

**EXPLORING FEEDING PRACTICES IN TYPICALLY DEVELOPING YOUNG  
CHILDREN IN THREE DISTRICTS OF TELANGANA- A PRELIMINARY  
SURVEY**

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A Dissertation Submitted in Part Fulfilment for the Degree of Masters in Science  
(Speech-Language Pathology)

University of Mysore

Mysuru



**ALL INDIA INSTITUTE OF SPEECH AND HEARING**

Manasagangothri, Mysuru-570006

**August 2022**

## **CERTIFICATE**

This is to certify that this dissertation entitled “**Exploring feeding practices in typically developing young children in three districts of Telangana- a preliminary survey**” is a bonafide work submitted in part fulfilment for the degree in Science (Speech-Language Pathology) of the student Registration number: 20SLP027. This has been carried out under the guidance of the faculty of this institute and has not been submitted earlier to any University for the award of any other Diploma or Degree.

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## **DECLARATION**

This is to certify that this dissertation entitled “**Exploring feeding practices in typically developing young children in three districts of Telangana- a preliminary survey**” is the result of my own study under the guidance of Dr. N Swapna, Professor in Speech Pathology, Department of Speech Language Pathology, All India Institute of Speech and Hearing, Mysuru and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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August, 2022

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## **Chapter I**

### **INTRODUCTION**

Feeding is one of the first abilities that a child usually develops to meet his/her nutritional needs. Feeding and swallowing are the fundamental activities of prime importance for growth, development, nutrition and general health of newborns and early infants. Through the process of feeding, the satisfaction of hunger and maintenance of homeostasis is achieved. It also provides opportunities for sensory and motor stimulation, mother-child bonding and oro-motor skill development (Kummer, 2008). Children's emotional and psychosocial growth are also impacted, in addition to their physical development and health.

The development of feeding skills in the neonates begins with suckling followed by sucking. Complex series of events and coordination of the neurologic, respiratory and gastrointestinal systems are required for efficient feeding. Oral sensory motor abilities are improved through general neurodevelopment, the development of muscle control (posture and tone), and psychosocial development (Torola et al., 2012). These early gains eventually lead to biting, chewing, eating from a spoon, drinking from a cup and a straw and independent finger feeding of food of different consistencies, textures and hardness, which are more mature feeding behaviours (Dodrill, 2014; Morris & Klein, 2000). These developments occur by two years of age as the higher cortical centers gain more control.

What, when and how young children are fed during the first two years of life lay the foundation for life-long survival, growth and development. This is a critical time in which feeding-related practices and behaviours are established. An infant's interpersonal

food environment includes both what and how they are fed. The term ‘interpersonal food environment’ primarily refers to the infant's close relationships with the parents or caregivers, who impose structural restrictions, routines, and expectations for food and mealtimes. For neonates, who solely rely on these connections to obtain food and facilitate mealtimes, these interpersonal interactions are significant elements of the food environment (Rosenkranz et al., 2008).

In the first few months, the infants are exclusively on breast milk. During this period, no other food or drink including water is recommended. The infants, then move on to a diet that includes non-milk items in the pureed, semisolid, and solid form after starting off on an all-milk liquid diet. Later, complementary feeding is initiated at around six months of age, in which foods are introduced to ‘complement’ the ongoing milk feeds. It is described as the intake of meals and liquids when breast milk, infant formula, or follow-up formulations are no longer sufficient to supply the nutritional needs of newborns (Fewtrell et al., 2017). This period is marked by changes in the diet with exposure to new foods, tastes, and feeding experiences. It should promote the consumption of a variety of meals that meet nutritional needs in addition to fostering the development of the best food-related behaviours, skills, and attitudes. Complementary feeding is an important step in the process of transitioning from breast feeding to family foods.

Parents serve as the gatekeepers of the early feeding environment, which is shaped through intricate interactions between parents and children related to feeding and eating. These interactions are known as ‘food parenting’ (Vaughn, Ward, Fisher, Faith, Hughes, & Kremers, 2016). Feeding styles and feeding practices are regarded to be part of food parenting. Feeding style refers to the overall emotional climate of the feeding dynamic,

whereas feeding practices refer to the specific strategies and behaviours (the "when, what, and how") of child feeding (Vaughn et al., 2016). Feeding practices are defined as strategies or behaviours which parents employ to manage their children's diets and food intake (e.g., what, when and how much a child should eat), both within and outside of the mealtime setting (Blissett, 2011; Schwartz, Scholtens, Lalanne, Weenen & Nicklaus, 2011; Ventura & Birch, 2008). There is evidence that feeding children involves two-way interactions, in which parents' feeding practices may influence or respond to children's eating behaviours (Jansen, Williams, Mallan, Nicholson & Daniels, 2018; Mallan, Jansen, Harris, Llewellyn, Fildes, & Daniels, 2018; Selzam, McAdams, Coleman, Carnell, O'Reilly, Plomin, et al. 2018). Additionally, research indicates that parental feeding methods have a significant impact on how children acquire their taste preferences, eating habits, nutrition, and final weight status (Carper, Fisher & Birch, 2000; Faith et al., 2004; Kremers, Brug, De Vries & Engels, 2003; Webber, Cooke, Hill & Wardle, 2010).

Parental feeding and child eating are fundamental to family life and are deeply ingrained in culture and tradition. Typically, the feeding techniques are passed down from grandmother to mother to daughter (Birch, 2006). Hence, feeding practices can be culture specific and can vary across different cultures. Different foods can be introduced to children at different ages as they grow, which may vary based on the place of dwelling. Additionally, the consistency and the type of utensils used could vary. The type of food provided could also vary depending on the place of dwelling and whether the parents are vegetarians or non-vegetarians.

The majority of neonates were given infant cereal by the time they were six months old, according to a study by Yu et al. (2019), making it the most frequently introduced food

(complementary feeds). In the Indian context, in addition to the cereals such as ragi, semolina, arrowroot or banana powder, other foods are also introduced such as pulses, soup, mashed and boiled fruits, fruit or vegetable purees etc. (<https://confusedparent.in/baby-food-chart-0-6-months/>).

In addition, the time of introduction of complementary foods also could differ based on a variety of factors such as maternal education, age, occupation, family type etc. The study by Yu et al., (2019) found that educated mothers introduced complementary foods earlier. Olatona et al. (2017) discovered that understanding of complementary feeding was low (14.9%) and was related to mother's age, education, and occupation. The relationship between the child and the primary caregiver, interaction, especially during meal and snack times, family mealtime environments, food preparation techniques, and children's participation in food planning and preparation, to name a few, all have an impact on feeding practices (Collins et al., 2014; Larsen et al., 2015; Stang & Loth, 2011). Additional environmental elements that affect feeding practices include food accessibility and availability, parental qualities (beliefs, attitudes, behaviours), child characteristics (temperament, health status, eating habits, learning behaviours, and food preferences), etc. (Scaglioni et al., 2008; Webber, Cooke, Hill & Wardle, 2010).

### **1.1 Need for the study**

India has numerous states and union territories, several thousand castes and tribes, six major world religions, and abundant ethnic and linguistic groups. It has a rich culinary heritage that evolved over centuries. Indian food style consists of a variety of regional and traditional cuisines native to the Indian subcontinent, which are unique to the soil, weather and various other environmental factors, leading to differences in locally available food



resources. Food in India has been impacted by many civilizations, each of which has contributed to its general evolution and current shape. Indian food is different from rest of the world in taste, in terms of preparation etc. as the food culture is shaped by climate, land, and access to natural resources.

Eating habits of the Indian culture are primarily based on culinary traditions. The type of food eaten across the country is diverse and highly influenced by social, cultural and economic factors. The diversity of India is surfaced with numerous cultures, religions, castes, class, family, kin-ship, tribe affiliation, lineage, religiosity, ethnicity, and increasingly, of secular group identification that can exhibit differences observed in the feeding practices, from that seen across the world. Given the diversity, what, when and how food is given to infants and children could differ across different states of India. There are higher opportunities of detailed variations in the type of food introduced at each age, its consistency, utensils, feeding position etc. Given the complexity and variation of feeding practices, studies exploring these in a country like India are vital. The present study is planned in the state of Telangana.

The state of Telangana has 33 districts, each with its own culture, traditions and beliefs. It lies on the Deccan plateau and its topography dictates more millets and roti-based dishes. Jowar and Bajra features more prominently in their cuisine. There are many styles of cooking in Telangana. In the villages, people still employ traditional methods in cooking. This includes wood-fired and Masonry's ovens. The food is typically spicy and ingredients such as tamarinds, sesame seeds, red chillies and asafoetida are predominantly used. There are many regional variations due to topographic differences in Telugu language speaking populations spread over a large area. Consequently, the parental

feeding practices and beliefs can vary from district to district. Studies examining the existing feeding practices in the Indian context are limited. Studies that have investigated the influence of parental education on feeding practices are also limited. To the best of researchers' knowledge, there is a dearth of studies that address this issue, particularly in Telangana. Keeping this in view, this research is designed to fulfil the following aim.

### **1.2 Aim of the study**

To investigate the nature of parental feeding practices in typically developing young children from one to three years in Telangana.

### **1.3 Objectives of the study**

The objectives of the study include the following:

1. To compare the parental feeding practices across the three districts (Hyderabad, Warangal and Bhuvanagiri)
2. To compare the parental feeding practices across the rural and urban population.

### **1.4 Hypothesis of the study**

The following hypothesis are proposed for the present study

***H<sub>01</sub>*** There is no significant difference in the parental feeding practices across the three districts

***H<sub>02</sub>*** There is no significant difference in the parental feeding practices across the rural and urban population.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Feeding appropriate types and amounts of foods promotes infant growth and development as well as overall health. Feeding refers to any part of eating or drinking, such as gathering and preparing food and fluids for consumption, sucking or chewing, and swallowing (Arvedson & Brodsky, 2002), while keeping the airway protected. The process of feeding in which the food gets transferred from the mouth to the stomach is classified into different phases. In order to make a cohesive bolus, the food or liquid is manipulated in the mouth. For liquids, the intake is through sucking, whereas for solids, it is chewed or masticated. This is the oral preparatory phase. This is followed by the posterior propulsion of the bolus, and the oral transit phase concludes with the commencement of the pharyngeal swallow. The pharyngeal swallow propels the bolus through the pharynx and upper esophageal sphincter, which constitutes the pharyngeal phase. Finally, the bolus is carried to the stomach through the process of esophageal peristalsis, which is the esophageal phase (Arvedson & Brodsky, 2002; Logemann, 1998).

All four steps of swallowing are reflexive and involuntary in neonates and young infants. Later, as the children age, the oral phase becomes voluntary, which is essential to allow them to begin to chew solid food. Mastication (biting and chewing) is safe and effective when appropriate sensory registration of the food supply is combined with a coordinated motor response driven by cognitive thought processes (Dodrill, 2014). In later life, the triggering of the swallow reflex is generally an involuntary activity, though it can be controlled voluntarily. However, the pharyngeal and esophageal phases of swallowing are involuntary activities.

## **2.1 Development of Feeding**

According to Dellow (1976), swallowing begins in the fetus, with suckling movements, drinking of amniotic fluid, and occasional presentation of the thumb in the mouth. The development of the embryonic gastrointestinal system, recirculating solutes from the fetal environment, and regulating the volume and content of the amniotic fluid all depend on the fetus's ability to swallow (Ross, 1998).

Socially acceptable eating starts at birth and develops during the course of the first few years of infancy in infants with regular development. It develops in a manner similar to that of general neurodevelopment, including the development of oral sensorimotor abilities, the acquisition of muscle control, including posture and tone, the development of cognition and language, and the development of psychosocial skills.

Homeostasis (0-2 months), attachment (3-6 months), and separation/individuation (6-36 months) are the three stages of normal feeding development (Chatoor & Egan, 1984). Infants aim for environmental homeostasis during the first 2 to 3 months of life. Sleep control, regular feeding patterns, and awake states that allow emotional attachment to primary caregivers are among the objectives. Infants begin to engage in interactional patterns with the caregiver during the attachment period (Greenspan & Lourie, 1981). During nipple feedings, they might pause more frequently after sucking bursts. This pausing could be for socialization purposes and thus feeding progressively turns into a social affair. Intuitive nipple control, reaching, grinning, and social play are all made easier by successful feeding experiences.

Around six months of age, infants start to exert more control over their surroundings, which marks the beginning of the separation/individuation phase. The fundamental behavioural development from 6 to 36 months is an effort to achieve a sense of self.

During the infancy period, infants are only able to suckle liquids and swallow, with the tongue still moving back and forth. The oral and pharyngeal cavities are smaller in infants because of the relatively small mandible and fat pads in the cheeks. Later, as the oropharyngeal skill improves, advanced feeding skill develops between 4 and 36 months (Arvedson & Brodsky, 1993). As the child grows, the sucking and swallowing action is followed by biting, chewing, eating from a spoon, drinking from a cup and a straw which are more mature feeding behaviors. The range of food textures which can be eaten by the children safely and efficiently, increases as the age progresses. These developments occur as the higher cortical centers gain more control (Arvedson & Brodsky, 1993). The progression seen in the development of feeding is as follows:

### ***2.1.1 Suckling and sucking in respect to breast feeding***

At this stage of development, suckling is characterized by the tongue moving back and forth as it fills the mouth cavity (Morris & Klein, 1987) such that suction and nipple compression succeed each other, which persist until 6 months of infancy. The direction of movement is more pronounced when moving backward. Forward movement does not extend beyond the border of the lips. It involves the coordination of tongue, hyoid, mandibular muscles and the lower lip. Suckling from the breast of the mother is what the infants learn to do first. The tongue's tip remains over the lower gum and under the lower lip while breast feeding, and the remainder of the tongue cups around the breast areola. The

mandible moves the tongue up, allowing the breast areola to be compressed against the infant's alveolar ridge. Milk is then expressed into the oral cavity (Arvedson & Brodsky, 1993). The World Health Organization (WHO), United Nations Children's Fund (UNICEF), recommend and promote exclusive breast feeding for the first six months of life and continuation of breast feeding thereafter till the age of two years or older (Global Strategy for Infant and Young Child Feeding, World Health Organization, 2003).

Sucking develops between 6 to 9 months. In this type of feeding pattern, the tongue body raises and lowers with strong movement of its intrinsic muscles, and thus the jaw makes a smaller vertical excursion (Morris & Klein, 1987). With a change in the direction of tongue movement during sucking, the infant is ready to move on to foods other than breastmilk.

### ***2.1.2 Transition from breast feeding to complementary food***

Complementary foods (CF) are defined as “all solid and liquid foods other than breastmilk or infant formula”. World Health Organization (WHO) defines complementary feeding as “a process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk” (WHO, 2001). In order to supply additional nutrients to newborns, complementary foods (items other than breast milk or infant formula) should be introduced (United States Department of Agriculture, USDA, 2009). The energy and nutritional gaps between the amount ingested through breast feeding and the amount needed daily for newborns and young children are intended to be filled by complementary foods.

Complementary feeding should be given timely (start receiving from 6 months onward) and adequately (in terms of amounts, frequency, consistency, and using a variety of foods). Food should be prepared and supplied in a safe and suitable manner (food should be of acceptable texture for the child's age) and by utilizing responsive feeding principles for psychosocial care (Monte & Giugliani, 2004).

Most newborns reach developmental readiness and the capacity to tolerate complementary feeding between the ages of 4 and 6 month (Issaka, 2015), which involves progressive gradation from suckle feeding of liquids to voluntary ingestion of physically varied food material. The target age range for complementary feeding is between the age of 6 and 23 months (with continued breast feeding), where most infants reach a general and neurological stage of development (chewing, swallowing, digestion, and excretion) that enables them to be fed other foods rather than breast milk (Monte & Giugliani, 2004).

Changes in the central nervous system along with the changes in anatomy are responsible for inclination for different textures. Additionally, when their neuromuscular system develops, they get the capacity to recognize food, accept spoons, chew and swallow food, and even recognize and appreciate the variety of food flavours and colours (Cohen, 1994). The intraoral space increases as the mandible grows downward and forward. The oral cavity also elongates in the vertical dimensions. The hyoid bone and larynx shift downward, so that the breathing and swallowing coordination becomes a factor during feeding, and breathing and swallowing truly become mutual activities (Arvedson & Brodsky, 1993). While the intestinal tract's capacity to metabolize proteins, lipids, and carbohydrates improves, it also has a well-developed defensive mechanism that reduces or eliminates the danger of allergic reaction following consumption of meals containing

foreign proteins. In a similar manner, the kidney of an infant matures to the point at which it can effectively flush out waste products from food.

The biting and chewing skills develop as an eruption of teeth occurs during this period. Since the size of the oral cavity increases due to the above changes, the tongue and the buccal wall play a major role in manipulating the food. An infant is ready for cup and spoon feeding when there is a decrease in the characteristic anteroposterior tongue action of sucking.

Infants show readiness for the transitional feeding i.e., introduction to complementary feeding can also be called spoon feeding around 4 to 6 months, which also is the period of attachment.

The ability to sit up straight without much support, maintain a midline head position without assistance for several minutes, use hand-to-mouth motor skills, and separate lip and tongue movements, which creates more space for the tongue inside the oral cavity and allows vertical tongue motion in addition to "in and out" sucking, are all signs that a child is ready to eat with a spoon. Infants develop the oral sensorimotor abilities necessary to consume thicker and lumpier food by spoon throughout the following few months.

About a month after spoon feeding becomes established, cup drinking is introduced. Generally, milk, juices and water are provided in the cup. Water should also be introduced to the infants only after 6 months along with other liquid complementary foods (Global Strategy for Infant and Young Child Feeding. World Health Organization, 2003). Normal infants usually get prepared to start drinking from an open cup with assistance from caregivers between 6 and 8 months of age. They initially swallow by sucking with their



tongues outward, which causes fluids to leak out of the mouth's corners. Most infants can drink successfully from a cup held by a caregiver by the time they are 9 to 10 months old. They eventually learn to take one or two drinks from the cup held by a caregiver. By the time they are 12 months old, the majority of infants can hold a cup with two hands and take four or five drinks in a row without choking. Thus, before they turn one year old, the majority of typically developing children can drink everything from a cup (Arvedson et al., 1996).

Between the ages of 6 and 9 months, the majority of children start using "soft chewable" for finger feeding. 'Annaprahsana' is the name of the religious ceremony performed by most of the communities in India, to start introducing other food items to the child. They eventually get better at picking up little bits of food (or other items) when they develop a thumb-and-forefinger pincer grip, which is projected to happen by 10 to 12 months.

As teeth develop by 6 months, biting emerges. Chewing also emerges with early munching patterns made with vertical jaw excursions and only limited lateral tongue movements. Children gradually develop a mature chewing pattern with rotating jaw motion and increasing lateral tongue excursions as they get more accustomed to certain textures. Foods with texture are gradually introduced, including dissolvable solids (for example, soft biscuits at 6 to 9 months), textured purees (for example, mashed banana at 6 to 9 months), ground solids at 6 to 9 months, and soft diced solids at the same time (for example, fruits and vegetables at 9-12 months). By 12-18 months of age, a standard toddler diet comprising table foods is introduced (Delaney & Arvedson, 2008). Chewing skills continue to mature

over a period of 2-4 years for "tougher" solids, such as some meats, raw vegetables, and fresh fruit.

Children between the ages of 12 and 36 months continue to develop their oral skills, expand the variety of foods they will eat, get better at chewing things that require more extensive oral manipulation, and handle liquids from open cups. Their eating is basically functional for regular table food with their peers and other family members. In summary, the feeding progression from birth to 24 months has been depicted in table 1 below.

**Table 2.1**

*Feeding progression from birth to 24 months (Source: Cichero & Murdoch: Dysphagia: foundation, theory and practice, 2006)*

| Age               | Food   | Feeding utensils                       |
|-------------------|--|--|
| Birth to 6 months | Milk, Liquids                                | Breast or bottle                       |
| 4-6 months        | Cereals, puree                               | Spoon                                  |
| 6-9 months        | Chunky puree, mashed food, soft finger foods | Spoon; drinking from cup (at 9 months) |

---

|              |  |  |
|--------------|--|--|
| 9-12 months  | Chopped food and finger food                           | Spoon; cup; self feeds with fingers; weaning from breast/ bottle as cup drinking increases |
| 15-24 months | Full diet with some exclusionary items (example- nuts) | Spoon, cup, fork; self-feeding predominates.   |

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Before birth, taste and flavour perception begins to develop. The fetus detects flavours in the amniotic fluid that were carried over from diet of the mother during pregnancy. Exposure to breast milk flavours may help to speed up the weaning process by enhancing preferences for certain flavours. After being weaned from the breast, the child accepts and appreciates that food's flavour. When a novel vegetable is initially presented, some breastfed babies are more receptive than formula-fed babies (Sullivan & Birch, 1994). Picky eating is also less likely to occur in infants who have been breastfed for at least six months (Galloway, Lee, & Birch, 2003).

Because of their sensory systems, infants have a natural affinity for sweets. Infants take about 4 months to develop the ability to taste salt and to like it. After birth, the capacity to recognize additional tastes and flavours grows. Early sensory exposure affects how children in infancy and childhood respond to flavours and foods (Mennella, Jagnow, & Beauchamp, 2001).

## **2.2 Prerequisites for Feeding Development**

The development of feeding and swallowing is the result of a complex interface between the developing nervous system, various physiological systems and the environmental factors that begins in embryological and fetal periods and continues through infancy and early childhood. For successful feeding, children need a typically functioning oral-motor, sensory and swallowing mechanism, and adequate musculoskeletal tone, for which the development and maturation of the neurologic, respiratory and gastrointestinal systems are also essential (ASHA, n.d.).

The transition from brainstem-mediated suckling reflexes to complex, voluntary mouth movement during feeding depends on a number of important preconditions, one of which is early neurologic development. The oral cavity, pharynx, and esophagus, important in feeding, effectively integrate and coordinate their functions through a neuronal network. The integrity of these structures that constitute the feeding and swallowing mechanism is essential. The complex feeding behaviors emerge from the interactions of cranial nerves of the brainstem, which is governed by the neural regulatory mechanisms in the medulla oblongata, as well as the higher cortical and subcortical structures.

Gross motor and fine motor development is a prerequisite for independent feeding to occur. As the nervous system develops, the control of pelvis, trunk, neck, shoulder, and jaw matures in a sequence, which leads to jaw stability. Jaw stability is a prerequisite for developing appropriate refined tongue, cheek and lip movement (Morris & Klein, 1987). The gross motor control is necessary to support the fine motor control which includes chewing and biting.

Adequate oral motor development is also an essential prerequisite (Bosma, 1986). The child's oral motor skills gradually improve as they transition from breast feeding to bottle feeding, take in solid foods with a spoon, move on to mashed and soft pieces that can be broken with the tongue, and then soft and hard food textures that require biting and chewing. They also help them drink from a bottle, straw, or open cup (Dodrill, 2014; Morris & Klein, 2000).

### **2.3 Critical and Sensitive Periods**

Lorenz (1965) stated that early on in development, the organism is prepared to take in and possibly permanently encode significant information from the environment. Although they emphasize the importance of the early experiences, these views do not rule out the possibility of later learning. It is thought that the formation of typical feeding behaviour occurs during critical and sensitive periods. Birth to two years is the important feeding learning phase (Bahr & Johanson, 2013). In humans, exposure to age-appropriate meals and experience are crucial. The introduction of chewable textures is the main emphasis of descriptions of sensitive times. When chewing, children often acquire oral side preferences that are related to hand preferences. Compared to foods that are fluid or pureed, children acquire mature chewing techniques for solid foods earlier. However, it is typical for children who haven't mastered the timing and coordination necessary for swallowing purees and other smooth foods to be maintained on such textures since caregivers could think these children aren't ready for the introduction of chewable food. This might not be the case because children need to be exposed to solid foods at the right times. If chewables are offered to infants after the crucial period, they can reject them. Many infants find it more challenging to accept chewable food the longer solids are delayed in being



## **2.5 Factors Affecting Feeding Development**

Feeding development is a learnt succession of behaviours that can be altered by a various factors, yet being dependent on anatomical integrity and brain maturation. Infant feeding is a reciprocal procedure involving a give-and-take exchange that is dependent on the skills and personality traits of the caregivers and the infants. This learning is heavily influenced by several experiential opportunities.

A healthy positive feeding relationship between the caregiver and the child is important for successful feeding. The process of self-regulation during the homeostasis stage is something that caregivers need to be aware of. When an infant shows signs of hunger, caregivers must notice them and act quickly. They should also help the child get back into a calm, orderly condition after becoming overstimulated or upset. Understanding the learning processes that underlie the development of food liking and self-regulation of intake during the first 24 months of life is important because what children learn in this domain during infancy and toddlerhood affects subsequent eating behavior, growth, and weight status (Paul 2009).

Caregivers also should respond appropriately to increased pauses taken during breast feeding, as they become more social. Additionally, parents and other caregivers should establish limits, rules, and structures that let infants safely experiment with food. They should have the knowledge of the type of food to be given to the child at different stages and also should use appropriate strategies during feeding.

Numerous environmental and societal factors, including religion and residence, have an impact on feeding. When compared to other religions, the Hindu religion, for

instance, was found to be strongly related with timely breast feeding initiation. The basic physiologic complexity of feeding is compounded by individual temperament, interpersonal relationships, and environmental influences. Oral feeding skill is also influenced by level of awareness, stress, illness and fatigue of the caregivers.

Additionally, experiences within families and social networks as well as social and cultural factors have an impact on feeding decisions (Bloom et al., 2008; Dar et al., 2012, Kruger & Gericke, 2003; Laroia & Sharma, 2006; Yadavannavar & Patil, 2011). Bloom et al., (2008) compared breast feeding women who were older and of higher socioeconomic position to formula-feeding mothers. They discovered that breast feeders had much higher propensities to consult literature or advice when making their decision to breastfeed. The study revealed the influence of social and cultural aspects in choosing the method of feeding.

Cultural factors, beliefs, knowledge regarding appropriate practices, timing and consistency of complementary food also influences the complementary feeding practices (WHO, 2019), which varies significantly with maternal education and paternal education and socioeconomic status. Cultural variables and women's experiences differ greatly across India. Grandmothers have an important influence on feeding practices (Laroia & Sharma, 2006), which is passed on from one generation to the next. Infant feeding and raising habits vary by community, and are influenced by social traditions, traditional beliefs and prejudices, literacy, and the family's socioeconomic situation, particularly that of the mother.

Kavitha et al. (2014) reported that the use of proper weaning practices was found to be significantly related with residence area and education level of the mother. Nursing



mothers who were home makers and had a family income of more than Rs.10,000 preferred commercial weaning foods. One of the challenges to practicing exclusive breast feeding may be maternal employment. Working mothers from rural areas find it very challenging to continue exclusively breast feeding because they must return to work as soon as possible (Annie, 2017; Zahiruddin et al., 2016). Hence, they tend to introduce complementary feeds at an early age.

In India, the pattern of complementary feeding and its timely commencement are not ideal. Women in employment face challenges for following ideal Infant and Young Child Feeding practices, which have a substantial impact on growth and development of child under 2 years of age. The goal was to research the problems encountered by women in employment for complementary feeding and its pattern in rural area. A qualitative study was carried out in the Wardha district of India's countryside. Six focus group discussions (FGDs) were held, with a total of 39 participants, including community-level service providers and working women with children aged 6 to 23 months. Women in remote areas could not practise exclusive breast feeding for six months and returned to work early. They started complementary feeding early and were not adequately informed about it. At 4-6 months, women begin semisolid and soft food, and at 7-9 months, they introduce mashed solid food. When women are at work, they frequently leave their infants in the care of local neighbours or elderly relatives. There are no creches or child care centers in villages. All of these factors put complementary feeding at risk in terms of timing, sufficiency, suggested dietary diversity, and safe feeding. The difficulties of practising exclusive breast feeding for 6 months, as well as early initiation and inadequate complementary feeding, have a negative impact on children's growth and development in rural areas, which may

have unintended long-term consequences for cognitive development. An effective technique for assisting the women in employment to follow the best IYCF guidelines would be to strengthen the Anganwadi programme in India with a greater emphasis on children under 2 years old and community infant care rooms / creches services. India needs measures that provide a positive work environment and enough legal protection for working women.

National Family Health Survey-III (NFHS) & National Family Health Survey-IV (NFHS) of India identified various other determinants like low maternal education, lower maternal Body Mass Index ( $<18.5 \text{ kg/m}^2$ ), lower wealth index, less frequent antenatal clinic visits, lack of postnatal visits and poor exposure to media for not meeting minimum dietary diversity and minimum acceptable diet in complementary feeding (International Institute for Population Sciences, 2017; Patel, 2012).

Mothers with two or more children were more likely to cease exclusive breast feeding in the first six months compared to mothers with less than two children. Also, mothers in nuclear families, compared to mothers from joint families, were more likely to cease breast feeding. Hence, the number of children and members in a family were a significant determinant (Velusamy et al., 2017).

In an Australian study, first-time mothers did not show a strong comprehension of the reasoning behind the advice to introduce complementary foods until after six months or of the signals that an infant is ready to start eating solid foods (Walsh et al., 2015).

Thus, several studies highlight that feeding practices such as age of introduction and termination of breast feeds, age of introduction of complementary feeds, the type of complementary feeds could be influenced by several factors.

## **2.6 Feeding Practices in the Western Context**

Several studies have explored the feeding practices primarily in terms of age of introduction and termination of breast feeds, introduction of formula milk and complementary feeds. For Eastern Ethiopia, the prevalence of timely beginning of complementary feeding was 60.5%. Nineteen percentage of mothers started complementary feeding before their babies were six months old. Due to mother's perceived insufficient breast milk production and lack of knowledge, complementary feeding was started too early. When compared to mothers of female children, mothers of male children were three times more likely to promptly begin complementary feeding. This might be due to traditional gender norms that discriminate against female feeding "female eat little talk little" this might start at an early age of life (Semahegn et al., 2014).

In a Pakistani research, just 49% of mothers started breast feeding within an hour after giving birth. For the first six months, 37% of mothers exclusively breastfed their babies. At 6 to 8 months of age, supplemental feeding was first offered by 70% of mothers. Breast feeding was continued by 82% of women for at least a year, and there were no appreciable differences in behaviours between boys and girls. Low-quality practices were discovered, and they were linked to factors like mother age, illiteracy, unemployment, and low household wealth status (Khan et al., 2017).

## 2.7 Feeding Practices in India

Similarly, studies have explored the feeding practices in India primarily in terms of age of introduction and termination of breast feeds, introduction of formula milk and complementary feeds. According to The Third National Family Health Survey (NFHS-3, 2005-2006) of India, overall, 48.3% of children between zero to five months were solely breastfed, and 53.8% of children aged six to nine months got introduced with complementary foods.

A study by Aggarwal et al. (2008) in an Indian tertiary hospital, 17.5% of women began complementary feeding at the suggested period. The most often cited justification for improper behaviour among women who postponed feedings was "tried but did not eat, vomits everything." Only nine of the 151 mothers interviewed in six villages in Uttar Pradesh's Ghaziabad area offered semi-solid/solid foods with breast feeding at six months of age, according to a study by Garg and Chadha (2009).

A study by Mahmood (2012) conducted in villages of Uttar Pradesh, indicated that within 24 hours of birth, majority of the mothers (78.8%) started nursing. Colostrum was not given to 15.4% of the newborns. The most prevalent reason given by women for rejecting colostrum is that they believe it is harmful to their children. The percentage of infants who weren't exclusively breastfed was about 22.8%. Insufficient milk secretion was the most common reason for not doing so (71.4 %). Pre-lacteal meals included Ghutti, which is water combined with honey and herbs (42.9%), heated water (21.4%), tea (21.4%), and animal milk (14.3%). One-fourth of those surveyed began complementary feeding before the infant was six months old. Semi solid food was the most prevalent type of complementary meal supplied (53.7% of mothers provided the semi solid food), out of

which 13.8 % of the mothers started introducing semi-solid meals, before the infant was six months old.

According to a cross-sectional study conducted by Khan et al. (2012) to examine the diet pattern of children under the age of two years with regard to specific infant and young child feeding (IYCF) indicators, 72% of Delhi children were found to be weaned at 6 to 8 months, which was greater than the data from the national family survey. 57.1 % of mothers of infants under 6 months old were found to exclusively breastfeed their children. Of children between the ages of 6 months and 2 years, 32.6 %, 48.6 %, and 19.7 %, respectively, thought their diets met the minimum requirements for nutritional diversity, meal frequency, and minimum acceptable diet.

The parents of 100 children aged six months to two years in Madhya Pradesh favored liquid feeds (63%), followed by semisolid (32%) and solid (5%) foods. The feeds that were deemed excellent were rice water (72%) and top milk (67%). Ghee/oil was added to the child's diet by 62% of parents (Lodha, 2013). Complementary feeding was typically initiated with liquid diets such as diluted bovine milk and rice water, followed by semi-solid meals such as dal, khichdi, rice, and other locally available foods in the majority of studies. At the age of nine months, solid meals such as chapati, eggs, and mashed vegetables were introduced. Green leafy vegetables were not offered to the majority of the infants.

Kavitha et al. (2014) assessed the complementary feeding practices of 50 mothers with infants between the ages of 6 months to one year in Salem, district of Tamil Nadu. They found that 62% of the mothers had initiated complementary feeding before the recommended time of 6 months.

At the age of 6-8 months, 46.67% of newborns were fed solid, semisolid, or soft foods, according to the results of a study conducted among 120 mothers in West Bengal with children aged 0 to 23 months. The proportion of children aged six to nine months who received supplemental feeding was substantially lower than the NFHS-3 findings in rural West Bengal (55.3%) (Mondal, 2014).

Foods including mashed dal and rice, mashed seasonal fruits and vegetables, and biscuits with milk were given to the majority of the children in a study of 100 children under the age of five in Pune. Milk was supplied to 73% of newborns, while the rest were unable to receive it either due to financial constraints (15%) or because the child refused to drink (11%) (Sapra, 2015).

In Kolkata, the weaning of only 36% of the children was started on complementary feeding at the correct age of 6 months and 32% of children aged from 6 to 23 months began before they were 6 months old (Dasgupta et al., 2014).

In another study carried out by Kalita and Borah (2016) in rural areas of Assam, it was found that before the age of six months, 14.2% (out of total 380 mothers) of mothers provided complementary foods. Insufficient breast milk was reported by 37 (68.5%) of the 54 women as the reason for starting complementary feeding earlier than six months, followed by child's demand by 17 (31.5%) of the mothers. 70 (50.3%) women were unaware of the real time of commencement, 41 (29.5%) mothers believed the kid could not digest solid food, and 28 (20.2%) mothers initiated late as instructed by elders among the 139 moms who introduced supplemental feeding later than six months.

Gaddapa and Behera (2016) studied 125 children aged 0 to 24 months and found that only 38% received complementary feeding between the ages of 6 and 9 months, compared to 48.8% who began complementary feeding before the age of six months, in some cases on the first day of birth. Sixty percent of children aged nine months and older who received complementary feeding suffered severe acute malnutrition. Malnutrition was found to have a statistically significant connection with the age at which supplemental feeding began.

According to a study conducted in Chandigarh to evaluate infant feeding behaviors among mothers of newborns, 81.7 % of 300 women began supplemental feeding between the ages of six and eight months for their infants (Pradhan, 2016).

Zahiruddin et al. (2016) investigated the difficulties faced by employed women for complementary feeding and the pattern of complementary feeding in rural area of Wardha district, Central India using focus group discussion. Thirty-nine women with children between 6-23 months were included as participants. They found that, in rural area, women start work early and find it difficult to practice exclusive breast feeding for six months. They commence complementary feeding early, but had scanty awareness regarding complementary feeding. They found that newborns were given prelacteal feeds such as honey, sugar or jaggery dissolved in water. They did not use a baby feeding bottle to feed the child. It was also noted that babies were given pacifiers in the form of biscuits and other food when he/she cries, especially when mothers are working women or when women are busy doing household work. Women begin semisolid and soft food at 4-6 months and crushed solid food at 7-9 months since they must leave their baby with elders

or neighbours. This impairs complementary feeding in terms of dietary diversity, timing, adequateness, and safety.

Dhami's study (2019) found a wide range of prevalence of solid, semi-solid, or soft food (complementary meals) introduction among infants aged 6–8 months throughout regional India, with the highest prevalence in the South (61%) and the lowest prevalence in the Central and Northern regions (38%). Similarly, the South (33%) had the highest minimum dietary diversity (MDD), while the Central region had the lowest (12%). The minimum meal frequency (MMF) and minimum acceptable diet (MAD) differed significantly between areas. The factors associated with complementary feeding practices also differed across Indian regions.

Other liquid foods, including as cow's milk, lentil soup, and rice water soup, were typically offered in Maharashtra between the ages of 5 and 7 months. The semisolid, solid foods and fruits were introduced by 6 to 8 months. Bananas were being introduced quite late compared to other fruits. It was found that infants between the ages of 6 months and 12 months received two food categories for 24 hours, namely milk and cereals, while children between the ages of 13 and 24 months received three food groups, primarily milk, cereals, vegetables, and/or fruits. However, older people, particularly grandmothers, made the decision regarding the choice of complementary feeding (Kogade et al., 2019).

Behera et al. (2020) assesses complementary feeding in an urban slum of East Delhi and explored its association with the socio-demographic factors. Early initiation of breast feeding was practiced in around half of the children. Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF) and Minimum Acceptable Diet (MAD) was found to be 17.7%, 69.1% and 16.6%, respectively. These complementary feeding indicators were



found to be better among higher age group children, mothers with higher level of education and middle socio-economic class in comparison to lower socioeconomic sections of the study population. They concluded that infant and young child feeding practices were poor.

Liaqualthali (2020) assessed the infant feeding practices in the rural region of Kancheepuram district, Tamil Nadu from June to December 2019. They found that only 10.2% were solely breastfed for 6 months. 58.6% of children were introduced to soft/solid/semisolid food at the end of 6 to 8 months. Infants who were breastfed had a minimum acceptable diet of 31.5 %, while non-breastfed infants had a minimum acceptable diet of 14 %. Additionally, they discovered that proper Infant and Young Child Feeding practices were statistically associated with the mother's age, educational level, employment position, and mode of delivery.

Kamble et al. (2020) found that mothers in Haryana had good knowledge about breast feeding, but with regard to complementary feeding practices, there was a knowledge gap regarding initiation and composition of complementary foods.

To summarize, an in-depth review of literature revealed that the feeding practices across India, particularly the age of introduction of complementary feeds and the type of food introduced are varied. The review also highlighted that the feeding practices are influenced by several factors. The existing studies mostly focused on the type of food and age of introduction of food. The consistency of the food, the utensils used and the position used for feeding have received less attention. These are important from the perspective of management of feeding difficulties for speech-language pathologists. Moreover, the knowledge regarding the type of food and liquid including water introduced and age of

introduction, will assist the speech-language pathologists during management. Most of the existing studies have been conducted from the nutritionist perspective. Similar studies in parts of South India, particularly in Telangana, which is a newly formed state, are scarce. Since studies investigating these aspects are limited, the present study was planned with the aim of assessing prevalent feeding practices. The next chapter describes the method of the study.

## **CHAPTER III**

### **METHOD**

The primary aim of the current study was to explore the feeding practices among three districts of Telangana. The study investigated the feeding practices across the three districts and across urban and rural population. This chapter describes the participants who were involved in the study, the tool that was developed and used in the survey, and the procedures that were followed in the process of collecting and analysing data.

#### **3.1 Research Method/Design**

The study followed a cross sectional survey type of research design conducted through an online mode.

The study was conducted in three phases:

Phase 1: Development of the survey tool

Phase 2: Validation of the tool

Phase 3: Administration of the tool

#### **3.2 Phase 1: Development of the survey tool**

A survey tool was developed to assess the feeding practices incorporating different sections. The survey tool was designed based on a literature search through google and books related to development of feeding. Item pools for each section were created after taking into consideration the redundancy of items and relevance under each domain of interest. Care was taken to maintain suitability of the items to Indian context.

### ***3.2.1 Section 1***

The survey tool comprised of a section on demographic details of the participants. The questions of the demographic section was intended to gather information like maternal age, contact details, number of children, their ages and gender. It also included questions to extract information about maternal education, employment, socioeconomic status, region, religion, type of family, type of diet, first/second time mother etc.

### ***3.2.1 Section 2***

The section 2 of the survey was developed to gather information on the infant/child's general health and behavior. This was included to ensure all the children had normal developmental milestones with no health and behavioral issues. It also gathered information on child's feeding behavior whether the child was a picky eater and whether the child was easy to feed.

### ***3.2.2 Section 3***

The third section of the survey tool was developed to extract information about the hierarchy of food type, texture and consistency introduced, the age at which introduced, position used to feed the child, utensils used etc. Information regarding introduction of water was also included. Provision was also made to document the variety of food items fed to the child in the first two years of life. Sixteen items were included in this section.

Pictures were added to support the written information for the options of a few items on consistencies, textures, utensils and positions used for feeding.

### **3.3 Phase 2: Validation of the tool**

The prepared survey tool was given to three Speech-Language Pathologists (SLPs) with at least ten years of clinical experience in the area of feeding and its disorders. The content validation was done using the parameters from feedback rating questionnaire (adapted from Manual for Non-fluent Aphasia Therapy in Kannada, Goswami et al., 2012) and Survey Instrument Validation Rating Scale (Michael, 2020). The SLPs were asked to judge the clarity, simplicity, relevance, framing, applicability and appropriateness of the items as well as clarity, simplicity, relevance, color, appearance and iconicity of the pictures included using a Likert rating scale from 1 to 5 wherein 1 indicated “poor”, 2 indicated “fair”, 3 indicated “good”, 4 indicated “very good” and 5 indicated “excellent”.

A master chart was made with the validation scores and remarks provided by all the three SLPs. The items with a rating of 3 and above by 2 or more SLPs were included in the tool. The modifications and suggestions provided by the judges were incorporated. The options under the items related to position were expanded. A few questions were reframed to resolve their ambiguity. A few questions were added based on the suggestions provided by the judges. A few pictures were replaced with other pictures better clarity.

A pilot study was conducted on six participants (two from each district) after which a few age ranges in the options were modified. The final survey tool had the same three sections as the initial one, however, the number of items in the third section were 21. The final survey tool has been attached in the Appendix

### **3.4 Phase 3: Administration of the tool**

#### **3.4.1 Participants**

The present study included 90 mothers of typically developing children in the age range of 1-3 years - 30 mothers from three districts each- Warangal, Hyderabad, and Bhuvanagiri. These three districts were taken because of their geographical location for better representation of the Telangana state as a whole. Convenience sampling method was used to select the participants. The participants were recruited through personal contacts, referral through friends and family, and parent groups on various social media platforms and Anganwadi schools. The participants were selected based on the following inclusion and exclusion criteria.

##### **Participant inclusion criteria:**

- Females in the age range of 18-40 of years
- Both first and second time mothers
- Mothers of typically developing children
- Native residents of the particular district
- Mothers with feeding experience of at least 2 years

##### **Participant exclusion criteria:**

- Mothers of specially abled children
- Mothers of children with frequent medical illness
- Mothers of children who went to the day care

The mothers belonged to the age group of 21-35 years. The mean age of infants across all the districts was 2.2 years out of which 44 were males and 51 females. In order to determine the socio-economic status of participants, Modified Kuppuswamy socioeconomic scale updated for the year 2021 (Sheikh et al., 2021) was used. Majority of the mothers belonged to middle class and resided in urban areas. 60 mothers were homemakers and the rest were employed. Majority of the mothers belonged to Hindu religion. 56 mothers were first time mothers. 58 mothers resided in nuclear family and rest were in a joint family. Majority of them were non vegetarians and rest of them half were eggetarians and half were vegetarians.

The participants of all the districts were divided into two groups based on their region: urban and rural. Among the total participants, urban region consisted of 46 mothers and rural region consisted of 44 mothers.

**Table 3.1**

*Distribution of region across all the districts*

| <b>Region</b> | <b>Warangal</b> | <b>Hyderabad</b> | <b>Bhuvanagiri</b> | <b>Total</b> |
|---------------|-----------------|------------------|--------------------|--------------|
| Urban         | 15              | 17               | 14                 | 46           |
| Rural         | 15              | 13               | 16                 | 44           |

### **3.4.2 Procedure**

The finalized survey tool was administered on the participants through the virtual mode in the form of an interview via Google Meet or Whatsapp Video Call. Since there were participants from all socioeconomic strata, both these online platforms were chosen.

The specific online platform for a particular participant was selected based on the convenience, availability and the knowledge regarding its use. During the interview, the participants were also shown the pictures of various utensils, positions used to feed the child, textures and consistencies of the food items, which were a part of the third section of the survey tool. Before the initiation of the interview, the purpose of study was explained. All ethical standards were met for participant selection and their participation. Prior to testing, a written consent was obtained from the parents of the participants after explaining the purpose of the study. AIISH Ethical Guidelines for Bio-Behavioural Research involving Human Subjects (AEC, 2009) were followed. The online interview was conducted for about 30-35 minutes for each participant.

### **3.5 Assessment of test-retest reliability**

To assess the reliability of the data, the survey tool was re administered on ten percent of the participant sample (3 per district) selected randomly after 1-2 weeks of the initial responses.

### **3.6 Data Analyses**

The compiled data was analysed through appropriate statistical measures. As the present study was survey type of research, simple descriptive statistics were applied to obtain the frequencies and the percentage.



## CHAPTER IV

### RESULTS AND DISCUSSION

The primary aim of the present study was to investigate the nature of feeding practices in typically developing young children from one to three years (Mean = 2.2, S.D = 0.47) in three districts of Telangana. The objectives of the study was to compare the feeding practices across the three districts (Hyderabad, Warangal and Bhuvanagiri) and across rural and urban population. A total of 90 mothers 30 from each district in the age group of 21-35 (Mean = 28.2, SD = 3.32) participated in the study.

The survey tool had three sections, section 1 focused on documenting the demographic details, section 2 focused on the child's general health and behaviour and section 3 included items related to the hierarchy of food type, texture and consistency introduced and the age at which introduced, position used to feed the child, utensils used etc. The third section contained 21 items.

The survey tool was validated by speech-language pathologists. The responses from the parents were obtained through an online interview and the responses were recorded. Statistical analysis (frequency and percentage) was carried out using SPSS-Statistical Package for Social Sciences Version 20.0 (IBM Corp., Armonk, NY, USA).

In order to assess the reliability of the responses obtained, the assessment of test-retest reliability was done. The survey tool was re-administered for 10% of the population (3 from each district) within 1-2 weeks from the first administration. The Cronbach's alpha value was calculated for each item, which turned out to be 1, indicating high reliability of the responses.

In addition to the maternal age, the other demographic details of the participants documented through the section 1 of the tool were religion, type of family, socioeconomic status, maternal literacy levels, first/second time mothers, maternal occupation, type of diet, and rural/urban area. This information was extracted as these factors could influence feeding practices. The details of the demographic information have been provided in the tables 4.1 to 4.9.

**Table 4.1**

*Distribution of religion of the participants across districts*

| Religion  | Warangal |    | Hyderabad |      | Bhuvanagiri |      | Total |      |
|-----------|----------|----|-----------|------|-------------|------|-------|------|
|           | n        | %  | n         | %    | n           | %    | n     | %    |
| Hindu     | 27       | 35 | 26        | 33.7 | 24          | 31.1 | 77    | 85.5 |
| Christian | 3        | 23 | 4         | 30.7 | 6           | 46.1 | 13    | 14   |

The data in table 4.1 revealed that greater number of participants belonged to Hindu religion compared to Christian religion as reflected through the total number and the number across districts.

**Table 4.2**

*Distribution of type of family across districts*

| Type of family | Warangal |    | Hyderabad |      | Bhuvanagiri |    | Total |      |
|----------------|----------|----|-----------|------|-------------|----|-------|------|
|                | n        | %  | n         | %    | n           | %  | n     | %    |
| Joint          | 12       | 40 | 8         | 26.7 | 12          | 40 | 32    | 35.6 |
| Nuclear        | 18       | 60 | 22        | 73.3 | 18          | 60 | 58    | 64.4 |

The data from table 4.2 revealed that greater number of participants stayed in nuclear family as reflected through the total number across districts. Studies in the literature suggest the type of family could influence feeding practices. For example, a study by Velusamy et al. (2017), found that mothers of nuclear family terminated the breastfeeding early because of their other household chores which have to be looked upon by them single handedly.

**Table 4.3**

*Distribution of socioeconomic status of participants across the districts*

| <b>Socioeconomic status</b> | <b>Warangal</b> |          | <b>Hyderabad</b> |          | <b>Bhuvanagiri</b> |          | <b>Total</b> |          |
|-----------------------------|-----------------|----------|------------------|----------|--------------------|----------|--------------|----------|
|                             | <b>n</b>        | <b>%</b> | <b>n</b>         | <b>%</b> | <b>n</b>           | <b>%</b> | <b>n</b>     | <b>%</b> |
| Upper                       | 5               | 16.7     | 4                | 13.3     | 5                  | 16.7     | 14           | 15.6     |
| Upper middle                | 9               | 30       | 12               | 40       | 10                 | 33.3     | 31           | 34.4     |
| Lower middle                | 7               | 23.3     | 10               | 33.3     | 6                  | 20       | 23           | 25.6     |
| Upper lower                 | 9               | 30       | 4                | 13.3     | 9                  | 30       | 22           | 24.4     |

The data in the table 4.3 revealed that the participants were distributed across various socio economic status as reflected through the total number across districts. Studies have revealed that mothers from lower socioeconomic status are less aware about how important breastfeeding is and they do not exclusively breast feed their child for first 6 months. Insufficient milk secretion is also the reason given by such mothers (Mahmood, 2012). Khan et al. (2017) also revealed that low quality feeding practices are associated with lower socioeconomic class, maternal illiteracy and unemployment.

**Table 4.4***Distribution of maternal literacy across districts*

| <b>Groups</b>                                     | <b>Warangal</b> |          | <b>Hyderabad</b> |          | <b>Bhuvanagiri</b> |          | <b>Total</b> |          |
|---|-----------------|----------|------------------|----------|--------------------|----------|--------------|----------|
|   | <b>n</b>        | <b>%</b> | <b>n</b>         | <b>%</b> | <b>n</b>           | <b>%</b> | <b>n</b>     | <b>%</b> |
| Group1- Graduate as well as post-graduate mothers | 12              | 40       | 15               | 50       | 9                  | 30       | 37           | 41.1     |
| Group 2- 10 <sup>th</sup> /12 <sup>th</sup> grade | 9               | 30       | 11               | 36.6     | 4                  | 13.3     | 28           | 31.1     |
| Group 3- Primary/middle school                    | 9               | 30       | 8                | 26.7     | 12                 | 40       | 25           | 27.7     |

It was found that the literacy level varied widely across the participants. The distribution of data indicated that participants in the group 1(Graduate as well as post-graduate mothers) were higher than in group 2(10<sup>th</sup>/12<sup>th</sup> grade) and group 3(Primary/middle school) across all districts. According to Kavitha et al. (2014), appropriate weaning practices are significantly related to the literacy levels of the mothers. Maternal education also influences feeding practices including, timing and consistency of complementary food (WHO, 2019; Behera et al., 2020; Liaqualthali, 2020).

**Table 4.5***Distribution of first time and second time mothers across districts*

| <b>Maternal feeding experience</b> | <b>Warangal</b> |          | <b>Hyderabad</b> |          | <b>Bhuvanagiri</b> |          | <b>Total</b> |          |
|------------------------------------|-----------------|----------|------------------|----------|--------------------|----------|--------------|----------|
|                                    | <b>n</b>        | <b>%</b> | <b>n</b>         | <b>%</b> | <b>n</b>           | <b>%</b> | <b>n</b>     | <b>%</b> |
| First time                         | 17              | 56.6     | 18               | 60       | 21                 | 70       | 56           | 62.2     |
| Second time                        | 13              | 43.3     | 12               | 40       | 9                  | 30       | 34           | 37.7     |

The data in the table 4.5 revealed that greater number of participants were first time mothers as reflected through the total number and the number across districts. Experience as a mother could also influence feeding practices. Second time mothers already have feeding experience of feeding their first infant. Hence, they tend to follow appropriate feeding practices as compared to the first time mothers with no experience. Walsh et al. (2015) also found that first time mothers introduced complementary feeding early because of lack of experience.

**Table 4.6**

*Distribution of maternal occupation across districts*

| Occupation | Warangal |    | Hyderabad |      | Bhuvanagiri |      | Total |      |
|------------|----------|----|-----------|------|-------------|------|-------|------|
|            | n        | %  | n         | %    | n           | %    | n     | %    |
| Employed   | 18       | 60 | 20        | 66.7 | 8           | 26.7 | 30    | 33.3 |
| Homemaker  | 12       | 40 | 10        | 33.3 | 22          | 66.7 | 60    | 66.7 |

The data from table 4.6 revealed that greater number of participants were unemployed as reflected through the total number and the number across districts. The employment status of the mothers also could influence feeding practices. For example, studies by Zahiruddin et al. (2016) and Annie (2017) found that the employed mothers tend to terminate breast feeding early and introduce complementary feeding because they have to return to their work. Also, Kavitha et al. (2014), found that working mothers from rural areas found it difficult to continue the exclusive breastfeeding and thus, started the complementary feeding early.

**Table 4.7***Distribution of type of diet across districts*

| Type of diet     | Warangal |      | Hyderabad |      | Bhuvanagiri |      | Total |      |
|------------------|----------|------|-----------|------|-------------|------|-------|------|
|                  | n        | %    | n         | %    | n           | %    | n     | %    |
| Non- vegetarians | 23       | 76.7 | 20        | 66.7 | 20          | 66.7 | 63    | 70   |
| Eggetarians      | 4        | 13.3 | 6         | 20   | 5           | 16.7 | 15    | 16.7 |
| Vegetarians      | 3        | 10   | 4         | 13.3 | 5           | 16.7 | 12    | 13.3 |

The data in table 4.7 revealed that greater number of participants belonged to the non- vegetarian group as reflected through the total number. The number of Eggetarians (diet with eggs, milk and milk products, fruits, vegetables, cereals and pulses with no other non-vegetarian items) and vegetarians were lesser.

**Table 4.8***Distribution of rural and urban population across districts*

| Geographical area | Warangal |    | Hyderabad |      | Bhuvanagiri |      | Total |      |
|-------------------|----------|----|-----------|------|-------------|------|-------|------|
|                   | n        | %  | n         | %    | n           | %    | n     | %    |
| Rural             | 15       | 50 | 13        | 43.3 | 16          | 53.3 | 44    | 48.9 |
| Urban             | 15       | 50 | 17        | 56.7 | 14          | 46.7 | 46    | 51.1 |

The data in table 4.8 revealed that there was equal distribution of mothers from rural and urban areas of Telangana. Since the distribution of rural and urban were nearly equal, feeding practices were compared across these areas. The mothers from rural areas were those who resided in villages or countryside, which were located outside towns and

cities. The mothers from urban areas included those who resided in cities, towns and suburbs.

The results of the section III of the survey tool have been described and discussed under the following sections.

#### **4.1 Breastfeeding practices:**

##### ***4.1.1 History of breast feeding:***

The item one of the survey tool focused on extracting information regarding whether all the participants breastfed their babies or not. This item was included because some studies revealed that some mothers would provide formula feed as they had insufficient breast milk.

**a. Comparison across districts:** The results revealed that all the mothers in all the districts across both the regions breastfed their infants, that is 100% of the participants breast fed their infants. However, among these, 83 mothers (92.2%) exclusively carried out breast feeding and 7 mothers (7.8%) also introduced formula feed at various ages before 6 months, the details of which are provided in the next section. Among these, 5 mothers (71.4%) who introduced formula feed, introduced it between 3-4months, since they had insufficient milk secretion.

For new-borns, breastmilk is the best food. It contains antibodies that aid in preventing a number of prevalent paediatric ailments, and it is secure and hygienic. Breastmilk continues to supply up to half or more of a child's nutritional needs during the second half of the first year of life and up to one third during the second year of life, providing all the energy and nutrients that the infant need for the first few months of life

as recommended by WHO. Very early skin-to-skin contact and suckling may have physical and emotional benefits as well (American Academy of Paediatrics, 2012). The finding of the current study revealed that all the participant's breastfed their babies.

The findings of the current study are not in agreement with the findings of The Third National Family Health Survey (NFHS-3) of India, which found that overall, only 48.3 % of children aged 0 to 5 months were solely breastfed. However, a direct comparison of this data with the current study cannot be made as this represent the data for infants across the country.

#### ***4.12 Breastfeeding termination age***

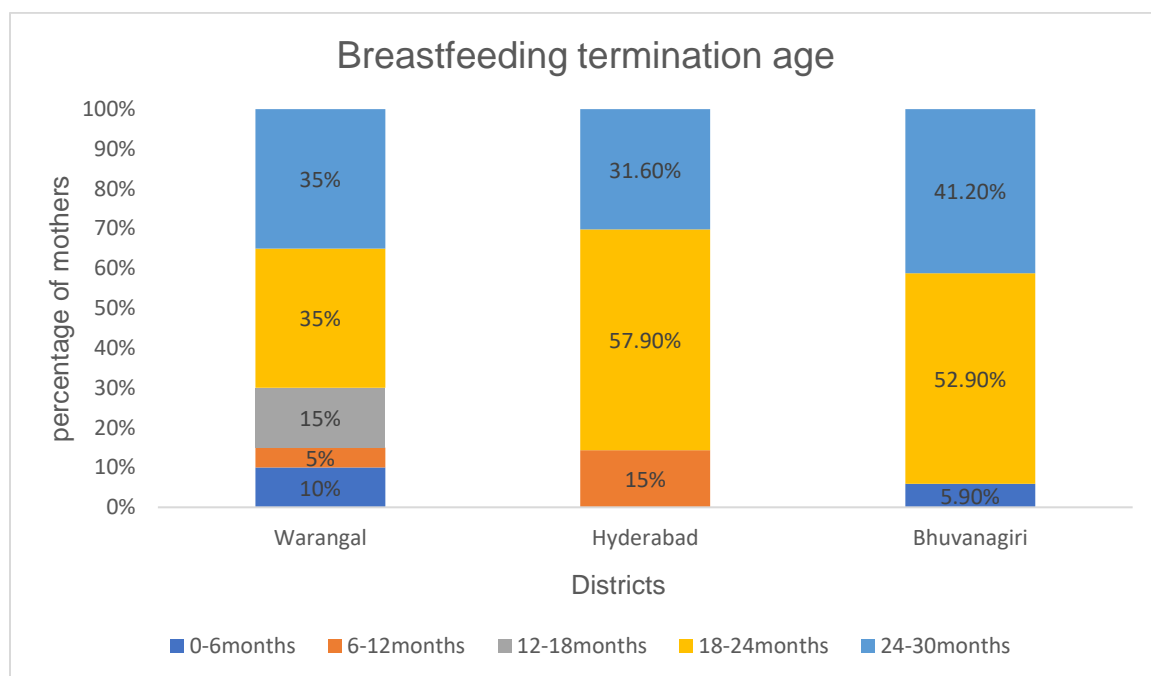
The second item on the survey tool extracted the information regarding the age at which breastfeeding was terminated. The data revealed that 56.7% of participants had terminated breastfeeding (Average age= 24 months), whereas 43.3% continued to breastfeed. The data with regard to the age at which breastfeed was terminated was compared across districts and across region. Among the total number of participants from all the districts, it was seen that 27 mothers (48.2%) out of 90 mothers terminated breastfeeding between 18-24 months.

**a.Comparison across districts:** Across all the districts, majority of the mothers terminated breastfeeding at 18-24 months, however, greater percentage of mothers from Hyderabad (n=11, 57.9%) as compared to Bhuvanagiri (n=9, 52.9%) and Warangal (n=7, 35%) terminated between 18-24months. Thus, the result revealed a similar age of termination of breastfeeding across districts, but the percentage of mothers varied. This is depicted in figure 4.1.



**Figure 4.1**

*Breastfeeding termination age across districts.*



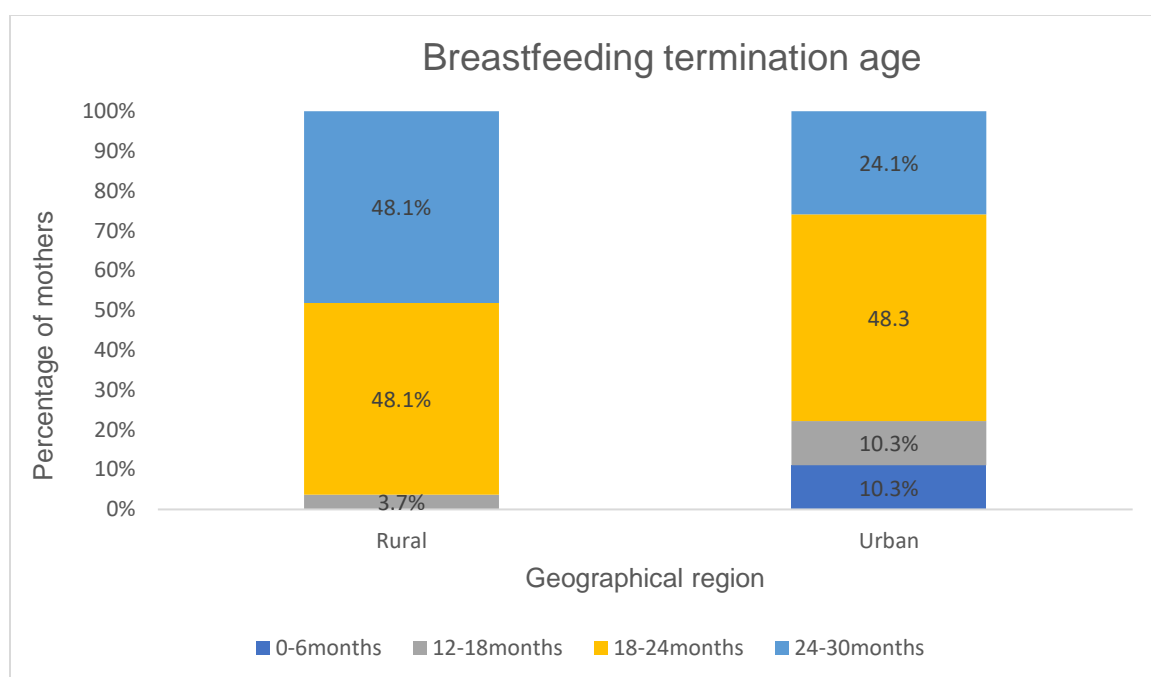
**b. Comparison across geographical area:** To assess if geographical area had an influence on termination of breast feeding, a comparison was made across the mothers residing in the rural and urban areas. Greater percentage of mothers from the urban areas (n=14, 48.3%) terminated breastfeeding at 18-24 months as against the rural areas, however, this difference is very negligible. But in the rural areas, it was also seen that nearly equal percentage of mothers (n= 13, 48.1%) terminated at 24-30 months as well. This is depicted in figure 4.2. Thus, the results revealed that the type of geographical area had an influence on the termination age of breastfeeding.

It was found that similar percentage of mothers from urban areas (n=14, 48.3%) and rural areas (n=13, 48.1%) terminated breastfeeding between 18-24months, whereas equal percentage of mothers from rural areas (n=48.1%) continued to breastfeed even after

24months. This information is depicted in the figure 4.2. Thus the results revealed that there was a difference across geographical region with respect to termination age of breastfeeding.

**Figure 4.2**

*Breastfeeding termination across geographical area*



This could be related to the employment status as most of the mothers from rural areas were unemployed and they were with their children. A review by Srikanth et al. (2017) also highlighted that level of education and employment of the mothers were influencing factors for breastfeeding behaviours.

#### **4.1.3 Introduction to formula/other milk**

The third item in the survey tool extracted information about any formula/other milk provided to the infant from an external source in addition to the breast milk. The data

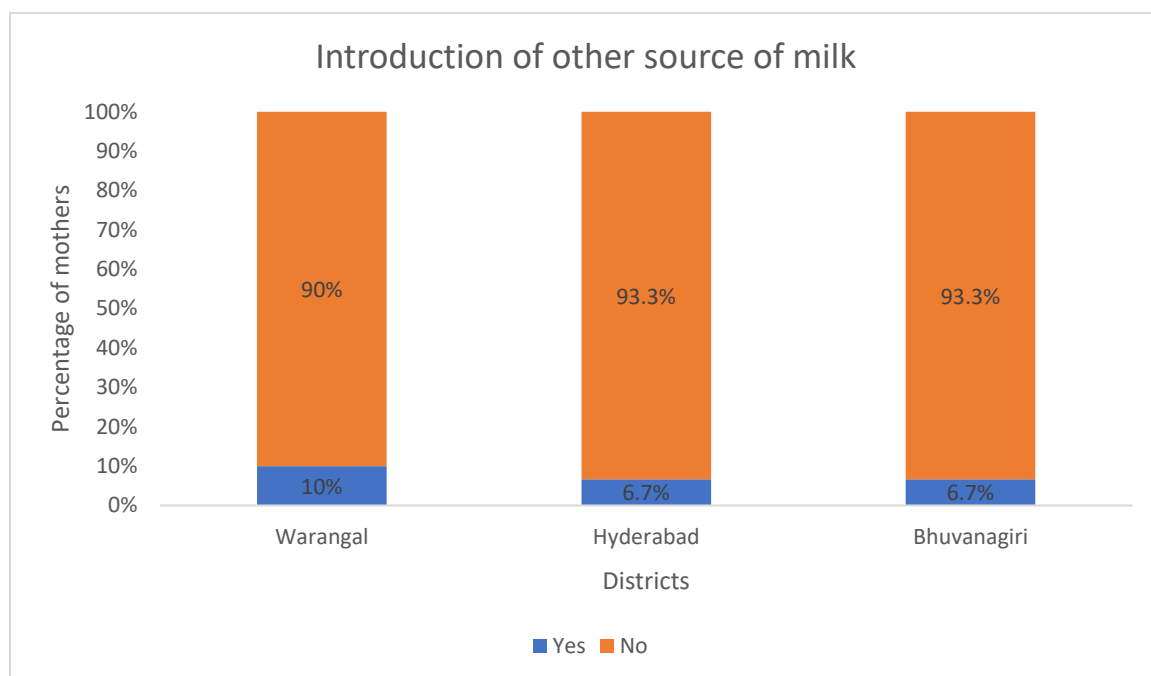
revealed that among the total number of participants from all the districts, only 7 mothers (7.8%) introduced formula/other milk.

In many countries, breast feeding is the norm and formula feeding is the second option (Callaghan & Lazard, 2012). The findings of the current study are in contrast to the findings by Taye et al. (2021), who reported that the prevalence of formula feeding in Ethiopia was 46.2 %. This could be attributed to geographical differences addressed in both studies. One of the prime reasons for early introduction of formula feed is the pain and discomfort that the mothers experience during breast feeding (Lee, 2009). However, such reasons for introducing formula milk were not reported by the mothers in the current study.

**a.Comparison across districts:** Less than 10% of mothers introduced formula or cow milk in all the three districts. Specifically, more mothers from Warangal district provided formula feeds. Greater number of mothers did not introduce any formula feeds. This is depicted in the figure 4.3.

**Figure 4.3**

*Introduction to formula/other milk across districts*



The results could be attributed to insufficient milk secretion as reported by a few mothers (n=5, 71.4%). Another reason reported by a few mothers (n=2, 28.6%) was their infants inability to suck the milk.

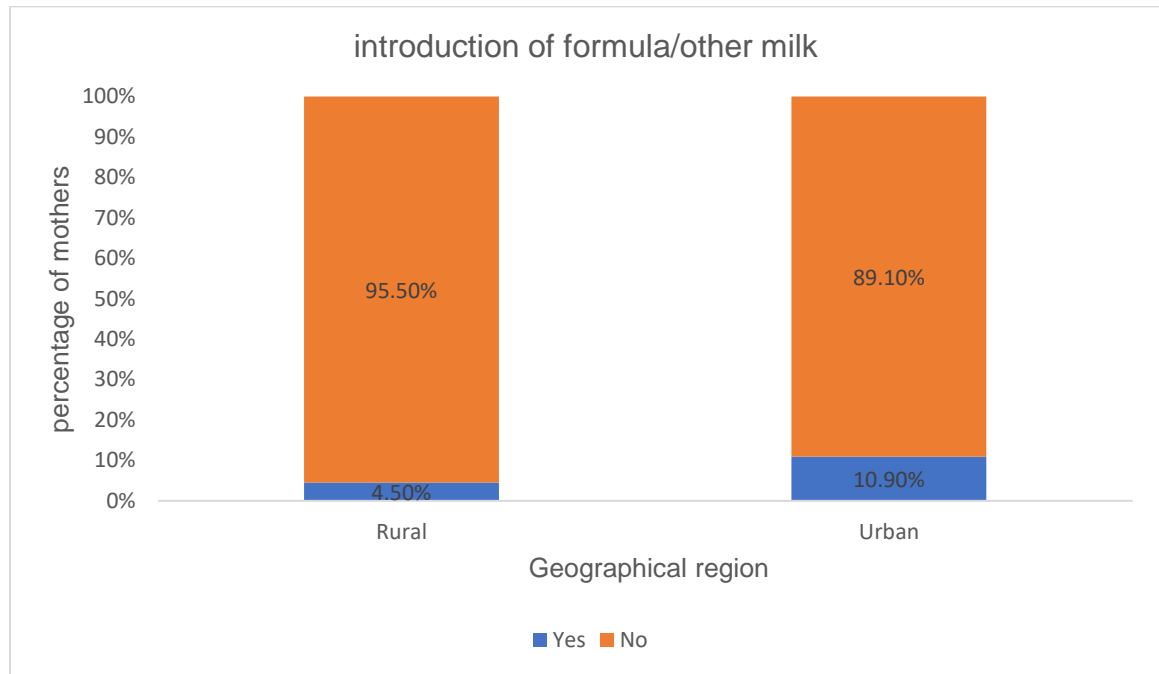
**b. Comparison across geographical area:** To assess if geographical area had an influence on introduction of formula feeds, a comparison was made across the mothers residing in the rural and urban areas.

Lesser percentage of mothers from both rural and urban region introduced formula milk/other milk. However compared to rural mothers greater percentage of urban mothers introduced formula milk/other milk. The distribution of number of participants who introduced formula/other milk across geographical region has been depicted in figure 4.4.

Thus the results revealed that number of mothers who introduced formula feeds varied slightly across region.

**Figure 4.4**

*Introduction of formula/other milk across geographical region*



#### ***41.4 Age of introduction of formula/other milk***

The fourth item in the survey tool extracted information about the age at which the mothers provided formula feed to their infants. The data revealed that among the total number of mothers who introduced formula feeds, it was seen that 5 mothers (71.4%) introduced milk from other sources between 3-4months.

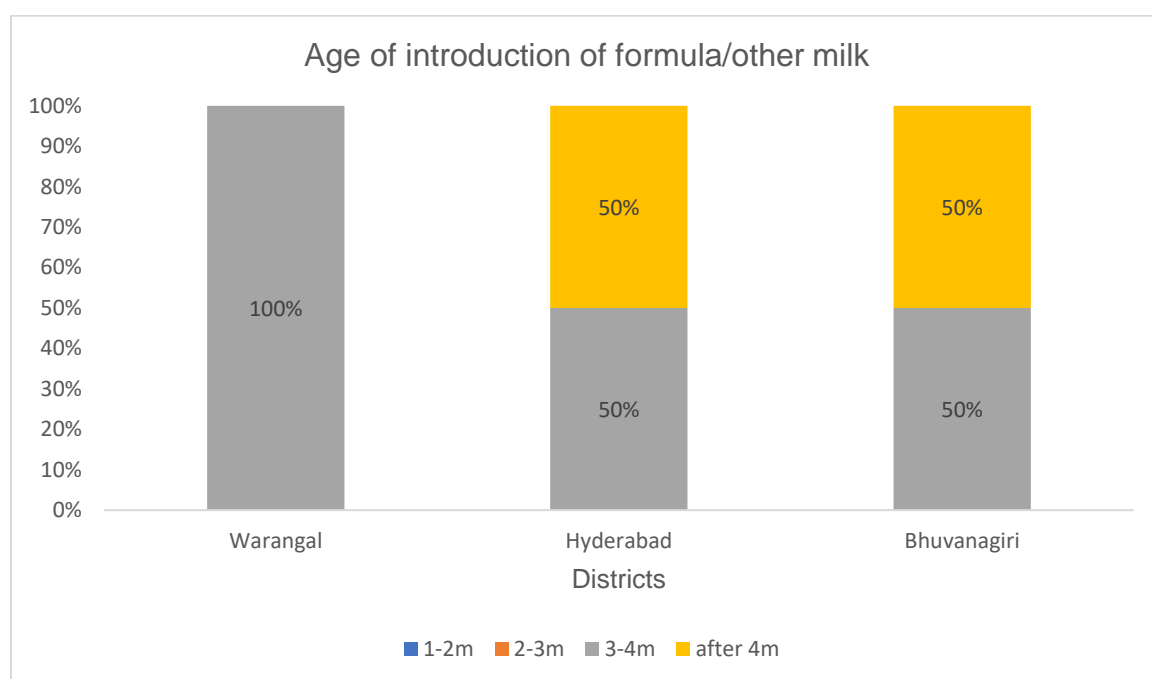
The American Academy of Paediatrics (2019) recommends that formula feed can be started after the first week. Formula can be given to the baby in their first 12 months, which was also recommended by a national support and informational service (Pregnancy,

Birth and Baby: <https://www.pregnancybirthbaby.org.au/>), especially if the milk production is inadequate.

**a. Comparison across districts:** In Warangal (n=3, 100%) all the mothers introduced milk from other sources between 3-4 months. Whereas equal percentage of mothers from Hyderabad and Bhuvanagiri introduced formula/other milk between 3-4 months and after 4 months. Thus the results reveal that the age of introduction of formula/other milk differed across districts. This is depicted in figure 4.5.

**Figure 4.5**

*Age of introduction of formula/other milk across districts*

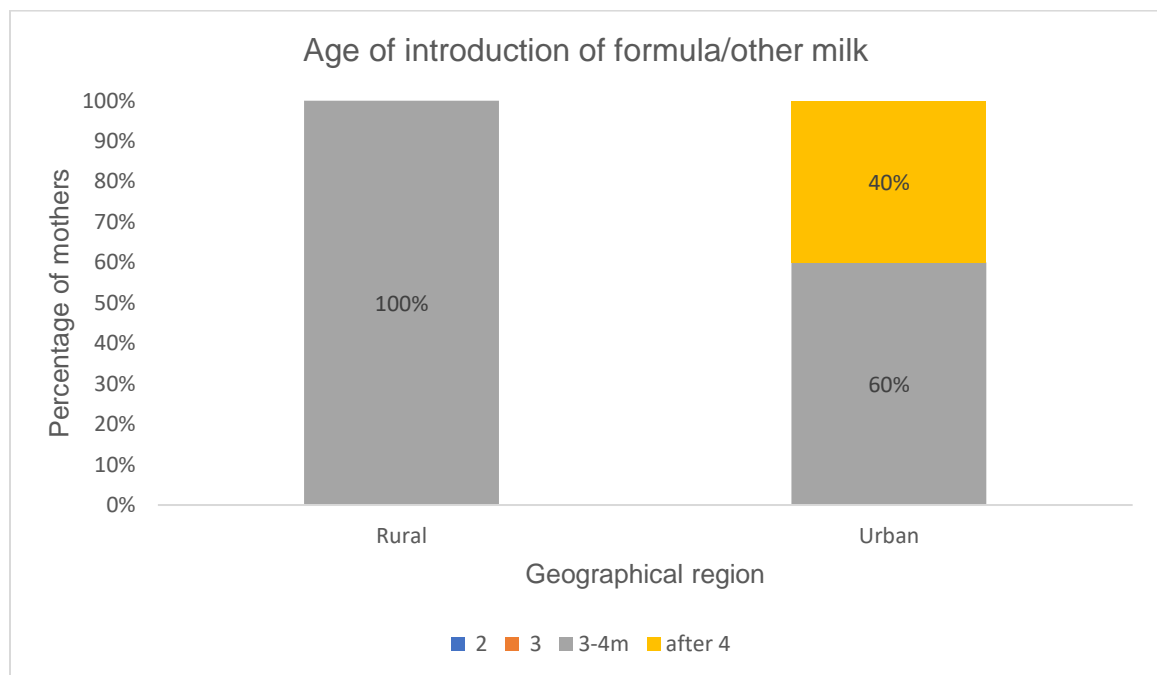


**b. Comparison across geographical area:** To assess if geographical area had an influence on age of introduction of formula feeds, a comparison was made across the mothers residing in the rural and urban areas. Across geographical area greater percentage of

mothers from rural area (n=2, 100%) introduced formula/other milk between 3-4months of age compared to urban mothers (n=3, 60%). This is depicted in figure 4.6. Thus the results revealed that there was a difference across geographical area in the age of introduction of formula/other milk.

**Figure 4.6**

*Age of introduction of formula/other milk across geographical area*



The reason for introducing cow milk among rural mothers was due to inability of the infant to suck the mother's milk and due to insufficient breastmilk production and inability to suck milk in urban mothers.

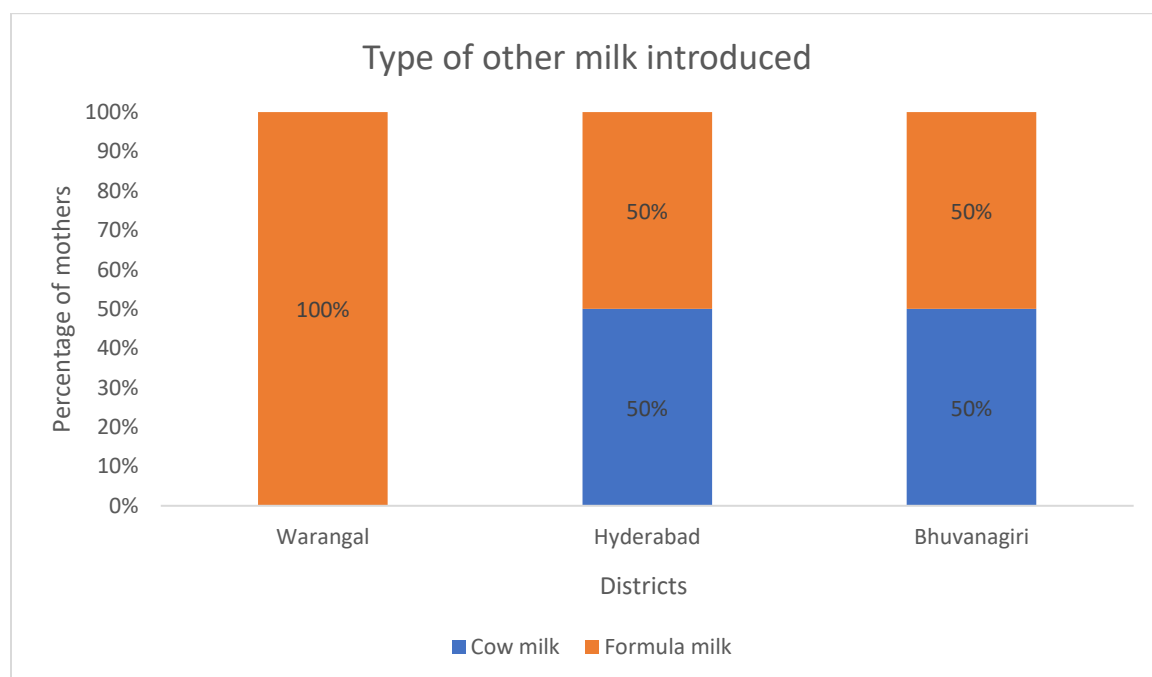
#### 4.1.5 Type of other milk introduced

The fifth item in the survey tool extracted information about the type of milk provided to the infant in addition to the breast milk. The data revealed that out of the mothers who introduced other milk, 5 mothers (71.4%) preferred formula milk.

**a. Comparison across districts:** All the mothers from Warangal (n=3, 100%) who fed other milk, preferred formula milk. In Hyderabad and Bhuvanagiri (n=1, 50%) mothers gave formula milk and (n=1, 50%) gave cow milk. This is depicted in figure 4. 7. The results revealed that there was a difference in the type of additional feeds introduced across districts.

**Figure 4.7**

*Type of other milk introduced across districts*



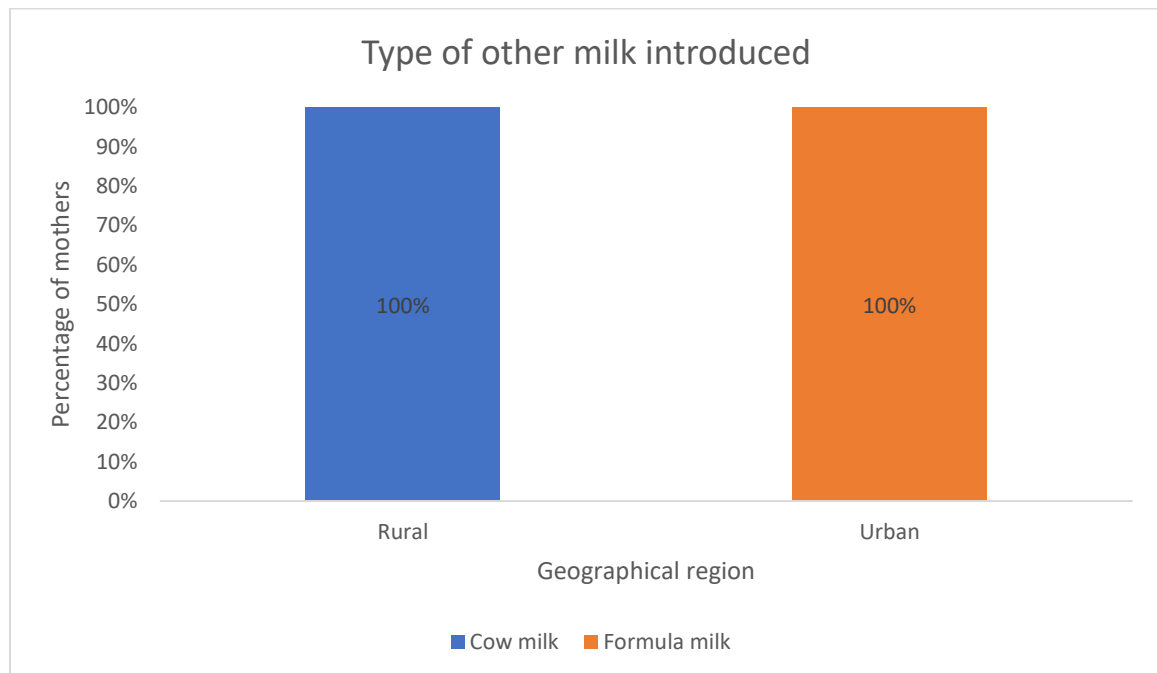


This finding is in consonance with the study by Roess (2018), who reported that in early and middle infancy, using cow milk instead of formula was uncommon. Rathaur et al. (2018) also reported that formula milk was most commonly used in the Himalayan region.

**b. Comparison across geographical area:** To assess if geographical area had an influence on type of formula feeds, a comparison was made across the mothers residing in the rural and urban areas. All the mothers from rural areas (n=2, 100%) gave cow milk; in contrast all the others from urban (n=5, 100%) gave formula milk. This is depicted in figure 4.8. The results indicated that geographical area had an influence on type of other milk introduced.

**Figure 4.8**

*Type of other milk introduced across geographical area*



It was observed that all the mothers from rural areas introduced cow milk as they had cattle at home and cow milk was freely available. They also thought that cow milk is rich with nutrients compared to formula milk.

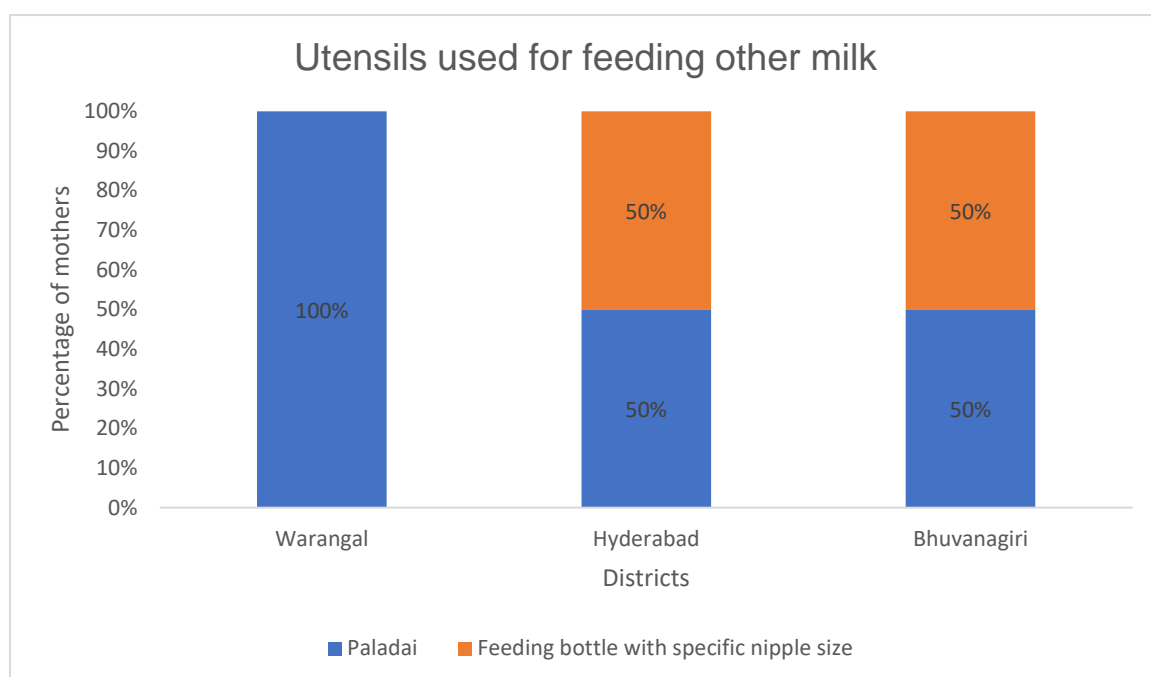
#### ***4.1.6 Utensils used for feeding other milk***

The next item in the survey tool extracted information about the utensils used for feeding other milk to the infant in addition to the breast milk. The data revealed that out of the mothers who introduced other milk, 5 mothers (71.4%) preferred paladai, which is a cup- like utensil with a narrow tip that has been used traditionally used to feed babies in India when the mother cannot breast feed.

**a. Comparison across districts:** In Warangal all the mothers (n=3, 100%) introduced formula milk through paladai, whereas 50% mothers (n=1) from Hyderabad and Bhuvanagiri introduced formula/other milk through paladai and 50% of the mothers (n=1) introduced formula feeds through feeding bottle with specific nipple size. This is depicted in figure 4.9. Thus the results revealed that there was difference across districts in utensils used for feeding other milk.

**Figure 4.9**

*Distribution of participants using different utensils for feeding other milk across districts*

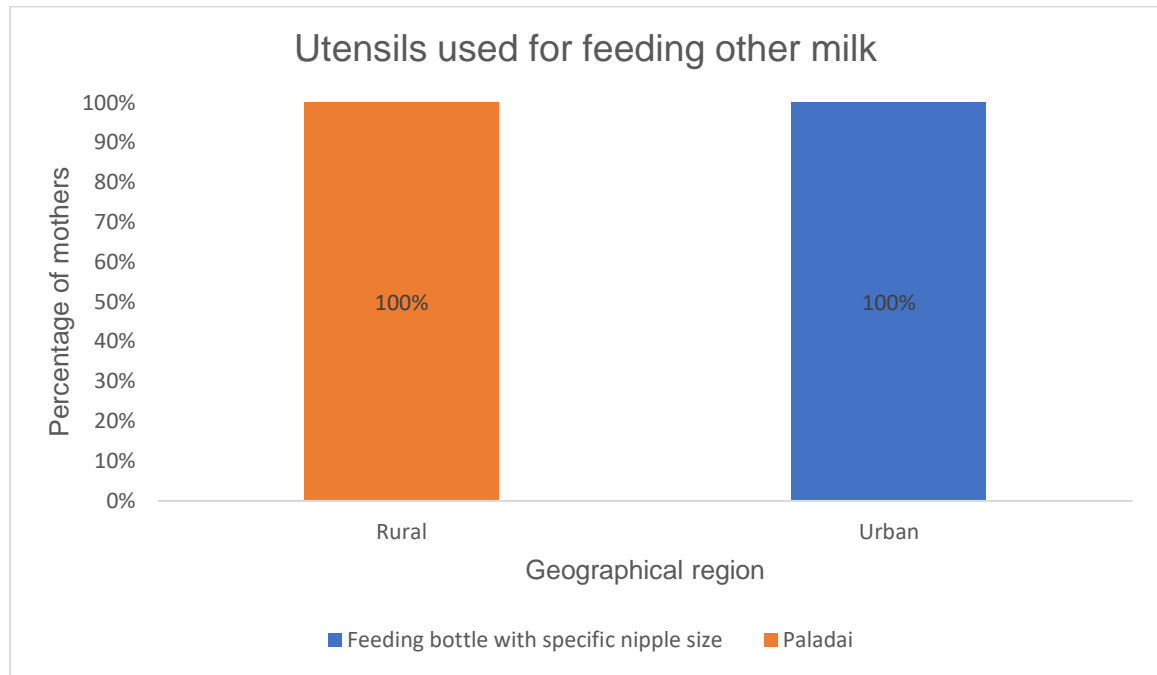


The findings with respect to Warangal district are in consonance with the findings of study done by Zahiruddin et al., (2016) where he found that no mothers used feeding bottle to feed the child in the district of Wardha.

**b. Comparison across geographical area:** To assess if geographical area had an influence on utensils used for formula feeds, a comparison was made across the mothers residing in the rural and urban areas. All the mothers from rural (n=2, 100%) introduced other milk through paladai and all the mothers from urban areas (n=5, 100%) introduced formula through feeding bottle with specific nipple size. This is depicted in figure 4.10. Thus the results revealed that there was a difference across geographical area.

**Figure 4.10**

*Distribution of participants using different utensils for feeding other milk across geographical area*



In a study done by Javalkar and Aras (2018), they found that 62.4% mothers from rural and 37.5% mothers from urban bottle fed, whereas in the present study, mothers from rural area did not use bottle feeding.

#### ***4.1.7 Position used to feed other milk***

The seventh item in the survey tool extracted information about the position used to feed other milk to the infant in addition to the breast milk. The data revealed that out of the mothers who introduced other milk, 100% of them held their infants in their arm to feed. This is in accordance to the recommendation by Connolly (2019) that infants should be held in arms for formula feeds.

**a. Comparison across districts:** All the mothers across all three districts held their infants in their arms while feeding formula/other milk. Thus the results revealed that there was a similar trend followed across all three districts.

**b. Comparison across geographical area:** To assess if geographical area had an influence on position used for formula feeds, a comparison was made across the mothers residing in the rural and urban areas. All the mothers from both rural and urban (n=7, 100%) fed their infants holding their infants in their arms. Thus the results revealed that there was a similar trend across geographical area.

## **4.2 Introduction to Complementary Feeding**

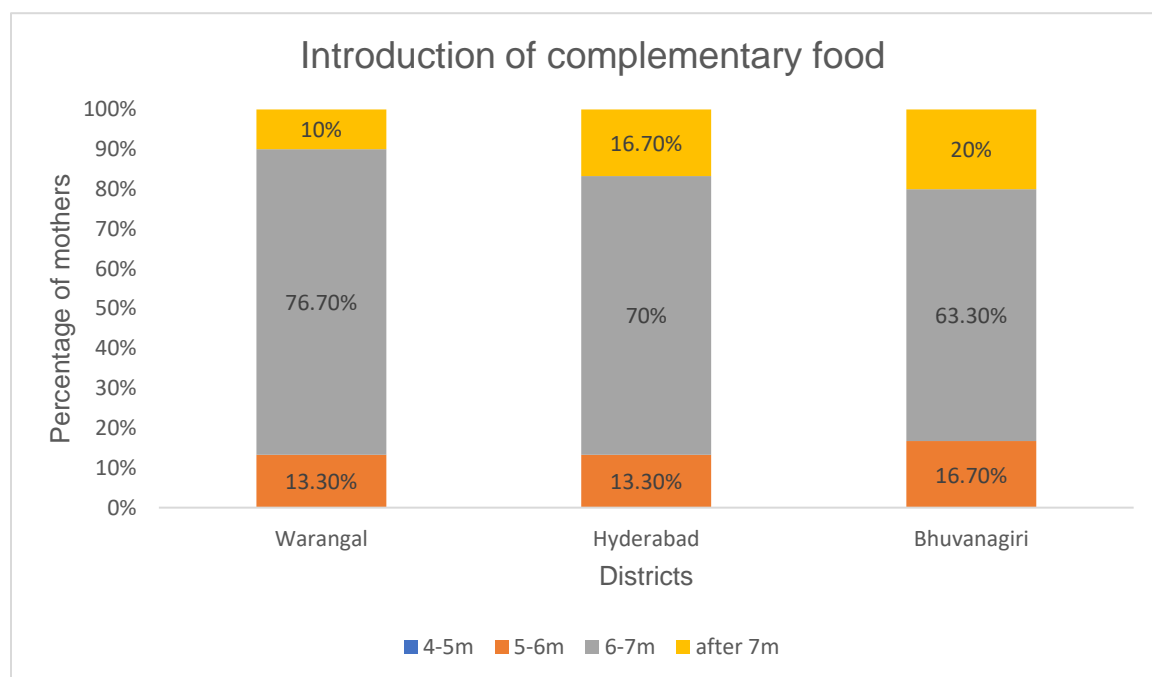
### ***4.2.1 Age of introduction of complementary feeding***

The first item under this section, extracted information about the age at which the complementary feeding was introduced. The data revealed that out of 90 mothers, 63 mothers (70%) introduced complementary feeding at 6-7 months.

**a. Comparison across districts:** The age of introduction of complementary feeding was compared across districts. A similar trend was seen across districts where all mothers introduced complementary feeds at 6-7 months. However, greater percentage of mothers from Warangal (n = 23, 76.7%) as compared to Hyderabad and Bhuvanagiri introduced complementary feeding at 6-7months of age. The data related to age of introduction of complementary feeding revealed very minimal differences across districts. This has been depicted in figure 4.11

**Figure 4.11**

*Age of introduction of complementary feeding across districts*



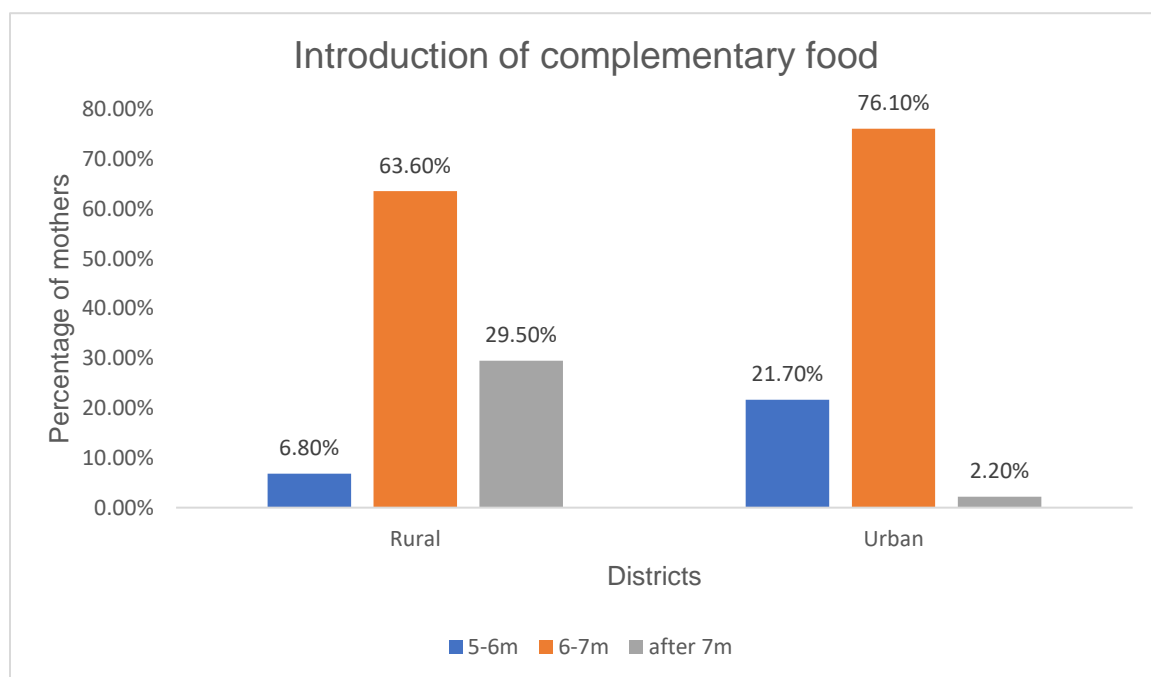
The study observed that majority of mothers from Warangal introduced complementary feeding at the appropriate time, i.e. between 6-7 months of time, which is as per the recommendation of WHO (2001). The National Guidelines on Infants and Young Child Feeding (2006) also states that it is crucial to supplement breast milk with solid or semi-solid foods once a child reaches the age of six months, because breast milk is no longer sufficient to meet the infant's nutritional needs after that age. In a study by Rao et al. (2011), it was reported that 77.5% of mothers in coastal South India had begun complementary feeding at the suggested time, which is in agreement with the present study. A study in Chandigarh also found that 81.7% of 300 women began complementary feeding for their infants between the ages of six and eight months (Pradhan, 2016).

This finding obtained in the current study is not in agreement with the study conducted by Gaddapa and Behera (2016), who reported that only 38% received complementary feeding between the ages of 6 and 9 months. The findings of the present study are also not in consensus with other studies, where only 36% of children in Kolkata and 6% mothers from six villages in Uttar Pradesh's Ghaziabad district who were given complementary foods with breastfeeding at six months of age (Dasgupta et al., 2014; Garg, 2009).

**b. Comparison across geographical area:** To assess if geographical area had an influence on age of introduction of complementary feeding, comparison was made between the mothers from the rural and urban areas. The data revealed that majority of the others from both areas introduced complementary feed at 6-7 months. However, greater percentage of mothers from urban (n = 35, 76.1%) as compared to rural (n= 28, 63.6%) areas indulged in doing so. Also in rural areas, some mothers (n = 13, 29.5%) introduced complementary feeding after 7months. Thus, the data revealed that age of introduction of complementary feeds varied across rural and urban areas.

**Figure 4.12**

*Age of introduction of complementary feeding across geographical area*



The results of the present study are in consonance with the conducted in Dharwad by Ashwini et al. (2014) where complementary feeds were initiated by 69.20% urban mothers before the infant was 6 months old and 42.11% rural mothers had initiated at recommended 6 months.

The most frequent reason reported by the mothers for the late introduction of supplemental feeds was revealed to be ignorance, which is also consistent with the findings of the study by Kalita et al (2017). Gupta et al. (2010) in his reported that in India, complementary food was introduced between 6 and 9 months of age, which matched with the findings of the present study.



#### 4.2.2 *Type of food introduced during complementary feeding*

The information about the food items introduced during complementary feeding was also extracted and compared across districts and geographical areas.

**a.Comparison across districts:** Dal soup, Uggu (rice cereal), and fruit puree was the most common combination of complementary feeds given to infants in the districts of Hyderabad and Bhuvanagiri. However in Warangal, the most prevalently used complementary feeds was a combination of Balamrutham, rice soup, and upma rava. Balamrutham is the weaning food introduced under ICDS (Integrated Child Development Services) scheme to provide improved supplementary nutrition to children between 7months to 3years. The weaning food is prepared with wheat, Chana dal, milk powder, oil and sugar. Thus, across districts there was a variation in the food items used as complementary feeds.

**Table 4.9**

*Food items introduced for complementary feeding across districts*

| Food items                                | Warangal |       | Hyderabad |       | Bhuvanagiri |       |
|---|----------|-------|-----------|-------|-------------|-------|
|   | n        | %     | N         | %     | N           | %     |
| Dal soup, uggu (rice cereal), fruit puree | 7        | 23.3% | 13        | 43.3% | 10          | 33.3% |
| Uggu, cerelac, mashed fruits              | 7        | 23.3% | 7         | 23.3% | 4           | 13.3% |

|              |   |       |   |      |   |       |  |
|--------------|---|-------|---|------|---|-------|--|
| Balamrutham, |   |       |   |      |   |       |  |
| Rice soup,   | 9 | 30%   | 6 | 20%  | 8 | 26.7% |  |
| upma rava    |   |       |   |      |   |       |  |
| Balamrutham, | 4 | 13.3% | 3 | 10%  | 3 | 10%   |  |
| Dal soup     |   |       |   |      |   |       |  |
| Balamrutham  | 3 | 10.0% | 1 | 3.3% | 5 | 16.7% |  |

Dal water and Rice water were the commonly used complementary feeds in the study done by Kogade et al (2019) as well. Also, Lodha (2013) found that rice water was given by 72% mothers of Madhya Pradesh. In India, complementary feeding was typically initiated with liquid diets such as diluted bovine milk and rice water, followed by semi-solid meals such as dal, khichdi, rice, and other locally available foods in a study observing infants from 0-23 months (Mehlawat et al., 2017). This is in consensus with the findings of the present study.

**b. Comparison across geographical area:** To assess if geographical area had an influence on type of food items introduced as a part of complementary feeding, a comparison was made across the mothers from rural and urban areas.

Majority of mothers from urban population gave a combination of dal soup, uggu (rice cereal), and fruit puree compared to the rural mothers, who provided Balamrutham, rice soup, upma rava to their infants. Balamrutham is the weaning food introduced under ICDS (Integrated Child Development Services) scheme to provide improved supplementary nutrition to children between 7months to 3years. The weaning food is prepared with wheat, Chana dal, milk powder, oil and sugar. This is depicted in table 4.10.

Thus, the data revealed differences in the type of food introduced across geographical areas.

**Table 4.10**

*Food items introduced for complementary feeding across geographical area*

| Food item                                 | Rural |       | Urban |       |
|---|-------|-------|-------|-------|
|   | n     | %     | n     | %     |
| Dal soup, Uggu (rice cereal), Fruit Puree | 1     | 2.3%  | 29    | 63%   |
| Uggu, cerelac, mashed fruits              | 2     | 4.5%  | 16    | 34.8% |
| Balamrutham, rice soup, upma rava         | 22    | 50%   | 1     | 2.2%  |
| Balamrutham, dal soup                     | 10    | 22.7% | 0     | 0.0%  |
| Balamrutham                               | 9     | 20.5% | 0     | 0.0%  |

The findings of the present study are in consonance with a study conducted by Ashwini et.al. (2014) which revealed that mothers from urban areas had given combination of various foods to their infants between 6 to 8 months of age, while mothers in rural area gave only cereal based foods like porridges, rava and rice.

#### ***4.2.3 Consistency used for complementary feeding***

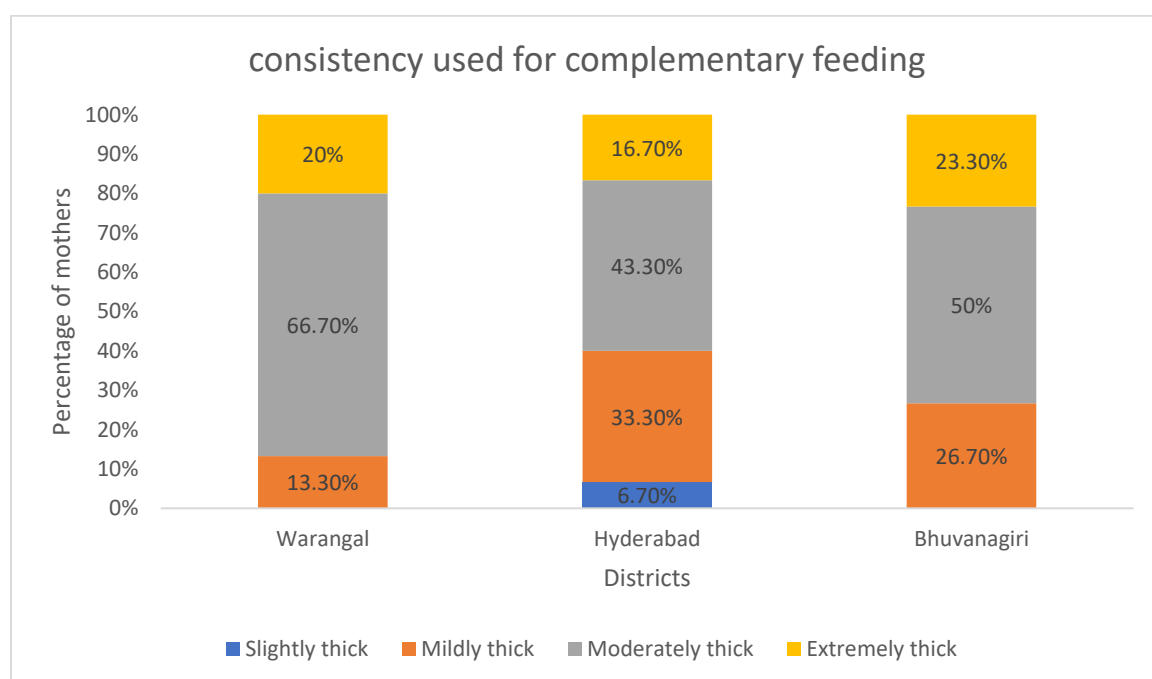
Information about the consistency of the complementary feeds was also elicited and compared across districts and geographical area. The data revealed that out of 90 mothers, 48 mothers (53.3%) used moderately thick consistency.

**a.Comparison across districts:** Mothers from all districts provided a moderately thick consistency of complementary feeds. However, greater percentage of mothers from Warangal (n=20, 66.7%) as compared to Bhuvanagiri (n=13, 43.3%) and Hyderabad

(n=15, 50%) gave moderately thick consistency. Mothers from Hyderabad gave foods with mildly thick and slightly thick consistency as well compared to mothers of Warangal and Bhuvanagiri. This has been depicted in the figure 4.13 Thus the data revealed that though moderately thick consistency was provided across all districts, there were differences in the percentage of mothers who provided this consistency.

**Figure 4.13**

*Distribution of participants using different consistencies for complementary feeding across districts*

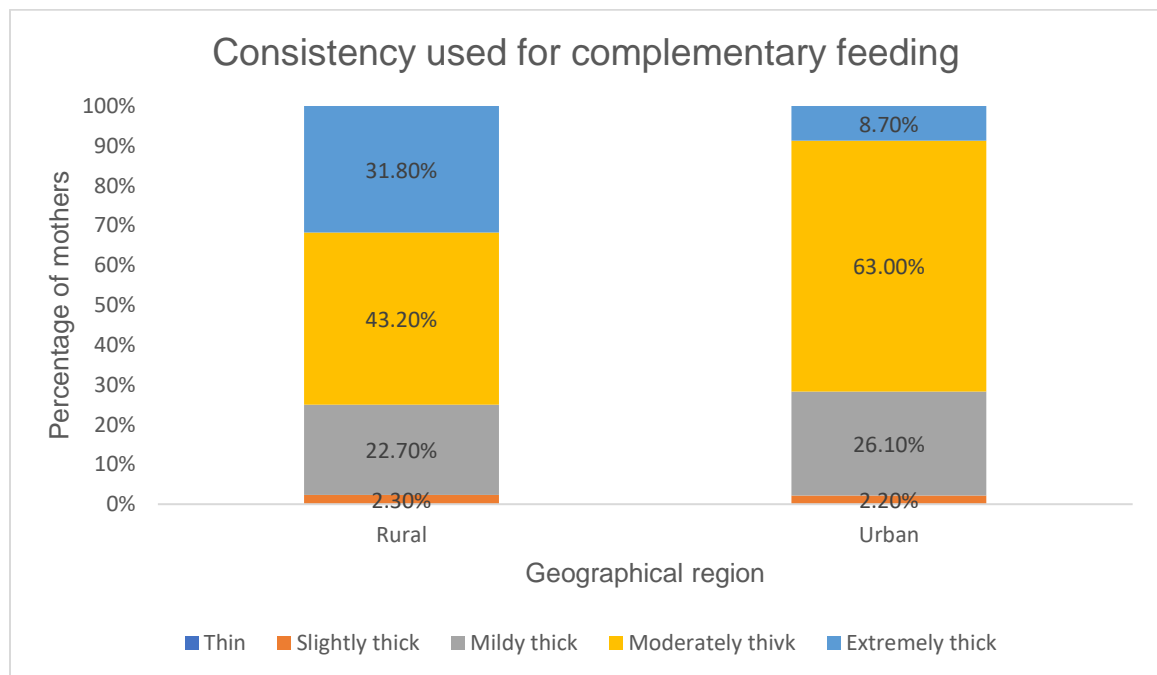


The results are in consonance with WHO (2009) which states that a complementing food ought to be thick enough to remain on a spoon without dripping off. Ones that are thicker or more solid tend to be more nutrient- and energy-dense than thin, watery foods.

**b. Comparison across geographical area:** To assess if geographical area had an influence on consistency of complementary feeds, a comparison was made across mothers from rural and urban areas. Majority of the mothers in both rural and urban population introduced complementary food through moderately thick consistency. However, this number was greater in the urban area (n= 29, 63%) compared to the rural (n = 19, 43.2%) area. In the rural areas, many mothers provided extremely thick consistency as well. Thus, the data revealed that there were differences across geographical area in the type of consistency given.

**Figure 4.14**

*Distribution of participants using different consistencies for complementary feeding across geographical area*



#### 4.2.4 Utensils used for complementary feeding

The utensils used to introduce the complementary feeds were investigated. The data revealed that out of 90 mothers, 72 mothers (80%) used steel spoon.

**a.Comparison across districts:** Greater percentage of the mothers from Bhuvanagiri (n=25, 83.3%) as compared to mothers from Warangal (n=24, 80%) and Hyderabad (n=23, 76.6%) used steel spoons. Also, greater percentage of mothers from Hyderabad (n=4, 13.3%) used special spoons for feeding. Thus the data revealed that across the districts the type of utensils used followed similar trend but the percentage varied. This has been depicted in table 4.11. The findings of the present study are in consonance with a study conducted by Berthold et.al. (2019) where they recommend the use of spoons or mother hands for complementary feeding.

**Table 4. 11**

*Distribution of participants using different utensils for complementary feeding across districts*

| Utensils | Warangal |      | Hyderabad |       | Bhuvanagiri |       |
|----------|----------|------|-----------|-------|-------------|-------|
|          | n        | %    | n         | %     | n           | %     |
| 1        | 24       | 80%  | 23        | 76.6% | 25          | 83.3% |
| 2        | 2        | 6.7% | 2         | 6.7%  | 1           | 3.3%  |
| 3        | 0        | 0.0% | 0         | 0.0%  | 0           | 0.0%  |
| 4        | 0        | 0.0% | 0         | 0.0%  | 0           | 0.0%  |
| 5        | 2        | 6.7% | 4         | 13.3% | 1           | 3.3%  |
| 6        | 2        | 6.7% | 1         | 3.3%  | 3           | 10.0% |

Note. 1= spoon, 2= feeding bottle with spoon attached, 3= Sippy cup or open, 4= nifty cup, 5= special spoon, 6=any other

**b. Comparison across geographical area:** To assess if geographical area had an influence on utensils used to introduce complementary feeding, comparison was made across the mothers from rural and urban areas. It was observed greater percentage of the mothers both from rural areas used steel spoons to feed their infants compared to mothers from urban areas. 10-15% of mothers from urban areas used feeding bottle with spoon attached and special spoons made of silicon for complementary feeding. Also few mothers (n=6, 6.7%) from rural areas used paladai. This is depicted in table 4.12. Thus, the results revealed that though the type of utensil used to feed complementary food was same across geographical area, the percentage of mothers varied.

**Table 4.12**

*Distribution of participants using different utensils for complementary feeding across geographical area*

| Utensils | Rural |       | Urban |       |
|----------|-------|-------|-------|-------|
|          | n     | %     | n     | %     |
| 1        | 38    | 86.6% | 34    | 73.9% |
| 2        | 0     | 0.0%  | 5     | 10.9% |
| 3        | 0     | 0.0%  | 0     | 0.0%  |
| 4        | 0     | 0.0%  | 0     | 0.0%  |
| 5        | 0     | 0.0%  | 7     | 15.2% |
| 6        | 6     | 6.7%  | 0     | 0.0%  |

Note. 1= Spoon, 2= Feeding bottle with spoon attached, 3= Sippy cup or open, 4= Nifty cup, 5= Special spoon, 6= Anyother (paladai)

As the mothers from urban regions were from upper socio-economic status and were well educated they used various utensils to feed their infants, whereas mothers from rural regions used the traditional paladai or spoon for feeding their infants.

#### ***4.2.5 Position used for complementary feeding***

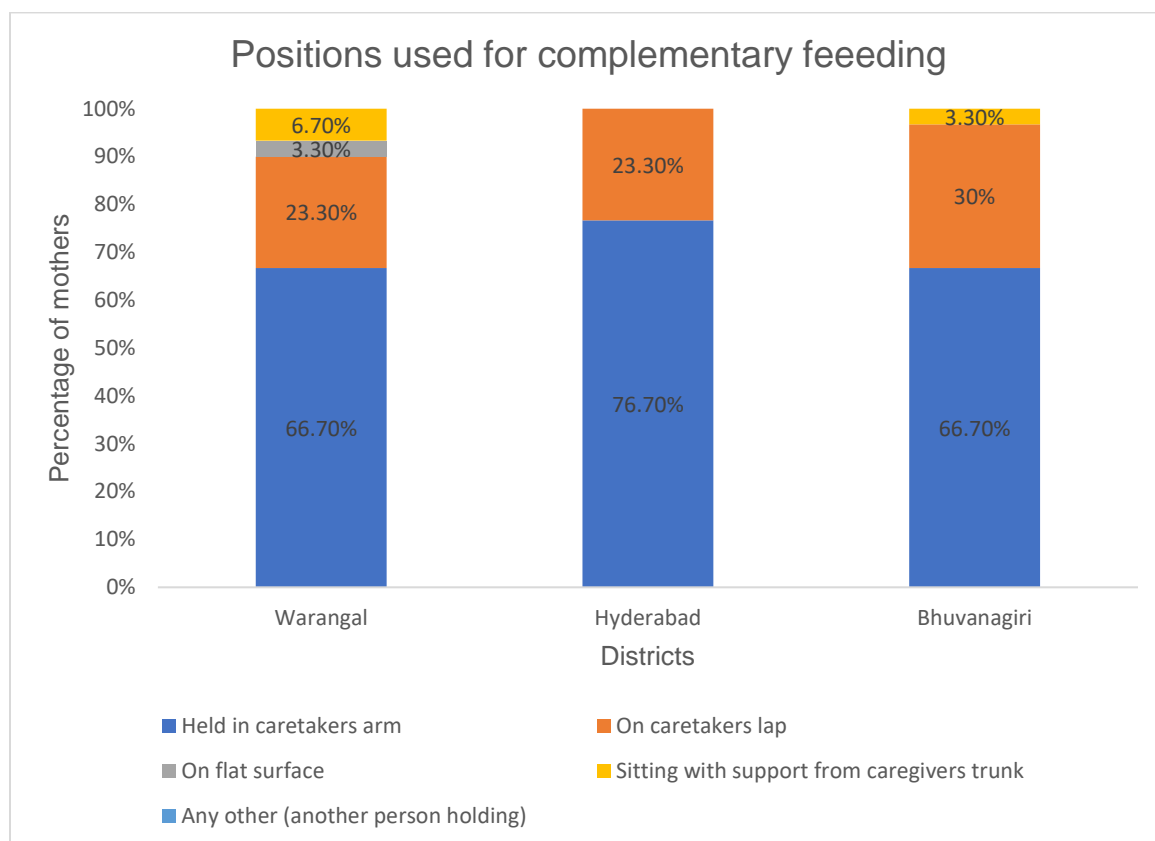
The information about the position used for complementary feeding was elicited. The data revealed that out of 90 mothers, 63 mothers (70%) held their infants in their arms.

**a.Comparison across districts:** As depicted from the figure 4.15, caretaker's arm was the most commonly used position across the districts by a vast majority of the mothers, i.e., feeding was done with the infant in the arms. However, this position was used most commonly used by mothers from Hyderabad (n= 23, 76.7%). Thus, the data revealed that though holding the infants in arms was the most common position across districts, there was a difference with respect to percentage of mothers using this position.



**Figure 4.15**

*Distribution of participants using different positions for complementary feeding across districts*

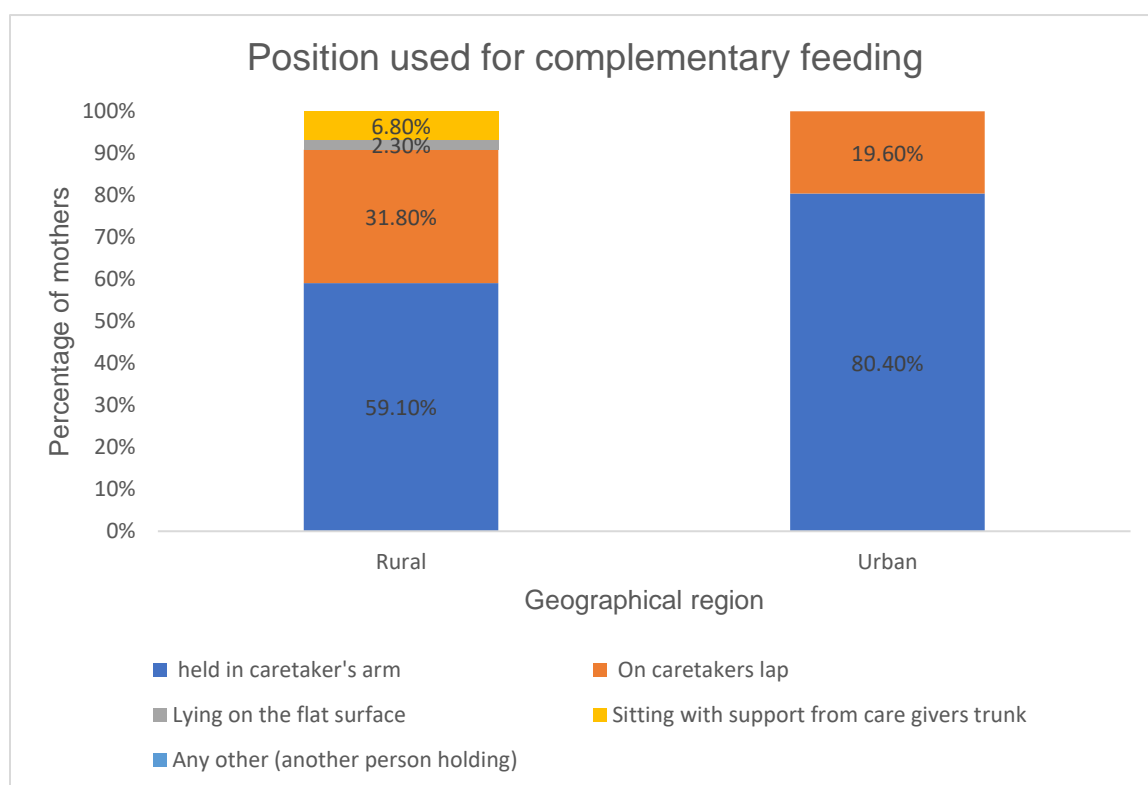


**B. Comparison across geographical area:** To assess if geographical area had an influence on positions used to introduce complementary feeding, a comparison was made across mothers from rural and urban areas. Greater percentage of mothers from urban (n=37, 80.4%) compared to rural areas (n=26, 59.1%) held their infants in their arms while feeding. Thus, the results revealed that though holding the infants in the arms was the most common position across geographical area, there was a difference with respect to the percentage of participants using this position. This is depicted in figure 4.16. Thus the

results revealed that there was a difference in the position used to feed their infants. Some of the mothers in the rural area also used the lap position for feeding.

**Figure 4.16**

*Feeding position used for complementary feeding across geographical area*



### 4.3 Introduction of next consistency

#### 4.3.1 Age of introduction of next consistency

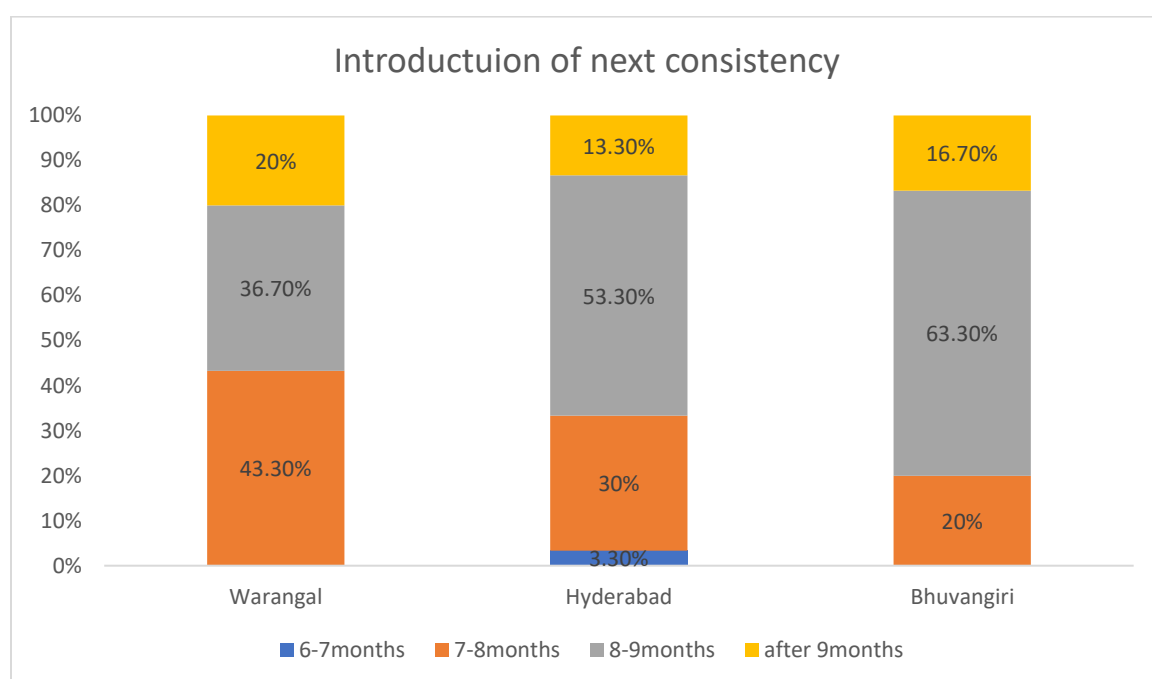
The first item under this section extracted information about the age at which the next consistency was introduced. The data revealed that out of 90 mothers, 46 mothers (51.1%) introduced the next consistency at 8-9 months.

**a. Comparison across districts:** Greater percentage of mothers from Bhuvanagiri (n= 19, 63.3%) and Hyderabad (n= 16, 53.3%) introduced the next consistency at the age of 8-

9months, whereas greater percentage of the mothers (n= 13, 43.3%) from Warangal introduced the next consistency between 7-8months of age. This has been depicted in figure 4.17. Thus the results revealed that there was a difference across districts with respect to the age of introduction of the next consistency.

**Figure 4.17**

*Age of introduction of next consistency across districts*

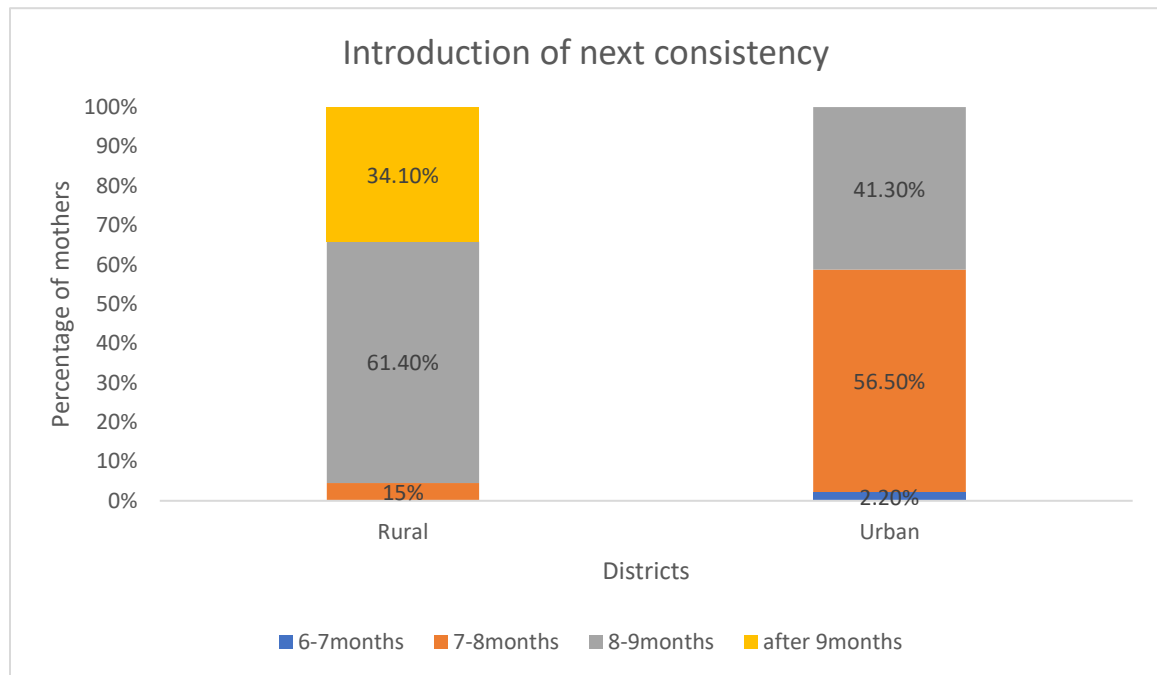


According to Centres for Disease Control and Prevention (2021), around 6 months of age is when the baby can start eating solid foods. The infant can eat a variety of meals from several food groups by the time he or she is 7 or 8 months old. The current findings are similar to Dharmi's findings (2019) of wide range of prevalence of solid, semi-solid, or soft food introduction among infants aged 6–8 months throughout regional India, with the highest prevalence in the South (61%) and the lowest prevalence in the Central and Northern regions (38%).

**b. Comparison across geographical area:** To assess if geographical area had an influence on age of introduction of the next consistency, a comparison was made across the mothers from rural and urban areas. Greater percentage of the mothers (n= 27, 61.4%) from rural areas introduced the next consistency of complementary food between 8-9months, whereas (n= 26, 56.6%), mothers from urban areas introduced the next level of consistency between 7-8months of age. Many mothers (n= 15, 34.1%) from rural areas introduced the next consistency of complementary food after 9months of age compared to mothers from urban areas. Thus the results revealed a difference across rural and urban areas. This has been depicted in figure 4.18

**Figure 4.18**

*Age of introduction of next consistency across geographical area*



Greater number of mothers from rural population introduced it late because of lack of knowledge and experience. The current findings are similar to Dharmi's findings (2019) of

wide range of prevalence of solid, semi-solid, or soft food introduction among infants aged 6–8 months throughout regional India, with the highest prevalence in the South (61%) and the lowest prevalence in the Central and Northern regions (38%). The findings of the present study are similar to that done by Ashwini et.al. (2014) where they found that mothers from rural areas introduced complementary foods late, which they attributed to lack of awareness and lesser education among the mothers from rural areas, who primarily belonged to lower socio economic status.

#### ***4.3.2 Food items introduce as next consistency***

The second part of the first question under this section also extracted information about the food items given to introduce next consistency.

**a.Comparison across districts:** The most common food items used to introduce next level of consistency to the infant across districts. Greater percentage of mothers from Hyderabad and Bhuvanagiri introduced pappu annam (dal rice), steamed vegetables, and fruits. However, the mothers from Warangal fed the infants with Pappu annam and curd rice. This has been depicted in table 4.13. Thus the results revealed a difference across districts.

**Table 4.13***Food items introduced as next consistency across districts*

| Food items | Warangal |       | Hyderabad |       | Bhuvanagiri |       |
|------------|----------|-------|-----------|-------|-------------|-------|
|            | n        | %     | n         | %     | n           | %     |
| 1          | 9        | 30%   | 12        | 40%   | 11          | 36.7% |
| 2          | 5        | 16.7% | 4         | 13.3% | 4           | 13.3% |
| 3          | 1        | 3.3%  | 3         | 10%   | 4           | 13.3% |
| 4          | 5        | 16.7% | 3         | 10%   | 2           | 6.7%  |
| 5          | 10       | 33.3% | 8         | 26.7% | 9           | 30%   |
| 6          | 12       | 44.4% | 9         | 36%   | 11          | 42.3% |
| 7          | 15       | 55.6% | 16        | 64%   | 15          | 57.7% |

Note. 1= Pappu annam, steamed vegetables, fruits, 2= Pappu annam, soaked chapatti, 3= Pappu annam, bread and fruits, 4= Pappu annam, curd rice, 5= Pappu annam, curries, 6= scrambled eggs, 7= soft boiled egg

The current findings correspond to findings of Sapra's (2014) study of 100 children in Pune, where the majority of the kids were fed foods like mashed dal and rice, mashed seasonal fruits and vegetables, and biscuits with milk. However, these findings of are not in line with the recommendations made by IAP Parent Guideline Committee and with the recommended practices for infant and early child feeding issued by the World Health Organization (IYCF, 2008), which calls for ingestion of at least four food groups, at least one animal-source food, at least one vitamin A-rich fruit and vegetable, legumes and nuts, eggs, in addition to a staple food (grain, root or tuber) in a day for children at 6 to 23 months of age.

**b. Comparison across geographical area:** To assess if geographical area had an influence on food items introduced as the next consistency, a comparison was made across the mothers from rural and urban areas. The table 4.14 indicated that the most common food items given as next consistency to infants by urban mothers (n = 45, 97%) was pappu annam, steamed vegetables, and mashed fruits, and soaked chapatti in dal along with eggs. However, greater percentage of mothers (n=36, 81.8%) from rural areas gave pappu annam and curries as the food for next consistency. The results indicated that there was a difference across rural and urban areas in the type of food items given.

**Table 4.14**

*Food items used to introduce the next consistency across geographical area*

| Food items | Rural |       | Urban |       |
|------------|-------|-------|-------|-------|
|            | n     | %     | N     | %     |
| 1          | 2     | 4.5%  | 30    | 35.6% |
| 2          | 5     | 11.4% | 8     | 14.4% |
| 3          | 1     | 2.3%  | 7     | 8.9%  |
| 4          | 9     | 20.5% | 1     | 10%   |
| 5          | 27    | 61.4% | 0     | 0.0%  |
| 6          | 5     | 12.8% | 34    | 87.2% |
| 7          | 27    | 69.2% | 12    | 30.8% |

Note. 1= Pappu annam, steamed vegetables, fruits, 2= Pappu annam, soaked chapatti, 3= Pappu annam, bread and fruits, 4= Pappu annam, curd rice, 5= Pappu annam, curries 6= scrambled eggs, 7= soft boiled eggs

The difference in the food items given to infants in urban and rural areas can be attributed to the socioeconomic status of the caregivers and the literacy level of the mother. The rural mothers lacked knowledge and awareness about the complementary feeding practices and belonged to lower socio economic status.

#### ***4.3.3 Consistency used to introduce the next consistency***

The third question under this section also extracted information about the consistency of food items introduced as next consistency.

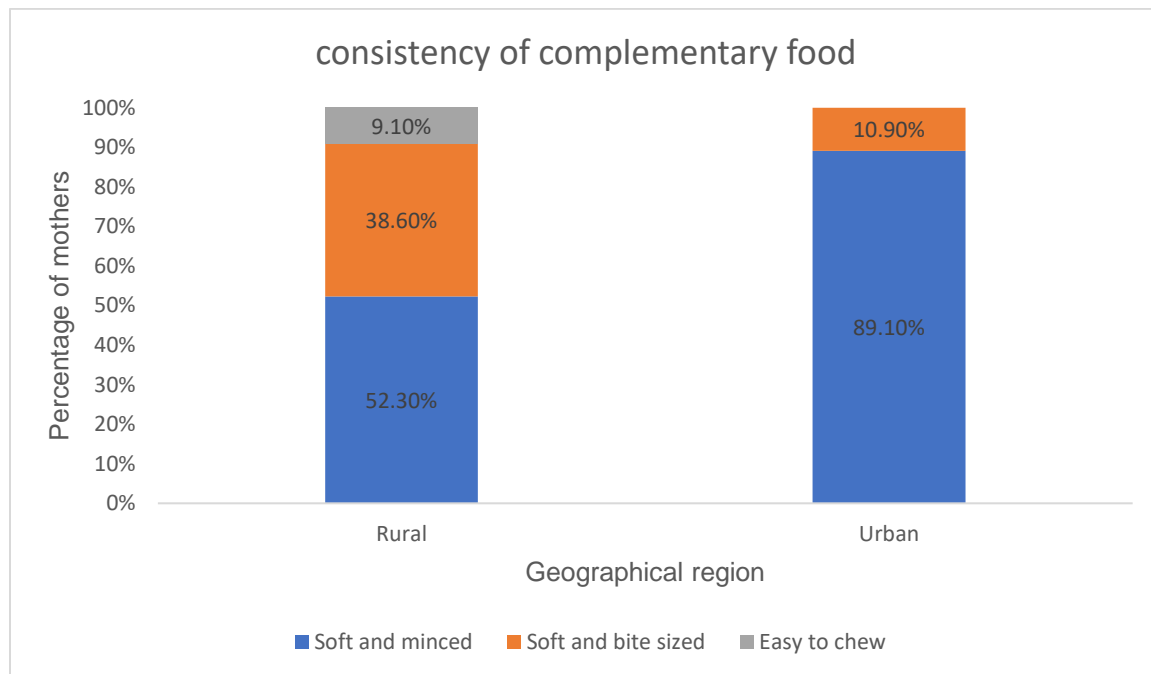
**a. Comparison across district:** Mothers from all the districts used soft, minced and soft bite sized consistency. The results revealed that the consistency across districts was similar but varied slightly in percentage.

**b. Comparison across geographical area:** Majority of the rural and urban mothers gave soft and minced food for their infants as the next consistency. However, greater percentage of mothers (n=41, 89.1%) from urban gave soft and minced compared to rural mothers (n= 23, 52.3%). Mothers from rural areas (n= 17, 38.6%) also gave soft and bite sized food more than urban mothers (n=5, 10.9%). This has been depicted in figure 4.19. Thus the results indicated that consistency varied across rural and urban areas.



**Figure 4.19**

*Consistency of the next complementary food introduced across geographical area*



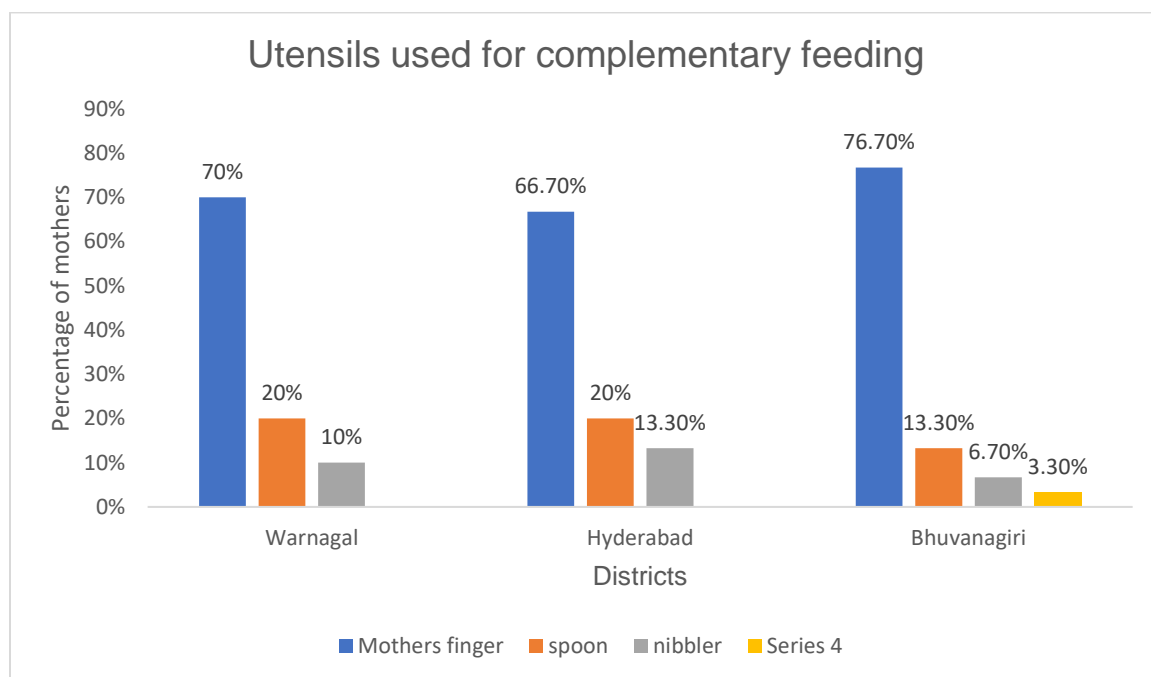
#### ***4.3.3 Utensils used to feed the next consistency***

The third question under this section also extracted information about the utensil used to introduce the next consistency. The data revealed that out of 90 mothers, 64 mothers (71.1%) used their fingers to feed their infants.

**a.Comparison across districts:** Majority of the mothers from all three districts used fingers to feed their infants. However this was greatest among the mothers from Bhuvanagiri (n=23, 76.7%) compared to Warangal (n=21, 70%) and Hyderabad (n= 20, 66.7%). Thus the results revealed that there was a slight difference across districts. This has been depicted in figure 4.20

**Figure 4.20**

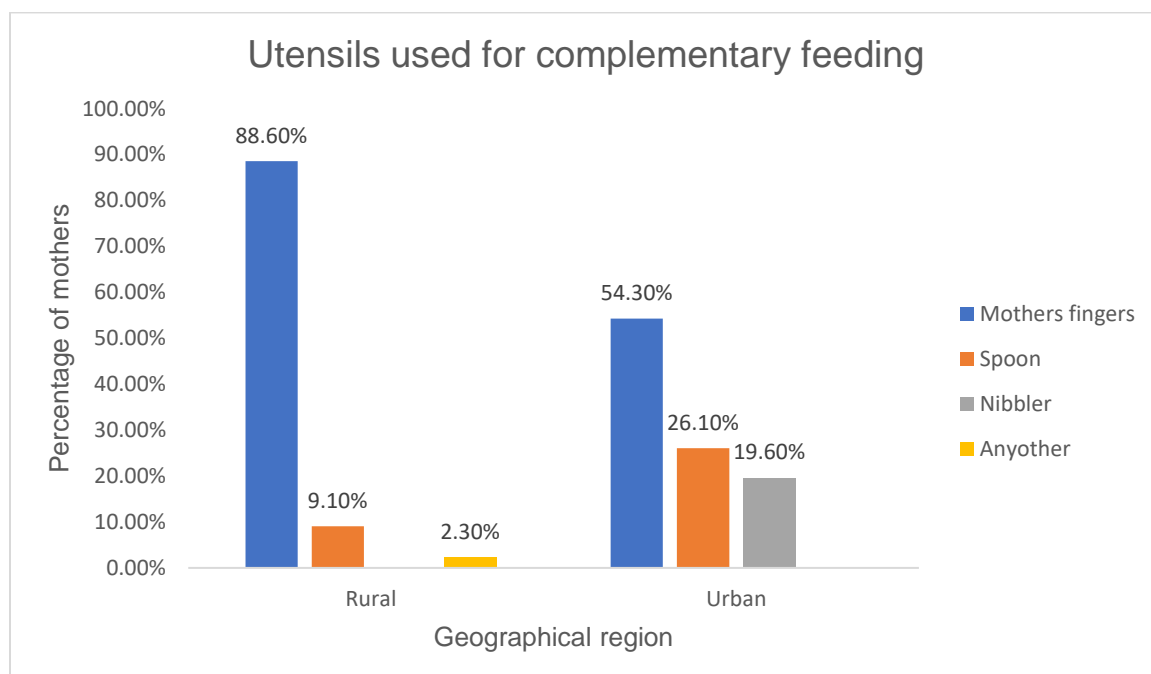
*Distribution of participants using different utensils to feed the next consistency across districts*



**b. Comparison across geographical area:** To assess if geographical area had an influence on utensils used to introduce the next consistency, a comparison was made across the mothers from rural and urban areas. Majority of the mothers from both the areas introduced the next consistency using their fingers, however, this was seen to a greater extent in the rural areas (n=39, 88.6%). Some mothers (n=12, 26.1%) from urban areas used special spoons and nibblers. Thus the results indicated that there was a difference across geographical areas in the utensils used to feed. This has been depicted in figure 4.21. Mothers from urban areas introduced nibblers and special spoon made of silicon as they had some knowledge about the child's feeding development and the use of various utensils used.

**Figure 4.21**

*Distribution of participants using different utensils to feed the next consistency geographical area*



#### **4.3.4 Position used to feed the next consistency**

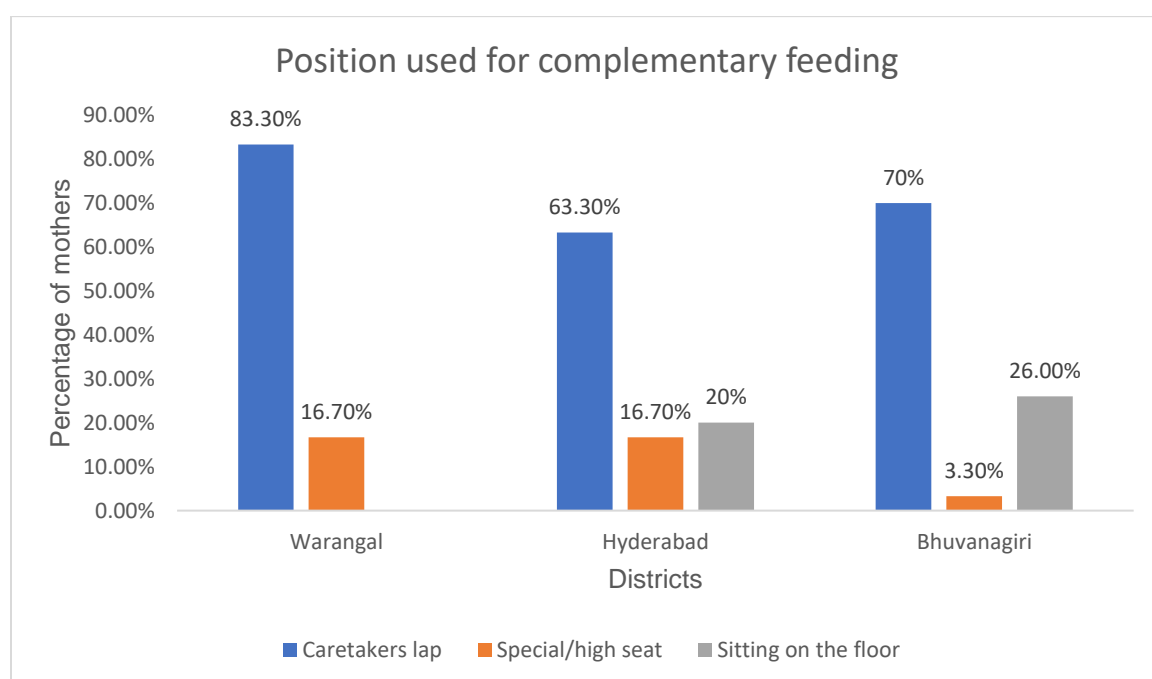
The fourth question under this section also extracted information about the positions used to introduce the next consistency. The data revealed that out of 90 mothers, 65 mothers (72.2%) mothers fed their infants on their laps at 45 degree angle. The findings are in consonance with the recommendation made by kidshealth.org where it is stated that it is best to make the baby sit supported in the lap or in a high chair with a safety strap during feeding.

**a.Comparison across districts:** There was a similarity in the position used for feeding across all districts, with majority of mothers feeding their infants by placing them on the

lap, however greater percentage of mothers from Warangal (n=25, 83.3%) used this position compared to mothers from Bhuvanagiri (n= 23, 76.7%) and Hyderabad (19, 63.3%). This has been depicted in figure 4.22 Thus the results revealed that though the position used was same across districts, the percentage of mothers using this varied.

**Figure 4.22**

*Distribution of participants using different positions to feed the next consistency across districts*

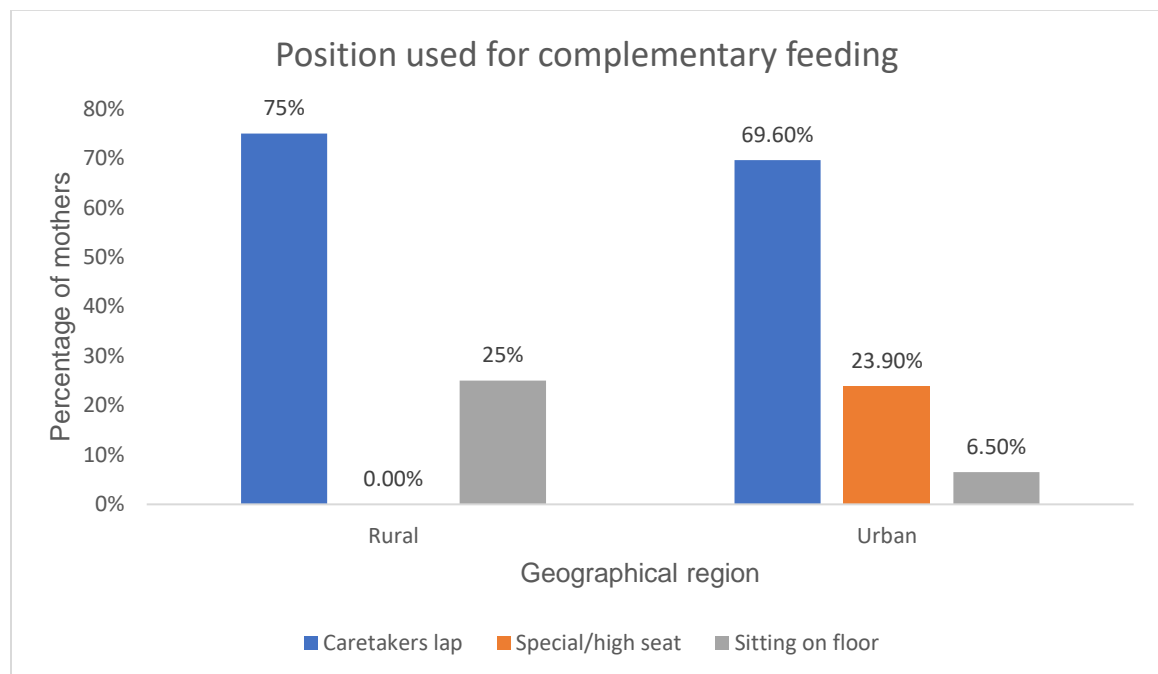


**b. Comparison across geographical area:** To assess if geographical area had an influence on position used to introduce the next consistency, comparison was made between the mothers from rural and urban areas. Nearly equal number of mothers from rural and urban areas fed their infants by placing them on the lap. Some mothers from urban areas (n=11, 23.9%) also fed their infants in special seat/high chair. This has been depicted in figure

4.23. The mothers from urban areas used high seat because mothers from urban areas were from a high socio economic status and were well educated.

**Figure 4.23**

*Distribution of participants using different positions to feed the next consistency across geographical area*



## 4.4 Introduction of water

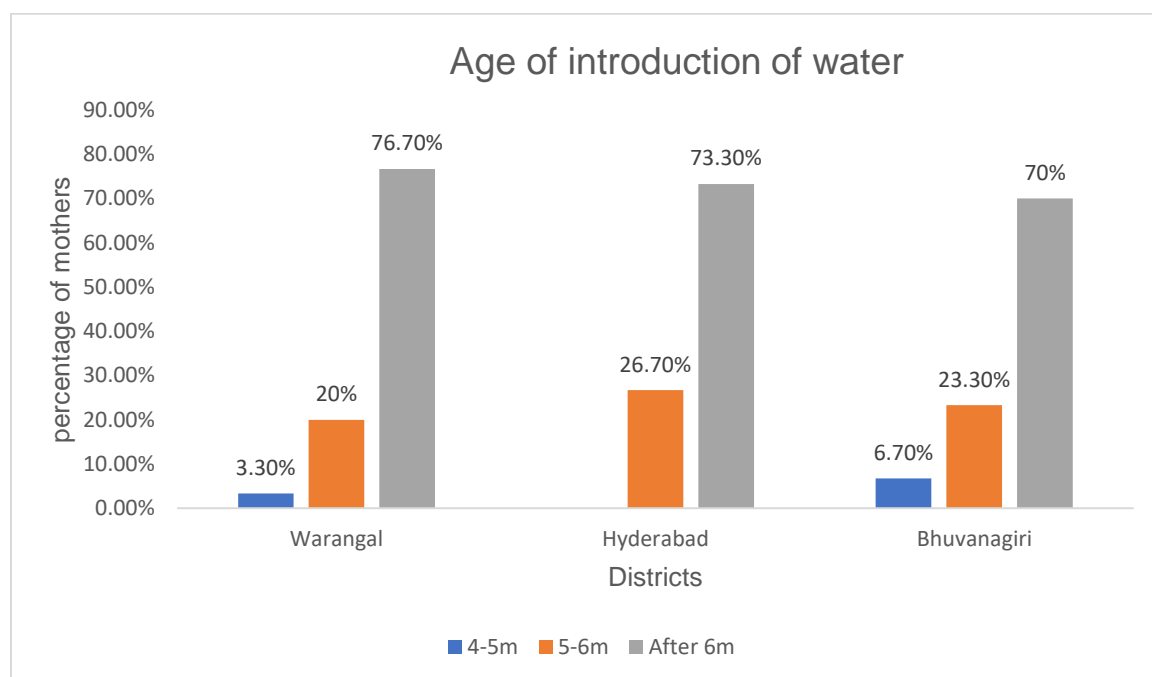
### 4.4.1 Age of introduction of water

The first question under this section extracted information about the age at which water was introduced. The data revealed that out of 90 mothers, 63 mothers (70%) introduced water after 6 months.

**a. Comparison across districts:** Nearly equal percentage of mothers from Warangal (n=23, 76.7%), Hyderabad (n= 22, 73.3%) and Bhuvanagiri (n=21, 70%) introduced water after 6months of age. Thus the results revealed that there was a similar trend across districts. This has been depicted in figure 4.24. The recommendation by American Academy of Paediatrics (AAP) also indicate that water may be given to infants older than six months.

**Figure 4.24**

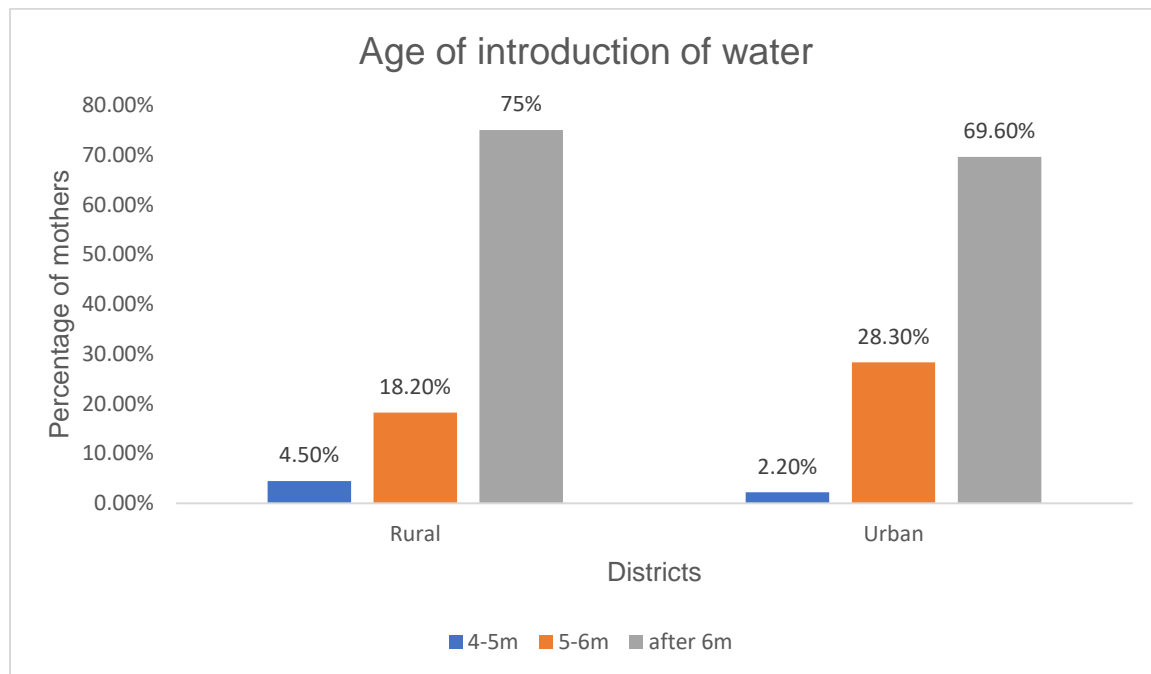
*Age of introduction of water across districts*



**b. Comparison across geographical area:** To assess if the area had an influence on age of introduction of water, a comparison was made across the mothers from rural and urban areas. Greater percentage of mothers from rural region (n= 34, 77.2%) compared to urban region (n=31, 70.5%) introduced water after 6 months of age. Thus the results revealed that there was a difference across rural and urban region. This has been depicted in Figure 4.25.

**Figure 4.25**

*Age of introduction of water across geographical area*



#### **4.4.2 Utensils used for giving water**

The second question under this section extracted information about the age at which water was introduced. The data revealed that out of 90 mothers, 46 mothers (51.1%) used glass with or without rim.

**a. Comparison across districts:** Across all districts majority of the mothers used glass with or without rim, however greater percentage of mothers from Warangal (n=16, 53.3%) and Hyderabad (n= 16, 53.3%) used this, compared to mothers from Bhuvanagiri (n=14, 46.6%). Open cup and Sippy cup was also used by a considerably equal and larger number of participants across all districts. The number and percentage of participants using

different utensils to feed water across districts has been depicted in the table 4.15. Thus, the results indicated a variation across districts.

**Table 4.15**

*Distribution of participants using different utensils to feed water across districts*

| Districts/<br>utensils          | Warangal |       | Hyderabad |       | Bhuvanagiri |       |
|---------------------------------|----------|-------|-----------|-------|-------------|-------|
|                                 | n        | %     | n         | %     | n           | %     |
| Glass with or without rim       | 16       | 53.3% | 16        | 53.3% | 14          | 46.6% |
| Steel glass with attached straw | 2        | 6.7%  | 2         | 6.7%  | 2           | 6.7%  |
| Open cup/Sippy cup              | 9        | 30%   | 10        | 33.3% | 9           | 30%   |
| Bowl and spoon                  | 1        | 3.3%  | 1         | 3.3%  | 2           | 6.7%  |
| Olle/nifty cup                  | 2        | 6.7%  | 1         | 3.3%  | 3           | 10%   |

**b. Comparison across geographical area:** To assess if area had an influence on utensil used for introduction of water, a comparison was made across the mothers from rural and urban areas. Greater percentage of mothers from rural population that is (n=29, 65.9%) used glass with or without rim to introduce water, whereas greater percentage of the mothers from urban population (n=24, 52.2%) used open/sippy cup. The number and percentage of participants using different utensils to feed water across districts has been depicted in the table 4.16 Thus, the results indicated there was a difference in the utensils used to introduce water across area.



**Table 4.16**

*Distribution of participants using different utensils to feed water across geographical area*

| Area/utensils                   | Rural |       | Urban |       |
|---------------------------------|-------|-------|-------|-------|
|                                 | n     | %     | n     | %     |
| Glass with or without rim       | 29    | 65.9% | 17    | 37%   |
| Steel glass with attached straw | 3     | 6.8%  | 3     | 6.5%  |
| Open cup/Sippy cup              | 4     | 9.1%  | 24    | 52.2% |
| Bowl and spoon                  | 3     | 6.8%  | 1     | 2.2%  |
| Olle/nifty cup                  | 5     | 11.4% | 1     | 2.2%  |

#### **4.4.3 Position used for giving water**

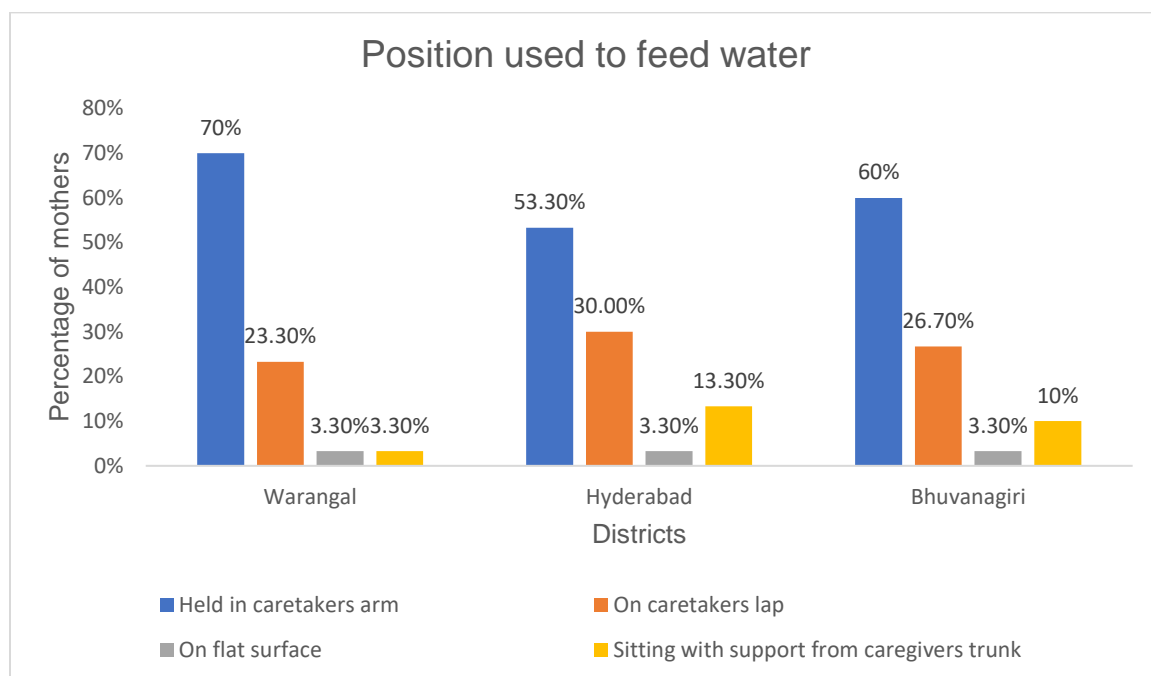
The third question under this section extracted information about the position used to introduce water. The data revealed that out of 90 mothers, 55 mothers (61.1%) fed water to their infants holding in their arms.

**a. Comparison across districts:** Majority of the mothers across all districts fed water to their infants by holding their infants in their arms, however this position was used by a greater percentage of mothers from Warangal (n=21, 70%) compared to mothers from Bhuvanagiri (n= 18, 60%) and Hyderabad (n=16, 53.3%) fed their infants holding them in the arms. Nearly equal and a considerably larger number also placed their infants on their lap while feeding water. The number of participants using different positions to feed water

across districts has been depicted in the figure 4.26. Thus, though the results revealed the usage of similar positions across districts, the percentage of mothers using this varied.

**Figure 4.26**

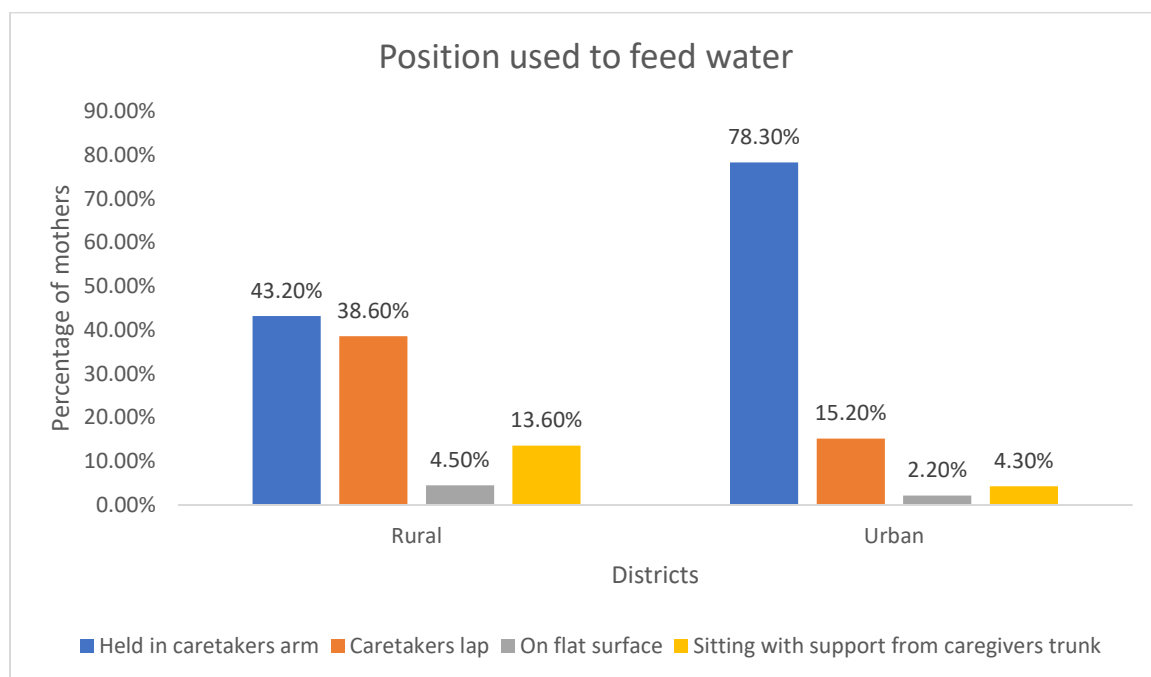
*Distribution of participants using different positions to feed water across districts*



**b. Comparison across geographical area:** To assess if area had an influence on position used for introduction of water, a comparison was made across the mothers from rural and urban areas. Greater percentage of mothers from urban (n=36, 78.3%) compared to mothers from rural region (n= 19, 43.2%) held their infants in arms while feeding water. Also, nearly equal number of mothers (n= 17, 38.6%) from rural areas introduced water by holding their infants on lap. The number of participants using different positions to feed water across areas has been depicted in the figure 4.27 the results revealed a difference across areas in the position used to feed water.

**Figure 4.27**

*Distribution of participants using different positions to feed water across geographical area*



## 4.5 Age of introduction of various tastes

### 4.5.1 Age of introduction of sweet taste

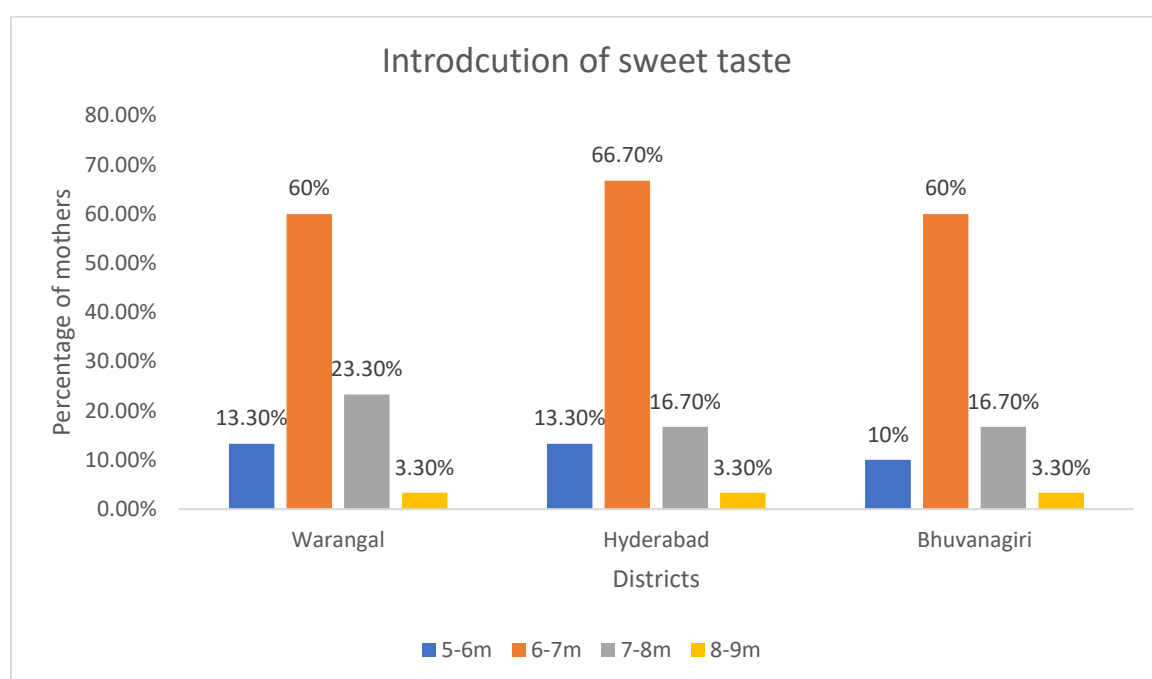
The first question under this section extracted information about the age at which sweet taste was introduced. The data revealed that out of 90 mothers, 56 mothers (62.2%) introduced sweet taste between 6-7months.

**a. Comparison across districts:** A comparison across districts revealed that nearly equal percentage of mothers introduced sweet taste between 6-7 months of age. Sweet taste was introduced through bellamannam (a dish made of rice, milk and jaggery), rava halwa and fruits in all districts. Thus, the results indicated that there was a similarity across districts

in the introduction of sweet taste. The number of mothers introducing sweet taste across age groups in all the districts has been depicted in figure 4.28. The results are supported by the evidence that infants favour sweet tastes even in the first three months of life (Dasher, 2022).

**Figure 4.28**

*Age of introduction of sweet taste across districts*

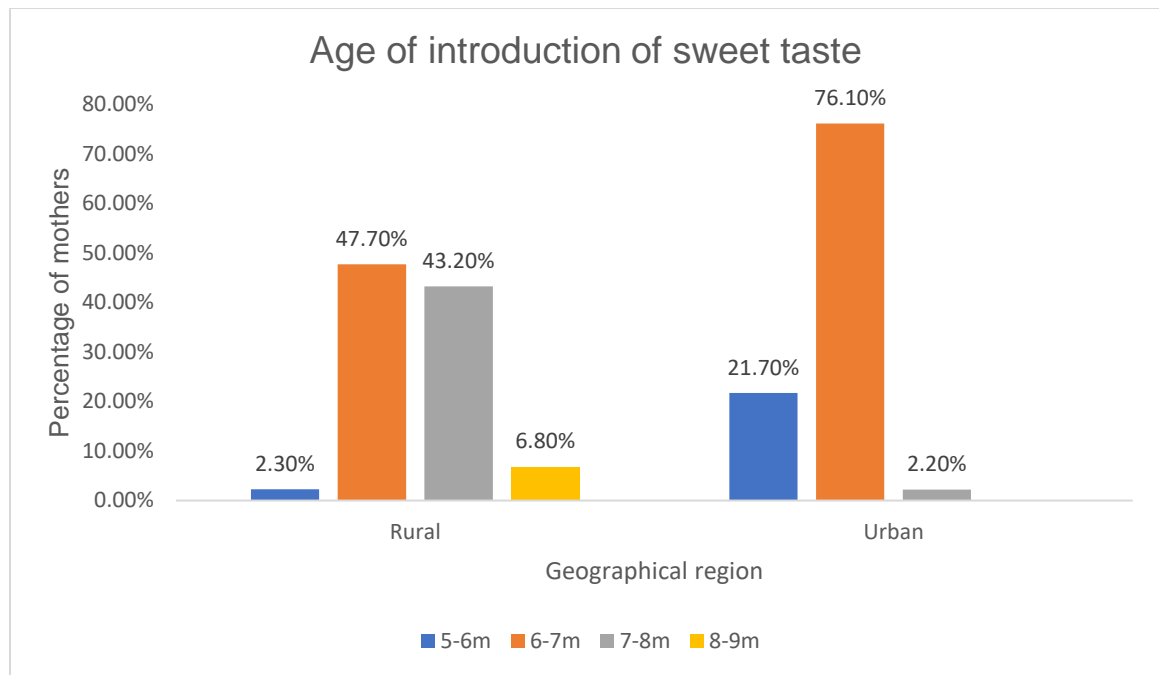


**b. Comparison across geographical area:** To assess if area had an influence on the age of introduction of sweet taste, a comparison was made across the mothers from rural and urban areas. It was seen that mothers from both areas introduced sweet taste at 6-7 months of age, however, greater percentage of mothers from urban (n=35, 76.1%) as compared to mothers from rural (n=21, 47.7%) introduced this. Nearly equal percentage of mothers from rural areas also introduced this taste at 7-8 months. Thus, the results indicated that though 6-7 months was the age at which sweet taste was introduced, there was a difference

in terms of the percentage of mothers who introduced this across areas. The number of mothers introducing sweet taste across age groups in the rural and urban area has been depicted in figure 4. 29

**Figure 4.29**

*Age of introduction of sweet taste across geographical areas*



#### ***4.5.2 Age of introduction of savoury taste***

The second question under this section extracted information about the age at which savoury taste was introduced. The data revealed that out of 90 mothers, 28 mothers (31.1%) introduced savoury taste between 8-9months and 27 mothers (30%) introduced between 9-10months.

**a. Comparison across districts:** The data in table 4.17 indicated that there was a difference in the age at which the savoury taste was introduced across districts. Greater

percentage of mothers from warangal (n=12, 40%) introduced this taste at 8-9 months, however greater percentage of mothers from Hyderabad introduced this at 9-10 months. Greater percentage of mothers from Bhuvanagiri (n=10, 33.3%) introduced this taste between 10-11 months. The mothers introduced this taste through curries and pickles. Thus the results revealed that there was a difference across districts in introduction of savoury taste.

**Table 4.17**

*Introduction of savoury taste across districts*

| Districts   | 8-9m |       | 9-10m |       | 10-11m |       | 11-12m |      | After 12m |      |
|-------------|------|-------|-------|-------|--------|-------|--------|------|-----------|------|
|             | n    | %     | n     | %     | n      | %     | n      | %    | n         | %    |
| Warangal    | 12   | 40%   | 6     | 20%   | 8      | 26.7% | 2      | 6.7% | 2         | 6.7% |
| Hyderabad   | 7    | 23.3% | 13    | 43.3% | 7      | 23.3% | 2      | 6.7% | 1         | 3.3% |
| Bhuvanagiri | 9    | 30%   | 8     | 26.7% | 10     | 33.3% | 2      | 6.7% | 1         | 3.3% |

**b. Comparison across geographical area:** To assess if area had an influence on age of introduction of savoury taste, a comparison was made across the mothers from rural and urban areas. The data in table 4.18 indicated that there was a difference across areas in the introduction of savoury taste. Greater percentage of the mothers from rural areas (n=23, 52.3%) introduced savoury taste between 10- 11 months, whereas more mothers from urban areas (n= 25, 54.3%) savoury taste between 8-9 months of the infants' age. Thus the results reveal that there is a difference across areas in the introduction of savoury taste.

**Table 4.18***Introduction of savoury taste across geographical area*

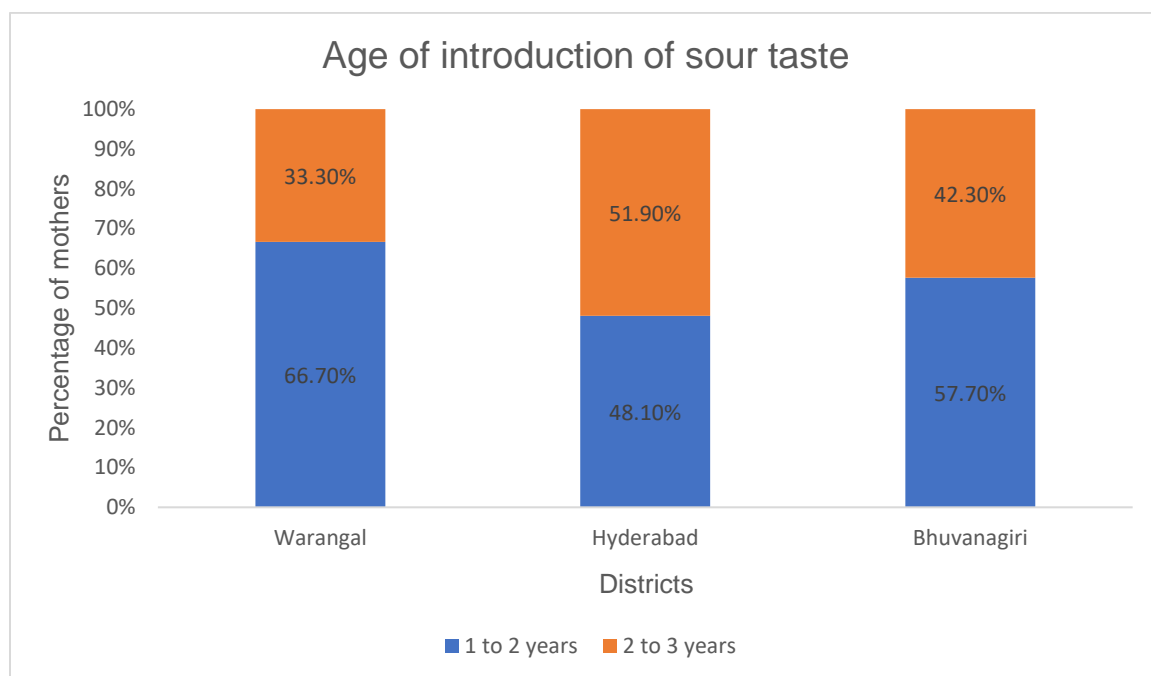
| <b>Area/<br/>age group</b> | <b>8-9m</b> |          | <b>9-10m</b> |          | <b>10-11m</b> |          | <b>11-12m</b> |          | <b>After 12m</b> |          |
|----------------------------|-------------|----------|--------------|----------|---------------|----------|---------------|----------|------------------|----------|
|                            | <b>n</b>    | <b>%</b> | <b>n</b>     | <b>%</b> | <b>n</b>      | <b>%</b> | <b>n</b>      | <b>%</b> | <b>n</b>         | <b>%</b> |
| Rural                      | 3           | 6.8%     | 9            | 20.5%    | 23            | 52.3%    | 5             | 11.4%    | 4                | 9.1%     |
| Urban                      | 25          | 54.3%    | 18           | 36.1%    | 2             | 4.3%     | 1             | 2.2%     | 0                | 0.0%     |

The findings are in line with the recommendation made by Lake (2022) that infants can be introduced to spices and herbs around 8-10 months. Mothers from rural region introduced spice after 10 months probably because of knowledge and lack of awareness.

**4.5.3 Age of introduction of sour taste**

The third question under this section extracted information about the age at which sour taste was introduced. The data revealed that out of 90 mothers, 80 mothers (88.8%) introduced sour taste.

**a. Comparison across districts:** As seen from the figure 4.30, greater percentage of mothers from Warangal (n=18, 66.7%) introduced sour taste compared to mothers from Bhuvanagiri (n=16, 53.3%) between 12-24 months of age. In Hyderabad, almost equal percentage of mothers introduced this taste in both the age groups. The most common foods through which sour taste was introduced across all three districts was lemon, tamarind, pickle, curd. Thus, the results revealed that there was a difference across districts in the introduction of sour taste.

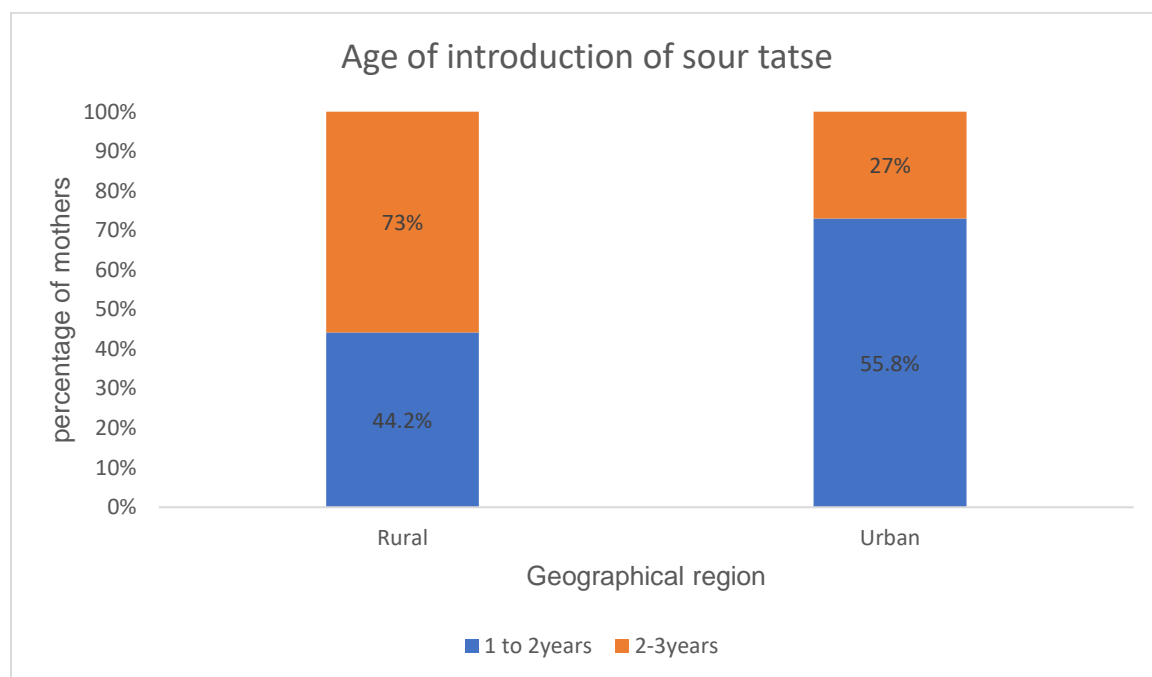
**Figure 4.30***Age of introduction of sour taste across districts*

**b. Comparison across geographical area:** To assess if area had an influence on age of introduction of sour taste, a comparison was made across the mothers from rural and urban areas. As seen from figure 4.31, greater percentage of mothers from urban areas (n=27, 73%) introduced sour taste between 12-24months of age, whereas greater percentage of mothers from rural areas (n= 24, 55.8%) introduced this between 24-36months of age. Thus results indicated a difference in the age of introduction of sour taste across areas.



**Figure 4.31**

*Age of introduction of sour taste across geographical area*



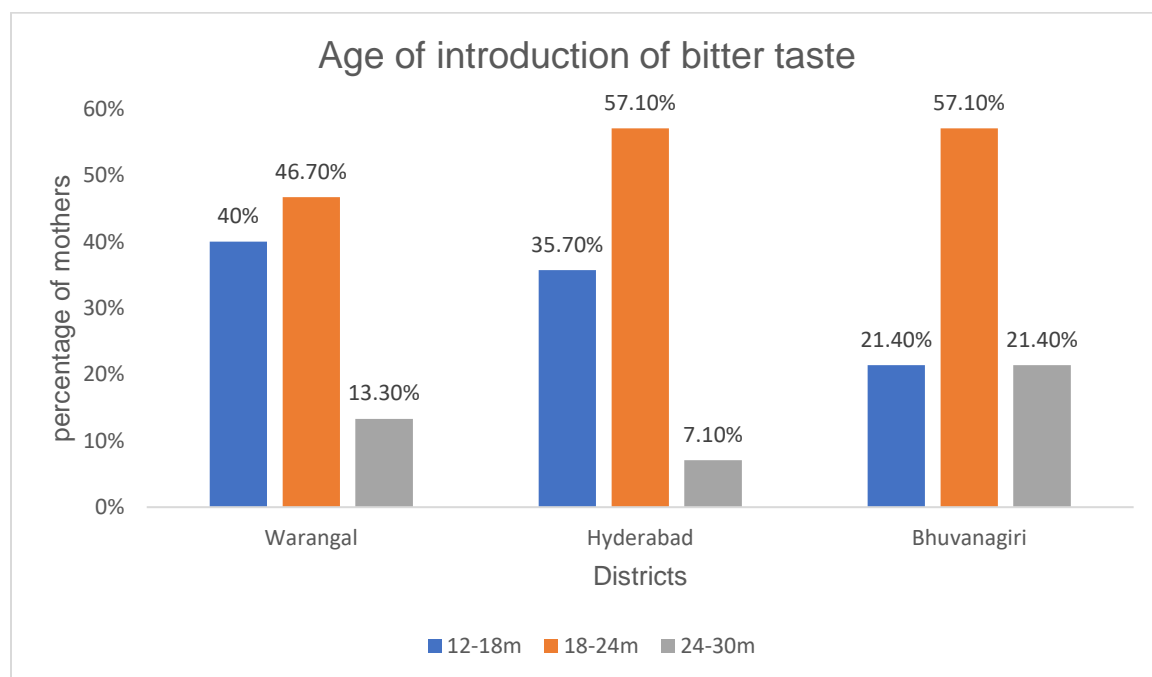
#### ***4.5.4 Age of introduction of bitter taste:***

The fourth question under this section extracted information about the age at which bitter taste was introduced. The data revealed that out of 90 mothers, only 43 mothers (47.7%) introduced bitter taste.

**a. Comparison across districts:** As depicted in figure 4.32 below similar percentage of the mothers (n=23, 53.5%) from all three districts introduced bitter taste at around 18-24 months. The food through which bitter taste was introduced by all the mothers was bitter gourd. Thus the results revealed a similar trend across districts.

**Figure 4.32**

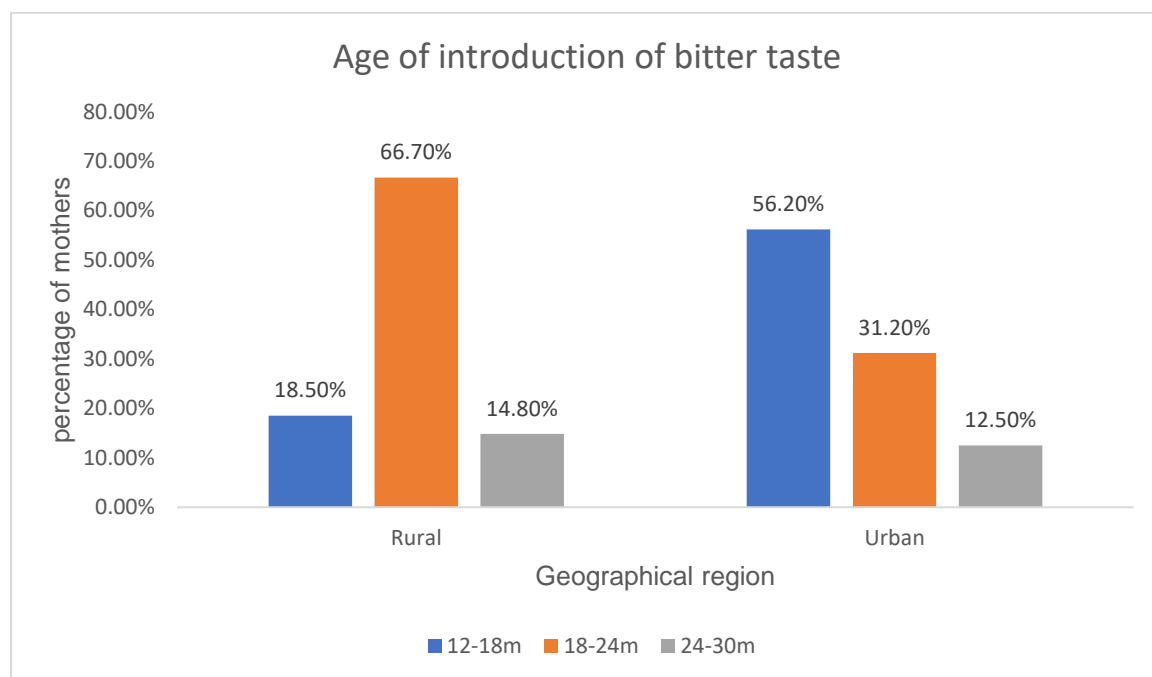
*Age of introduction of bitter taste across districts*



**b. Comparison across geographical area:** To assess if area had an influence on age of introduction of bitter taste, a comparison was made across the mothers from rural and urban areas. Greater percentage of mothers from rural areas (n=18, 66.7%) introduced compared to urban mothers. In contrast more number of mothers from urban introduced between 12-18months (n=9, 56.2%). This is depicted in figure 4.33. Thus the results revealed a difference across geographical region. This is because mothers from urban wanted their infants to taste various tastes as young age as possible.

**Figure 4.33**

*Introduction of bitter taste across geographical area*



#### **4.6 Time taken to feed the child**

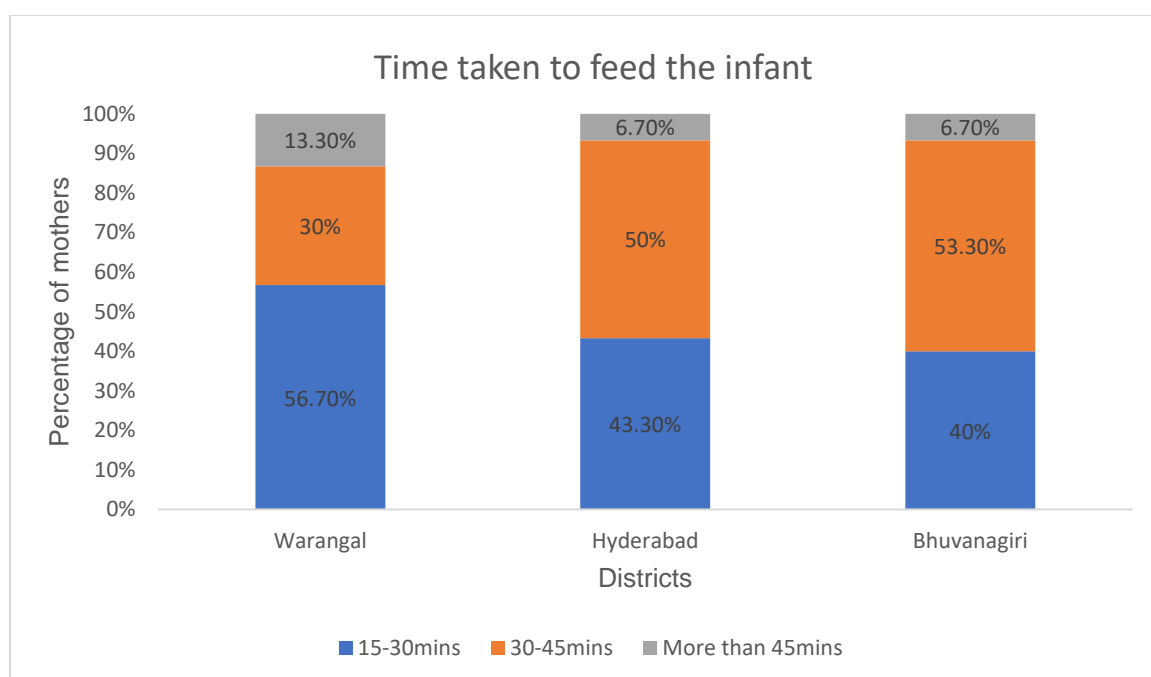
The last question of this section extracted information on time taken for infant's meal. The data revealed that out of 90 mothers, 42 mothers (46.7%) took around 15-30 minutes to feed the meal to their infants. The findings correlate with suggestion made by Nationwide Children's Hospital (2011). It suggests that infants' meals should last up to 20-30 minutes.

**a. Comparison across districts:** Greater percentage of mothers from Warangal (n=17, 56.6%) took 15-30min to feed their infants. In contrast greater percentage of mothers from Hyderabad (n=15, 50%) and Bhuvanagiri (n=16, 53.3%) took 30-45min. this is depicted in

figure 4.34. The results revealed that there was a difference across districts. The probable reason behind mothers from Warangal taking 15-30min to feed is because the number of mothers employed were more in Warangal.

**Figure 4.34**

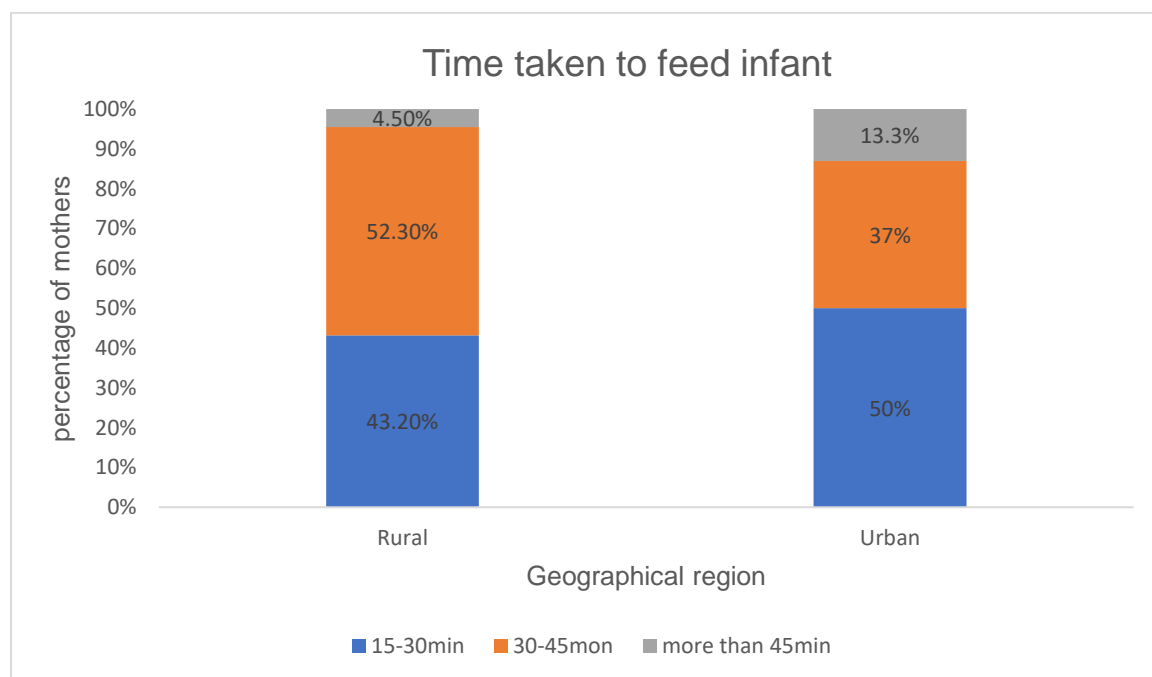
*Time taken to feed the infants across various districts*



**b. Comparison across geographical area:** To assess if area had an influence on time taken to feed the infant, comparison was made across the mothers from rural and urban areas. The data in figure 4.35 depicted that greater percentage of mothers from urban areas (n=23, 52.3%) took 15-30min to feed their infants. In contrast, mothers from rural (n=23, 50%) took 30-45min to feed. Thus, the results revealed that there was a difference across areas. Majority of the mothers from urban were employed and lived in nuclear families and this could have contributed to the differences with respect to feeding time.

**Figure 4.35**

*Time taken to feed the infants across geographical area*



To summarize, there were many findings of interest that were revealed through the current study. Though it was found that 100% of mother's breastfed their infants from birth, 92.2% of them carried out breast feeding exclusively, as the remaining 7.8% of mothers introduced formula feeds, the majority of whom were from Warangal district. The age of introduction of formula milk differed across districts and geographical area. Greater percentage of mothers from Warangal introduced formula feed between 3-4 months due to insufficient milk secretion. The most prevalent type of feed introduced was formula milk than cow milk. Thus, the type of feed used varied across districts and rural and urban region. The utensils used to feed milk to their infants also varied across districts and geographical region. Greater percentage of mothers from Warangal and rural regions used

paladai compared to others who used feeding bottle. The position used to feed the formula milk remained same across districts and geographical areas.

The age of introduction of complementary feeding across districts and geographical area followed a similar trend. However the percentage varied and few mothers from rural region introduced complementary food after 7 months. The food items used for complementary feeding were similar across districts and varied across region, mothers from urban gave cerlac and pureed fruits to their infants.

The consistency of food was moderately thick and was similar across districts and geographical area, however few mothers from rural areas also gave extremely thick consistency. Steel spoons was the most prevalent utensil used to feed complementary foods. Majority of the mothers across districts and geographical area fed their infants holding in their arms, whereas a few from rural region held their infants on lap.

The age of introduction of next consistency was different across districts and geographical area. Mothers from Warangal and urban mothers from all districts introduced around 7-8months, whereas mothers from rural areas and Hyderabad and Bhuvanagiri introduced mostly around 8-9months. The food introduced as next consistency remained same across all three districts, but percentage varied and differed across geographical area. Urban mothers fed mashed fruits and steamed vegetables and rural mothers gave more cereal based food like rice. Across districts and geographical area the consistency used to feed was soft and minced and soft bite size, however the percentage varied. Mother's fingers were used to feed across districts and geographical area and few mothers from urban used special spoons made of silicon to feed their infants. Feeding the child on the mother's

lap was the commonly used position across the districts and the geographical area. However, special seats were also used by few of the mothers from urban area.

Age of introduction of water was mostly after 6 months across districts and geographical area, however few mothers from urban areas introduced it before 6months. The usage of utensils used to feed water followed a similar trend across districts and varied across geographical area. The position in which water was fed remained same across districts and geographical area, however the percentage varied. A few mothers from urban areas fed water by placing child on lap.

With respect to introduction of taste, most mothers introduced sweet taste between 6-7months across all three districts. However a difference was seen across geographical area as few rural mothers introduced after 7-8months. Introduction of Savoury taste and sour taste varied across districts and geographical areas. Introduction of bitter taste remained same across districts and differed across geographical areas. The trend of time taken to feed meals to the infants differed across districts and geographical areas.

Thus, age of introduction of formula feed, type of milk, utensils used, age of introduction of next consistency, introduction of savoury and sour taste and time taken to feed their infants varied across districts. Other feeding aspects like termination of breastfeeding, position used for formula feed, age of introduction of complementary food, type of complementary food, consistency of complementary food, utensils and position used for complementary food, food items used for next consistency, utensils and position used for next consistency, age of introduction of water, utensils and position used for introduction of water, age of introduction of sweet and bitter taste were similar across districts. Though, similar trend was found in feeding practices, variations were seen in the

percentage of mothers with respect to termination of breastfeeding, age of introduction of complementary food, food type used for complementary feeding, consistency and position used, type of food given and consistency of next complementary food, position used to feed next consistency, age of introduction of water, utensils, position used to feed water and age of introduction of sweet and bitter taste. Thus there were some similarities and differences in feeding practices across districts.

Across geographical area, the age of introduction of formula feed, type of other milk, utensils used for formula feed, the type of food used for complementary feeding, age of introduction of next complementary food, food items used for next consistency, consistency of next complementary food introduced, utensils used for the next consistency, age introduction of sweet, savoury, sour and bitter taste and time taken to feed their infants varied across rural and urban region. However, other feeding aspects like termination of breastfeeding, position used for formula feed, age of introduction of complementary food, consistency of complementary food, utensils and position used for complementary food, utensils and position used for the next consistency, age of introduction of water, position used to feed water were similar across geographical area. Though, similar trend was found in feeding practices, variations were seen in the percentage of mothers with respect to age of introduction of complementary food, consistency of complementary food, position used to feed the child complementary food, utensils used to feed next consistency, age of introduction of water, position used to feed water and age of introduction of sweet taste. Thus, across geographical area differences in feeding practices were seen. In conclusion it can be stated that feeding practices varied across districts and geographical area.



## **CHAPTER V**

### **SUMMARY AND CONCLUSIONS**

Parent feeding and child eating are central to the fabric of family life and are strongly rooted in culture and tradition. Indian food style is diverse and unique from that seen across the world and is highly influenced by these factors. Given the diversity, what, when and how food is given to infants could differ across different states and districts of India. There are higher opportunities of detailed variations in the utensils, the type of food introduced at each age, its consistency etc. Given the complexity and variation of feeding practices, such studies in a country like India are vital. Studies examining the existing feeding practices in the Indian context are limited. The culinary culture of Telangana is also unique from other states of India. The state of Telangana has 33 districts, each with its own culture, traditions and beliefs. It lies on the Deccan plateau and its topography dictates more millets and roti based dishes. Jowar and Bajra features more prominently in their cuisine. There are many styles of cooking in Telangana. In the villages, people still employ traditional methods in cooking. This includes wood-fired and Masonry's ovens. The food is typically spicy and ingredients such as tamarinds, sesame seeds, red chillies and asafoetida are predominantly used. There are many regional variations due to topographic differences in Telugu language speaking populations spread over a large area. Consequently, the parental feeding practices and beliefs can vary from district to district. Keeping this in view, this research is designed to investigate the parental feeding practices in Telangana. The objectives were to compare the parental feeding practices across three districts of Telangana and across Rural and urban population.

This was a cross sectional survey. A survey tool was developed to assess the parental feeding practices among the mothers in Telangana. The survey tool was created using a google literature search and books about the evolution of feeding. After considering the overlap and significance of things under each domain of interest, item pools for each section were developed. It was carefully maintained that the products were appropriate for the Indian environment. The questions in the survey tool focused on the termination of breastfeeding, age of introduction of different food items and tastes, its consistency, utensils used and the position used to feed the infants.

Three Speech-Language Pathologists (SLPs) with at least ten years of clinical expertise in the field of feeding and associated disorders received the survey tool that had been created for validation purpose. The SLPs were asked to judge the clarity, simplicity, relevance, framing, applicability and appropriateness of the items as well as clarity, simplicity, relevance, color, appearance and iconicity of the pictures included using a Likert rating scale from 1 to 5 wherein 1 indicated “poor”, 2 indicated “fair”, 3 indicated “good”, 4 indicated “very good” and 5 indicated “excellent”. The modifications suggested by the SLPs were incorporated in the survey tool. The options under the items related to position were expanded. A few questions were reframed to resolve their ambiguity. A few questions were added based on the suggestions provided by the judges. A few pictures were replaced with other pictures better clarity. A pilot study was conducted on six participants (two from each district) after which a few age ranges in the options were modified.

Ninety mothers of children in the age range of 1-3 years (30 mothers from each of the three districts- Warangal, Hyderabad and Bhuvanagiri) were included as participants. The participants of all the districts were divided into rural and urban, out of which 44 belonged

to rural areas and 46 belonged to urban areas. The mothers were between the ages of 21 and 35. The average age of new-borns in all the districts was 2.2 years, and there were 49 males and 41 females among them. The participants were distributed among various socio economic status but compared to others most of them belonged to upper middle class. 60 mothers were homemakers and the rest were employed. Most of them belonged to Hindu religion. Majority of the mothers were first time mothers. 58 participants resided in nuclear families and the remaining in joint family. Most of the participants were non vegetarians. The survey tool was administered via online mode. Before the survey, an informed consent was obtained for participation in the survey.

The current investigation revealed a wide range of intriguing discoveries. It was discovered that all the mothers breastfed their exclusively from birth, 92.2% of them exclusively breastfed and remaining 7.8% mothers introduced other sources of milk. It was discovered that rural mothers gave cow milk and urban mothers gave formula milk. The milk from other sources was given due to insufficient milk secretion by mothers of urban areas and inability to suck during breastfeeding in rural areas. Those who introduced, most of them did so between 3-4 months and majority were from Warangal. Across all three districts paladai was the most commonly used utensil to feed formula milk. Whereas mother from urban used feeding bottle with specific size and rural mothers used paladai. The position used to feed the other source of milk remained same across districts and region.

The age of introduction of complementary feeding varied slightly across districts and more across different rural and urban population. The consistency used to introduce complementary foods to infants was moderately thick foods such as dal soup, rice soup,

fruit puree, Uggu, cerelac and balamrutham were introduced across all three districts. Across region rural mothers introduced food such as balamrutham which was supplied by government of Telangana whereas mothers from urban areas gave Uggu, dal soup and pureed fruits. Steel spoons were the most frequently used for complementary feeding, but the proportion varied slightly majority of the mothers from Hyderabad introduced complementary feeding with special silicon spoons. Across region all the mothers from rural areas used steel spoon to feed whereas few mothers from urban areas used feeding bottle with spoon attached and through special spoons. Majority of the mothers from all three districts fed their infants holding them in arms, the same has been across region however few mothers from rural held their infants in lap while feeding.

Mothers from Warangal introduced the next consistency of complementary food between 7-8 months of age whereas as majority of the mothers from Hyderabad and Bhuvanagiri introduced between 8-9months of age. Across region most of the urban mothers introduced between 7-8months and rural mothers introduced between 8-9months. That is the age of introduction varied depending on districts and region. The food used to introduce the next consistency across districts remained same Pappu Annam, steamed vegetables, mashed fruits and curd rice. And differed across region, rural mother introduced Pappu Annam, curd rice and curries whereas mothers from urban areas introduced Pappu Annam, steamed vegetables and mashed fruits. The consistency of food given across districts and region remained same that is soft and minced consistency was given mostly by mothers of all three districts and across rural and urban population. This consistency was fed mostly through the mothers hands across all three districts and region however few mothers from urban used spoons also to feed. Feeding the child on the

mothers lap was the commonly used position across the districts and region. However special seats were also used by few mothers from urban areas.

Similar trend was seen across districts and rural and urban region for introduction of water, majority of the mothers introduced water after 6months. Few mothers from urban introduced between 5-6months. Mothers from Warangal and Hyderabad gave water through a glass with or without rim compared to mothers of Bhuvanagiri. Most of the mothers from rural introduced water through glass in contrast mothers from urban gave it through Sippy cup. Therefore the utensils through which water was introduced varied across region and districts. Majority of the mothers held their child in arms while feeding however compared to Hyderabad and Bhuvanagiri more mothers from Warangal held their infants in hand while feeding. Across region most of the mothers held infants in arms whereas in rural few mothers held their infants in their lap while feeding water.

Introduction of sweet taste majority of the mothers introduced sweet between 6-7months of age however compared to Warangal and Bhuvanagiri more mothers from Hyderabad introduced between 6-7months and the food through which sweet was introduced bellamannam was same across districts but more number of mothers from Bhuvanagiri than in Warangal and Hyderabad. Across region majority of mothers introduced sweet between 6-7months however the number varied and more were from urban population. Mothers from rural introduced sweet through bellamannam whereas urban mothers gave fruits along with bellamannam.

Most mothers from Warangal and Bhuvanagiri introduced savoury taste between 8-9months whereas mothers from Hyderabad introduced between 9-10months. Difference was seen across region also mothers from rural introduced between 10-11months and urban

introduced between 8-9months. The food through which savoury was introduced remained same across districts. And varied across region.

The introduction of sour and bitter taste also varied across districts and region, however majority of the mothers across districts and region introduced sour taste through lemon between 12-24months and bitter through bitter gourd between 18-24months.

The time taken to feed varied across districts and region majority of the mothers from Warangal took 15-30min to feed their infants whereas mothers from Hyderabad and Bhuvanagiri took 30.45mins. Mothers from rural areas took 30-45min to feed their infants whereas mothers from urban took 15-30min.

A few clear differences as well as some areas of similarity in feeding practices emerged through the current research across districts and geographical area. Age of introduction of formula feed, type of milk, utensils used, age of introduction of next consistency, introduction of savoury and sour taste and time taken to feed their infants varied across districts. Other feeding aspects like termination of breastfeeding, position used for formula feed, age of introduction of complementary food, type of complementary food, consistency of complementary food, utensils and position used for complementary food, food items used for next consistency utensils and position used for next consistency. Age of introduction of water, utensils and position used for introduction of water. Age of introduction of sweet and bitter taste were similar across districts. Though, similar trend was found in feeding practices, variations were seen in the percentage of mothers with respect to termination of breastfeeding, age of introduction of complementary food, food type used for complementary feeding, consistency and position used, type of food given and consistency of next complementary food, position used to feed next consistency, age

of introduction of water, utensils, position used to feed water and age of introduction of sweet and bitter taste. Thus there were some similarities and differences in feeding practices across districts.

Across geographical area, the age of introduction of formula feed, type of other milk, utensils used for formula feed, the type of food used for complementary feeding, age of introduction of next complementary food, food items used for next consistency, consistency of next complementary food introduced, utensils used for the next consistency, age introduction of sweet, savoury, sour and bitter taste and time taken to feed their infants varied across rural and urban region. However, other feeding aspects like termination of breastfeeding, position used for formula feed, age of introduction of complementary food, consistency of complementary food, utensils and position used for complementary food, utensils and position used for the next consistency, age of introduction of water, position used to feed water were similar across geographical area. Though, similar trend was found in feeding practices, variations were seen in the percentage of mothers with respect to age of introduction of complementary food, consistency of complementary food, position used to feed the child complementary food, utensils used to feed next consistency, age of introduction of water, position used to feed water and age of introduction of sweet taste. Thus, across geographical area differences in feeding practices were seen. In conclusion it can be stated that feeding practices varied across districts and geographical area.

### 5.1 Implications of the study

This study tried to profile the feeding practices including the specifics of the food type, consistency, utensil used, posture used with young children in the districts of Telangana Warangal, Hyderabad and Bhuvanagiri. The results revealed differences in

feeding practices across districts and region. The findings of this study will facilitate an open approach for ethno cultural inclusivity/ sensitivity during assessing and intervening the young children with feeding issues from these districts among the practicing speech-language pathologists (SLPs). The SLPs will be aware of the changes in feeding practices between different districts, therefore while evaluating the young infants, the SLP can take into account these variances before deciding if a particular behaviour or food type is appropriate. The findings of this study will help the SLP understand the type of food offered in a certain district and recommend the most appropriate type of food based on the district's staple meal. For young children from these districts, a reference chart of food kind, consistency, utensils and positions used to feed, can be created, which can be used during feeding assessment and management.

## **5.2 Limitations of the study**

One potential flaw is the study's small, restricted population and geographic confinement. The findings of this study cannot be generalized to the full state of Telangana. The cross-sectional design of the study made it impossible to determine the cause and effect relationship between events. In addition, because data were gathered from the mother's perspective and self-reports rather than the practice being observed, recall and social desirability biases may represent additional study limitations.

## **5.3 Future Directions**

Future research should thus attempt to expand on the current study using a sample that is more typical of the entire population of the state in terms of the characteristics of both the parents and the children. Similar research that sheds light on typical new-born



feeding and care practices should be conducted across the other states of India. A longitudinal study can also be carried out to track the changes in feeding practices. Further research with a broader emphasis, larger sample size, and better statistical techniques is required to show the impact of variables such as socioeconomic status, type of family, feeding experience of the mother and maternal employment on the nature of the prevalent feeding practices.

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## APPENDIX I

### SURVEY TOOL TO ASSESS FEEDING PRACTICES

#### Section I- Demographic Data

|                      |                     |
|----------------------|---------------------|
| Name of the child:   | Age/Gender:         |
| Date of Birth:       | Date of evaluation: |
| Present address:     | Permanent address:  |
| District:            |                     |
| Mobile no:           | Email id:           |
| Mother's Name:       | Mother's Age:       |
| Mother's Education:  | Employment:         |
| Father's Name:       | Father's Age:       |
| Father's Education:  | Employment:         |
| Socioeconomic Status |                     |

*Modified Kuppuswamy socioeconomic scale updated for the year 2021*

| Sl. No. | Occupation of the Head Score                    | Score |
|---------|---|-------|
| 1       | Legislators, Senior Officials & Managers        | 10    |
| 2       | Professionals                                   | 9     |
| 3       | Technicians and Associate Professionals         | 8     |
| 4       | Clerks  | 7     |
| 5       | Skilled Workers and Shop & Market Sales Workers | 6     |
| 6       | Skilled Agricultural & Fishery Workers          | 5     |
| 7       | Craft & Related Trade Workers                   | 4     |
| 8       | Plant & Machine Operators and Assemblers        | 3     |
| 9       | Elementary Occupation                           | 2     |
| 10      | Unemployed                                      | 1     |

| Sl. No. | Education of the Head Score | Score |
|---------|-----------------------------|-------|
| 1       | Profession or Honours       | 7     |
| 2       | Graduate                    | 6     |
| 3       | Intermediate or diploma     | 5     |
| 4       | High school certificate     | 4     |
| 5       | Middle school certificate   | 3     |
| 6       | Primary school certificate  | 2     |

|   |            |   |
|---|------------|---|
| 7 | Illiterate | 1 |
|---|------------|---|

| Sl. No. | Updated Monthly Family Income in Rupees (2021) | Score |
|---------|--|-------|
| 1       | >123322  | 12    |
| 2       | 61663-123321                                   | 10    |
| 3       | 46129-61662                                    | 6     |
| 4       | 30831-46128                                    | 4     |
| 5       | 18497-30830                                    | 3     |
| 6       | 6175-18496                                     | 2     |
| 7       | <6174  | 1     |

| Sl. No. | Socioeconomic Class | Score |
|---------|---------------------|-------|
| 1       | Upper (I)           | 26-29 |
| 2       | Upper Middle (II)   | 16-25 |
| 3       | Lower Middle (III)  | 11-15 |
| 4       | Upper Lower (IV)    | 5-10  |
| 5       | Lower (V)           | <5    |

Religion:

Caste:

Mother tongue:

Rural/Urban:

No. of children in the family:

First time mother/ second time mother:

Type of family: Nuclear/Joint

No. of persons in the family:

No. of elders in the family:

Type of diet:

- Vegan (No milk and milk products. Includes fruits, vegetables, cereals and pulses)
- Vegetarian (Includes milk and milk products, fruits, vegetables, cereals and pulses)
- Eggetarian (Include eggs, milk and milk products, fruits, vegetables, cereals and pulses)
- Non-veg.(Include eggs, fish, meat, milk and milk products, fruits, vegetables, cereals & pulses)
- Jain (Completely lacto-vegetarian, no roots and underground vegetables such as onion, potato, garlic etc)

Who is the main feeder?

- Mother
- Father

- c. Grandmother
- d. Guardian
- e. Maid

How often does the main feeder feed the child?

- a. Always
- b. Often
- c. Sometimes

How often do you let the child feed him/her?

- a. Always
- b. Often
- c. Sometimes

What is the time taken by the caregiver to feed the child?

- a. 10-15 mins
- b. 15-30 mins
- c. 30-45 mins
- d. More than 45 mins

### **Section II- General Health, Behaviour and Feeding Behaviour**

1. How would you rate your child's health?

- a. My child seems to be less healthy than other children I know
- b. My child has never been seriously ill
- c. When there is something going around my child usually catches it; I expect my child will have a very healthy life
- d. I worry about my child's health more than other people worry about their children's health

2. Considering your child's age and abilities, has he/she been limited in any of the following because of health or learning problems?

| Sr.No |                           | YES | NO |
|-------|---------------------------|-----|----|
| 1     | Feeding                   |     |    |
| 2     | Eating                    |     |    |
| 3     | Sleeping                  |     |    |
| 4     | Grasping                  |     |    |
| 5     | Rolling over              |     |    |
| 6     | Playing                   |     |    |
| 7     | Taking steps              |     |    |
| 8     | Understanding and talking |     |    |

3. How much bodily pain or discomfort (due to gas, teething, injury, illness) has your child had anywhere in his/her body?

4. How much do you agree/disagree with each statement about your child's general behaviour?

| Sr.No |   | AGREE | DISAGREE |
|-------|---|-------|----------|
| 1     | My child's behaviour is sometimes difficult to manage             |       |          |
| 2     | My child seems to misbehave more often than other children I know |       |          |
| 3     | People have complimented me on my child's behaviour               |       |          |
| 4     | Others have complained about my child's behaviour                 |       |          |

5. How much do you agree/disagree with each statement about your child's eating behaviour?

| Sr.No |   | AGREE | DISAGREE |
|-------|---|-------|----------|
| 1     | My child is easy to feed, compared to children of similar age |       |          |
| 2     | My child is not a picky or a fussy eater                      |       |          |

Does the child have any food allergy? If yes specify

### **Section III- Particulars Regarding Introduction of Food**

#### **A) Breast feeding**

1. Was the child breastfed? Yes / No

2. At what age was breast feeding terminated?

#### **B) Introduction to Formula milk/ any other source of milk**

1. Was any kind of milk other than breast milk introduced to the child within the first 3-4 months of life? Yes/ No

2. If yes, what was it?

- a. Cow milk
- b. Formula milk

3. What was the reason for introducing other type of milk?

- a. insufficient milk secretion
- b. inability to suck during breast feeding

c. any other

**4. At what age was the other type of milk introduced to the child?**

- a. Birth to 1 month
- b. 1-2 months
- c. 2-3 months
- d. 3-4 months
- e. Any other

**5. Which type of utensil was mostly used to feed the child?**

a. Olle/paladai/nifty cup



b. Spoon



c. Feeding Bottle with specific nipple size



d. Syringe/Dropper



d. Any other

**6. In which position was the child was fed during feeding the other type of milk most of the times?**

a. Held in caretaker's arms



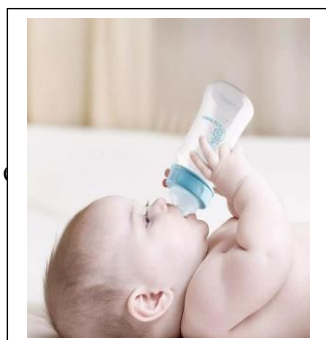
b. On caretaker's lap



d. On flat surface



c. On flat surface  
trunk



d. Sitting with support from caregiver's trunk



e. Any other

### **C) Introduction to Complementary feeding**

**1. When was the next type of food?**

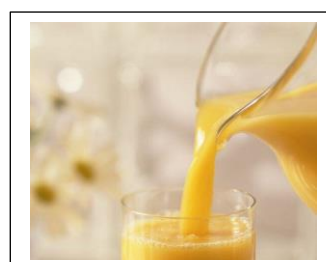
(e.g., pureed food like ragi porridge, cerelac etc.) Introduced? (Specify food given)

- a. 4-5 months
- b. 5-6 months
- c. 6-7 months
- d. Any other

**2. What was the consistency of the food introduced?**

a. 0- Thin

b. 1- Slightly Thick





c. 2- Mildly Thick



d. 3- Moderately Thick



e. 4-Extremely Thick



### 3. What utensil was used to introduce the food?

a. Spoon



b. Feeding bottle with spoon attached



c. Sippy cup or open cup



d. Nifty cup



e. Special spoons



f. Any other

**4. In which position was the child was fed?**

- a. Held in caretaker's arms
- b. On caretaker's lap
- c. On flat surface
- d. Sitting with support from care giver's trunk
- e. Any other

**D) Transition to other food consistencies****1. When was the next type of food consistency introduced? (Specify food items given)**

- a. 6-7 months
- b. 7-8 months
- c. 8-9 months
- d. Any Other

**2. What was the consistency of the food?**

- a. Soft and minced



- b. Soft and bite sized



- c. Easy to chew



- d. Any other

**3. How was this consistency fed to the child?**

- a. Mother's fingers
- b. Spoon
- c. Nibbler



d. Any other

**4. In which posture the child was usually fed?**

a. Caretaker's lap with infant in sitting position

b. Special seat/high chair



c. Any other

**E) Introduction of water in child's diet**

**1. When was water first given to the child?**

a. 4-5 months

b. 5-6 months

c. After 6 months

d. Any other

**2. What was usually used to feed water?**

a. Glass with or without rim



b. Steel glass with attached straw



c. Sippy cup or open cup

d. Bowl and spoon

e. Olle/ nifty cup

f. Any other

**3. Which posture was used usually to feed water?**

a. Held in caretaker's arm

b. On caretaker's lap

c. On flat surface

d. Sitting with support from care giver's trunk

e. Any other

**F) Textures introduced in the child's diet**

**1. What other foods were provided? Specify under each the type of texture/consistency and age at which it was introduced along with utensils used.**

| <b>Type of food</b> | <b>Age of Introduction</b> | <b>Through which food item</b> |
|---------------------|----------------------------|--------------------------------|
| Cereals             |                            |                                |
| Pulses              |                            |                                |
| Eggs                |                            |                                |
| Any other           |                            |                                |

**G) Flavours introduced to the child**

**1. What tastes have been exposed to the child and at what age?**

| <b>Taste</b> | <b>Age of introduction</b> | <b>Through what food</b> |
|--------------|----------------------------|--------------------------|
| Sweet        |                            |                          |
| Spicy        |                            |                          |
| Sour         |                            |                          |
| Bitter       |                            |                          |

Image sources:

<https://pixabay.com/>

<https://iddsi.org/framework/>