G., Moursi, M., Savy, M., Mariotti, F., & Martin-Prevel, Y. (2021). Dietary Diversity Indicators and Their Associations with Dietary Adequacy and Health Outcomes: A Systematic Scoping Review. Advances in Nutrition, 12(5), 1659–1672. https://doi.org/10.1093/ADVANCES/NMAB009

Vollmer, R. L. (2019). Parental feeding style changes the relationships between children's food preferences and food parenting practices: The case for comprehensive food parenting interventions by pediatric healthcare professionals. Journal for Specialists in Pediatric Nursing : JSPN, 24(1). https://doi.org/10.1111/JSPN.12230

Vollmer, R. L., & Mobley, A. R. (2013). Parenting styles, feeding styles, and their influence on child obesogenic behaviors and body weight. A review. Appetite, 71, 232–241. https://doi.org/10.1016/J.APPET.2013.08.015

Walters, C. N., Rakotomanana, H., Komakech, J. J., & Stoecker, B. J. (2019). Maternal determinants of optimal breastfeeding and complementary feeding and their association with child undernutrition in Malawi (2015-2016). BMC Public Health, 19(1). https://doi.org/10.1186/S12889-019-7877-8

WHO Guideline for complementary feeding of infants and young children 6–23 months of age. Geneva: World Health Organization; 2023. Licence: CC BY-NC-SA 3.0 IGO.

World Population Prospects. (n.d.). Retrieved April 1, 2025, from https://population.un.org/wpp/

Annexure 1 Ethical Certificate

सत्यं शिवं सुन्दरम्
Estd. 1949

Institutional Ethics
Committee for Human
Research
(IECHR)

FACULTY OF FAMILY AND COMMUNITY SCIENCES
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Ethical Compliance Certificate 2024-2025

This is to certify Ms. Heer Desai study titled; "Parental feeding style and dietary quality of complementary food among 6-24 months children in urban block of Vadodara." from Department of Foods and Nutrition has been approved by the Institutional Ethics Committee for Human Research (IECHR), Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda. The study has been allotted the ethical approval number IECHR/FCSc/M.Sc./10/2024/30.

Komal

Prof. Komal Chauhan
Member Secretary
IECHR

Prof. Mini Sheth
Chairperson
IECHR

Chair Person
IECHR
Faculty of Family & Community Sciences
The Maharaja Sayajirao University of Baroda

Annexure 2 Questionnaire

Section 1: Basic Information of the Survey		
Date Of Survey:		—/—/—
Area:		1. Vadodara 2. Dabhoi 3. Pardi
Sr. No.	**Questions**	**Answer**
1	Address	
2	Name of Mother	
3	Age of Mother (yrs)	
4	Education of Mother	1. Profession or Honors 2. Graduate 3. Intermediate or diploma 4. High school certificate 5. Middle school certificate 6. Primary school certificate 7. Illiterate
5	Occupation of Mother	1. Legislators, Senior Officials and Managers 2. Professionals 3. Technicians and Associate Professionals 4. Clerks 5. Skilled Workers and Shop and Market Sales Workers 6. Craft and Related Trade Workers 7. Skilled Agricultural and Fishery Workers 8. Elementary Occupation 9. Plant and Machine Operators and Assemblers 10. Unemployed
6	Name of Father	
7	Age of Father (yrs)	
8	Education of Father	1. Profession or Honors 2. Graduate 3. Intermediate or diploma 4. High school certificate 5. Middle school certificate 6. Primary school certificate 7. Illiterate

9	Occupation of Father	1. Legislators, Senior Officials and Managers 2. Professionals 3. Technicians and Associate Professionals 4. Clerks 5. Skilled Workers and Shop and Market Sales Workers 6. Craft and Related Trade Workers 7. Skilled Agricultural and Fishery Workers 8. Elementary Occupation 9. Plant and Machine Operators and Assemblers 10. Unemployed
10	Religion	1. Hindu 2. Muslim 3. Christian 4. Sikh 5. Any other (Specify) _____
11	Caste	1. ST 2. SC 3. OBC 4. General
12	Type of family	1. Nuclear 2. Joint 3. Extended
13	Total no. of family member	
14	Any Other source of income	1. Agriculture 2. Poultry 3. House/Shop rent 4. None 5. Any other (specify) _____
15	Total monthly income of the family	
16	Is there a toilet facility available in the household?	1. Yes 2. No

Section 2: Child Information		
Sr. No.	**Questions**	**Answer**
17	Name of the child	
18	Gender of the child	1. Male 2. Female 3. Transgender
19	Birth date of the child	
20	Birth weight (in kg) of the child	
21	Birth order of child	

Anthropometric Measurements		
22	Wight (in kg)	
23	Length/Hight(in cm)	

Section 3: Complementary feeding Information:		
Sr. No.	**Questions**	**Answer**
24	In which month did you introduce complementary feed?	1. At Completion of 6 months 2. Before 6 months 3. After 7 months 4. Not started yet
25	How many times do you give complementary feed in a day?	1. Breakfast 2. Brunch 3. Lunch 4. Snack5. Dinner 6. Any other (specify) _____
26	How much is the child fed at one time?	1. 1 tbsp 2. 1/4th cup 3. ½ cup 4. 1 cup
27	What is the consistency of the complementary food?	1. Thin 2. Medium 3. Thick

WASH Practices:

Sr. No.	Questions	Answer
28	When do you wash your hands with soap? (Multiple response)	1. Before cooking 2. After cooking 3. Before feeding the child 4. After feeding the child 5. After cleaning the child's feces
29	For how long do you store cooked complementary foods?	1. Not storing 2. For 2-3 hours 3. More than 4 hours 4. More than 1 day
30	When do you cut your vegetables?	1. Before washing 2. After washing
31	Could you please describe step by step how you wash your hands?	1. Washes hands in a bowl of water (sharing with other people) — poor practise 2.With someone pouring a little clean water from a jug onto one's hands — appropriate practise 3.Under running water — appropriate practise

		4. Washes hands with soap or ashes 5.Other (specify _____) 6. Don't know/no answer
32	What is the main source of water used by your household for drinking, cooking and hand washing?	1=Piped water into dwelling 2 = Piped into yard or plot 3= Public tap/standpipe 4= Tube well/borehole 5 =Dug well protected 6 = Dug well unprotected 7= Bottled water
33	How do you treat the item you use to collect water? Did you treat it in any way to make it clean?	0 = no treatment 1 = Use of water and soap (clean container) 2 = Other Don't know/no answer = 88
34	Could you describe how you store water?	1 = Clean container or jar 2 = Covered container or jar 3 = Clean and covered container or jar 4 = Other Don't know/no answer =88
35	What container is used to store drinking water?	1.Earthen pot 2.Metal pot 3.Plastic container 4.RO tank 5.Any other (specify) _____
36	What is used for taking out the water?	1.Glass 2.Tap 3.Doyo
37	Do you treat your water in any way to make it safe to drink?	1= Yes 2= No Don't know/no answer =88
38	What do you usually do to the water to make it safer to drink? (multiple response)	Boil it Add bleach/chlorine Strain it through a cloth Use a water filter (ceramic, sand, composite, etc.) Use solar disinfection Let it stand and settle Other (specify_____) Don't know/no answer=88
39	If you know that the water you are going to use for cooking or drinking is not safe or does not come from a safe source, what should you do? (multiple response)	Boil it Add bleach/chlorine Strain it through a cloth Use a water filter (ceramic, sand, composite, etc.) Use solar disinfection Let it stand and settle Other (specify_____) Don't know/no answer=88

40	Do you add extra fats,oils,sugar and jaggery after preparing complementary foods?	1. Yes 2. No
41	How much time do you take to feed the child?	1. 15 minutes 2. 30 minutes 3. 45 minutes 4. 1 hour

Support Domains Questions:

Sr. No.	Questions	Answer
42	Who is responsible for spending money for food for children?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this
43	Who is responsible for purchasing food for children?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this
44	Who is preparing food for the child?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this
45	Who gives advice/reminds the mother on feeding the child?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this
46	Who teaches the child to eat by him/herself?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this

47	Who washes the child's hands before the child eats?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this
48	Who helps in other chores so that the mother can prepare food or feed the child?	1. Mother 2. Father 3. Both 4. Grandfather 5. Grandmother 6. Other family member 7. None of this

Knowledge of Parents of Children Under 2 years on Complementary Feeding Practices:

Sr. No.	Questions	Answer
49	Are these age-appropriate feeding behaviors? Yes/No	1. Feeding milk to a 3 month old who has lost his mother with a cup rather than a bottle. Yes/No 2. Giving a 10-month child own bowl and spoon to eat alone. Yes/No 3. Talking to a 10-month-old child during a meal. Yes/No 4. Keeping a 12-month old child from touching her food and plate. Yes/No 5. Showing affection to a 15 month old child while feeding, showing that he/she is loved by everyone. Yes/No 6. Spoon feeding and holding a cup for a 24-month-old, not allowing child to touch spoon. Yes/No
50	From what age a child should be given complementary food?	1. Less than 6 months 2. At 6 month 3. After completion of 6 months 4. After 9 months
51	What consistency of food should be given to the 7 month child?	1. Liquid form 2. Solid 3. Semi solid 4. All of them

52	From what age a child should be eating food by him herself?	1. 7-8 months 2. 8-10 months 3. 11-12 months 4. After 1 year 5. After 2 years
53	How many times a child is fed complementary feed in a day?	Breakfast Brunch Lunch Snack Dinner
54	How many times do we have to give complementary feed in a day?	Breakfast Brunch Lunch Snack Dinner
55	Breast milk should be continued along with complementary food?	1. Yes 2. No
56	Which food items should be fed to the child?	1. Breastmilk 2. Cereal, roots & tuber 3. Legumes & nuts 4. Vit. A rich fruits & vegetables 5. Dairy products 6. Egg 7. Other fruits & vegetables 8. Flesh foods

Parent's role in complementary feeding: Practices

Sr. No.	Questions	Answer
57	How do you participate in complementary feeding?	1. Purchasing 2. Selecting food item 3. In feeding 4. Meal preparation
58	Do you feed the child?	1. Yes 2. No 3. Some times
59	How many times do you give complementary feed in a day?	1. Breakfast 2. Brunch 3. Lunch 4. Snack 5. Dinner 6. None of them

60	How do you feed the child?	1. Watching TV 2. Telling stories 3. Giving toys 4. Giving books (Storybook, hardbound book) 5. Giving mobile phone 6. None of them
61	Do you wash your child's hands before feeding?	1. Yes 2. No 3. Some times
62	Do you wash your child's hands after feeding?	1. Yes 2. No 3. Some times
63	Do you change your child's nappy?	1. Yes 2. No 3. Some times
64	Do you make your child visit the hospital?	1. Yes 2. No 3. Some times
65	If yes, When do you make your child visit the hospital?	1. Suffering from illness 2. For immunization 3. Both times 4. No 5. Any other (specify) _____
66	How would you rate your involvement in your child's feeding practices?	1. not involved at all 2. Slightly involved 3. Moderately involved 4. Quite involved 5. Very involved
67	How often do you have meals with your child?	1. Daily 2. Most days of the week 3. A few times a week 4. Rarely 5. Never
68	How did (name of child) receive the food yesterday?	1= The child ate by him/herself 2= The child was fed by me 3= The child was fed by someone else 99= Other (specify
69	Does (name of child) use a separate bowl/plate/cup for feeding?	1.Yes 2.No

Communication and Support:

Sr. No.	Questions	Answer
70	How often do you discuss your child's nutrition and feeding practices with your partner?	1. Daily 2. Weekly 3. Monthly 4. Sometimes 5. Rarely 6. Never
71	Do you provide emotional and practical support to your partner in matters related to child feeding and nutrition?	1. Yes, regularly 2. Occasionally 3. Sometimes 4. No, not at all
72	Have you attended any parenting or nutrition education programs that have influenced your knowledge about cold feeding practices?	1. Yes 2. No 3. Not sure

Challenges and Barriers:

Sr. No.	Questions	Answer
73	Do you face any cultural or society norms that affect your ability to be involved in your child's nutrition? If yes, specify	1. Yes 2. No

Diet Quality Questionnaire: DQQ for IYCF

Sr. No	Questions	Circle the answer	
1	Was [NAME] ever breastfed?	Yes/No/or Don't	Don't Know (DK)
2	How long after birth was [NAME] first put to the breast? If immediately, circle "000" 000 If less than one hour, record "00" hours If less than 24 hours, record hours Otherwise, record days	000	
	How long was the Child exclusively breastfed?	1. 0 2. 1 3. 2 4. 3 5. 4 6. 5 7. 6	

3	In the first 2 days after delivery, was [NAME] given anything other than breastmilk to eat or drink – anything at all like water, infant formula or baby milk, honey, sugar water, or gripe water?	Yes or No	Don't Know (DK)
4	Was [NAME] breastfed yesterday during the day or at night?	Yes or No	Don't Know (DK)
5	Did [NAME] drink anything from a bottle with a nipple yesterday during the day or at night?	Yes or No	Don't Know (DK)
6.1	Plain water?	Yes or No	Don't Know (DK)
6.2	Infant formula or baby milk such as Amul, Lactogen, or Dexolac? IF YES: How many times did (NAME) drink infant formula? (IF 7 OR MORE TIMES, RECORD '7').	Yes or No	Don't Know (DK) Don't Know (DK
6.3	Milk from animals including fresh, packaged, or or powdered?	Yes or No	Don't Know (DK)
6.4	IF YES: How many times did (NAME) drink milk? (IF 7 OR MORE TIMES, RECORD '7'). IF YES: Was any of the milk a sweet or flavored type of milk?	Yes or don't	Don't Know (DK)
6.5	Bournevita, Horlicks, or Boost?	Yes or don't	Don't Know (DK)
6.6	Fruit juice, packet juice such as Rasna or Frooti, sugarcane juice, or nannari sarbath?	Yes or don't	Don't Know (DK)
6.7	Yes or No	Yes or No	Don't Know (DK)
6.8	Tea, coffee, or herbal drinks?	Yes or No	Don't Know (DK)
6.9	IF YES: was the drink sweetened?	Yes or No	Don't Know (DK)
7	Yesterday, did you eat any of the following foods:		
1	Rice, idli, dosa, poha, naan, kulcha, paratha, or upma?	Yes or No	
2.1	Chapati, roti, dalia, or roasted maize?	Yes or No	
2.2	Pearl millet or finger millet?	Yes or No	
3	Potato, sweet potato, turnip, arum root, tapioca, or raw banana?	Yes or No	
4	Daal, sambar, chickpeas, kidney beans, soya, or khichdi?	YES or NO	
	Yesterday, did you cat any of the following vegetables:		
5	Carrots, or pumpkin that is orange inside?	YES or NO	

6.1	Mustard leaves, spinach, radish leaves, cassava leaves, taro leaves, drumstick leaves, Amaranth leaves, or wild greens/other greens?	YES or NO	
7.1	Tomatoes, eggplant, okra/lady finger, French beans, cauliflower, cabbage, or beetroot?	YES or NO	
7.2	Bitter gourd, bottle gourd, pointed gourd, ivy gourd, apple gourd, ridged gourd, or beetroot?	YES or NO	
7.3	Cucumber, radish, capsicum, German turnip, or drumstick?	YES or NO	
	Yesterday, did you cat any of the following fruits:		
8	Papaya, mango, orange musk melon, or apricots?	YES or NO	
9	Orange, tangerine, or grapefruit?	YES or NO	
10.1	Ripe banana, apple, pear, watermelon, guava, custard apple, pomegranate, or pineapple?	YES or NO	
10.2	Grapes, kiwi, peaches, jackfruit, chickoo, jamun, palmyra palm fruit, or other wild fruits?	YES or NO	
	Yesterday, did you eat any of the following sweets:		
11	Cakes, cream biscuits, biscuits, suji halwa/kesari bath, jalebi, or ladoo?	YES or NO	
12	Other mithai, rice pudding, kulfi, ice cream, milkshake, toffees, or chocolates?	YES or NO	
	Yesterday, did you eat any of the following foods of animal origin:		
13	Eggs?	YES or NO	
14	Paneer or cheese?	YES or NO	
15	Curd, lassi, buttermilk, or raita?	YES or NO	
16	Sausages or salami?	YES or NO	
17	Mutton, beef, lamb, or liver?	YES or NO	
18	Pork or wild meat?	YES or NO	
19	Chicken, duck, or turkey?	YES or NO	
20	Fish, prawn, crab, or seafood?	YES or NO	
	Yesterday, did you eat any of the following other foods:		

21	Peanuts, cashews, almonds, pistachios, walnuts, pumpkin seeds, or sunflower seeds?	YES or NO	
22	Potato chips, namkeen or mixture?	YES or NO	
23	Instant noodles such as Maggi noodles or Wai Wai?	YES or NO	
24	Samosa, pakora, puri, vada, mathri, kachori, murukku, or bonda?	YES or NO	
	Yesterday, did you have any of the following beverages:		
25	Milk, flavoured milk, chai with milk, or coffee with milk?	YES or NO	
26	Tea with sugar, coffee with sugar, milk with sugar, flavoured milk, Bournevita, Horlicks, or Boost?	YES or NO	
27	Fruit juice, packet juice such as Rasna or Frooti, sugarcane juice, or nannari sarbath?	YES or NO	
28	Soft drinks such as Sprite, Pepsi, Mirinda, or energy drinks?	YES or NO	
	Yesterday, did you get food from any place like...		
29	McDonald's, KFC, Pizza Hut, Domino's, Burger King, or other places that serve pizza or burgers?	YES or NO	

Food Frequency Questionnaire (FFQ)

Food item	**Daily**	**4-5 times a week**	**Thrice a week**	**Once a week**	**Once in 10 days**	**Once in 15 days**	**Once in a month**	**Occasionally**	**Never**
Ultra-Processed Foods									
Infant formula									
Cereal (Ceralac)									
Bread/Buns									
Biscuits									
Cornflakes, Chocos									
Sev mamra / papad Poha (Outside)									

Instant Noodles (Maggie)									
High in fat									
Sev									
Chips,kurkure									
Choda fadi, mathiya									
Papdi, gathiya									
Namkeen/ chavanu									
High in sugar									
Cream roll/Bun									
Ice-cream									
Cakes / pastry									
Homemade sweets (Sukhdi)									
Ready to eat sweets (Shrikhand)									
Cookies/ Khari /toast									
Chocolates, candies									
Health drinks (bornvita, horlics)									
High in salt									
Bhungla									
Instant soup									
sauces									
Papad									
Pickle									

Feeding Practices and Structure questionnaire:

Please circle only one number per row	Never	Rarely	Sometimes	Often	Always
Milk feeding version Feeding on demand					
I feed my baby whenever he wants	1	2	3	4	5
I feed my baby at set times*	1	2	3	4	5
I decide when it is time for my baby to have a feed*	1	2	3	4	5
I let my baby decide when he would like to have a feed	1	2	3	4	5
Parent-led feeding					
When deciding how much to feed my baby, I rely on how hungry he is	1	2	3	4	5
I feed my baby for a set time	1	2	3	4	5
I carefully control how much my baby feeds	1	2	3	4	5
I follow a rule about how much my baby should feed	1	2	3	4	5
I let my baby decide how much he feeds	1	2	3	4	5
I decide how much my baby feeds	1	2	3	4	5

Persuasive feeding					
I feed my baby extra milk, just to make sure he gets enough	1	2	3	4	5
If my baby indicates he is not hungry, I try to get him to feed anyway	1	2	3	4	5
I feed my baby extra milk so he sleeps longer	1	2	3	4	5
Using food to calm					
I feed my baby to settle him, even if he is not hungry	1	2	3	4	5
I offer my baby a feed when he is unsettled or crying	1	2	3	4	5
I offer my baby a feed when he is hurt	1	2	3	4	5
When my baby gets unsettled or is crying, feeding him is one of the first things I do	1	2	3	4	5
I feed my baby to make sure that he does not get unsettled or cry	1	2	3	4	5
(Semi-)Solids feeding version					
Feeding on demand (lower score indicates feeding on demand	1	2	3	4	5
My child eats at set times	1	2	3	4	5

I decide when it is time for my child to eat	1	2	3	4	5
I let my child decide when she/he would like to eat	1	2	3	4	5
My child has a set mealtime routine	1	2	3	4	5
Family Meal Environment					
My child eats together with other family members.	1	2	3	4	5
My child is given the same foods as the rest of the family (pureed, mashed, chopped).	1	2	3	4	5
Whether my child is eating or not, my child sits with the rest of the family when they are having a meal.	1	2	3	4	5
I eat my meals while my child eats	1	2	3	4	5
Parent-led feeding					
I carefully control how much my child eats	1	2	3	4	5
I have a rule about how much my child should eat	1	2	3	4	5
I let my child decide how much she/he eats	1	2	3	4	5
I decide how much my child eats	1	2	3	4	5

Persuasive feeding					
I encourage my child to eat all of the food in front of him/her	1	2	3	4	5
When my child turns away, I try to get her/him to eat a little bit more	1	2	3	4	5
If my child indicates she/he is not hungry I try to get her/him to eat anyway	1	2	3	4	5
I say or do something to show my disapproval of my child for not eating	1	2	3	4	5
I praise my child after each bit to encourage finishing the food	1	2	3	4	5
When my child refuses food they usually eat, I encourage her/him to eat it	1	2	3	4	5
I play games to make sure my child eats enough	1	2	3	4	5
Using food to calm	1	2	3	4	5
I give my child food to settle him/her even if he/she is not hungry	1	2	3	4	5
I offer my child something to eat to make her/him feel better when she/he is unsettled or crying	1	2	3	4	5
I offer my child something to eat to make her/him feel better when she/he is hurt	1	2	3	4	5
When my child gets unsettled or is crying, one of the first things I do is give her/him food	1	2	3	4	5

I give my child food to make sure that they do not get unsettled or cry	1	2	3	4	5
I use food to distract my child or keep him/her busy	1	2	3	4	5
Using (non-)food rewards					
I offer foods to my child as a reward for good behaviour	1	2	3	4	5
I offer my child their favourite foods in exchange for good behaviour	1	2	3	4	5
I promise my child something other than food if they eat (for example: “If you eat your beans, we can go to the park”).	1	2	3	4	5
When my child refuses food they usually eat, I encourage eating by offering a non-food reward (for example: favourite toy or sticker).	1	2	3	4	5
I encourage my child to eat something by using food as a reward (for example: “If you finish your vegetables, you will get some dessert")	1	2	3	4	5
When my child refuses food they usually eat, I encourage eating by offering a food reward (for example: dessert).	1	2	3	4	5
I use desserts as an encouragement to get my child to eat the main course	1	2	3	4	5
I make my child finish the main course before having a dessert.	1	2	3	4	5

I warn my child that I will take a favourite food away if my child does not eat a food they do not like (for example: “If you don’t finish your vegetables, you won’t get dessert”).	1	2	3	4	5

Annexure 3 Information letter and consent form (English)

The Maharaja Sayajirao University of Baroda
Faculty of Family and Community Sciences
Department of Foods and Nutrition

INFORMATION LETTER FOR MOTHERS/FATHER

I Heer Desai a student of Sr. M.Sc. in Dept of Foods and Nutrition at The Maharaja Sayajirao University of Baroda, carrying out a research study under the guidance of Dr. Shweta Patel. The proposed topic of our research is "Parental feeding style and dietary quality of complementary food among 6-24 months children in the selected area".

This study aims to assess the feeding pattern and quality of diet among children (6 months - 2 years) of selected areas. Both of these factors influence the nutrient intake as well as growth among children. Diets of many children lack sufficient nutrients resulting in compromised physical growth because of faulty dietary practices, inappropriate knowledge, dislikes for particular foods, lack of support from child's father and their family members, etc.

With the help of an interview, we will ask some questions regarding family background, dietary intake, feeding pattern. Weight and height of the children will be taken for nutritional status assessment. No Blood samples will be collected.

If you do not want to answer certain questions or do not want to disclose certain information, then you are free to omit them. The information given by you will be confidential and used only for study purpose. By taking part in this research, no remuneration will be provided to the child or the parents, neither would it harm the child.

We thank you for your willingness and participation in this research.

By:

Guide: Dr. Shweta Patel

Student: Heer Desai

Department of Foods and Nutrition, The Maharaja Sayajirao University of Baroda.

CONSENT FORM

I am thereby ready to allow participation in this research. I have understood that in this study, I will need to provide information on family background, dietary intake and feeding pattern in the interview. I have read all the information regarding this research or the information has been read out to me. I have got an opportunity to ask questions regarding the same and I have got satisfactory answers to my question. Therefore, I willingly consent to participate in the study.

Name: Gender: Age: Date:

Contact No: _____

Signature of the parents: _____

Annexure 4 Information letter and consent form (Gujarati)

The Maharaja Sayajirao University of Baroda
Faculty of Family and Community Sciences
Department of Foods and Nutrition

માહિતી પત્ર

હું હીર દેસાઈ, સિનિયર M.Sc.ની વિદ્યાર્થીની. બરોડાની મહારાજા સયાજીરાવ યુનિવર્સિટીમાં ખોરાક અને પોષણ વિભાગમાં, ડૉ. શ્વેતા પટેલના માર્ગદર્શન હેઠળ સંશોધન અભ્યાસ કરી રહ્યા છે. અમારા સંશોધનનો સૂચિત વિષય છે "બાળકોમાં માતા-પિતાની ખોરાકની શૈલી અને આહારની ગુણવત્તા" છે. આ પત્રમાં સંશોધન સંબંધિત માહિતી છે.

આ અભ્યાસનો ઉદ્દેશ્ય બાળકો (6 મહિના - 2 વર્ષ) માં ખોરાકની પદ્ધતિ અને આહારની ગુણવત્તાનું મૂલ્યાંકન કરવાનો છે. આ બંને પરિબળો બાળકોમાં પોષક તત્વોની માત્રા તેમજ વૃદ્ધિને પ્રભાવિત કરે છે. ઘણા બાળકોના આહારમાં પૂરતા પોષક તત્વોનો અભાવ હોય છે જેના પરિણામે શારીરિક વૃદ્ધિ ખોરવાઈ જાય છે કારણ કે ખોરાકની ખોટી પદ્ધતિઓ, અયોગ્ય જ્ઞાન, ખાસ ખોરાક પ્રત્યે અણગમો, બાળકના પિતા અને તેમના પરિવારના સભ્યો તરફથી સમર્થનનો અભાવ વગેરે.
ઈન્ટરવ્યુની મદદથી, અમે કેટલાક પ્રશ્નો પૂછીશું અને જવાબો નોંધીશું. ઈન્ટરવ્યુ દ્વારા કૌટુંબિક પૃષ્ઠભૂમિ, આહારનું સેવન, ખોરાક આપવાની પેટર્ન પરનો ડેટા એકત્રિત કરવામાં આવશે. પોષણની સ્થિતિના મૂલ્યાંકન માટે બાળકોનું વજન અને ઊંચાઈ લેવામાં આવશે. બાયોકેમિકલ અંદાજો માટે રક્ત નમૂના એકત્રિત કરવામાં આવશે નહીં.
જો તમે અમુક પ્રશ્નોના જવાબ આપવા માંગતા નથી અથવા અમુક માહિતી જાહેર કરવા માંગતા નથી, તો તમે તેને છોડી દેવા માટે સ્વતંત્ર છો. તમારા દ્વારા આપવામાં આવેલી માહિતી ગોપનીય રહેશે અને તેનો ઉપયોગ ફક્ત અભ્યાસ હેતુ માટે જ કરવામાં આવશે.
સંશોધનના અંતે, પરિણામો તમારી સાથે શેર કરવામાં આવશે. આ સંશોધનમાં ભાગ લેવાથી, બાળકને કોઈ મહેનતાણું આપવામાં આવશે નહીં, ન તો તેનાથી બાળકને નુકસાન થશે.
આ સંશોધનમાં તમારી ઈચ્છા અને સહભાગિતા બદલ અમે તમારો આભાર માનીએ છીએ.
દ્વારા,

(માર્ગદર્શન): ડૉ. શ્વેતા પટેલ

(વિદ્યાર્થીની): હીર દેસાઈ

ખોરાક અને પોષણ વિભાગ,મહારાજા સયાજીરાવ યુનિવર્સિટી ઓફ બરોડા.

સંમતિ પત્રક

આથી હું આ સંશોધનમાં ભાગ લેવા માટે તૈયાર છું. હું સમજી ગયેલ છું કે આ અભ્યાસમાં, મારે ઈન્ટરવ્યુમાં કૌટુંબિક પૃષ્ઠભૂમિ, આહારનું સેવન અને ખોરાક આપવાની પદ્ધતિ વિશે માહિતી પ્રદાન કરવાની જરૂર પડશે. મેં આ સંશોધન સંબંધિત તમામ માહિતી વાંચી છે અથવા માહિતી મને સમજાવવામાં આવી છે. મને તે અંગેના પ્રશ્નો પૂછવાની તક મળી છે અને મને મારા પ્રશ્નના સંતોષકારક જવાબો મળ્યા છે. તેથી, હું અભ્યાસમાં ભાગ લેવા માટે સ્વેચ્છાએ સંમતિ આપું છું.

નામ: જાતિ: ઉંમર: તારીખ:

મો.નં.: _____

વાલીની સહી: _____

Annexure 5 Photo Gallery