"INFANT AND YOUNG CHILD FEEDING PRACTICES PREVAILING IN THE RURAL COMMUNITY- A CROSS SECTIONAL STUDY"

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LIST OF ABBREVIATIONS USED

S.No.	Abbreviations	Expansion of the abbreviations
1.	ANM	Auxiliary Nurse Midwife
2.	AOR	Adjusted Odd’s Ratio
3.	ASHA	Accredited Social Health Activist
4.	AWW	Anganwadi Worker
5.	CF	Complementary feeding
6.	CI	Confidence Interval
7.	EBF	Exclusive Breast Feeding
8.	EIBF	Early Initiation of Breast Feeding
9.	GDM	Gestational Diabetes Mellitus
10.	ICU	Intensive Care Unit
11.	IQ	Intelligence Quotient
12.	IQR	Interquartile Range
13.	IYCF	Infant and Young Child Feeding
14.	LSCS	Lower segment caesarean section
15.	MAD	Minimum Acceptable Diet
16.	MDD	Minimum Dietary Diversity
17.	MMF	Minimum Meal Frequency
18.	NFHS	National Family Health Survey
19.	NIS	National Immunization Schedule

20.	PHC	Primary Health Centre
21.	PUC	Pre-University Course
22.	SD	Standard Deviation
23.	SES	Socio Economic Status
24.	TICF	Timely Initiation of Complementary Feeding
25.	UNICEF	United Nations Children’s Fund
26.	URTI	Upper Respiratory Tract Infection
27.	WHO	World health organization
28.	χ^2	Chi – Square

// ABSTRACT

Title: "Infant and young child feeding practices prevailing in the rural community- A cross sectional study"

Introduction: Infancy and early childhood are most crucial period for a child's growth and development. As the child needs more nutrition during this period, an appropriate and adequate infant and young child feeding practice have a profound impact on the child's survival as well as the physical, social, and cognitive development [1].

WHO says "As a global public health recommendation, infants should be exclusively breastfed for the first six months, should receive safe and nutritionally adequate complementary foods while breastfeeding continues for up to two years of age or beyond''.[2]

In India NFHS 4 & 5 showed, there is an improvement in breastfeeding practices. So this was study was conducted to study the IYCF practices along with customs and beliefs associated with it and its association with the nutritional status.

Objectives: To know the Infant and young child feeding practices prevailing in the rural community, to know the customs and beliefs associated with feeding practices and also to find association between feeding practices and nutritional status.

Materials and Methods: A cross sectional study was conducted among the mothers with children aged 6 months to 24 months residing in rural field practice area of Belagavi, data was collected in between Jan 2021- Dec 2021. Sample size was calculated as 782. Systematic sampling method was used for selecting the sample. Data was collected using the questionnaire based on IYCF guidelines.

Results: Out of 782 participants, 394 (50.40%) were male and 388 (49.60%) were female. Median age of the children was 14 with an interquartile range (IQR) of 7-20 and >70% children first born. Only around 19 % of the mothers had graduated with degree and majority of the mothers were house wife (90%). Study also showed, more than half the participants belonged to socio-economic class between I and III and 40% of the participants lived in a nuclear family. Among the study participants, 9 (1.20%) had not visited any hospital for ante natal checkup, 259 (33.10%) mothers chose private hospitals and others chose government centers. Around 77% mother had adequate antenatal visits of at least 4 or more and 71% mothers had received adequate antenatal care. Majority of the (> 90%) participants had received information regarding nutrition of mother, breastfeeding, and complementary feeding of the child from health care workers.

Early initiation of breast feeding within one hour was seen in 86% children, physical inability of the mother was the most common reason for delayed initiation. Around 20 % mother had given prelacteal feeds to their children, elder's advice was the most common reason for giving prelacteal feeds. 98% mothers had fed their child with colostrum. 10% mothers had fed their child with water in first 6 months thinking that the child needs water along with breast milk. Also, 18% mothers had fed their child with other liquid diet along with breast milk, most common reason being working mother. Among the study participants, 612 children (78%) had received exclusive breastfeeding for six months. Introduction of complementary feeding at 6 months was seen among 80% participants. Most common reason for introducing CF before 6 months was 'working mother' and reason for delaying >6 months was 'not tolerated by the infant'. 47% mothers avoided giving animal foods to their child. Minimum

acceptable diet was not received by 57% children. Malnutrition was observed among 20% of the children, among which wasting (11%) was found high.

Early initiation of breast feeding was associated with factors like gender, birth order, maternal education, SES, and type of family with p value <0.05. Exclusive breastfeeding was associated with factors like gender, birth order, maternal education, and type of family (<0.05). Minimum acceptable diet was associated with factors like age, birth order, and type of family. It was found in this study, that various feeding practices were associated with malnutrition (p value <0.05).

Conclusion: Majority of the participants had received some information regarding breastfeeding and complementary feeding practices from the health care workers. This study showed many participants had improved breastfeeding practices like early initiation of breastfeeding and exclusive breastfeeding for 6 months. Cultural practices were found in this study were pre lacteal feeding practices which was found in one fifth of the participants, feeding water before 6 months along with breast milk which was found in 10% of the participants, avoiding animal foods till 1 year which was seen in around 50% of the participants. Malnutrition was found in one fifth of the children, which was associated with poor feeding practices. A timely intervention with appropriate feeding practices among children between 6 months and 2 years can prevent undernutrition in the later life.

Keywords: Young child, feeding practices, rural, pre-lacteal feeds, breastfeeding, complementary feeding, dietary diversity.

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INTRODUCTION:

Infancy and early childhood are most crucial period for a child's growth and development. As the child needs more nutrition during this period, an appropriate and adequate infant and young child feeding practice have a profound impact on the child's survival as well as the physical, social, and cognitive development and it also protects infants against diarrheal infections and pneumonia.[1]

Breastfeeding has numerous maternal benefits too. It serves as a protection against ovarian cancer and breast cancer among nursing mothers and assists them with birth spacing.

As the children grow, their nutrient demands also grow with them. To fulfil these growing demands, WHO has recommended that infants should begin eating safe and nutritious solid, semi-solid or soft foods at 6 months of age in addition to breast feeding.

Optimal Infant and Young Child Feeding (IYCF) is presented in the WHO/UNICEF Global Strategy for Infant and Young Child Feeding as follows:

"As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development, and health. Thereafter, to meet their evolving nutritional needs, Infants should receive safe and nutritionally adequate complementary foods while breastfeeding continues for up to two years of age or beyond. Exclusive breastfeeding from birth is possible except for a few rare medical conditions, and virtually every mother can breastfeed."[2]

Timing is everything, when it comes to breastfeeding. A growing body of recent evidence highlights the important global recommendation, that breastfeeding should be initiated within the first hour of birth[2].

A meta-analysis[3] of five studies was conducted from four countries which included more than 1,30,000 breastfed newborns, showed that those who were initiated breastfeeding between 2 hours and 24 hours after birth had a 33% greater risk of dying when compared with those who initiate within one hour of birth. The risk was twice among newborns who were initiated breastfeeding after 24 hours or more. The breastmilk consumed during the first few days also called as colostrum, is extremely rich in nutrients and antibodies and acts as a "child's first vaccine," providing a vital protection against disease and death.

Although it is highly recommended and emphasized, the National family health survey, INDIA (NFHS) 4 (2015-16) & 5 (2019-21) shows that only around 41% of newborns in India received breastfeeding within one hour of life, and the rate is poor in rural when compared with urban population. In Karnataka, it is reduced from 56% (in NFHS 4) to 49.1% (NFHS 5).[4]

Though, it may be delayed due to various medical conditions but there are other social, cultural, and religious beliefs and practices which hinders the child from receiving colostrum.

Speaking of beliefs and practices, pre lacteal feeding practices [i.e., feeding any substances (honey, animal milk, water) to the newborns before initiating breast feeding in the early hours of life.] can lead to infections in the newborn and it also delays the establishment of lactation.

Exclusive breastfeeding (EBF) which is feeding infant nothing except breastmilk for the first 6 months of life is adequate to meet the developing infant's nutrition demand for the first 6 months, also it is safe and healthiest. Hence, prevents the infant from infection such as diarrhea and pneumonia[1]. It also enhances the bonding between mother and baby. Though breastfeeding is common everywhere, exclusive breast feeding is not practiced everywhere. Some infants are fed with other foods like animal milk, water, formula feeds etc., due to various cultural practices and misguided beliefs, (e.g., breastmilk alone is not sufficient). In India NFHS 4 & 5, there is an improvement in practicing EBF from 55 to 63 %. NFHS survey for Karnataka also shows a similar increase from 54% to 61%. [4]

Timely initiation of complementary feeding (TICF) (Soft solid or semi solid) along with breastmilk after 6 months provides additional nutritional support for the infants growing demand. So, a careful hygienic preparation of such foods is essential to prevent contamination and infection. National guidelines on IYCF suggest the food should be properly cooked, utensils and hands must be washed with soap and water before handling the food. NFHS survey showed that around 43% (NFHS 4) and 46% (NFHS 5) children aged 6-8 months in India received TICF. In Karnataka survey shows a similar report.

Infant should receive a minimum acceptable diet (MAD) which should have

Minimum meal frequency (MMF) that is, receiving solid or semi-solid food at least twice a day for breastfed infants 6-8 months and at least three times a day for breastfed children 9-23 months, and

Minimum dietary diversity (MDD) that is solid or semi-solid foods from at least four food groups not including the milk or milk products food group.[1]

NFHS 5 survey shows only 12.8 % and 11.3% of the infants receive adequate diet in Karnataka and in India.

Poor feeding practices contribute to malnourishment in children. NFHS 5 survey in India shows 35%, 19%, 32% and 3% of the children under 5 years in India and Karnataka were stunted, wasted, underweight and overweight respectively.

Poor feeding practices during infancy and early childhood can contribute to malnutrition, impairment of cognitive and social development, poor school performance and reduced productivity in later life. WHO quotes based on the article published on the Lancet journal by Cesar G Victoria et al. that 'Over 820000 children's lives could be saved every year among children under 5 years, if all children 0–23 months were optimally breastfed'. Breastfeeding improves IQ, school attendance, and is associated with higher income in adult life.[5]

Therefore, studying IYCF practices along with customs and beliefs associated with it and its association with the nutritional status is important in child health and development.

OBJECTIVES

1. Primary objective of this study is to know the Infant and young child feeding practices prevailing in the rural community,
2. To identify customs and beliefs associated with breastfeeding and complimentary feeding
3. To find association between infant and young child feeding practices and nutritional status by using anthropometric methods.

REVIEW OF LITERATURE:

A good nutrition through a correct feeding practice is necessary for growth and development of a child. Hence, it is important to know about optimal infant and young child feeding practices. It includes adequate breast feeding especially early initiation, exclusive breast feeding for 6 months and continued breast feeding up to 2 years. Along with breastfeeding, adequate, safe, and appropriate complementary feeding should be started from 6th month onwards. This prevents the children from the risk of malnutrition.[1]

Breastmilk is the best food for infants, because it is safe, clean and contains antibodies that protects them from many common childhood illnesses. It provides adequate energy and nutrients for the first 6 months of life which is essential for child's health and survival. It also has numerous benefits to the mother and the child such as

Benefits to the children:

- It is safe and clean and protects from diseases.
- Reduces risk of diarrhea and respiratory infections.
- It enhances child's intelligence and cognitive development.
- It increases the bonding between mother and child.

Benefits to the mothers:

- It reduces the risk of maternal ovarian and breast cancers.
- It helps spacing between childbirth.
- It helps in faster maternal recovery and weight loss during post-partum period.

Timing of initiation of breastfeeding is crucial for child's survival. Newborn babies who were initiated breastfeeding within first hour of life are more likely to survive when compared to newborns with delayed initiation. Delayed initiation of breast feeding is associated with increased risk of infections. Colostrum during the first few days is extremely rich in nutrients and antibodies. WHO recommends Exclusive breastfeeding which is feeding infants nothing but breastmilk for the first six months of life and to continue breast feeding to 2 years or beyond along with soft solid or semi solid foods.

The nutritional demand of the infants grows, after 6 months of life breastmilk alone cannot provide adequate nutrients. WHO recommends timely introduction of solid or semi solid foods at 6 months. These foods should be safe and nutritious. Safe food preparation, safe storage and good hygiene practices are recommended to prevent spreading of diseases.

Tiny stomachs of the infants allow them to consume very small amount of food with each feeding. To meet the energy and nutritional demand they must eat frequently. WHO recommends a minimum meal frequency of at least two meals in breastfed infants aged 6-8 months and three meals in breastfed children aged 9 to 23 months. Non breastfed children should have 4 meals a day from 6 months.

In order to maximize nutrients with each bite, child should also be fed with diverse range of foods. WHO recommends a minimum diet diversity of at least four food groups like grains, roots, and tubers; legumes and nuts; dairy products; meat and fish; oil / ghee; eggs; vit-A rich fruits and vegetables; and other fruits and vegetables. Children should receive a minimum acceptable diet, i.e., they should have a minimum meal frequency and a minimum dietary diversity.

Key indicators of Infant and Young Child Feeding practices include:

- Early initiation of breastfeeding: Proportion of children who were put to the breast within one hour of birth.
- Exclusive breastfeeding: Proportion of infants aged 0-5 months of age who received exclusive breastfeeding.
- Continued breastfeeding: Proportion of children aged 12-15 months who received breastmilk.
- Introduction of complementary foods: Proportion of infants aged 6-8 months who received solid, semi-solid or soft foods.
- Minimum dietary diversity: Proportion of children aged 6-23 months of age who received foods from >4 food groups.
- Minimum meal frequency: Proportion of children aged between 6-23 months who received solid/soft solid foods the minimum required number of times or more.
- Minimum acceptable diet: Proportion of children aged between 6-23 months who received a minimum acceptable diet.

In India a study was conducted in 2019 to investigate the regional prevalence and determinants of Exclusive Breastfeeding (EBF) using NFHS 4 data. It showed a wide difference in the prevalence of EBF and other childhood feeding practices existing across regions of India, where highest being in southern region with prevalence 79.2% and the North-East reported the lowest i.e., 68.0%. Prevalence of EBF decreased with the age of the infant, decreasing faster in the South 43.7% at 5 months compared to the North-East region 54.0% at 5 months. Key determinants for non-EBF are higher maternal education in the South and belonging to rich households

in Central India, while those for EBF were higher maternal education in the Central region and frequent antenatal care (≥ 4) visits in Northern India. Though, the study used a self-reported data, it was collected from sources with high response rates and study did not measure variables like cultural belief system which affects the infant and young child feeding. The study has concluded that there were considerable variations in the prevalence of IYCF practices across the regions of India.[6]

A cross sectional study was conducted in 2012 to study the diet pattern of children less than 2 years about infant and young child feeding (IYCF) indicators in east Delhi. A total of 374 children less than 24 months of age were included. Exclusive breastfeeding till 6 months was 57.1%. Minimum dietary diversity, minimum meal frequency, and minimum acceptable diet were seen adequate in 32.6%, 48.6%, and 19.7% of children aged between 6 months and 2 years of age, respectively. The sample size was small and the study was conducted in an urban health center among the health-conscious mothers who brought their children for immunization. The study has concluded that the status of IYCF practices was poor among the study participants.[7]

A cross-sectional study was conducted in Bareilly district, Uttar Pradesh in the year 2012. A total of 123 women were interviewed to assess the pattern of infant feeding and its relation to certain practices of maternity and new born care, and to assess the knowledge of mothers on the advantages of exclusive breastfeeding. About 15.4% of the infants did not receive colostrum and 22.8% of the infants were not exclusively breastfed. Ghutti (water mixed with honey and herbs), boiled water, tea, and animal milk were commonly used as pre-lacteal feeds. About 47.2% of the respondents were not aware of the benefits of exclusive breastfeeding. Various factors

such as socio-economic status, maternal education, antenatal care, advice on feeding practices, were analyzed. The sample size was low and the study cannot be generalized. The study has concluded that there was low awareness of the benefits of EBF and underutilization of maternal and child health care facilities.[8]

A cross-sectional study was conducted in Belgaum in the year 2011, to compare breast feeding practices among urban and rural mothers and the factors influencing these practices. Prelacteal feeds was given to 54.25% of newborn by urban mothers and 57.11% by rural mothers. Colostrum was discarded by 14.75% urban mothers and 25.79% rural mothers. Initiation of breast feeding after delivery was delayed by 24.50% in urban and 33.68% in rural areas. Elder's advice had played an important role in influencing the breastfeeding practices in this study. Children aged between 6 months to 1 year were included in the study, feeding practices till 2 years were not assessed. Various factors like maternal education, SES, receiving information regarding breastfeeding has influenced the feeding practices.[9]

A study was conducted in 2012 to describe the EBF practices in the Indian MAL-ED birth cohort in Vellore. Early initiation of BF within first hour of life was 59% infants. Colostrum was given to 89.6% infants, 32 (12.7%) infants received prelacteal feeds. Exclusive breastfeeding up to four months was given in 22.1% infants and only 1.1% mothers continued exclusively breastfeed up to six months. Being a cohort study was the main strength of the study but the study did not measure factors like maternal education and maternal employment status. The study has concluded that there was increased rate of initiation of exclusive breast feeding but continued EBF till 6 months was significantly low.[10]

A cross-sectional study was undertaken in the rural area of Kancheepuram district, Tamilnadu in 2019. Children of age less than 2 years were selected to assess the IYCF practices and the factors influencing it, among the children of age 7–24 months. The study showed 10.2% were EBF for 6 months, 58.6% of children were introduced on soft/solid/semisolid food at the end of 6–8 months. The minimum acceptable diet of breastfed children was 31.5% and non-breastfed children was 14%. Appropriate Infant and Young Children feeding practices were statistically associated with age of mother, educational qualification of mother, working status of mother, and mode of delivery. The sample size was low in this study. The study had explored the practices of feeding iron and lipid rich foods to the children. The study has concluded that the breast-feeding practices were improved but the complementary feeding practices was poor.[11]

A cross-sectional study was conducted in the year 2012 to assess feeding practices of infants and young children in rural areas of Medak district, Andhra Pradesh. A total of 805 children were included. The study showed only 22% of mothers-initiated breastfeeding within one hour Whereas 44% initiated it within three hours after delivery, 44.7% used Pre-lacteal feeds. About 41% of infants who were exclusively breastfed for 6 months. In addition to breast milk almost 80.6% received complementary feeding, whereas children who were completely weaned were 19%. Various feeding practices were analyzed with the nutrition status of the child in this study. The study has concluded that breastfeeding and complementary feeding practices were sub optimal.[12]

A cross sectional study was conducted in 2014 in a rural area of Mangalore, to study the breastfeeding practices. Children less than two years of age were included in

the study. Early initiation of breastfeeding within one hour was done in 37.4% of children, exclusive breastfeeding up to 6 months was seen in 32%. Practice of giving prelacteal feeds and discarding colostrum was done mostly by the primiparous mothers compared to multiparous mothers, 73.7% of the mothers followed breastfeeding on demand. Though the study has measured cultural practices associated with infant feeding it did not measure sociodemographic factors and nutritional status of the child. The study has concluded that feeding prelacteal feeds and avoiding colostrum was seen more in primi-parous mothers than multiparous mothers.[13]

A cross- sectional study was conducted at Urban and Rural field practice area of Aligarh Muslim University, Aligarh, in the year 2014-2015, to study the complementary feeding practices among children aged 6–23 months and its association with various socio-demographic factors. The study showed prevalence of MDD, MMF and MAD was 42.6%, 50.9% and 35.6% respectively. They were significantly associated with area of residence, birth order of child; in addition, MMF was significantly associated with literacy status of mother. The sample size was low in this study. The study concluded that the complementary feeding practices was poor and various socio demographic factors influence the complementary feeding practices.[14]

A mixed method study was conducted in south India in the year 2017 to know the prevalence of dietary diversity and to assess factors associated with it. Caregivers of 603 eligible children 6-23 months from villages were selected, 75.1% had inappropriate dietary diversity. Inappropriate dietary diversity was more significant in mothers with less than primary education and not on current breastfeeding. Ignorance,

lack of literacy, affordability issues, nuclear family pattern, and influence of junk foods were other restraining factors associated. The study concluded that the diet diversity among children aged between 6 months to 24 months was inappropriate.[15]

A cross sectional study was conducted in Gujarat in the year 2016, to know the prevalence of various feeding practices, 367 mothers participated in the study. About 78% did early initiation of breastfeeding within 1 h of birth, 68% gave colostrum to the newborn, 30% practiced bottle feeding, 25% gave prelacteal feeds. On univariate analysis, breastfeeding initiation was associated with the gender of the baby (P value—0.006) and type of delivery (P value < 0.001); exclusive breastfeeding practice was associated with the maternal age (P value—0.004); practice of giving prelacteal feeds was associated with the type of delivery (P value—0.034); the time of the initiation of breastfeeding was also associated with cough and cold episodes. The study has found influence of cultural, economic, and regional factors in feeding practices.[16]

A cross sectional study was conducted in ten states across India in the year 2018, to study the infant and young child feeding (IYCF) practices, socio-demographic factors, and their association with nutritional status among young children age less than 3 years. Prevalence of early initiation and exclusive breastfeeding was 36% and 50% respectively. 38, 41 and 22 %, of the children were underweight, stunted and wasted respectively. Poor Minimum dietary diversity was associated with under-nutrition among 12–23months old children. National representation is the main strength of the study with large sample. The study concludes that undernutrition was more in poor SES and in inappropriate dietary diversity.[17]

A study was conducted in an urban resettlement colony of east Delhi in the year 2020, to know the complementary feeding practices, and nutritional status of children aged 6–23 months. The prevalence of MMF, MDD and MAD was 60.6%, 15.1%, and 9%. The prevalence of wasting, underweight and stunting was 43.7%, 43.4%, and 29.1%, as per Z- score. Wasting was significantly associated with low birth weight, bottle feeding, and consumption of market food ($P < 0.05$). Complementary feeding indicators were unsatisfactory in most children. The sample size in this study was low. The study has analyzed various socio demographic factors, antenatal factors, complementary feeding factors with nutritional status, and concluded that the mothers who received counseling were more likely to practice MAD.[18]

A cross sectional study was conducted in the year 2015 in Ahmedabad, to assess IYCF practices for children aged 6–36 months and to find out association of infant and child feeding index (ICFI) with nutritional status. Nearly 65.2%, 43.3%, 11.9% were stunted, underweight, and wasted. 38.3% had early introduction of BF within 1 h of birth; 19.1% had continued breastfeeding for 2 years and beyond. MMF, MDD was 64.3% and 15.7%. Children with low ICFI scores were significantly associated with illiterate mothers and older mothers who belonged to lower socioeconomic strata. Various socio demographic factors and birth weight were not studied in this study.[19]

A cross sectional study was conducted in the urban slums of Ganjam District, Odisha, India, from January to December 2019, among 360 children of 6–23 months, to assess the risk of malnutrition as a result of various feeding practice patterns among the children. The prevalence of children with EIBF, EBF, MMF and MDD was 62.2%,

59.7%, 41.9%, and 19.4%, respectively and wasting, stunting, and underweight was 36.4%, 31.1%, and 35.3%, respectively. EBF, EIBF, and MDD associated with wasting; EBF, MMF, and MDD associated with stunting and for underweight EBF, EIBF, and MDD were associated. Decision tree approach was used to statistically classify participants into various subgroups based on feeding practices and the risk of occurrence of undernutrition was predicted among the subgroups.[20]

A cross sectional study was conducted in the year 2016 in an urban slum, in Hyderabad, to assess the nutritional status of infants and children of age group 6 months to 6 years; The study showed 39.81% were underweight, 46.92% were stunted and 22.27% were wasted. Stunting and underweight was significantly associated with inappropriate feeding practices. The sample size was low in this study, age group of the children were more, which could lead to a potential recall bias in breastfeeding data. The study concluded that undernutrition was significantly associated with feeding practices.[21]

A study was conducted in the year 2017 in urban slum of B.K. Nagar, Bangalore, India, to study IYCF from birth up to two years of age and to find the association between feeding practices and anthropometric measurements among children of 12-23 months of age. All children had mean anthropometric measurements below the "WHO- Multicenter Growth Reference Study'' (WHO-MGRS) standard. Delayed introduction of BF was observed in female children (54.5%), with a significant reduction in their weight (P=0.020) as compared to those initiated early. Continuation of breastfeeding was found to be declining as the age progress from age 12 months to 23 months. High consumption of gripe water (68.8%) and bottle feeding (40.4%) was also found. A significant difference was found in children who

consumed nutritious food (especially meat) with height (P=0.018) and weight (P=0.011). the study was conducted with a very small sample size. The study did not measure, exclusive breastfeeding and initiation of complementary feeding. The study concluded with addressing the importance of continued breastfeeding up to 2 years of age.[22]

A study was conducted based on a comprehensive review of the latest nationally representative survey data (before 2015) was done in the year 2017, in South Asia (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka), to investigate the complementary feeding practices for infants and young children 6–23 months old among 30,966 children aged 6–23 months. Timely introduction, minimum meal frequency, minimum dietary diversity, and minimum acceptable diet were estimated at 57.4%, 47.7%, 33.0%, and 20.5%, respectively. Effect of feeding practices on nutritional status was not measured in this study. The study had concluded that the feeding practices in South Asia were unacceptably poor.[23]

In Malaysia, a study was conducted among 300 subjects aged 6 to 23 months residing in urban suburbs of Malaysia in the year 2016, to know the Compliance with WHO IYCF Indicators and Dietary Intake Adequacy. Timely introduction of complementary foods at 6 to 8 months was 97.9%; minimum meal frequency among non-breastfed children aged 6 to 23 months was 95.2%; minimum dietary diversity was 78.0%. Malaysian urban infants and toddlers showed good compliance with WHO IYCF indicators. Homogenous study subjects had affected the generalizability of the results to other socio-economic groups.[24]

A study was conducted based on a prospective pregnancy cohort in Calgary, Alberta, in the year 2015 to examine the association between mode of delivery and breastfeeding initiation. 7.4 % women who delivered by planned c-section had no intention to breastfeed and 4.3% did not initiate breastfeeding, when compared to women with vaginal births (3.4 % and 1.8 %, respectively) and emergency c-section (2.7 % and 2.5 %, respectively). Women with planned c-section were more likely to discontinue breastfeeding before 12 weeks postpartum (OR = 1.61; 95 % CI: 1.14, 2.26; p = 0.014) compared to those who delivered vaginally. The study has relatively large sample size and the results were generalizable to urban population of Calgary. Study suggested that a proper guidance regarding breastfeeding could be provided to women considering a planned c-section and additional supportive care could be made available to lactating women with emergency c-sections.[25]

A cross-sectional study was conducted among 581 mothers in northern Ghana in June 2018, to assess the association between IYCF indicators and child undernutrition (stunting and wasting). 66.4% of the children (6–23 months) had a timely introduction of complementary feeding, 69.4% had the minimum meal frequency, and 38.9% had the minimum acceptable diet daily. The study also showed stunting (33.2%), wasting (14.1%), underweight (27%) and overweight (2.6%). The sample size was comparatively large in this study but none of the individual IYCF indicators showed significant association with undernutrition, except intake of iron-rich foods for stunting.[26]

A Cross-sectional study was conducted in Addis Ababa Ethiopia in the year 2019 among 575 mother-child pairs, to assess the level of minimum acceptable diet and its associated factors among children aged 6–23 months. MAD was 74.6%, MMF

was 90.6% and MDD was 80.2%. Having a husband with secondary and above educational level [AOR = 4.789(95%CI:1.917–11.967)], being a housewife [AOR = 0.351(95% CI: 0.150–0.819)], having a history of more than three postnatal follow-ups [AOR = 2.616(95%CI:1.120–6.111], Having mothers aged between 25 and 34 years [AOR = 2.051(95%CI:1.267–3.320)], being male child [AOR = 1.585(95%CI:1.052–2.388)] and having children aged between 18 and 23 months [AOR = 3.026(95%CI:1.786–5.128)] were some of the factors significantly associated with a minimum acceptable diet. Study was conducted in the government health facilities, the people utilizing private health facility were missed the study may not generalizable. The study had concluded that the practice of minimum acceptable diet was comparatively high in the study population.[27]

A cross sectional study was conducted based on data collected from dabat demographic surveillance system in the rural population of northwest Ethiopia in the year 2018, to determine timely initiation of complementary feeding and associated factors among mothers with children aged 6–24 months. The study showed timely initiation of complementary feeding in 53.8% [95% CI 45.9, 61.7] and 4.6% [95% CI 1.3, 7.9] had minimum dietary diversity. The odds of timely initiation of complementary feeding were higher among mothers with medium IYCF knowledge [AOR=2.34, 95% CI 1.54, 3.81] and high IYCF knowledge [AOR=2.10, 95% CI 1.41, 3.87]. Impact of feeding practices on nutritional status was not measured in this study. The study concluded that in Dabat district, complementary feeding practice is lower.[28]

A study was conducted from the 2015–2016 National Family Health Survey in India in the year 2020 to find the association between IYCF practices and diarrhea in regional India. Diarrhea prevalence was lower among infants who were breastfed

within one-hour of birth and those who were exclusively breastfed. The study used a nationalized data with high response rates and the study had suggested that improvements in IYCF practices are likely to reduce the burden of diarrhea-related morbidity and mortality across regions in India.[29]

A systematic review and metanalysis was done in 2015, to synthesize the evidence for effects of optimal breastfeeding on all-cause and infection-related mortality in infants. The risk of all-cause mortality was higher in predominantly (RR 1.5), partially (RR4.8) and non-breastfed (RR14.4) infants compared to exclusively breastfed infants and the risk of infection-related mortality in 0–5 months was higher in predominantly (RR 1.7), partially (RR 4.56) and non-breastfed (RR 8.66) infants. The study concluded by addressing the importance of optimal breastfeeding in reducing the infant mortality.[30]

A nationwide prospective birth cohort study was conducted in Japan in the year 2019-2020, to investigate the association between breast feeding and infant development during the first year of life. Reduced exclusive breast feeding less than 3 months was associated with reduced developmental delay at 12 months of age. Being a cohort study with large sample size was the main strength of the study. Association with nutritional status was not measured in this study.[31]

A study was conducted on a birth cohort in China in 2014, to discuss the relationship between breastfeeding and the behavioral development of infants and children. Compared to never-breastfeeding, continuous breastfeeding could protect children from severe developmental delay in fine motor domain, communication domain, and social domain. The study had concluded that the breastfeeding with

longer duration and increased intensity could promote better development in children.[32]

Using data from India Human Development Survey-II a study was conducted to investigate the role of timing of initiation of breastfeeding on neonatal deaths in the year 2016-2017. Only 21% of children were breastfed within 1 h of birth across the different districts of India, (which varies from the lowest 15% in Sarasvati of Uttar Pradesh state to the highest 94.6% in Thiruvananthapuram of Kerala state). The study had concluded that when women did not breastfeed their newborn within the 1 h after birth, there is increase in the odds of neonatal deaths by nearly threefold and the timely initiation of breastfeeding was beneficial for neonatal survival.[33]

METHODS

Source of data: Mothers and children residing in Kinaye PHC area.

Study design: A cross sectional study.

Study population: Children aged between 6months to 24 months residing in rural field practice area.

Period of Study: Data collection was done from Jan 2021-Dec 2021.

Sample size: Sample was calculated by taking prevalence of early initiation of breast feeding as 36 % from a study conducted in India based on the findings of the National Nutrition Monitoring Bureau survey, 2011–2012.[17]

$n = 4pq/d^2$

where, p = 36

q = 100 - p = 64

d = 10% (absolute error) of p = 3.6

hence, $n = 4x36x64/ (3.6)^2 = 711$

by adding 10% (non-response)

Sample size is 782.

Sampling method: Systematic sampling (total number of children born between July 2019 Dec 2020 in Kinaye is 1785 and the sample size is 782, every 2nd child fitting into the inclusion criteria was included in the study).

Data collection method: List of children born between July 2019 and Dec 2020 was obtained from the 9 sub-centers under Kinaye PHC. First child was selected randomly from each subcenter and every second child who are eligible were included (systematic sampling) till the desired sample size (782) was reached.

Name of the sub centre	**No of children born between July 2019 to Dec 2020**	**Total Sample selected from each centre**
Mache II	372	169
Peeranwadi	334	135
Kaderwadi	316	148
Karle	154	63
Waghawade	145	63
Mache I	141	57
Shantibaswad	118	49
Desur	107	49
Kinaye	98	49
Total	1785	782

The data was collected using the questionnaire (based on IYCF guidelines – UNICEF and WHO) which contained information regarding

- Demography,
- Antenatal care received,
- Breastfeeding and infant and young child feeding practices,
- Customs and belief associated with it,
- Anthropometry of the child such as height/length, weight, head circumference, chest circumference, mid upper arm circumference.

Consent from the mother was taken before collecting the information.

Inclusion criteria:

- Mothers of children aged between 6 months to 24 months residing in Kinaye PHC area at least for 1 year.

Exclusion criteria:

- Children born with congenital anomaly which affects the normal feeding.
- Mothers in whom breast feeding is contraindicated.

Statistical method:

- Percentages and proportions were used to know the infant and young child feeding practices
- Chi square test was used to study the factors influencing the infant feeding practices
- Chi square test was used to find association between feeding practices and nutritional status
- P value of <0.05 will be considered as significant.

Definition of study variables

Age: Age was recorded to the nearest completed months.

Gender: Male/Female

Educational status:

No formal schooling- Those who did not attend any school.

Schooling from 1 to 10- Those who had attended schooling between 1st and 10th standard.

PUC (11th ,12th) / Diploma: Those who had studied up to high school or diploma.

Degree: Those who had graduated with degree.

Post graduate or more: Those who had master's degree or more.

Socio-economic status: Calculated using 'per capita income' based on "modified B.G. Prasad's classification (2021)''.

Socio-economic class	Per capita income in INR as per original classification in 1961	Per capita in INR as per modified classification for 2021
Class I	≥ 100	≥ 7863
Class II	50-99	3931 – 7862
Class III	30-49	2359 – 3930
Class IV	15-29	1179 – 2358
Class V	<15	< 1179

Type of family:

Nuclear family: The family consisting of married couple along with their dependent children.

Joint family: It consists of number of married couple and their children who live in the same household.

Three generation family: It is a family were representatives of three generations related to each other by direct descent live together.

Immunization:

Completed: when the child had received all the vaccines as per National Immunization Schedule (NIS)

Not Completed: when the child has partially received or not received all the vaccines as per the National Immunization Schedule (NIS)

Early initiation of breast feeding [34]: Children who were put to the breast within 1 hour of birth.

Exclusive breastfeeding [34,35]: Infants who received only breastmilk and no other foods or liquid provided, including water.

Continued breastfeeding [34]: Children who are received breastmilk during the previous day.

Complementary feeding [35]: Children who received solid or semi solid (soft solid) foods along with breastmilk.

Minimum meal frequency [34]: Children who received semi-solid or soft foods the minimum number of times or more during the previous day

Minimum is defined as:

-2 times for infants 6-8 months who were breastfed

-3 times for children 9-23 months who were breastfed

-4 times for children 6-23 months who were not breastfed.

Minimum dietary diversity [34]: children who receive foods from 4 or more food groups

Food groups included were i) cereals, roots and tubers; ii) legumes, pulses and nut; iii) milk and milk products; iv) meat and animal foods; v) eggs; vi) vitamin-A rich fruits and vegetables; vii) other fruits and vegetables; viii) oils and ghee.

Minimum acceptable diet [34]: Children who had at least the minimum dietary diversity and the minimum meal frequency during the previous day.

Wasting [36]: Weight for height < -2 standard deviation (SD) of the WHO child growth standard median.

Stunting [36]: Height < -2 SD of the WHO child growth standard median.

Under-weight [36]: Weight for age < -2 SD of the WHO child growth standard median.

Overweight [36]: Weight for height > +2 SD of the WHO Child Growth Standards median.

RESULTS:

This cross-sectional study was conducted in the field practice area of a rural Primary health centre (PHC), Kinaye, under Department of Community Medicine, Jawaharlal Nehru Medical College, Belagavi. A total of 782 mothers with children aged between six months to two years were included during the period of January to December 2021.

The data collected were coded in excel sheet, tabulated, and analyzed using IBM-SPSS software version 23, under the following categories:

- Socio-demographic variables.
- Ante natal care received by the mother.
- Infant and Young Child Feeding practices and various factors associated with it.
- Nutritional status of the children by anthropometry.
- Association between various socio demographic factors and infant feeding practices.
- Association between nutritional status with feeding practices.

I. Socio demographic variables:

Table 1: Distribution of study participants according to Gender, Age, and Birth order.

Variables		Frequency n=782 N (%)	
		N (Number)	% (Percentage)
Gender	Males	394	50.40%
	females	388	49.60%
	Total	**782**	**100%**
Age	Median (IQR)	14	IQR- (7-20)
	6-12 months	337	43.10%
	13-18 months	207	26.50%
	19-24 months	238	30.40%
	Total	**782**	**100%**
Birth order	1	558	71.40%
	2-3	211	27.00%
	>3	13	1.60%
	Total	**782**	**100%**

Graph 1: Distribution of study participants according to place of living

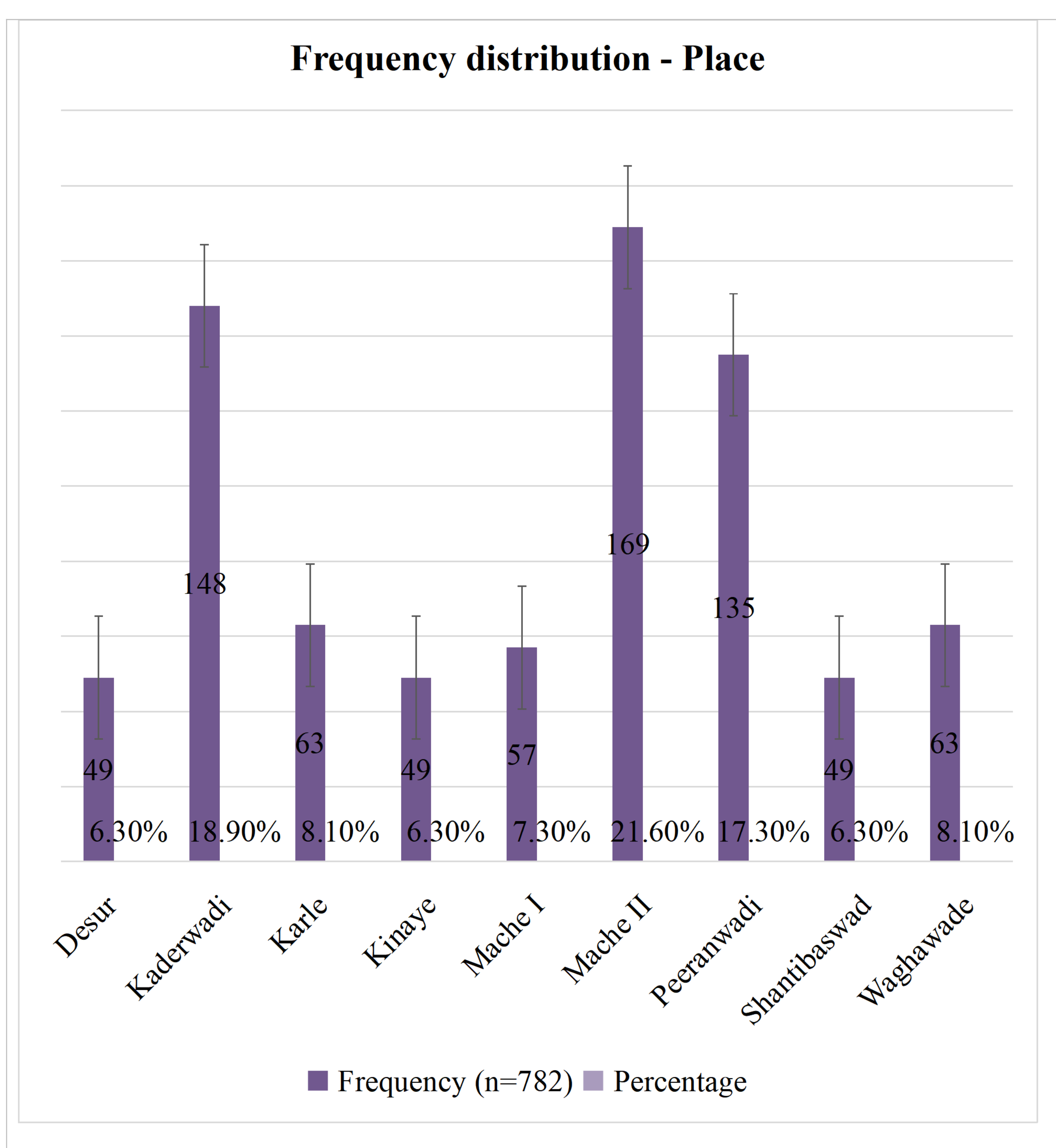
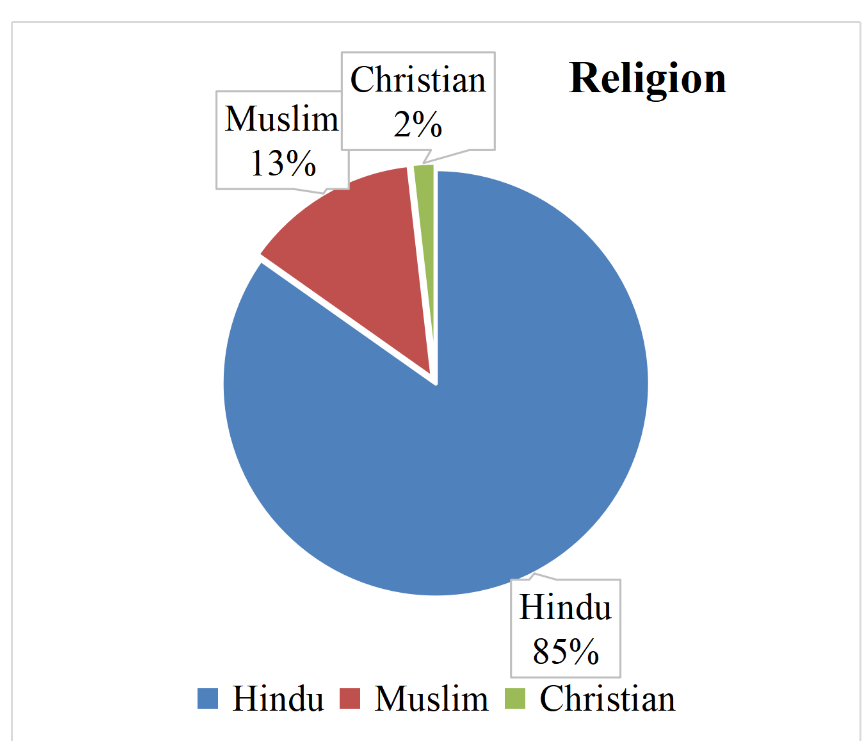


Figure 1: Distribution of participants based on religion.



Out of 782 study participants, 394 (50.40%) were male and 388 (49.60%) were female. Median age of the children was 14 with an interquartile range (IQR) of 7-20. A total of 337 (43.10%) children were aged between 6 to 12 months, 207 (26.50%) children were aged between 13 to 18 months, 238 (30.40%) children were aged between 19 to 24 months. In our study, 558 (71.40%) were first born, 211 (27.00%) were second or third born and only 13 (1.60%) children had birth order >3. (Table 1.) Graph 1 showed that many of the study participants were from Mache II (21.6%), Kaderwadi (19%), and Peeranwadi (17.3%). Others were from Karle (8%), Waghawade (8%), Mache I (7%), Desur (6%), Kinaye (6%), Shantibaswad (6%). Most of the study participants belonged to Hindu religion (85%), while 13% and only 2% belonged to Islam and Christianity respectively as showed in the figure-1.

Table 2: Frequency distribution of education level of parents.

Education of the parents		Frequency (n=782) N (%)	
		N (Number)	**% (Percentage)**
Mother	No formal schooling	7	0.9%
	Studied between 1-10 (standard)	304	38.9%
	PUC/Diploma	324	41.4%
	Degree	119	15.2%
	Post-graduate /more	28	3.6%
	Total	**782**	**100%**
Father	Studied between 1-10 (standard)	134	17.1%
	PUC/Diploma	445	56.9%
	Degree	136	17.4%
	Post-graduate /more	67	8.6%
	Total	**782**	**100%**

In our study, 324 (41.4%) mothers had education till PUC/ diploma; 304 (38.9%) mothers had studied between 1-10th standard, whereas 119 (15.2%) had degree and 28 (3.6%) mothers had studied till post-graduate or more; less than 1% mothers had no formal schooling (Table-2), whereas fathers of 445 (56.9%) children had received education level till PUC/diploma, 134 (17.1%) had studied between 1-10th standard, 136 (17.4%) had degree and 67(8.6%) had studied till and above postgraduation.

Table 3: Frequency distribution of occupation status of parents.

Occupation of the parents		Frequency (n=782) N (%)	
		N (Number)	**% (Percentage)**
Mother	Farmer	4	0.5%
	Labourer	3	0.4%
	Self-employed	14	1.8%
	Govt-employee	35	4.5%
	Private employee	28	3.6%
	Home maker	698	89.3%
	Total	**782**	**100%**
Father	Farmer	24	3.1%
	Labourer	18	2.3%
	Self-employed	169	21.6%
	Govt-employee	106	13.6%
	Private employee	465	59.5%
	Total	**782**	**100%**

Among the study participants most of the mothers were homemakers 698 (89.3%); 14 (1.8%) were self-employed; 35 (4.5%) were govt-employees; less than 1% of the mothers were farmers and labourers (Table-3), whereas among fathers 465 (59.5%) were private employees; 169 (21.6%) were self-employed; 106(13.6%) were govt-employees and around 5 % were farmers and labourers.

Table 4: Distribution of participants based on other socio-demographic variables

Variables		Frequency n=782 N (%)	
		N (Number)	**% (Percentage)**
Socio-economic status (Modified B.G Prasad's classification)	Class I	42	5.4%
	Class II	176	22.5%
	Class III	239	30.5%
	Class IV	240	30.7%
	Class V	85	10.9%
	Total	**782**	**100%**
Type of family	Nuclear family	316	40.4%
	Joint family	108	13.8%
	Extended family	358	45.8%
	Total	**782**	**100%**
Family size (Number of children the couple have)	1	529	67.6%
	2-3	239	30.6%
	>3	14	1.8%
	Total	**782**	**100%**

Socio-economic status of the participants was calculated using modified B.G Prasad's classification, the number of participants belonging to socio-economic status of class I, class II, class III, class IV and class V were 42 (5.4%), 176 (22.5%), 239 (30.5%), 240 (30.7%), and 85 (10.9%) respectively (Table-4). The table also shows a total of 358 (45.8%) participants belonged to a vertically extended three generation family, 316 (40.4%) participants belonged to a nuclear family and 108 (13.8%) participants belonged to joint family. Family size (number of children the couple have) of most [529 (67.6%)] of the participants were one, 239 (30.6%) participants had family size between two and three, 14 (1.8%) participants had family size above three.

II. Antenatal data:

Table 5: Distribution of participants based on hospital chosen for antenatal care

Variables		Frequency (n=782) N (%)	
		N (Number)	% (Percentage)
Hospital chosen for ante natal care	Primary health center	265	33.90%
	Other govt. hospitals	249	31.80%
	Private hospitals	259	33.10%
	Not visited	9	1.20%
	Total	**782**	**100%**

In our study, 265 (33.90%) mothers had chosen Primary Health Centers for antenatal checkup, 249 (31.80%) mothers chose other government hospitals, 259 (33.10%) mothers chose private hospitals and 9 (1.20%) had not visited any hospital for ante natal checkup (Table 5).

Table 6: Distribution of participants based on number of visits for antenatal check-up

Variables		Frequency (n=782) N (%)	
		N (Number)	**% (Percentage)**
No. of visits	7-12	268	34.30%
	4-7	337	43.00%
	<4	168	21.50%
	Not visited	9	1.20%
	Total	**782**	**100%**

Among our study participants 268 (34.30%) had 7-12 antenatal checkup, 337 (43.00%) had 4-7 visits, 168 (21.50%) had less than 4 visits and 9 (1.20%) had no antenatal checkup during pregnancy. (Table 6)

Table 7: Distribution of quality of antenatal care received by mother

Variables		Frequency (n=782) N (%)	
		N (Number)	% (Percentage)
Adequate antenatal care received	Yes	555	71.00%
	No	227	29.00%
	Total	**782**	**100%**

In our study, 555 (71.00%) participants had adequate antenatal care while 227 (29.00%) had not received adequate antenatal care. (Table 7)

Table 8: Distribution of participants based on home visits done by female health worker

Variables		Frequency (n=782) N (%)	
		N (Number)	% (Percentage)
Home visit by female health worker	Yes	747	95.50%
	No	35	4.50%
	Total	**782**	**100%**

Among the participants 747 (95.00%) mothers were visited by female health workers at home and 35 (4.50%) had no home visit by a female health worker (Table 8).

Table 9: Information received regarding nutrition of mother, breastfeeding and complementary feeding

Information received from*	Information about					
	Nutrition of mother		Breastfeeding of the child		Complementary feeding of the child	
	N	%	N	%	N	%
Not received	56	7.16%	26	3.32%	34	4.35%
ASHA workers	388	49.61%	374	47.82%	374	47.82%
Anganwadi workers	35	4.47%	30	3.83%	32	4.09%
ANM	445	56.90%	472	60.35%	456	58.31%
Lady health visitor	21	2.68%	19	2.42%	16	2.04%
Doctor	295	37.72%	252	32.22%	326	41.68%
Nurses	42	5.37%	23	2.94	21	2.68%
Social workers	8	1.02%	8	1.02%	8	1.02%
Others	25	3.19%	27	3.45%	32	4.09%

***** *Multiple response question***

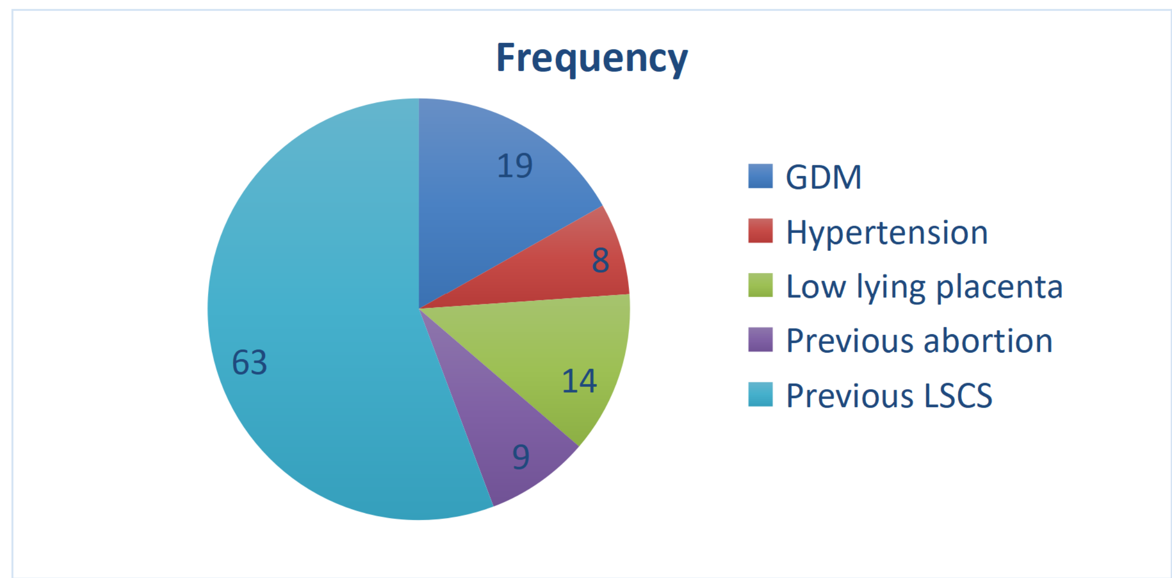
In our study, 56 (7.16%), 26 (3.32%) and 34 (4.35%) participants had not received any information regarding nutrition of mother, breastfeeding, and complementary feeding respectively (Table 6). Among the participants who had received information, 445 (56.90%), 472 (60.35%) and 456 (58.31%) participants had received information from Auxiliary Nurse Midwifes (ANM) regarding nutrition of mother, breastfeeding and complementary feeding respectively. 388 (49.61%), 374 (47.82%) and 374 (47.82%) participants had received information from ASHA workers; 295 (37.72%), 252 (32.22%) and 326 (41.68%) participants had received information from doctors; 35 (4.47%), 30 (3.83%) and 32 (4.09%) participants had received information from

anganwadi workers; 21 (2.68%), 19 (2.42%) and 16 (2.04%) participants had received information from Lady Health Visitor (LHV); 42 (5.37%), 23 (2.94) and 21 (2.68%) participants had received information from nurses; 8 (1.02%), 8 (1.02%) and 8 (1.02%) participants had received information from social health workers; 25 (3.19%), 27 (3.45%) and 32 (4.09%) participants had received information from other sources like internet, health camps etc.

Table 10: Distribution of mothers according to high-risk pregnancy

Variables		**Frequency (n=782) N (%)**	
		N (Number)	**%**
High risk pregnancy	Yes	113	14.50%
	No	619	79.20%
	Don't know	50	6.40%
	Total	**782**	**100%**

Figure 2: Distribution of mothers according to reasons for high-risk pregnancy:



The study has also found 113 (14.50%) participants with history of high-risk pregnancy, 619 (79.20%) participants without any high risk, and 50 (6.40%) participants has said they don't not know. Among the 113 high-risk pregnancy, 63 (55.75%) had previous LSCS, 19 (16.81%) had Gestational Diabetes Mellitus (GDM), 14 (12.38%) had low lying placenta, 9 (7.96%) had previous abortion and 8 (7.10%) had hypertension (Figure 2).

Table 11: Distribution of mothers based on birth spacing between pregnancy

Variables		Frequency (n=782) N (%)	
		Number	**%**
Birth spacing	<2 years	98	12.50%
	>2 years	126	16.10%
	Not applicable	558	71.40%
	Total	**782**	**100%**

For 558 (71.40%) participants, spacing between pregnancy was not applicable as it was their first pregnancy, 98 (12.50%) had birth spacing less than 2 years. 126 (16.10%) had 2 or more years birth spacing. (Table 11)

Table 12: Distribution of mothers based on place and mode of delivery

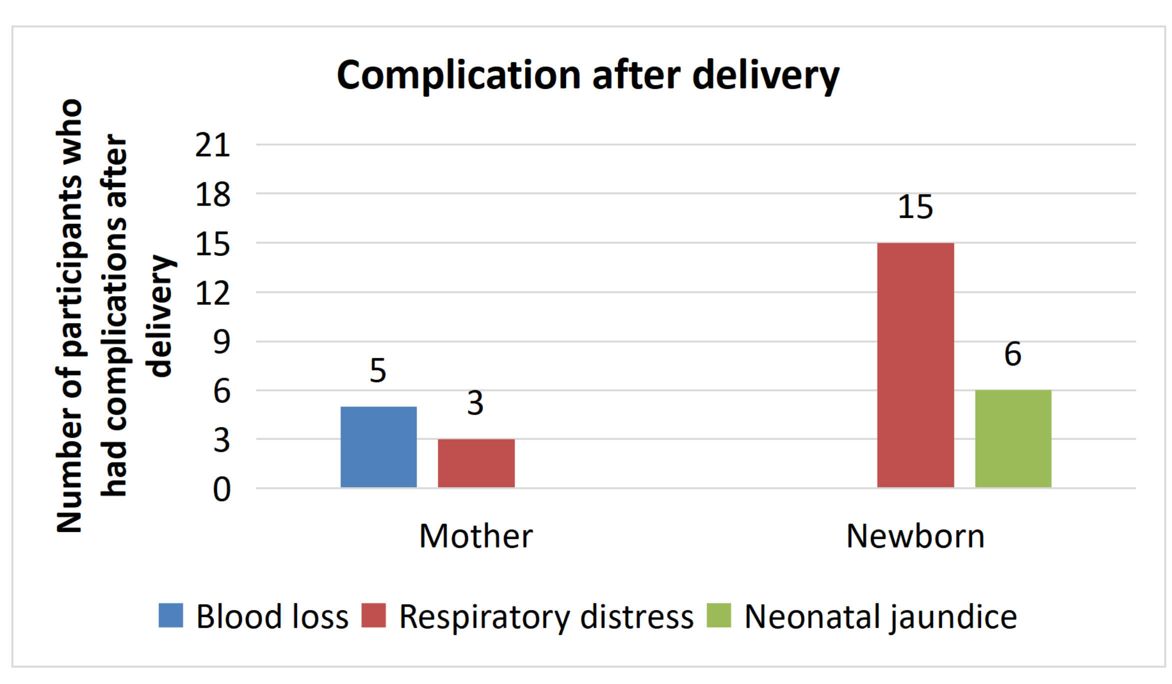
<table>
<tr><th colspan="3" rowspan="2">Variables</th><th colspan="2">Frequency (n=782) N (%)</th></tr>
<tr><th>Number</th><th>%</th></tr>
<tr><td rowspan="3">Place of delivery</td><td colspan="2">Home</td><td>8</td><td>1.00%</td></tr>
<tr><td colspan="2">Institutional</td><td>774</td><td>99.00%</td></tr>
<tr><td colspan="2">Total</td><td>782</td><td>100%</td></tr>
<tr><td rowspan="4">Mode of delivery</td><td colspan="2">Normal vaginal delivery</td><td>599</td><td>76.60%</td></tr>
<tr><td rowspan="2">LSCS</td><td>Elective</td><td>127</td><td>16.20%</td></tr>
<tr><td>Emergency</td><td>56</td><td>7.20%</td></tr>
<tr><td colspan="2">Total</td><td>782</td><td>100%</td></tr>
</table>

Our study showed 774 (99.00%) had institutional delivery and 8 (1.00%) had home delivery; 599 (76.60%) had normal vaginal delivery and 183 (23.40%) had Lower Segment Caesarean Section (LSCS) in which, 127 (16.20%) were elective and 56 (7.20%) were emergency LSCS. Common reason for LSCS seen among the participants was previous history LSCS 77 (42.07%), whereas 97 (49.73%) participants had other indicators like fetal distress, low lying placenta, big baby, breech presentation, low liquor, meconium aspiration, obstructed labour, pre-eclampsia, or eclampsia and 15 (8.20%) participants did not know the reason for LSCS.

Table 13: Distribution of participants based on complications after delivery

<table>
<tr><th colspan="3" rowspan="2">Variables</th><th colspan="2">Frequency (n=782) N (%)</th></tr>
<tr><th>Number</th><th>%</th></tr>
<tr><td rowspan="6">Complication after delivery</td><td rowspan="3">Mother</td><td>Yes</td><td>8</td><td>1.00%</td></tr>
<tr><td>No</td><td>774</td><td>99.00%</td></tr>
<tr><td>Total</td><td>782</td><td>100%</td></tr>
<tr><td rowspan="3">Newborn</td><td>Yes</td><td>21</td><td>2.70%</td></tr>
<tr><td>No</td><td>761</td><td>97.30%</td></tr>
<tr><td>Total</td><td>782</td><td>100%</td></tr>
<tr><td rowspan="2">Admitted in ICU</td><td colspan="2">Mother</td><td>5</td><td>0.63%</td></tr>
<tr><td colspan="2">Newborn</td><td>15</td><td>1.92%</td></tr>
</table>

Graph 2: Complication after delivery among mother and newborn



Almost 99% (774) of the participated mothers did not have any complications after delivery while 1% (8) had complication such as heavy blood loss requiring blood transfusion (5) and respiratory distress (3). Whereas, 2.70% (21) newborns had complication after delivery such as respiratory distress (15) and neonatal jaundice (6). 5 (0.63%) mothers and 15 (1.92%) newborns were admitted in ICU after delivery (Table 10). Among the participants 5 mothers and 15 newborns were admitted in ICU after delivery (Graph 2).

Table 14: Distribution of mothers based on gestational age at delivery and birth weight of the baby

Variables		Frequency (n=782) N (%)	
		Number	**%**
Gestational age	Preterm	9	1.20%
	Term	767	98.10%
	Late / post term	6	0.80%
	Total	**782**	**100%**
Birth weight	Mean (SD) Median (IQR)	2.83 2.80	SD: 0.33 IQR: (2.60-3.0)
	< 2.5kg	36	4.60%
	2.5 – 4 kg	736	94.10%
	>4 kg	10	1.30%
	Total	**782**	**100%**

A total of 767 (98.10%) participants had a full-term delivery, 9 (1.20%) and 6 (0.80%) percentages of the participants had preterm and post term delivery respectively. Mean birth weight was 2.83 with 0.33 SD (standard deviation) and 36 (4.60%) participants were <2.5kg (low birthweight LBW), 736 (94.10%) were between 2.5 - 4 kg, 10 (1.30%) were > 4 kg. (Table 14)

Table 15: Distribution of children based on immunization status

Variables		Frequency (n=782) N (%)	
		Number	**%**
Immunization	Received up to date	761	97.30%
	Not received / not completed	21	2.70%
	Total	**782**	**100%**

All the children participated in the study had no congenital anomalies and 761 (97.30%) children had received immunization UpToDate while 21 (2.70%) had not received.

III. Infant and Young Child Feeding Practices:

Breastfeeding data:

Table 16 : Distribution of children according to time of initiation of breastfeeding & reasons for delayed breastfeeding

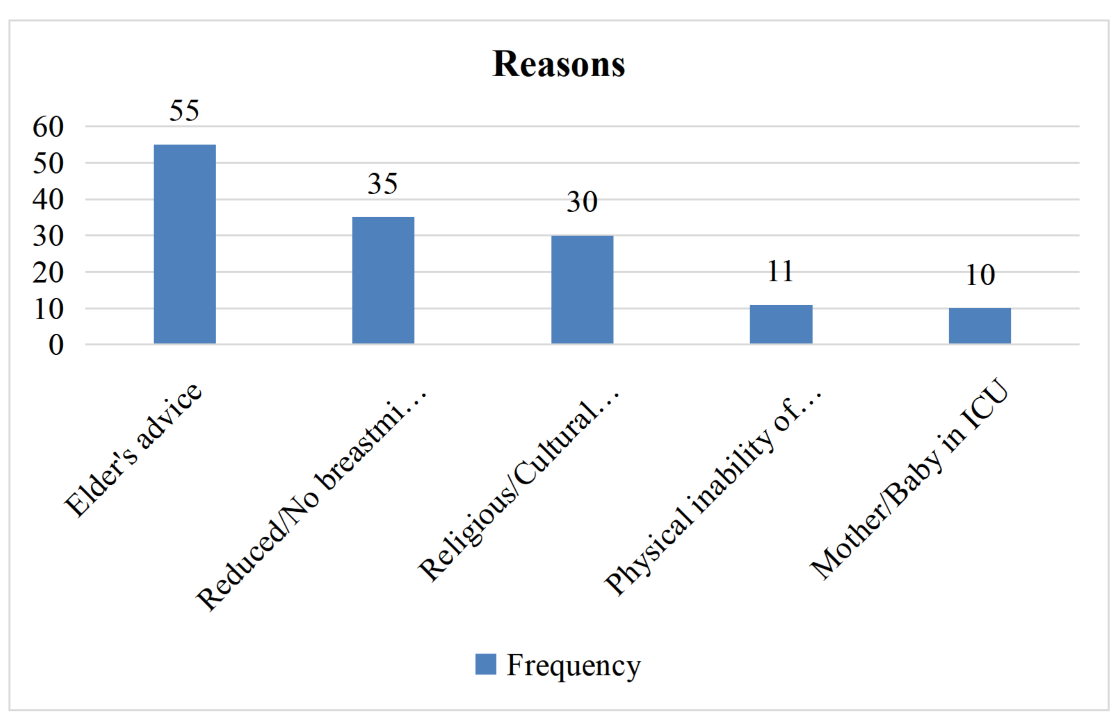
Variables		Frequency (n=782)	
		Number	**%**
Initiation of breastfeeding	Immediately (<1 hour)	677	86.60%
	After few hours	91	11.60%
	After few days	14	1.80%
	Total	**782**	**100%**
Reason for delayed breastfeeding	Baby admitted in ICU	9	1.20%
	Physical inability of the mother	83	10.60%
	No milk secretion	13	1.70%
	Total	**105**	**13.40%**

All the children participated in the study has received breastmilk. Among which 677 (86.60%) had Early Initiation of Breastfeeding (EIBF) within 1 hour, 91 (11.60%) had received after few hours and 14 (1.80%) had received after few days. Common reason found in the study for delayed initiation of breastfeeding was physical inability of the mother 83 (79.05%) and other reasons includes, no milk secretion 13 (12.38%) and baby admitted in ICU 9 (8.57%). (Table 16)

Table 17: Distribution of children based on feeding prelacteal feeds & type of prelacteal feeds given

Variables			Frequency (n=782)	
			Number	**%**
Pre-lacteal feeding		No	641	82.00%
		Yes	141	18.00%
		Total	**782**	**100%**
Types of pre-lacteal feed	Milk based	Formula feed	50	6.39%
		Others	6	0.75%
	Non milk based	Honey	35	4.47%
		Sugar water	50	6.39%
		Total	**141**	**18.00%**

Graph 3: Reasons for giving pre-lacteal feeding



This study also showed that 18 % (141) of the children among the participants had received pre-lacteal feeding such as formula feed (50), honey (35), water (50) and others (6) and 641 (82.00%) participants did not give pre-lacteal feeds. Many mothers have said that the reason for giving pre lacteal feeds was elder's advice (55), other reason being, no milk secretion (35), religious or cultural custom (30), physical inability of the mother (11) and mother or baby admitted in ICU (10)

Table 18: Distribution of mothers who practised feeding colostrum to the newborn & reasons for not feeding colostrum

Variables		Frequency (n=782)	
		Number	**%**
Feeding colostrum	Yes	769	98.30%
	No	13	1.70%
	Total	**782**	**100%**
Reason for not feeding colostrum	No milk secretion	13	100%

Table 18 shows the number of children fed with colostrum in the first few days. Majority of the mothers had fed their children with colostrum (98.30%), 1.70% did not feed their child with colostrum due to reduced or no milk secretion. Majority of the participants (98.80%) fed their child on demand.

Table 19: Distribution of mothers who practised feeding expressed breastmilk to the children

Variables		Frequency (n=782)	
		Number	**%**
Feeding expressed breastmilk	Yes	9	1.15%
	No	773	98.85%
	Total	**782**	**100%**

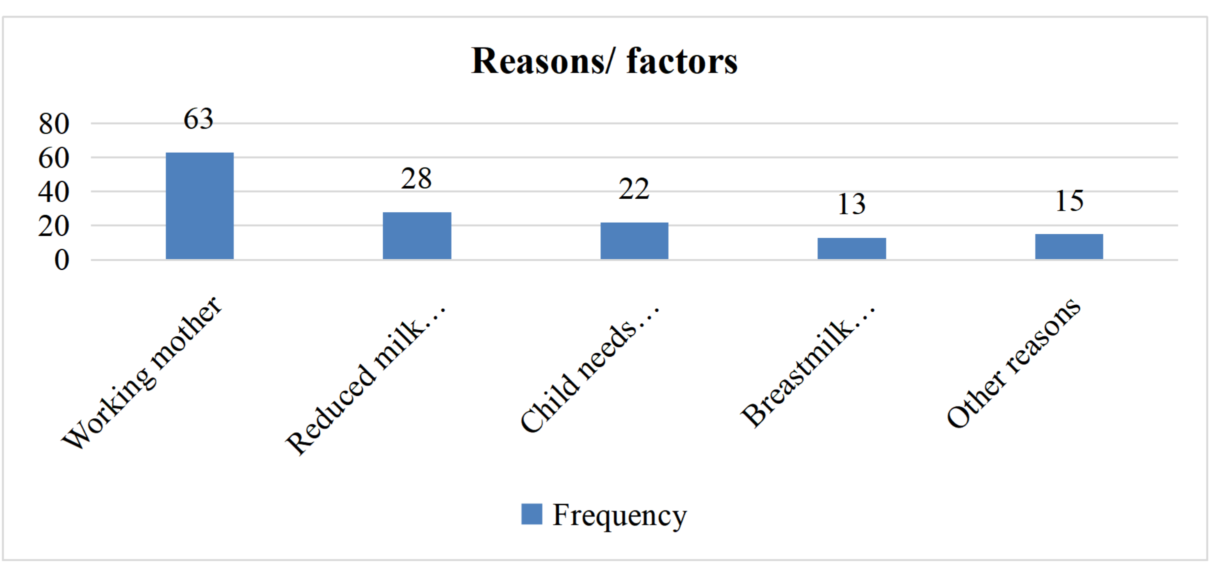
A total of 9 mothers (1.15%) said they had given expressed breast milk when the baby was admitted in ICU and majority of the mothers (98.85%) said they had never fed expressed breastmilk to their children. (Table 19)

Table 20: Distribution of participants based on feeding water / other liquid diet along with breast milk & reasons for feeding water.

Variables			Frequency (n=782)	
			Number	**%**
Feeding water along with breastmilk	Yes		78	10.00%
	No		704	90.00%
	Total		**782**	**100%**
Reason	Baby needs water		78	100%
Feeding other liquid diet / water along with breastmilk before 6 months	No		641	82.00%
	Yes	1st month	16	2.00%
		2nd month	20	2.60%
		3rd month	18	2.30%
		4th month	51	6.50%
		5th month	36	4.60%`
	Total		**782**	**100%**
Type of liquid diet given to the child*	Cow's milk		8	1.00%
	Formula feed		112	14.32%
	Water		78	9.97%
	Rice ganji		20	2.56%

** Multiple response question*

Graph 4: Reason for feeding other liquid diet/water along with breastmilk before six months

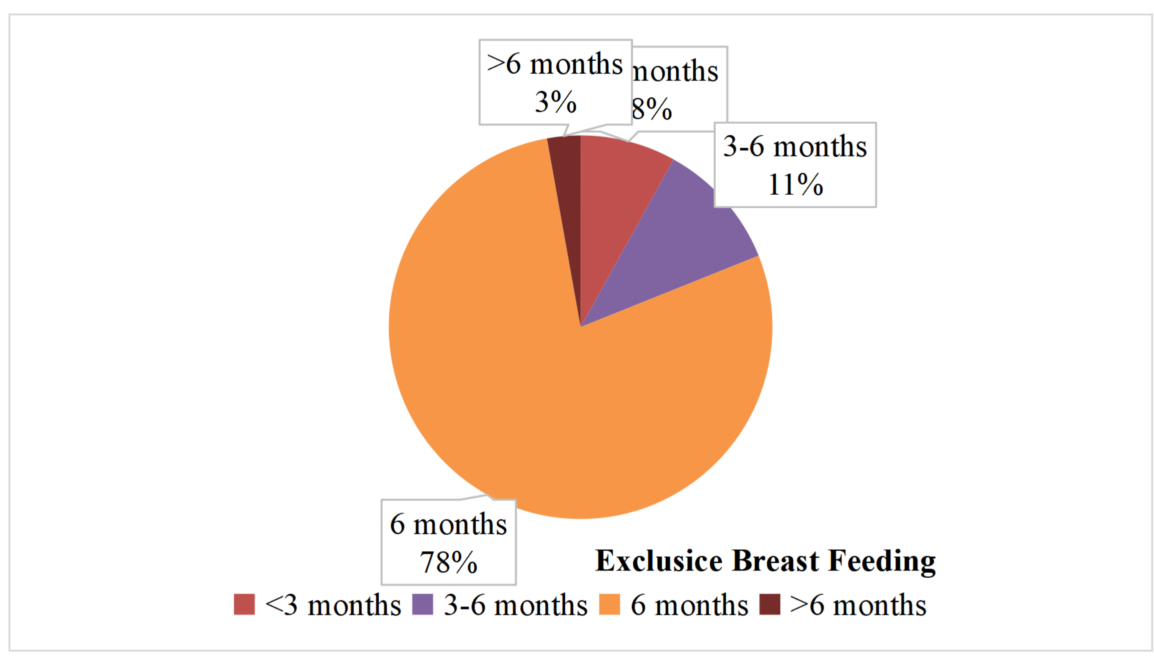


Total of 78 (10.00%) mothers said they thought the baby needs water, so they had given water along with breastmilk. At 1st month 16 (2.00%), 2nd month 20 (2.60%), 3rd month 18 (2.30%), 4th month 51 (6.50%) and at 5th month 36 (4.60%) mothers had fed their child with other foods along with breastmilk before 6 months. Common foods given before 6 months includes, formula feed (112), water (78), rice mix (20), cow's milk (8) (Table 20). Reason for feeding other liquid diet along with before six months were working mother (8.05%), reduced milk secretion (3.58%), child needs more nutrition (2.81%), breastmilk alone is not sufficient (1.66%) and 15(1.91%) participants had other reasons.

Table 21: Distribution of children according to duration of Exclusive Breastfeeding (EBF)

Variables		Frequency (n=782)	
		Number	**%**
Exclusive breastfeeding	<3 months	63	8.00%
	3-6 months	85	10.90%
	6 months	612	78.30%
	>6 months	22	2.80%
	Total	**782**	**100%**

Figure 3: Exclusive Breastfeeding



Among our study participants, 612 (78.30%) children had received EBF for six months, 63 (8.00%) and 85 (10.90%) children had received EBF for less than three months and three to six months respectively and 22 (2.80%) children had received EBF for more than six months. (Table 21 & Figure 3)

Table 22: Distribution of children based on the use of pacifiers and frequency of using pacifiers.

Variables		Frequency (n=782)	
		Number	**%**
Use of pacifiers	Yes	64	8.20%
	No	718	91.80%
	Total	**782**	**100%**
Frequency of using pacifiers	Most frequently	33	4.23%
	Less frequently	31	3.97%
	Total	**64**	**8.20%**

A total of 64 (8.20%) children used pacifiers, 33 of them used most frequently and 31 of them used less frequently (Table 22), all the participants had said that they have not given purgatives and any nutritional supplements other than vit A.

Complimentary feeding data:

Table 23: Distribution of participants based on time of introduction of complementary feeding and reason for giving it before / after 6 months

Variables		Frequency (n=782)	
		Number	**%**
Initiation of complementary feeding	<6 months	127	16.20%
	6 months	626	80.10%
	>6 months	29	3.70%
	Total	**782**	**100%**
Reason for giving complimentary feeding before 6 months	Breast milk alone is not sufficient	29	22.83%
	Reduced breastmilk secretion	32	25.20%
	Working mother	66	51.97%
	Total	**127**	**100%**
Reason for giving complimentary feeding after 6 months	Not accepted by the infant	10	34.48%
	Breastmilk is sufficient	4	13.79%
	Could not afford	3	10.35%
	Not tolerated by the infant	12	41.38%
	Total	**29**	**100%**

Timely introduction of complementary feeding (CF) at 6 months was observed in 626 (80.10%) participants, 127 (16.20%) and 23 (3.70%) had introduced complementary feeding before and after 6 months respectively. Mothers who started CF before 6 months had said breast milk alone is not sufficient (29), reduced milk secretion (32) and working mother (66) as the reason, whereas mothers who started after six months had said reasons such as not tolerated by the child (12), not accepted by the child (10), breast milk is sufficient (4) and could not afford (3). (Table 23)

Table 24: Distribution of type and frequency of complementary feeds given intially

Variables		Frequency (n=782)	
		Number	**%**
Type of complimentary feed initiated	Solid / soft solid	22	2.80%
	Semi solid	543	69.40%
	Liquid	217	27.80%
	Total	**782**	**100%**
Frequency of complementary feeds per day given initially	Once	374	47.80%
	Twice	366	46.80%
	Thrice	37	4.75%
	> 3 times	5	0.65%
	Total	**782**	**100%**
Type of Complementary foods*	Cow's milk/other animal's milk	141	18.03%
	Rice porridge	120	15.34%
	Fruits(smashed/juice)	60	7.67%
	Formula feed	251	32.10%
	Rice mixed (with dhal, veg etc.)	212	27.11%

* *Multiple response question*

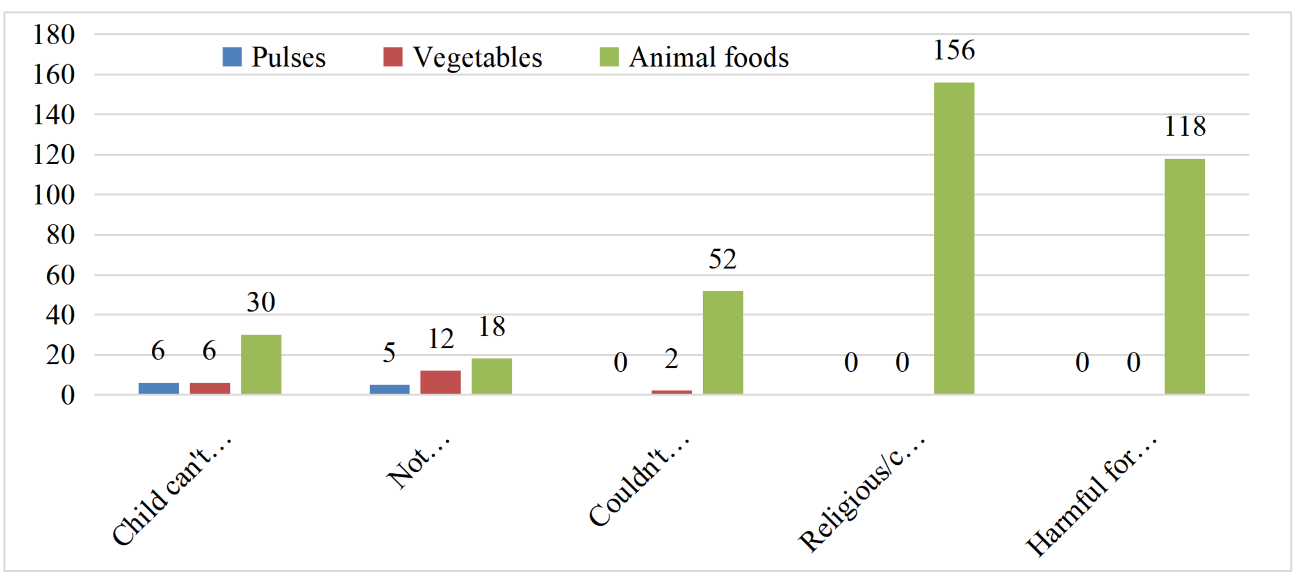
Type of complementary feeds introduced initially were solid 22 (2.80%), semi solid 543 (69.40%), liquid 217 (27.80%). Frequency given per day as once, twice, thrice and more than thrice were 374 (47.80%), 366 (46.80%), 37 (4.75%) and 5 (0.65%) respectively. Foods given for introduction of CF were formula feed like Cerelac etc., (251), rice mixed and blunt with dhal / veg (212), cow's/other animal milk source (141), porridge (120) and smashed fruits or juice (60). (Table 21)

Table 25a: Type foods avoided till one year

Variables		Frequency (n=782)	
		Number	%
Avoided pulses till one year	Yes	11	1.40%
	No	771	98.60%
	Total	**782**	**100%**
Avoided vegetables till one year	Yes	20	2.60%
	No	762	97.40%
	Total	**782**	**100%**
Avoided animal food till one year	Yes	374	47.80%
	No	408	52.20%
	Total	**782**	**100%**

** Multiple response question*

Graph 5: Reason for avoiding pulses, vegetables, and animal foods



Foods avoided till one year of age, it was observed that 11 (1.40%), 20 (2.60%) and 374 (47.80%) mothers had avoided giving pulses, vegetables, and animal food till one year age respectively. Eleven Mothers avoided giving pulses either because they thought that the child cannot digest (6) or it was not accepted/tolerated by the child (5); 20 mothers avoided giving vegetables because they thought that the child cannot digest(6), it was not accepted/tolerated by the child (12), they could not afford (2); 374 mothers avoided giving animal foods because they thought that the child cannot digest(6), it was not accepted/tolerated by the child (12), they could not afford (2), due to religious /cultural factors (156), they thought it was harmful for the child (118). (Graph 5)

Table 25b: Customs and beliefs associated with breastfeeding and complementary feeding

Customs and beliefs associated with feeding practices		Frequency (n=782)	
		Number	**%**
Pre-lacteal feeding practices	Yes	141	18.00%
	No	641	82.00%
	Total	**782**	**100%**
Feeding water before six months	Yes	78	10.00%
	No	704	90.00%
	Total	**782**	**100%**
Feeding any liquid diet before 6 months	Yes	141	18.00%
	No	641	82.00%
	Total	**782**	**100%**
Use of pacifiers	Yes	64	8.20%
	No	718	91.80%
	Total	**782**	**100%**
Initiation of complementary feeding	<6 months	127	16.20%
	>6 months	29	3.70%

In this study, the customs and beliefs associated with breast feeding and complimentary feeding practices were prelacteal feeding practices (18%), feeding water before six months (10%), feeding any liquid diet before six months (18%), use of pacifiers (8.20%), early initiation of complementary feeding before 6 months (16.20%), delayed initiation of complementary feeding >6 months (3.70%).

Table 26: Distribution of other practices associated with Complementary Feeding

Variables		Frequency (n=782)	
		Number	**%**
Consumption of commercial snacks/beverages	No	333	42.60%
	Daily	84	10.70%
	Twice weekly	126	16.10%
	Weekly	183	23.40%
	Once/twice a month	56	7.20%
	Total	**782**	**100%**
Bottle feeding	Always	48	6.20%
	Most frequently	107	13.70%
	Less frequently	156	19.90%
	Not bottle fed	471	60.20%
	Total	**782**	**100%**
Time taken between cooking to feeding	Immediately (<30 mins)	535	68.40%
	Within 2 hours	224	28.60%
	>2 hours	16	2.00%
	Kept throughout the day	7	0.90%
	Total	**782**	**100%**
Food stored in safe container	Yes	677	86.60%
	No	105	13.40%
	Total	**782**	**100%**
Hand washing before and after feeding	Yes	760	97.20%
	No	22	2.80%
	Total	**782**	**100%**

Consumption of commercial snacks or beverages was observed daily, twice daily, weekly and once/twice a month in 84 (10.70%), 126 (16.10%), 183 (23.40%) and 56 (7.20%). Also, 48 (6.20%), 107 (13.70%) and 156 (19.9%) participants used bottle feeding always, most frequently and less frequently; 471 (60.20%) were not bottle fed (Table 26). The table also shows the safety and hygienic measures followed during CF, it is observed that 535 (68.40%) mothers fed their child immediately (<30mins) after cooking the food, whereas 224 (28.60%), 16 (2.00%) and 7 (0.90%) had fed within 2 hours, more than 2 hours and kept throughout the day after cooking. A total of 677 (8.60%) mothers out of all the participants stored food in a safe, closed container and 760 (97.20%) mothers have a practice of washing hand before and after feeding the child.

Table 27: Distribution of participants practising continued breastfeeding

Variables			Frequency (n=782)	
			Number	**%**
Continued breast feeding	<12 months	Yes	329	97.63%
		No	8	2.37%
	12 – 18 months	Yes	184	88.90%
		No	23	11.10%
	18 – 24 months	Yes	222	93.27%
		No	16	6.73%
	Total		**782**	**100%**

It was observed that 329 (97.63) among children aged 6 months to 12 months had continued breast feeding, 184 (88.90%) and 222 (93.27%) children aged between 12 months to 18 months and 18 months to 24 months had continued breastfeeding respectively. Majority of the study participants continues breastfeeding along with CF (94%)

Table 28: Distribution of children who had received Minimum adequate diet

Variables		Frequency (n=782)	
		Number	%
Minimum meal frequency	1	92	11.80%
	2	282	36.00%
	3	359	45.90%
	>3	49	6.30%
	Total	**782**	**100%**
Minimum diet diversity (Number of food groups)	1	14	1.80%
	2	72	9.20%
	3	184	23.50%
	4	344	44.00%
	>4	168	21.50%
	Total	**782**	**100%**
Minimum acceptable diet	Yes	330	42.20%
	No	452	57.80%
	Total	**782**	**100%**

This study also showed 92 (11.80%), 282 (36.00%), 359 (45.90%) and 49 (6.30%) children had received minimum meal frequency (MMF) of 1, 2, 3 and >3 respectively; and also 14 (1.80%), 72 (9.20%), 184 (23.50%), 344 (44.00%) and 168 (21.50%) children received minimum diet diversity of 1, 2, 3, 4 and >4 food groups respectively. Table 25 also shows 330 (42.20%) children had minimum acceptable diet (MAD) whereas 452 (57.80%) did not have MAD.

<u>Illness in the past 15 days:</u>

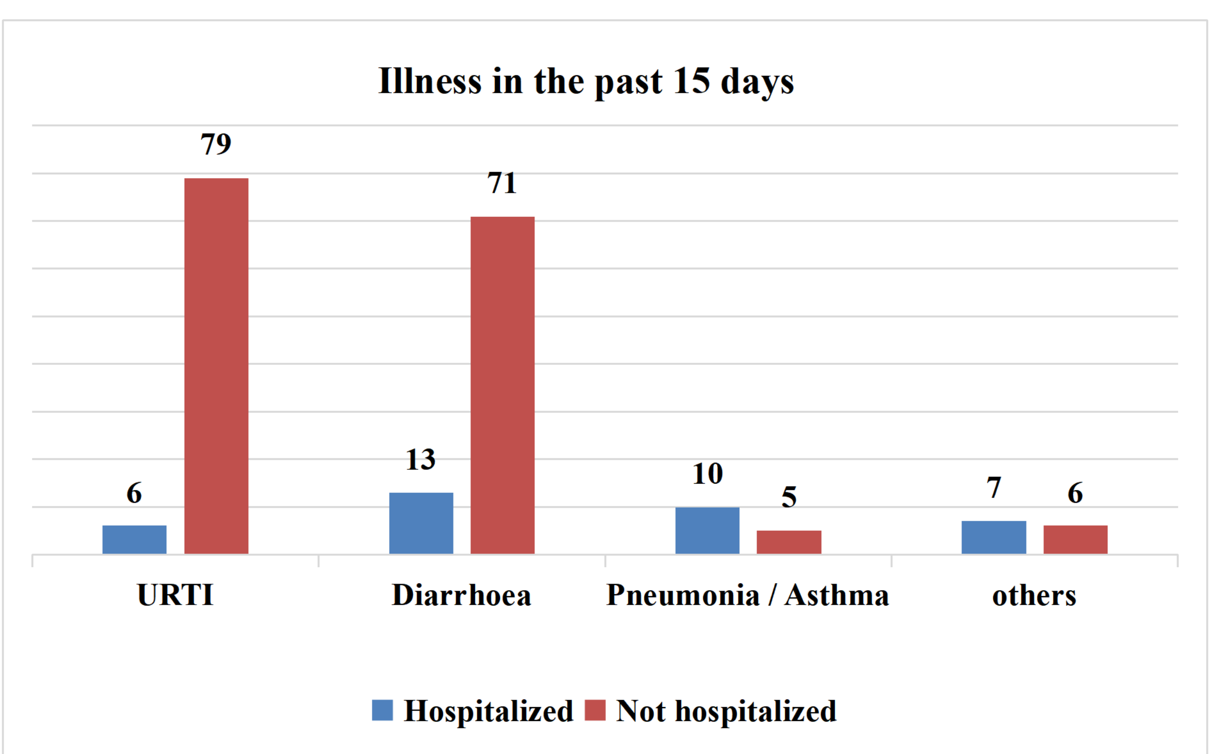
Table 29: Distribution of children based on history of illness in the past 15 days

Variables			Frequency (n=782)	
			Number	**%**
History of any illness in the past 15 days	Yes	Hospitalized	36	4.60%
		Not hospitalized	161	20.60%
	No		585	74.80%
	Total		**782**	**100%**

Table 30: Distribution of children based on type of illness

Hospitalization	Type of illness (n=197)				Total
	Acute upper respiratory tract infection	Diarrhoea	Pneumonia/ asthma	others	
Yes	6	13	10	7	**36**
No	79	71	5	6	**161**
Total	**85**	**84**	**15**	**13**	**197**

Graph 6: Type of illness and hospitalization



This study also observed history of recent illness in the past 15 days, it was found that 197 (25.20%) children had history illness in the past 15 days, among which 36 were hospitalized, 585 (74.80%) children did not have history any illness in the past 15 days. Type of illness observed in the past 15 days was Acute upper respiratory tract infection (85), diarrhea (84), pneumonia /asthma (15) and other febrile illness (13).

IV. Nutritional status assessment by anthropometry:

Table 31: Distribution of children according to mean anthropometric score

Anthropometry	Test	Age of the child		
		6 – ≤12 months	>12 – ≤18 months	>18 – 24 months
Height / length (Cm)	Mean (±2SD)	70.8(6.0)	81.4 (10.0)	86.1 (9.0)
	Median	71.0	80.5	86.1
Weight (Kg)	Mean (±2SD)	8.0 (2.4)	9.8(2.8)	11.0 (3.8)
	Median	7.8	9.8	10.5
Mid upper-arm circumference	Mean (±2SD)	14.2 (1.6)	14.6 (1.2)	15.3 (2.0)
	Median	14	14.5	15.0
Head circumference (Hc)	Mean (±2SD)	44 (2)	47 (2)	48 (2)
	Median	44	47	48
Chest circumference (Cc)	Mean (±2SD)	42.6 (4.4)	47.7 (5.4)	49.2 (4.8)
	Median	42.0	47.5	49.0
Hc / Cc	Mean (±2SD)	1.03 (0.05)	0.98 (0.09)	0.97 (0.09)
	Less than 1	12.50%	71.50%	73.90%
	More than 1	87.5%	28.50%	20.20%
	1	0%	0%	5.90%

Mean (±2SD) of height / length observed among children aged 6-12 months, 12 -18 months, and 18-24 months was 70.8 (6.0), 81.4 (10.0) and 86.1 (9.0). Mean (±2SD) of weight observed among children aged 6-12 months, 12 -18 months, and 18-24 months was 8.0 (2.4), 9.8 (2.8) and 11.0 (3.8), Mean (±2SD) of mid upper arm circumference observed among children aged 6-12 months, 12 -18 months, and 18-24

months was 14.2 (1.6), 14.6 (14.5) and 15.3 (2.0), Mean (±2SD) of head circumference (Hc) observed among children aged 6-12 months, 12 -18 months, and 18-24 months was 44 (2), 47 (2) and 48 (2), Mean (±2SD) of chest circumference (Cc) observed among children aged 6-12 months, 12 -18 months, and 18-24 months was 42.6 (4.4), 47.7 (5.4) and 49.2 (4.8). Mean ratio between head and chest circumference was 1.03, 0.98 and 0.97 among children aged 6-12 months, 12 -18 months, and 18-24 months respectively. The ratio between Hc and Cc was less than 1 in 71.50% children aged 12 months to 18 months and 79.80% in (Table 31)

Table 32: Distribution of children based on their nutritional status a per WHO standards *(Z score)*

Variables	Frequency (n=782)	
	Number	**%**
Normal	621	79.40%
Under-weight	35	4.50%
Over-weight	14	1.80%
Stunted	21	2.70%
Wasted	91	11.60%
Total	**782**	**100%**

The observed data was categorized as per WHO standard growth chart for Asian population into normal, underweight (<-2SD - weight for age), over weight (>2SD – weight for age), stunted (<2 SD – height for age), and wasted (<2 SD – weight for height). It was observed that among the participated children 621 (79.4%), 35 (4.50%), 14 (1.8%), 21 (2.7%) and 91 (11.6%) were normal, underweight, over-weight, stunted and wasted respectively.

V. Association between various socio-demographic factors and infant young child feeding practices

Table 33: Association between age and gender of the child and early initiation of breast-feeding

Variable		Early initiation of breastfeeding (n=782)		Test (significance)
		<1 hour	**>1 hour**	
Gender	Male	331 (84.00%)	63 (16.00%)	$\chi^2 = 4.48$ (p = 0.034)
	Female	346 (89.20%)	42 (10.80%)	
	Total	**677**	**105**	**Total = 782**
Age	6-12 months	309 (91.60%)	28 (8.40%)	$\chi^2 = 13.39$ (p = 0.001)
	12-18 months	172 (83.10%)	35 (16.90%)	
	18-24 months	196 (82.40%)	42 (17.60%)	
	Total	**677**	**105**	**Total = 782**

Early initiation of breast feeding within one hour of birth was found almost equally in both males (84%) and females (89%), the association was statistically significant with a p value 0.034. EIBF was found more in children aged 6-12 months (91.60%) when compared to children aged 12 – 18 months (83.10%) and 18 – 24 months (82.40%), and the association was statistically significant with p value 0.001.

Table 34: Association between birth order and early initiation of breastfeeding

Variable		Early initiation of breastfeeding (n=782)		Test (significance)
		<1 hour	>1 hour	
Birth order	1	495 (88.70%)	63 (11.30%)	χ^2 =10.161 (0.006)
	2	133 (79.20%)	35 (20.80%)	
	3 and above	49 (87.50%)	7 (12.50%)	
	Total	**677**	**105**	**Total = 782**

In our study, EIBF within 1 hour was found in 495 (88.70%) first born children, 133 (79.20%) second born children and in 49 (87.50%) children whose birth order were 3 and above. 20.80% second born children were delayed EIBF >1 hour and it was slightly high when compared to first born children (11.30%) and children with birth order 3 and above (12.50%) and the association was statistically significant with p value 0.006

Table 35: Association between education of mother and early initiation of breastfeeding

Variable		Early initiation of breastfeeding (n=782)		Test (significance)
		<1 hour	>1 hour	
Education of mother	No formal schooling	6 (85.70%)	1 (14.30%)	χ^2 = 41.864 (<0.001)
	Studied between 1-10 (standard)	255 (83.90%)	49 (16.10%)	
	PUC/Diploma	297 (91.40%)	27 (8.60%)	Fisher's exact test = 31.54 (<0.001)
	Degree	104 (88.20%)	15 (11.80%)	
	Post-graduate /more	15 (53.60%)	13 (46.40%)	
	Total	**677**	**105**	**Total = 782**

Association of educational status of the mother with EIBF was found statistically significant in this study with p value <0.001 using fisher's exact test. 46.40% mothers with postgraduate or more education level had delayed more than 1 hour, whereas 14.30%, 16.10%, 8.60% and 11.80% mothers with no formal schooling, who studied between 1-10 standard, with PUC/Diploma, with degree had delayed breastfeeding respectively.

Table 36: Association between socio-economic status and early initiation of breastfeeding

Variable		**Early initiation of breastfeeding (n=782)**		**Test (significance)**
		<1 hour	>1 hour	
Socio economic class	I	28 (66.70%)	14 (33.30%)	$\chi^2 = 24.47$ (<0.001)
	II	156 (88.10%)	20 (11.90%)	
	III	217 (91.20%)	22 (8.80%)	
	IV	198 (82.50%)	42 (17.50%)	Fisher's exact test = 21.564 (<0.001)
	V	78 (91.80%)	7 (8.20%)	
	Total	**677**	**105**	**Total = 782**

Association of socio-economic status (SES) of the participants with EIBF was found statistically significant in this study with p value <0.001 using chi-square test. Among the study participants with socio economic status I, 33.30% participants had delayed EIBF > 1 hour, 11.90%, 8.80%,17.50% and 8.20% participants with SES II, III, IV and V had delayed EIBF respectively.

Table 37: Association between type of family and early initiation of breastfeeding

Variable		Early initiation of breastfeeding (n=782)		Test (significance)
		<1 hour	>1 hour	
Type of family	Nuclear	276 (87.30%)	40 (12.70%)	χ^2 = 6.799 (0.033)
	Joint	85 (78.70%)	23 (21.30%)	
	Extended (three generation)	316 (88.30%)	42 (11.70%)	
	Total	**677**	**105**	**Total = 782**

Association of type of family with EIBF was found statistically significant in this study using chi-square test with p value 0.033. Among the participants who live in a joint family, 21.30% had delayed EIBF >1 hour, it was 12.70% and 11.70% among participants who live in a nuclear family and three generation family respectively.

Table 38: Association between age and gender of the child and feeding prelacteal feeds

Variable		Prelacteal feeding (n=782)		Test (significance)
		Yes	**No**	
Gender	Male	92 (23.40%)	302 (76.60%)	χ^2 =15.20
	Female	49 (12.60%)	339 (87.40%)	(<0.001)
	Total	**141**	**641**	**782**
Age	6-12 months	35 (10.40%)	302 (89.60%)	χ^2 =36.61
	12-18 months	64 (30.90%)	143 (69.10%)	(<0.001)
	18-24 months	42 (17.60%)	196 (82.40%)	
	Total	**141**	**641**	**782**

In this study, association of gender and age with giving prelacteal feeds to the child was statistically significant with p value <0.001. More male children (23.40%) were given prelacteal feeds when compared with female children (12.60%). 30.90% children aged 12-18 months were given prelacteal feeds, 10.40% and 17.60% children aged 6-12 months and 18-24 months were given prelacteal feeds respectively.

Table 39: Association between birth order and giving prelacteal feeds

Variable		Prelacteal feeding (n=782)		Test (significance)
		Yes	**No**	
Birth order	1	106 (19.00%)	452 (81.00%)	Fisher's exact test = 19.679 (<0.001)
	2	35 (20.80%)	133 (79.20%)	
	3 and above	0 (0.00%)	56 (100%)	
	Total	**141**	**641**	**782**

Prelacteal feeding practices was associated with birth order of the child with p value <0.001 using fisher exact test. More 1st (19.00%) and 2nd (20.80%) born children were given prelacteal feeds when compared with children with birth order 3 and above.

Table 40: Association between education of mother and prelacteal feeding practice

Variable		Prelacteal feeding (n=782)		Test (significance)
		Yes	No	
Education of mother	No formal schooling	3 (42.80%)	4 (57.20%)	χ^2 =38.04 (<0.001) Fisher's exact test = 39.53 (<0.001)
	Studied between 1-10 (standard)	71 (23.40%)	233 (76.60%)	
	PUC/Diploma	28 (8.60%)	296 (91.40%)	
	Degree	35 (29.40%)	84 (70.60%)	
	Post-graduate /more	4 (14.30%)	24 (85.70%)	
	Total	**141**	**641**	**782**

Association between prelacteal feeding practice and education level of the mother was statistically significant with p value <0.001 using fisher's exact test. Prelacteal feeding practices was found in 42.80%, 29.40%, 23.40%, 14.30% and 8.60% mothers with no formal education, with degree, who studied between 1-10 standard, with postgraduate degree or more and with PUC/Diploma respectively.

Table 41: Association between Socio-economic status and prelacteal feeding practice

Variable		Prelacteal feeding (n=782)		Test (significance)
		Yes	No	
Socio economic class	I	15 (34.00%)	27 (66.00%)	$\chi^2 = 13.418$ (0.009)
	II	29 (16.50%)	147 (83.50%)	
	III	41 (17.60%)	198 (82.40%)	
	IV	49 (20.40%)	191 (79.60%)	
	V	7 (8.20%)	78 (91.80%)	
	Total	**141**	**641**	**782**

Association of socio-economic status (SES) of the participants with prelacteal feeding practice was found statistically significant in this study with p value 0.009 using chi-square test. Among the study participants with SES I, 34.00% participants had given prelacteal feeds. Whereas it is comparatively less among other groups. 16.50%, 17.60%, 20.40% and 8.20% participants with SES II, III, IV and V had given prelacteal feeds respectively.

Table 42: Association between prelacteal feeding practice and family type

Variable		Prelacteal feeding (n=782)		Test (significance)
		Yes	No	
Type of family	Nuclear	64 (20.30%)	252 (79.70%)	$\chi^2 = 2.98$ (p = 0.226)
	Joint	15 (13.00%)	93 (87.00%)	
	Extended (three generation)	62 (17.60%)	296 (82.40%)	
	Total	**141**	**641**	**782**

Association between prelacteal feeding practice and family type was not statistically significant using chi-square test with p value 0.226. prelacteal feeding practice was seen 20.30%, 13.00% and 17.60% among participants with nuclear, joint and three generation family type respectively.

Table 43: Association between gender and age of the child and feeding colostrum

Variable		Feeding colostrum (n=782)		Test (significance)
		Yes	**No**	
Gender	Male	383 (97.20%)	11 (2.80%)	χ^2 =6.20 (0.013)
	Female	386 (99.50%)	2 (0.50%)	Fisher's exact test (0.021)
	Total	**769**	**13**	**782**
Age	6-12 months	330 (97.90%)	7 (2.10%)	χ^2 =6.31 (0.043)
	12-18 months	201 (97.10%)	6 (2.90%)	Fisher's exact test = 7.50 (0.022)
	18-24 months	238 (100%)	0 (0%)	
	Total	**769**	**13**	**782**

In our study, association of age and gender was found statistically significant using fisher exact test with a p value 0.022 and 0.021 respectively. More male newborns (2.80%) were not fed colostrum when compared with female newborns (0.50%). Among children aged 6 months to 1 year, only 2.10% were not fed with colostrum, and among children > 1 year, 2.90% children were not fed with colostrum.

Table 44: Association between birth order and feeding colostrum

Variable		Feeding colostrum (n=782)		Test (significance)
		Yes	**No**	
Birth order	1	556 (99.60%)	2 (0.40%)	Fisher's exact test = 22.68 (<0.001)
	2	157 (93.50%)	11 (6.50%)	
	3 and above	56 (100%)	0 (0%)	
	Total	**769**	**13**	**782**

Association between birth order and feeding colostrum was found statistically significant with p value <0.001 using fisher's exact test. Colostrum was not fed in 1st (0.40%) and 2nd (6.50%) born children, all the children (100%) born in birth order 3 and above were given colostrum.

Table 45: Association between education of mothers and feeding colostrum

Variable		Feeding colostrum (n=782)		Test (significance)
		Yes	**No**	
Education of mother	Less than PUC	300 (96.50%)	11 (3.50%)	χ^2 =11.09 (0.001) Fisher's exact test (0.001)
	PUC and above	469 (99.60%)	2 (0.40%)	
	Total	**769**	**13**	**782**

Among the mothers with education level less than PUC, 3.50% had not given colostrum to their children and only 0.40% mothers with PUC and above education level had not given colostrum to their children. This association was statistically significant with p value 0.001 using fisher's exact test.

Table 46: Association between socio economic status and feeding colostrum

Variable		Feeding colostrum (n=782)		Test (significance)
		Yes	No	
Socio economic class	I to III	448 (98.00%)	9 (2.00%)	Fisher's exact test (0.574)
	IV & V	321 (98.80%)	4 (1.20%)	
	Total	**769**	**13**	**782**

Association between SES and feeding colostrum was not statistically significant in this study with a p value 0.574 using fisher's exact test. Only 2.00% and 1.20% mothers with SES between I to III and >III had not given colostrum to their child respectively.

Table 47: Association between type of family and feeding colostrum

Variable		Feeding colostrum (n=782)		Test (significance)
		Yes	**No**	
Type of family	Nuclear	310 (98.10%)	6 (1.90%)	$\chi^2 = 2.12$ (p = 0.346) Fisher's exact test = 1.824 (0.434)
	Joint / three generation family	459 (98.50%)	7 (1.50%)	
	Total	**769**	**13**	**782**

Association between type of family and feeding colostrum was not statistically significant in this study with a p value 0.346 using chi-square test. Participants living in nuclear family (1.90%) and joint / three generation family (1.50%) had not given colostrum to their children.

Table 48: Association between age and gender of the child and the duration of exclusive breastfeeding

Variable		Exclusive breast feeding for 6 months (n=782)		Test (significance)
		Yes	No	
Gender	Male	295 (74.90%)	99 (25.10%)	χ^2 = 5.36
	Female	317 (81.70%)	71 (18.30%)	(0.021)
	Total	**612**	**170**	**782**
Age	6-12 months	273 (81.00%)	64 (19.00%)	χ^2 = 2.654
	12-18 months	157 (75.80%)	50 (24.20%)	(0.265)
	18-24 months	182 (76.50%)	56 (23.50%)	
	Total	**612**	**170**	**782**

In our study, association of gender with Exclusive Breast-Feeding (EBF) was found statistically significant with p value 0.021 using chi-square test. EBF practice was almost equally found in both male (74.90%) and female (81.70%) children. Among infants aged 6-12 months, 81% children had EBF, in children aged 12-18 months and 18-24 months, 75% and 76% had EBF respectively. The association between age and EBF was not statistically significant in this study with p value 0.265 using chi-square test.

Table 49: Association between birth order and the duration of exclusive breastfeeding

Variable		Exclusive breast feeding for 6 months (n=782)		Test (significance)
		Yes	No	
Birth order	1	430 (77.10%)	128 (22.90%)	Fisher's exact test = 24.983 (<0.001)
	2	126 (75.00%)	42 (25.00%)	
	3 and above	56 (100%)	0 (0%)	
	Total	**612**	**170**	**782**

Association between birth order and EBF was statistically significant in this study with p value <0.001 using fisher's exact test. EBF in 1st (77.10%) and 2nd born (75.00%) children were lower when compared to birth order 3 and above (100%) children.

Table 50: Association between education level of mothers and the duration of exclusive breastfeeding

Variable		Exclusive breast feeding for 6 months (n=782)		Test (significance)
		YES	NO	
Education of mother	Less than PUC	260 (83.60%)	51 (16.40%)	$\chi^2 = 8.656$
	PUC and above	352 (74.70%)	119 (25.30%)	(0.003)
	Total	**612**	**170**	**782**

In this study, association between education level of the mother and EBF was statistically significant with p value 0.003 using chi-square test. 83% among the mothers with education level less than PUC had given their child EBF and 74% among the mothers who studied PUC and above had given EBF to their children.

Table 51: Association between socio economic status and the duration of exclusive breastfeeding

Variable		Exclusive breast feeding for 6 months (n=782)		Test (significance)
		YES	**NO**	
Socio economic class	I to III	323 (70.70%)	134 (29.30%)	$\chi^2 = 37.16$ (<0.001)
	IV & V	289 (88.90%)	36 (11.10%)	
	Total	**612**	**170**	**782**

Association between SES and EBF was found statistically significant in this study with p value <0.001 using chi-square test. More mothers with SES IV & V (88.90%) had given EBF when compared with mothers with SES I to III (70.70%).

Table 52: Association between type of family and the duration of exclusive breastfeeding

Variable		Exclusive breast feeding for 6 months (n=782)		Test (significance)
		Yes	No	
Type of family	Nuclear	238 (75.30%)	78 (24.70%)	χ^2 = 17.233 (p = <0.001)
	Joint / Three generation	374 (80.25%)	92 (19.75%)	
	Total	**612**	**170**	**782**

EBF was found almost equally in both nuclear family (75%) and joint/three generation family (80%). The association between EBF and the type of family was statistically significant in this study with a p value of <0.001.

Table 53: Association between gender and age of the child and timely initiation of complementary feeding at six months

Variable		Timely initiation of complementary feeding at 6 months (n=782)		Test (significance)
		Yes	**No**	
Gender	Male	288 (73.10%)	106 (26.90%)	χ^2 =24.05
	Female	338 (87.10%)	50 (12.90%)	(<0.001)
	Total	**626**	**156**	**782**
Age	6-12 months	280 (83.10%)	57 (16.90%)	χ^2 = 10.196
	12-18 months	150 (72.50%)	57 (27.50%)	(0.006)
	18-24 months	196 (82.40%)	42 (17.60%)	
	Total	**626**	**156**	**782**

Association of gender and age with complementary feeding (CF) was statistically significant in this study with p value <0.001 and 0.006 respectively. 73% male children and 87% female children had timely initiation of CF at 6 months. 83% children among age group 6-12 months, 72% children among age group 12-18 months and 82% children among age group 18-24months had timely initiation of CF at 6 months.

Table 54: Association between birth order and timely initiation of complementary feeding at six months

Variable		Timely initiation of complementary feeding at 6 months (n=782)		Test (significance)
		Yes	**No**	
Birth order	1	444 (79.60%)	114 (20.40%)	$\chi^2 = 2.109$ (0.348)
	2	133 (79.20%)	35 (20.80%)	
	3 and above	49 (87.50%)	7 (12.50%)	
	Total	**626**	**156**	**782**

Association between birth order and initiation of CF was not significant statistically in this study with p value (0.348). Initiation of CF among 1st (79%) and 2nd (79%) born children was almost equal whereas, 87% of the children with birth order 3 and above had timely initiation of CF at 6 months.

Table 55: Association between education level of the mothers and timely initiation of complementary feeding at six months

Variable		Timely initiation of complementary feeding at 6 months (n = 782)		Test (significance)
		Yes	**No**	
Education of mother	Less than PUC	267 (85.90%)	44 (14.10%)	$\chi^2 = 10.88$ (0.001)
	PUC and above	359 (76.20%)	112 (23.80%)	
	Total	**626**	**156**	**782**

Association between mother's education and initiation of CF was statistically significant with p value 0.001 using chi- square. 85% and 76% among mothers who has studied less than PUC and studied PUC and above had initiated CF at 6 months.

Table 56: Association between socio economic status and timely initiation of complementary feeding at six months

Variable		Timely initiation of complementary feeding at 6 months (n=782)		Test (significance)
		Yes	**No**	
Socio economic class	I to III	323 (70.70%)	134 (29.30%)	χ^2 = 60.491 (<0.001)
	IV & V	303 (93.20%)	22 (6.80%)	
	Total	**626**	**156**	**782**

Association between SES and initiation of CF was statistically significant in this study with p value <0.001. Timely initiation of CF was observed more among participants belonging to SES IV&V (93%) when compared with people belonging to SES I to III (70%).

Table 57: Association between type of family and timely initiation of complementary feeding at six months

Variable		Timely initiation of complementary feeding at 6 months (n=782)		Test (significance)
		Yes	**No**	
Type of family	Nuclear	252 (79.70%)	64 (20.30%)	$\chi^2 = 15.512$ (p= <0.001)
	Joint	101 (93.50%)	7 (6.50%)	
	Extended (three generation)	273 (76.30%)	85 (23.70%)	
	Total	**626**	**156**	**782**

Association between type of family and initiation of CF was significant statistically with p value <0.001. Timely initiation of CF at 6months was seen 79%, 93% and 76% among participants living in nuclear, joint and three generation family respectively.

Table 58: Association between age and gender of the child and continued breastfeeding

Variable		Continued breastfeeding along with complementary feeding (n=782)		Test (significance)
		Yes	No	
Gender	Male	372 (94.40%)	22 (5.60%)	$\chi^2 = 0.256$ (0.613)
	Female	363 (93.60%)	25 (6.40%)	
	Total	**735**	**47**	**782**
Age	6-12 months	329 (97.60%)	8 (2.40%)	$\chi^2 = 17.63$ (<0.001)
	12-18 months	184 (88.90%)	23 (11.10%)	
	18-24 months	222 (93.30%)	16 (6.70%)	
	Total	**735**	**47**	**782**

Association between gender and continued breast-feeding (CBF) along with complementary feeding was not statistically significant with p value 0.613. CBF was observed almost equally in both male (94%) and female (93%) children. Association between age and CBF was statistically significant in this study with p value <0.001. Majority of the children (97%) among age group 6-12 months, 88% children among age group 12-18 months and 93% children among age group 18-24 months had CBF along with CF.

Table 59: Association between birth order and continued breastfeeding

Variable		Continued breastfeeding along with complementary feeding (n=782)		Test (significance)
		Yes	**No**	
Birth order	1	525 (93.70%)	35 (6.30%)	$\chi^2 = 1.923$ (0.382) Fisher's exact test = 1.688 (0.438)
	2	157 (93.50%)	11 (6.50%)	
	3 and above	55 (98.20%)	1 (1.80%)	
	Total	**735**	**47**	**782**

Association between birth order and CBF was not significant statistically with p value 0.438 using fisher's exact test. CBF was observed almost equally among 1st (93.70%) and 2nd (93.50%) born children, and it is 98% in children with birth order 3 and above.

Table 60: Association between mother's education and continued breastfeeding

Variable		Continued breastfeeding along with complementary feeding (n=782)		Test (significance)
		Yes	No	
Education of mother	Less than PUC	299 (96.10%)	12 (3.90%)	$\chi^2 = 4.232$ (0.040)
	PUC and/ above	436 (92.60%)	35 (7.40%)	
	Total	**735**	**47**	**782**

Association between education level of mother and CBF was significant statistically with p value 0.040. 7 % mother who studied PUC and above and 4% mother had studied < PUC had not given CBF.

Table 61: Association between socio economic status and continued breastfeeding

Variable		Continued breastfeeding along with complementary feeding (n=782)		Test (significance)
		Yes	**No**	
Socio economic class	I to III	422 (92.30%)	35 (7.70%)	$\chi^2 = 5.289$ (0.021)
	IV & V	313 (96.30%)	12 (3.70%)	
	Total	**735**	**47**	**782**

Association between SES and CBF was statistically significant with p value 0.021 using chi – square test. CBF was observed more among participants belonging to SES IV & V (96%) when compared with SES I to III (92%).

Table 62: Association between type of family and continued breastfeeding

Variable		Continued breastfeeding along with complementary feeding (n=782)		Test (significance)
		Yes	**No**	
Type of family	Nuclear	293 (92.70%)	23 (7.30%)	$\chi^2 = 1.951$ (p= 0.377)
	Joint	101 (93.50%)	7 (6.50%)	
	Extended (three generation)	341 (95.30%)	17 (4.70%)	
	Total	**735**	**47**	**782**

Association between CBF and type of family was not significant statistically with p value 0.377 using chi-square test. CBF was observed almost equal in participants living in nuclear (92.70%), joint (93.50%) and three generation (95.30%) families.

Table 63: Association between age and gender of the child and minimum acceptable diet

Variable		Minimum acceptable diet (n=782)		Test (significance)
		Yes	No	
Gender	Male	176 (44.70%)	218 (55.30%)	χ^2 = 1.99 (0.159)
	Female	154 (39.70%)	234 (60.30%)	
	Total	**330**	**452**	**782**
Age	6-12 months	119 (35.30%)	218 (64.70%)	χ^2 = 38.82 (<0.001)
	12-18 months	71 (34.30%)	136 (65.70%)	
	18-24 months	140 (58.80%)	98 (41.20%)	
	Total	**330**	**452**	**782**

In this study, the association between gender and minimum acceptable diet (MAD) was not statistically significant with p value 0.159. MAD was observed in 44.70% and 39.70% of the male and female children respectively. Association between age and MAD was statistically significant with p value <0.001. MAD was observed 35%, 34% and 58% among children belonging to age group 6-12 months, 12-18 months, and 18-24 months respectively.

Table 64: Association between birth order and minimum acceptable diet

Variable		Minimum acceptable diet (n=782)		Test (significance)
		Yes	No	
Birth order	1	204 (36.60%)	354 (63.40%)	$\chi^2 = 36.170$ (<0.001)
	2	84 (50.00%)	84 (50.00%)	
	3 and above	42 (75.00%)	14 (25.00%)	
	Total	**330**	**452**	**782**

Association between birth order and MAD was significant statistically with p value <0.001. Only 36% children among 1st born children had MAD, 50% among 2nd born children had MAD and 75% among children with birth order 3 and above had MAD.

Table 65: Association between education level of mothers and minimum acceptable diet

Variable		Minimum acceptable diet (n=782)		Test (significance)
		YES	**NO**	
Education of mother	Less than PUC	120 (38.60%)	191 (61.40%)	$\chi^2 = 2.765$ (P = 0.096)
	PUC and/ above	210 (44.60%)	261 (55.40%)	
	Total	**330**	**452**	**782**

Association between MAD and education level of the mother was not significant statistically with a p value 0.096. MAD was observed more in mothers who had studied PUC and / above (44.60%) when compared with mothers who had studied less than PUC (38.60%).

Table 66: Association between socio economic status and minimum acceptable diet

Variable		Minimum acceptable diet (n=782)			Test (significance)
		Yes	No		
Socio economic status	I to III	197 (43.10%)	260 (56.90%)		$\chi^2 = 0.371$ (0.542)
	IV & V	133 (40.90%)	192 (59.10%)		
	Total	**330**	**452**		**782**

Association between SES and MAD was not significant statistically with p value 0.542. MAD was observed almost equally in SES I to III (43.10%) and SES III and above (40.90%).

Table 67: Association between type of family and minimum acceptable diet

Variable		Minimum acceptable diet (n=782)		Test (significance)
		Yes	No	
Type of family	Nuclear	160 (50.60%)	156 (49.40%)	$\chi^2 = 16.51$ (p= <0.001)
	Joint	44 (40.70%)	64 (59.30%)	
	Extended (three generation)	126 (35.20%)	232 (64.80%)	
	Total	**330**	**452**	**782**

Association between type of family and MAD was statistically significant with p value <0.001. MAD was observed more in children in nuclear family (50%), compared children living in joint (40%) and three generation (35%) family.

Table 68: Association between age of the children and nutritional status

Variables		Nutritional status										Total
		Underweight (Weight for age <-2SD)		Overweight (Weight for age >2SD)		Stunting (Height for age <-2SD)		Wasting (Weight for height <-2SD)		Normal (-2SD to +2SD)		
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**N (%)**
Age group	6-12 months	21	6.23%	6	1.80%	8	2.37%	35	10.39%	267	79.00%	337 (43.10%)
	12-18 months	13	6.28%	2	0.96%	7	3.38%	21	10.14%	164	79.20%	207 (26.50%)
	18-24 months	1	0.42%	6	2.52%	6	2.52%	35	14.70%	190	79.80%	238 (30.40%)
	Pearson Chi-square χ^2 = 17.37 df = 8 p value = 0.026 (Only 2 cells have count less than 5 (13.3%))										**Total**	**782 (100%)**

Association between nutritional status of the child and age was significant statistically with a p value of 0.026. Among children from age group 6 months to 12 month, 267(79.00%) were normal and 21 (6.23%), 6 (1.80%), 8 (2.37%) and 35 (10.39%) were under weight, overweight, stunted and wasted respectively. Among children from age group 12 months to 18 months, 164 (79.20%) were normal and 13 (6.28%), 2 (0.96%), 7 (3.38%) and 21 (10.14%) were under weight, overweight, stunted and wasted respectively. Among children from age group 18 months to 12 months, 190 (79.80%) were normal and 1 (0.42%), 6 (2.52%), 6 (2.52%) and 35 (14.70%) were under weight, overweight, stunted and wasted respectively.

VI. Association between nutritional status and feeding practices.

Table 69: Association between early initiation of breastfeeding and nutritional status of the child

Variables		Nutritional status										Total
		Underweight (Weight for age <-2SD)		Overweight (Weight for age >2SD)		Stunting (Height for age <-2SD)		Wasting (Weight for height <-2SD)		Normal (-2SD to +2SD)		
		No.	%	No.	%	No.	%	No.	%	No.	%	N (%)
Early initiation of breastfeeding	Less than 1 hour	29	4.28%	6	0.88%	15	2.21%	31	4.57%	596	88.03%	677 (86.60%)
	More than 1 hour	6	5.71%	8	7.61%	6	5.71%	60	57.14%	25	23.80%	105 (13.40%)
	Pearson Chi-square $\chi^2 = 291.43$ df = 4 p value = <0.001										**Total**	**782 (100%)**

Association between nutritional status of the child and early initiation of breastfeeding was observed significant statistically in this study with a p value of <0.001. Among children who were initiated breastfeeding within one hour of birth, 596 (88.03%) were normal and 29 (4.28%), 6 (0.88%), 15 (2.21%) and 31 (4.57%) were under weight, overweight, stunted and wasted respectively. Among children who were initiated breastfeeding after few hours or days of birth, 25 (23.80%) were normal and 6 (5.71%), 8 (7.61%), 6 (5.71%) and 60 (57.14%) were under weight, overweight, stunted and wasted respectively.

Table 70: Association between duration of exclusive breastfeeding and the nutritional status of the child

Variables		Nutritional status										Total
		Underweight (Weight for age <-2SD)		Overweight (Weight for age >2SD)		Stunting (Height for age <-2SD)		Wasting (Weight for height <-2SD)		Normal (-2SD to +2SD)		
		No.	%	No.	%	No.	%	No.	%	No.	%	N (%)
Exclusive breastfeeding for 6 months	Yes	27	4.41%	8	1.30%	6	0.98%	41	6.70%	530	86.61%	612 (78.30%)
	No	8	4.71%	6	3.53%	15	8.82%	50	29.41%	91	53.53%	170 (21.70%)
	Pearson Chi-square $\chi^2 = 111.47$ df = 4 p value = <0.001										**Total**	**782 (100%)**

Association between nutritional status of the child and duration of exclusive breastfeeding was significant statistically with a p value <0.001. Among children who were exclusively breastfed for 6 months, 530 (86.61%) were normal and 27 (4.41%), 8 (1.30%), 6 (0.98%) and 41 (6.70%) were under weight, overweight, stunted and wasted respectively. Among children who had not received exclusive breastfeeding for six months, 91 (53.53%) were normal and 8 (4.71%), 6 (3.53%), 15 (8.82%) and 50 (29.41%) were under weight, overweight, stunted and wasted respectively.

Table 71: Association between timely initiation of complementary feeding and nutritional status of the child

Variables		Nutritional status										Total
		Under-weight (Weight for age <-2SD)		Overweight (Weight for age >2SD)		Stunting (Height for age <-2SD)		Wasting (Weight for height <-2SD)		Normal (-2SD to +2SD)		
		No	%	No	%	No.	%	No.	%	No	%	N (%)
Initiation of complementary feeding at 6 months	Yes	12	1.92%	9	1.44%	10	1.59%	27	4.31%	568	90.74%	626 (80.00%)
	No	23	14.74%	5	3.20%	11	7.05%	64	41.02%	53	33.97%	156 (20.00%)
	Pearson Chi-square $\chi^2 = 257.22$ df = 4 p value = < 0.001										**Total**	**782 (100%)**

Association between timely initiation of complementary feeding and the nutritional status of the children was found statistically significant with a p value < 0.001. Among children who had timely introduction of complementary feeding along with breastmilk at 6 months, 568 (90.74%) were normal and 12 (1.92%), 9 (1.44%), 10 (1.59%) and 27 (4.31%) were under weight, overweight, stunted and wasted respectively. Among children who did not have timely introduction of complementary feeding at 6months, 53 (33.97%) were normal and 23 (14.74%), 5 (3.20%), 11 (7.05%) and 64 (41.02%) were under weight, overweight, stunted and wasted respectively.

Table 72: Association between children having minimum acceptable diet and nutritional status of the child

Variables		Nutritional status										Total
		Underweight (Weight for age <-2SD)		Overweight (Weight for age >2SD)		Stunting (Height for age <-2SD)		Wasting (Weight for height <-2SD)		Normal (-2SD to +2SD)		
		No.	%	No.	%	No.	%	No.	%	No.	%	N (%)
Minimum Acceptable Diet	Yes	6	1.81%	13	3.94%	6	1.81%	19	5.76%	286	86.67%	330 (42.20%)
	No	29	6.41%	1	0.22%	15	3.32%	72	15.93%	335	74.11%	452 (57.80%)
	Pearson Chi-square $\chi^2 = 46.08$ df = 4 p value = < 0.001										**Total**	**782 (100%)**

Association between minimum acceptable diet received by the child and the nutritional status was observed statistically significant in this study with a p value <0.001. Among the children who had received minimum acceptable diet, 286 (86.67%) were normal and 6 (1.81%), 13 (3.94%), 6 (1.81%) and 19 (5.76%) were under weight, overweight, stunted and wasted respectively. Among children who did not receive, 335 (74.11%) were normal and 29 (6.41%), 1 (0.22%), 15 (3.32%) and 72 (15.93%) were under weight, overweight, stunted and wasted respectively.

DISCUSSION

The present cross-sectional study was conducted among 782 mothers with children aged between six months to 2 years from the field practice area of a rural primary health centre in Kinaye under department of community medicine, Jawaharlal Nehru medical college, Belagavi, during the period of January to December 2021.

i) Socio-Demographic profile of the study participants

Table 1: Distribution of study participants according to Age, Gender, and Birth order

In the present study, out of 782 study participants, >50% were male. Similarly, a study conducted in east Delhi reported that, 50% were males [18], whereas a study in Tamilnadu reported 63% male and 37% female children who were participated[11]. This slight difference in distribution of gender will always be there from place to place and time to time.

In this study, Median age of the children was 14 and a total of 43% children were aged between 6 to 12 months, 57% children were aged between 12 to 24 months. In a similar study conducted in east Delhi, mean age of the children was 13.4 and 49% were aged between 6 to 12 months, and 52% were aged between 12 to 24 months[18]. Also, in a study conducted in Ghana, 42% children were aged between 6 to 11 months and 58% children were aged between 12 to 24 months [26]. The distribution of children based on age group in our study was found similar to other studies.

In our study, 71% were first born, 29% children had birth order ≥2. In contrast, a study in Belgaum had 47% first born children and 53% were with birth order ≥2 [9].

Children with birth order 1 was found more in our study as these age group was more during the study period in our study area.

Most of the study participants in this study belonged to Hindu religion (85%), while 13% and only 2% belonged to Islam and Christianity respectively. In a similar study in Belgaum, 85% participants were Hindus, 15% were Muslims and 0.6% were Christians[9], whereas a study in Uttar Pradesh reported 70% Hindu and 30% Muslim participants[8]. The distribution of participants based on religion varies from region to region.

Table 2 and 3: Distributions of children based on education level and occupation status of the mother

In this study, 40% mothers had education level less than higher secondary school and 60% had education ≥ higher secondary school. Similarly, in a study in Karnataka, 44.4 % mothers had education level less than high school and 55.6% had education ≥ higher secondary school[37]. In contrast, a study in Tamilnadu had 70% mothers who studied less than high school, 27 % had studied till high school and 3% had studied above higher secondary school[11]. This difference is due to the distribution of maternal education level varies from region to region.

Among the study participants most of the mothers were homemakers (89.3%), 9.8% were employed, less than 1% of the mothers were farmers and labourers. In a similar study in Karnataka, 86% mothers were homemakers and 13% were employed[22]. Also, a study in Tamilnadu reported that only 14% mothers were employed[11].

Table 4: Distribution of Socio-economic status and type of family

In this study, the participants belonging to socio-economic status of class I, class II, class III, class IV, and class V were 5.4%, 22.5%, 30.5%, 30.7%, 10.9% respectively according to modified B.G Prasad's classification. In a similar study conducted in Belgaum, 1.6%, 5.8%, 28.4%, 46.8% and 17.4% participants were belonging to Socio-economic class I, II, III, IV and V respectively[9], whereas a study in Tamilnadu reported that more than 80% participants belonged to socio-economic class IV and V and only less than 20% participants belonged to class I to III [11]. This variation in distribution of SES of the participants will be found across the globe due to regional variation, employment status, literacy level of the population.

In this study, a total of 358 (45.8%) participants belonged to a vertically extended three generation family, 316 (40.4%) participants belonged to a nuclear family and 108 (13.8%) participants belonged to joint family. In a study conducted in Karnataka, 65% of the participants were belonging to a nuclear family, 20% belonged to three generation family and 15% belonged to joint family[22] and in a study in Tamilnadu, less than 50% were living in a nuclear family and > 50% mothers lived in a joint family[11]. This difference in distribution of participants based on type of family varies from region to region due to social and cultural practices.

ii) <u>Antenatal details of the mother</u>

Table 5 to 8: Distribution of participants based on quality of antenatal care received by the mother

In this study, 1% participants had not visited any hospital for antenatal care, 66% had chosen public/govt hospitals and 33% had chosen private hospital for

antenatal care. 77% participants had at least 4 antenatal visits. NFHS 4 & 5 survey Belgaum states that, 79% and 64% mothers had at least four antenatal care visits respectively[4]. In a study Tamilnadu, less than 20% mothers had less than 4 antenatal visit and more than 80% had ≥4 antenatal visits[11].

This study also shows that 71% mothers had received adequate antenatal care. A study done in Uttar Pradesh states that, 80% mother had received antenatal care[14]. 95% mothers in the present study were visited by female health worker at home. Similarly, a study in Tamilnadu 93% mothers had at least 1 postnatal home visit by female health workers[11].

Table 9: Distribution of participants based on information received regarding nutrition of mother and baby

Majority of the participants (>90%) in this study had received information or knowledge regarding nutrition of mother and the child from ASHA workers, anganwadi workers, ANM, LHV, Doctors and nurses etc. A study in east Delhi showed less than 50% mothers had received counseling regarding infant feeding[18].

Table 10 to 12: Distribution of mothers according to high-risk pregnancy, spacing between pregnancy, place, and mode of delivery

In this present study, less than one fourth of the mothers had high risk pregnancy. Around 12% mothers had birth spacing less than 2 years, almost all the (99%) mothers had institutional delivery, and one fourth had caesarean section.

Similarly, in a study conducted in Tamilnadu stated that, around 14% mothers had birth spacing less than 2 years[11]. NFHS 5 Belgaum survey shows that, 98% institutional delivery and 24% had caesarean section delivery[4].

Table 13 to 15: Distribution based on complication after delivery, gestational age at the time of delivery, birth weight at delivery and immunization status of the child

In this study, only 1% mother and 3% newborn had complication after delivery. 98% mothers gave birth to term babies, mean birth weight of the newborn was 2.83kg, 5% babies had birth weight <2.5kg. Majority of the children (97%) were fully vaccinated. In another study conducted in Belgaum, median birth weight of the child was 2.5kg and 97% children were fully vaccinated[9] and a study in Ghana had 10% child with birthweight less than 2.5kg and around 70% children were immunized up to date[26]. NFHS 5 data reported that around more than 80% children aged between 12 months to 24 months were fully vaccinated[4].

iii) <u>Infant and young child feeding practices</u>

Table 16: Distribution of children according to time of initiation of breastfeeding and reasons for delayed breastfeeding

In this study, all the participants had received breastmilk and 86.60% (677) children had early initiation breastfeeding within one hour and only 13.40 % (105) children did not receive their first feed within one hour. The most common reasons stated by the mothers were physical inability of the mother and no milk secretion. In a study conducted in Tamilnadu, 82.4% children had received their first breastmilk within one hour of birth[11]. NFHS 5 showed more than 50% children in Belgaum were breastfed within one hour of birth[4].

Table 17: Distribution of prelacteal feeding practices among the participants

In this study, 82% (641) mothers had not given prelacteal feeds to their children and about 18% (141) mothers had practiced giving prelacteal feeds to the baby. Most commonly used non milk based prelacteal feeds were sugar water and honey. In Uttar Pradesh, a study showed that 22% mother had given prelacteal feeds to their children[8]. Another study in Andhra Pradesh showed that, most used prelacteal feeds were honey and sugar water[12].

Table 18: Distribution of participants who practiced feeding colostrum to their newborn

In this present study, almost all the mothers (98%) had fed their children with colostrum and only 1.70% (13) mothers had not given colostrum to their newborn. The common reason for not giving colostrum was due to no milk secretion as stated by the mothers. In the Tamilnadu study, 88% mothers had fed their newborn with colostrum[11]. Similarly in a study conducted in Belgaum, more than 80% mothers had fed their children with colostrum[9].

Table 19 and 20: Distribution of mothers who practiced feeding expressed breastmilk and mothers who practiced feeding water and other liquids along with breast milk

In this present study, 99% mothers had never fed their child with expressed breastmilk and only 1% mothers fed their child with expressed breastmilk when the baby was admitted in the ICU. Majority of the mothers (90%) had not given water along breastmilk, only 10% mothers had given water to their child as they thought

that the child needs water and 18% mothers had given water/ other liquid foods along with breastmilk.

Table 21: Distribution of children according to duration of exclusive breastfeeding for six months

In this present study, we have observed that among the study population 78% had given exclusive breastfeeding for six months to their infants. NFHS 5 data shows that 63% children in India received exclusive breastfeeding for six months[4]. In contrast, in a study in Tamilnadu, EBF was found in less than 50% of the children[11]. Like our study, a study in Uttar Pradesh had 77% children who had received EBF[8].

Table 22: Distribution of study participants based on the use of pacifiers

In our study, 8% (64) children used pacifiers and in a similar study in Belgaum, the pacifiers were not used by any children[9].

Table 23 and 24: Distribution of participants based on complementary feeding practices

In this present study, 80% (626) mothers had introduced complementary feeding to their children at six months, common reasons observed among those who had initiated before six months were 'breastmilk alone is not sufficient', 'working mother', 'reduced milk secretion', and common reasons among those who delayed beyond six months were 'not accepted or tolerated by the child', 'could not afford'. In a similar study conducted in Andhra Pradesh, about 70% of the children had timely introduction of complementary feeding[12]. NFHS 5 showed less than 50 % children had received timely initiation of complementary feeding[4].

Type of complementary foods which were introduced were predominantly formula feed or commercial baby foods (32%), next is homemade semi solid foods (27%), and cow's milk (18%). In the Andhra Pradesh study, cow's milk (65%) was predominantly used, then commercial baby food and homemade foods. This difference may be due to the regional variation in cultural practices[12]. Also, a study in Uttar Pradesh showed > 50% children had homemade semi solid foods, 40% had animal milk and around 10% had infant formula feeds[8].

Table 25: Type of food avoided till one year to the infant

In this study, majority of the mothers gave pulses (98%) and vegetables (97%) to the infant till one year and 2% and 3% mothers had avoided giving pulses and vegetables to their children till one year because they thought that the child cannot tolerate them or they were not tolerated by the child. 50% of the mother participated in this study had avoided giving animal foods to the infant till one year, most common reason being religious or cultural practices and they thought it was harmful for the baby, some mothers had said they could not afford it.

Table 26: Distribution participants based on other practices associated with complementary feeding

In this present study, more than 50% children consumed commercial snacks or beverages. Around 40% of the children were bottle fed and 97% mothers practiced washing hands before feeding the child. In the Tamilnadu study around 37% children were bottle fed[11], and a study in Delhi showed 40% children were bottle fed[18]. In Andhra Pradesh study more than 90% of the mothers practiced washing hands before feeding the baby[12].

Table 27: Distribution of participants practicing continued breast feeding

In this present study, 94 % of the participants were practicing continued breast feeding. Similarly, in Tamilnadu study almost 90% of the mothers practiced continued breast feeding[11].

Table 28: Distribution of children who had received minimum adequate diet

In the present study, around 60 % of the children were not receiving minimum acceptable diet. Similarly, in Tamilnadu study 57% children did not receive minimum acceptable diet[11]. NFHS 5 showed 11% children aged between 6 months and 24 months in India had received minimum acceptable diet [4].

Table 29 and 30: distribution children based on history of illness in the past 15 days and the type of illness

In the present study, 25% children had history of illness in the past 2 weeks. The type of illness was URTI (11%) and diarrhea (10%), LRTI was 2%. NFHS 5 data showed that 5.6% diarrhoea and 2% ARI were prevalent 2 weeks before the survey[4].

Table 31 and 32: Distribution of nutritional status by anthropometry

In this study, among children aged between 6 months to 12 months, median height was 71cm, median weight and mid upper-arm circumference were 7.8kg and 14cm respectively; among children aged 12 months to 18 months, median height was 80.5cm, median weight and upper-arm circumference were 9.8kg and 14.5cm, head circumference to chest circumference ratio was less than 1 in 70% of the children; among children aged 18 months to 24 months, median height was 86.1cm, median

weight and upper-arm circumference were 10.5kg and 15cm, head circumference to chest circumference ratio was less than 1 in >70% of the children.

In this study, nutritional status as per WHO standard z-score, around 20% of the children were malnourished, among which 12% were wasted, 3% were stunted, 2% were overweight and 5% were underweight. Malnourishment was comparatively low in this study population probably due to improved feeding practices. The malnutrition in these age group is less when compared to under five age group probably due to improved breast-feeding practices.

iv) Association between various socio-demographic factors and infant young child feeding practices

Table 33 to 52: Association between various socio-demographic factors and breastfeeding practices

Early initiation of breastfeeding:

In this study, early initiation of breast feeding (EIBF) within one hour of birth was found almost equally in both males (84%) and females (89%). This study also showed, 18% children among children with birth order two and above, were delayed EIBF >1 hour and it was slightly high when compared to first born children (11.30%). It was found in this study, that the factors like gender and birth order of the child had a significant association with early initiation of breast feeding with p value <0.05

In this study, 46% mothers with postgraduate or more education level had delayed more than 1 hour, whereas 14%, 16%, 9% and 12% mothers with no formal schooling, who studied between 1-10 standard, with PUC/Diploma, with degree had delayed breastfeeding (>1hour) respectively. Among the study participants with socio

economic status I, 33% participants had delayed EIBF > 1 hour, and 12%, 9%, 17% and 8% participants with SES II, III, IV and V had delayed EIBF respectively. Among the participants who live in a joint family, 21% had delayed EIBF >1 hour, it was 13% and 12% among participants who live in a nuclear family and three generation family respectively. It was found in this present study, that the factors like education of the mother, socio-economic class and type of family had a significant association with early initiation of breast feeding with p value <0.05

Prelacteal feeding practices:

In this study, more male children (23%) were given prelacteal feeds when compared with female children (13%). This study also showed more 1st (19%) and 2nd (21%) born children were given prelacteal feeds while none of the children with birth order 3 and above were given prelacteal feeds. It was found in this present study, that factors like gender and birth order of the child had a significant association with prelacteal feeding practices with p value <0.05

In our study, Prelacteal feeding practices was found in 43%, 29%, 23%, 14% and 9% mothers with no formal education, with degree, who studied between 1-10 standard, with postgraduate degree or more and who studied high school / diploma respectively. Among the study participants with SES I, 34% participants had given prelacteal feeds, whereas it is comparatively less among other groups. 17%, 18%, 20% and 8% participants with SES II, III, IV and V had given prelacteal feeds respectively. Prelacteal feeding practice was seen 20.30%, 13.00% and 17.60% among participants with nuclear, joint and three generation family type respectively. It was found in our present study, that factors like education level of the mother, socio-economic class had a significant association with prelacteal feeding practices

with p value <0.05 and there was no significant association between type of family and prelacteal feeding practice (>0.05).

Feeding colostrum:

In this present study, more male newborns (3%) were not fed colostrum when compared with female newborns (0.5%). 0.4% 1st born and 6.5% 2nd born children were not fed colostrum, whereas all the children with birth order 3 and above were given colostrum. It was found in our study, that factors like gender and birth order of the child had a statistically significant association with feeding colostrum to the child. This study also showed, practice of feeding colostrum was not statistically associated with socio-economic class and type of the family.

Exclusive Breastfeeding

In our study, EBF practice was found high among both male (75%) and female (82%) children. EBF in 1st (77%) and 2nd born (75%) children were slightly lower when compared to children with birth order 3 and above (100%). It was found in our study, that factors like gender and birth order of the child had a statistically significant association with Exclusive breastfeeding practice with p value <0.05.

In this study, 83% among the mothers with education level less than high school had given EBF and 74% among the mothers who studied high school and above had given EBF to their children. This association between education level of mother and EBF was found statistically significant in this study. Also, more mothers with SES IV & V (89%) had given EBF when compared with mothers with SES I to III (70%). EBF was found almost equally in both nuclear family (75%) and joint / three generation family (80%). It was found in our study, that factors like socio-

economic class and type of family had a statistically significant association with Exclusive breastfeeding practice with p value <0.05.

Similarly in a study conducted in Chennai, appropriate IYCF practice was found to be associated with education level of the mother[11]. In a study conducted in Karnataka, it was found that gender of the child was not associated with feeding practices[37].

Table 53 to 67: Association between various socio-demographic factors and complementary feeding practices

Complementary Feeding (CF) practices

In our study, 73% male children and 87% female children had timely initiation of CF at 6 months. Initiation of CF among 1st (79%) and 2nd (79%) born children was almost equal whereas, 87% of the children with birth order 3 and above had timely initiation of CF at 6 months. %). It was found in our study, that gender of the children had a statistically significant association with complementary feeding practice with p value <0.05. Whereas, birth order of the child had no significant association with complementary feeding practices (p value >0.05).

In this study, 85% and 76% among mothers who has studied less than high school and studied high school or above had initiated CF at 6 months. Timely initiation of CF was observed more among participants belonging to SES IV & V (93%) when compared with people belonging to SES I to III (70%). Timely initiation of CF at 6 months was seen 79%, 93% and 76% among participants living in nuclear, joint and three generation family respectively. It was found in our study, that factors like education level of mother, socio-economic class and type of family had a statistically significant association with timely initiation of complementary feeding with p value <0.05.

Continued Breastfeeding (CBF) practice

In this study, CBF was observed almost equally in both male (94%) and female (93%) children. It was observed almost equally among 1st (93.70%) and 2nd (93.50%) born children, and it is 98% in children with birth order 3 and above. It was found in our study, that factors like gender and birth order of the child was not statistically associated with continued breastfeeding practice (p value >0.05).

In our present study, 7% mother who studied high school or above and 4% mother had studied less than high school had not given CBF. CBF was observed almost equally among participants belonging to SES IV & V (96%) when compared with SES I to III (92%). It was also observed almost equal in participants living in nuclear (92.70%), joint (93.50%) and three generation (95.30%) families. It was observed in this study that factors like mother's education level, socio-economic status had a statistically significant association between continued breastfeeding practice with p value < 0.05. Whereas, association between CBF practice and type of family was not statistically significant (>0.05).

Minimum acceptable diet (MAD)

In this study, MAD was observed in 45% and 40% of the male and female children respectively. This association between gender and MAD was not statistically significant. MAD was observed 35%, 34% and 58% among children belonging to age group 6-12 months, 12-18 months and 18-24 months respectively. Only 36% children among 1st born children had MAD, 50% among 2nd born children had MAD and 75% among children with birth order 3 and above had MAD. It was found in this study,

that factors like age and birth of the child is associated with minimum acceptable diet with p value <0.05.

In our study, MAD was observed more in mothers who had studied high school or above (45%) when compared with mothers who had studied less than high school (38%). It was also observed almost equally in SES I to III (43%) and SES III and above (41%). This association between MAD and factors like maternal education and socio-economic class was not significant (p value >0.05). Also, MAD was observed more in children in nuclear family (50%), compared children living in joint (40%) and three generation (35%) family. This association between type of family and MAD was statistically significant with p value less than 0.05.

In a study conducted in Belgaum, factors like education level of mother, socio economic class, type of family associated with complementary feeding practices[9]. Similarly, in Chennai study, maternal education was associated with good complementary feeding practices[11].

Table 68 to 72: Association between various feeding practices and nutritional status of the child

In this study, among children who were delayed initiation of breast feeding more than one hour, 3% were normal and 1%, 1%, 1% and 8% were under weight, overweight, stunted and wasted respectively. Among children who had not received exclusive breastfeeding for six months, 12% were normal and 1%, 1%, 2% and 7% were under weight, overweight, stunted and wasted respectively. Among children who did not have timely introduction of complementary feeding at 6 months, 7% were normal and 3%, 1%, 1% and 8% were under weight, overweight, stunted and wasted

respectively. Among children who did not receive MAD, 42% were normal and 3%, 0.13%, 2% and 9% were under weight, overweight, stunted and wasted respectively. It was found in this study, that various feeding practices such as early initiation breast feeding, exclusive breast feeding, timely introduction of complementary feeding and minimum acceptable diet were associated with malnutrition such as underweight, stunting, wasting and over-weight.

In a study conducted in Ahmadabad, various breast-feeding practices and complementary feeding practices were associated with malnutrition such as wasting, stunting and underweight[19]. Similarly, in a study conducted in Ghana, nutritional status was found to be associated with minimum acceptable diet[26].

CONCLUSION:

This study was done to study the infant and young child feeding practices prevailing in the rural community. Majority of the participants had received some information regarding breastfeeding and complementary feeding practices from the health care workers. This study showed many participants had improved breastfeeding practices. EBF was given to > 75% infants. Though timely initiation of complementary feeding practices was found in majority of the participants, >50% children had not received minimum acceptable diet.

Cultural practices found in this study were pre lacteal feeding practices which was found in one fifth of the participants, avoiding colostrum which was seen in 2% participants, avoiding animal meat foods which was seen in around 50% of the participants.

Malnourishment was found in 20 % of the participated children, among which wasting was seen more, suggestive of acute or recent weight loss. Almost all the children completely immunized. Majority of the mother practiced food safety precautions such as keeping it in safe container, washing hands before feeding etc.

Prelacteal feeding practices was seen in 20% of the participants. More than half the children had a habit of consuming commercial snacks / beverages. Less than half of the children participated were bottle fed.

Malnutrition was seen higher among children with poor feeding practices such delayed initiation of breast feeding, exclusive breast feeding less than / more than six months, delayed introduction of complementary feeding, etc. The feeding practices were statistically associated with malnutrition.

RECOMMENDATION:

Based on the finding our study, the following recommendations were suggested.

- Adequate knowledge about the appropriate feeding practices and its benefits should be given to every mother right from ante natal visits and especially post-delivery.

- IEC (information, education, and communication) campaigns should be done regarding benefits of IYCF practices and harmfulness of poor feeding and cultural practices, targeting mothers, elders in the family and the people of the community.

- IEC activities should be conducted to educate mothers regarding diet diversity and required meal frequency with practical demonstration.

- Supplementary nutrition provided to under five children at anganwadi can be planned to include diverse range of food groups and mothers can be educated and trained to provide minimum acceptable diet to the children.
- Prevalence of undernutrition among 6 months to 2 years children is less when compared to children under five years age group, so a timely intervention with appropriate feeding practices among children between 6 months and 2 years can prevent undernutrition in the later life.

LIMITATIONS:

The limitations noted in our study were,

- Mothers with children aged till 2 years were included in the study, so there could be a possible recall bias related to infant feeding practices.
- Plate size per servings varies from house to house, which could lead to a potential bias in calculating the diet of the child.
- Covid#19 pandemic has created some hurdle in data collection.

SUMMARY:

The present cross-sectional study was conducted among 782 mothers with children aged between 6 months and 24 months, residing in Kinaye PHC area, Belagavi during January to December 2021. The study was conducted to assess the prevailing infant and young child feeding practices and to identify customs and beliefs associated with it. Also, to find association between nutritional status and feeding practices.

Out of 782 participants, 394 (50.40%) were male and 388 (49.60%) were female. Median age of the children was 14 with an interquartile range (IQR) of 7-20 and >70% children first born. More participants were from Mache II (21%), Kaderwadi (19%) and Peeranwadi (17%) and majority of the study participants were Hindu by religion. Only around 19 % of the mothers had graduated with degree and majority of the mothers were house wife (90%). Study also showed, more than half the participants belonged to socio-economic class between I and III and 40% of the participants lived in a nuclear family.

Among the study participants, 9 (1.20%) had not visited any hospital for ante natal checkup, 259 (33.10%) mothers chose private hospitals and others chose government centers. Around 77% mother had adequate antenatal visits of at least 4 or more and 71% mothers had received adequate antenatal care. This study also showed 95 % of the mothers had home visits by female health worker. Majority of the (> 90%) participants had received information regarding nutrition of mother, breastfeeding, and complementary feeding of the child from health care workers.

Among the study participants, 15% mothers had high risk pregnancy majority being previous LSCS and 12% mother had birth spacing less than 2 years. Majority (99%) mothers had institutional delivery and 76% were normal vaginal delivery. Majority of mothers (99%) and newborns (97%) had no complication after delivery. Most of the children were term babies (98%) and median birth weight was 2.83 kg. 97% children had completed immunization up to date.

Early initiation of breast feeding within one hour was seen in 86% children, physical inability of the mother was the most common reason for delayed initiation. Around 20 % mother had given prelacteal feeds to their children, elder's advice was the most common reason for giving prelacteal feeds. 98% mothers had fed their child with colostrum. 10% mothers had fed their child with water in first 6 months thinking that the child needs water along with breast milk. Also, 18% mothers had fed their child with other liquid diet along with breast milk, most common reason being working mother. Among the study participants, 612 children (78%) had received exclusive breastfeeding for six months.

Introduction of complementary feeding at 6 months was seen among 80% participants. Most common reason for introducing CF before 6 months was 'working mother' and reason for delaying >6 months was 'not tolerated by the infant'. Most common type of CF initiated was semi solid (70%) and commonly used food for initiating CF was rice mixed (with dhal, veg etc.). 47% mothers avoided giving animal foods to their child. More than 50% children in this study, had a habit of consuming commercial snacks / beverages and 40% children had a habit of bottle feeding. Majority of the mother practiced food safety precautions such as keeping it in safe container (86%), washing hands before feeding (97%) etc. Continued

breastfeeding was practiced by 97% of the participants. Minimum acceptable diet was not received by 57% children.

Among the children participated in this study, 25% had history of any illness the past 15 days. Most common illness were, upper respiratory tract infection and diarrhea. Median height of the children among age 6-12 months was 71cm, among 12-18 months was 80.5cm and 18-24 months was 86.1cm. Median weight of the children among age 6-12 months was 7.8 kg, among 12-18 months was 9.8 kg and 18-24 months was 10.5 kg. malnutrition was observed among 20% of the children, among which wasting was found high.

Early initiation of breast feeding was associated with factors like gender, birth order, maternal education, SES, and type of family with p value <0.05. Exclusive breastfeeding was associated with factors like gender, birth order, maternal education, and type of family (<0.05). Minimum acceptable diet was associated with factors like age, birth order, and type of family. It was found in this study, that various feeding practices were associated with malnutrition (p value <0.05).

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ANNEXURE – I

INFORMED CONSENT

"INFANT AND YOUNG CHILD FEEDING PRACTICES PREVAILING IN THE RURAL COMMUNITY- A CROSS SECTIONAL STUDY".

Primary Investigator: **DR.**

Guide: Professor **Dr.**

Introduction: As the infant and young child's growth, survival and development depends on the adequate feeding practices, a study has been planned to identify and analyse the feeding practices. You are being invited to participate in this study which will be conducted to know the Infant and young child feeding practices prevailing in the rural community, the customs and beliefs associated with it and its association with the nutritional status of the child.

Methodology: Investigator will be interviewing you to know about your demography, antenatal care received, breastfeeding, infant and young child feeding practices, customs and beliefs associated with it and will be measuring the height, weight, head circumference, chest circumference and mid arm circumference of the child. This will take about 25 -30mins. No laboratory investigations will be done.

Possible benefits: You will not be eligible for any kind of monetary benefits or free services for your participation in the study. By taking part in the study you will help the researcher to know the breastfeeding, infant and young child feeding practices in the region.

Possible risks: There is no risk involved in this study and the methods involved in this study are completely safe.

Cost of participation: The cost of the study will be entirely borne by the researcher. You will not have any cost for your participation in this study.

Legal rights: By signing this consent form, you are not waiving off any of your legal rights.

Privacy and Confidentiality: The results of the study may be published for scientific purposes. However your identity will not be revealed and all information collected will be coded so that, no one other than the investigator will know your identity.

Withdrawal from the study: You can withdraw from the study at any point of time if you wish to do.

Authorization to publish the results: The researcher may use the information gathered from this study for presentation or publication in scientific journals. However, your personal identity will not be revealed.

Questions: If you have any queries/doubts regarding the study, you can contact **Dr. ____________** PG Student, Dept. of Community Medicine, J.N. Medical College, Belagavi-590010, or **Dr. _________________MD, Ph.D**, Professor, Dept. of Community Medicine, J.N. Medical College, Belagavi-590010.

If you have any questions about the rights as a research participant you may contact **Dr. Roopa M. Bellad** Chairperson, Institutional Ethics Committee for Human Subjects' Research, J.N. Medical College, Belagavi – 590010.

CONSENT STATEMENT

"I have read / have been explained in my own understandable language about the contents in this form and my queries have been clarified by the investigator and I have been told that I have the right to withdraw from participating in this study at any point of time. I have been assured that confidentiality will be maintained and will be used only for this study and my identity shall never be revealed in future".

I hereby give my consent for participation in the study voluntarily and not under the influence of the investigator or any other influence.

Name of the participant. Signature.

Name of the interviewer Signature.

Date: __/__/_____

Place: ____________.

ANNEXURE – II

RESEARCH QUESTIONNAIRE:

"Infant and young child feeding practices prevailing in the rural community- A cross sectional study".

Primary Investigator: **Dr.**

Guide: **Dr.**

Sl. No: ______

A. SOCIO-DEMOGRAPHIC INFORMATION:

A 1. Name of the child: ______________________________ Gender: _______

Date of birth: __/__/________

Age in completed months: _____ months _____days. Birth order: _______

A 2. Name of the informer (caregiver): ___________________________

Age: _____ Gender: ______

Relation to the child: _____________

A 3. Address: ____

A 4. Religion: Hindu ☐ Muslim ☐ Christian ☐ Others: (specify) ☐ _______

A 5. Education of the parents:

Mother: ☐No formal schooling ☐Illiterate ☐Number of years of schooling _____(1-10)

☐PUC (11th,12th) / Diploma ☐Degree ☐Post Graduate or more.

Father: ☐No formal schooling ☐Illiterate ☐Number of years of schooling _____(1-10)

☐PUC (11th,12th) / Diploma ☐Degree ☐Post Graduate or more.

A 6. Occupation of the parents:

Mother: ☐Farmer ☐Laborer ☐Self-employed ☐Govt. employee ☐Pvt. Employee

☐Retired/pensioner ☐Unemployed ☐Home maker

Father: ☐Farmer ☐Laborer ☐Self-employed ☐Govt. employee ☐Pvt. Employee

☐Retired/pensioner ☐Unemployed

A 7. Total income of the family: Rs ________/ month.

A 8. Total number of family members: _______.

A 9. Per capita income: Rs ________/ month.

A 10. Socio economic status: (Modified B.G Prasad's classification)

☐Class I ☐Class II ☐Class III ☐Class IV ☐Class V

A 11. Type of family: ☐ Nuclear family / ☐ Joint family / ☐ Extended family.

A 12. Family size (number of children the couple have):

B. ANTENATAL, NATAL and POST NATAL INFORMATIONS:

B 1. Hospital chosen for ante natal care: ☐ Primary Health Centre ☐ Other govt. hospitals ☐ Private hospitals ☐ Not visited

B 2. No of visits: ☐ 7 to 12 ☐ 4 to 7 ☐ Less than 4 ☐ Not visited

B 3. Adequate antenatal care received: ☐ Yes / No ☐

(Minimum 4 visit / injection T.T 2 doses or booster dose / iron and folic acid supplements prophylactic or therapeutic) ☐ ☐

B 4. Home visit by female health worker: Yes / No

B 5. Did you get any information about the following from health centre/hospital ? ☐ ☐

Nutrition of the mother, Breastfeeding and Complimentary feeding of the child: Yes / No

If yes , (from whom): ASHA workers / Anganwadi workers / ANM / nurses / Lady health worker / Social worker / Doctor / others (specify) ☐ .

B 6. Was it a high risk pregnancy? Yes / No / don't know

If yes, (specify)

B 7. Birth Spacing (Previous pregnancy): <2 years >2years NA

B 8. Place of delivery: ☐ Home Institutional (Specify)

B 9. Mode of delivery: Normal delivery LSCS

IF LSCS, Elective / Emergency (Reason)

B 10. Any complication after delivery?

Mother: ☐

Yes / No if yes (specify)

Newborn: ☐ ☐ ☐

Yes / No if yes (specify) ☐ (whether admitted in NICU Yes / No)

B 11. Gestational age: Term Preterm Late / Post term

B 11. Birth weight in kg: Kg.

B 12. Any congenital anomalies that affects feeding? (E.g. cleft lip, cleft palate, cerebral palsy etc.) ☐ ☐

Yes / No If yes , (specify)

<table>
<tr><td rowspan="7">munization</td><td colspan="6">☐ Yes / No ☐
yes,</td></tr>
<tr><td>Vaccine</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>BCG</td><td>☐ At birth</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>OPV</td><td>☐ At birth</td><td>☐ 6weeks</td><td>☐ 10 weeks</td><td>☐ 14 weeks</td><td>☐ 1 ½years</td></tr>
<tr><td>DPT/ Pentavalent</td><td>-</td><td>☐ 6weeks</td><td>☐ 10 weeks</td><td>☐ 14 weeks</td><td>☐ 1 ½years</td></tr>
<tr><td>Rota virus</td><td></td><td>☐ 6weeks</td><td>☐ 10 weeks</td><td>☐ 14 weeks</td><td>-</td></tr>
<tr><td>MR</td><td>1st dose</td><td>2nd dose</td><td></td><td></td><td></td></tr>
</table>

C. INFORMATION ABOUT BREASTFEEDING:

C 1. Has the child ever been breastfed? ☐ Yes / No☐

If NO, (reason)________________________________

IF NO, what was given?________________________________

(If No skip to C10).

C 2. Initiation of breast feeding: ☐ Immediately (< 1 hour) ☐After_____ Hours ☐ After _____ Days.

If delayed more than one hour, (Reason)

Baby was in ICU / Physical inability of the mother / Elder's advice / Colostrum is bad for baby's

health / No milk secretion or inadequate secretion / Others (specify) ____________________

C 3. Any pre lacteal feeds given? ☐Yes / No ☐

If Yes,☐ Non milk based (mention) ______________

☐ Milk based (mention) ______________

If yes, (Reason) ____________________________

C 4. Has the child received breast milk in the first three days of life? (Colostrum) ☐ Yes / No ☐

If No,(Reason),

Baby was in ICU / Physical inability of the mother / Elder's advice / Colostrum is bad for baby's

health / No milk secretion or inadequate secretion / Others(specify)______________

C 5. Feeding frequency: ☐ Fed on demand /☐ Fed on scheduled time ______________

C 6. Has the child ever received expressed breast milk? ☐ Yes / No☐

If Yes, (reason) ________________________________

C 7. Whether expressed breast milk was fed using feeding bottle? ☐ Yes / ☐ No /☐ NA

C 8. Do you give additional water along with breast milk during first 6 months? ☐ Yes / No ☐

If Yes, (reason)

Elder's advice / baby needs water (thirsty) / Weather was hot / Along with medication / Others (specify) ____________________

C 9. Was the child given anything along with breast milk? (0-6months) (tick if yes)

☐ 1st month ☐ 2nd month ☐ 3rd month ☐ 4th month ☐ 5th month ☐ 6th month

If yes, (mention)

☐ Milk based ____________________

☐ Non milk based ____________________

☐ Medication ____________________

If yes, (reason) Breast milk alone is not sufficient / Child needs more nutrition / Elder's advice / Working mother / Reduced milk secretion / others (specify) ____________________

C 10. How long the child was exclusively breastfed?

☐ < 3 months ☐ 3-6 months ☐ >6 months ☐ Not breastfed

C 11. Whether any purgatives were given to clean the gut after birth? ☐ Yes / No ☐

If yes, what did you give? ____________________

C 12. Does the child use pacifiers? ☐ Yes / No ☐

If yes, ☐ Always ☐ Most frequently ☐ Less frequently

C 13. Was the child given any micro-nutrient supplementation? ☐ Yes / No ☐

If yes, (specify) ____________________

D. INFORMATION ON COMPLEMENTARY FEEDING PRACTICES:

D 1. Initiation of complementary feeding:

D 1.1 Age of initiation: ☐ **< 6 months** ☐ **At 6 months** ☐ **>6 months**

If < 6months, what was the reason?

Breast milk alone is insufficient to meet the infant's need / Advised by health care personnel/ Advised by elder's / No or reduced milk secretion/working mother/Others(specify)

____

If >6months, what was the reason?

Infant cannot eat anything till it gets teeth / Infant was not accepting food / Breast milk (or other milk) is sufficient / could not afford / not tolerated by the infant / Others (specify)

____

D 1.2 Type of complementary fee Solid ☐ Semi-solid☐ Formula feeds☐ not yet started☐

D 1.3 Frequency of complementary - feeds per day: ☐ Once ☐ twice ☐ thrice ☐ >3 times

D 1.4 With what did you start complementary feeding?

Cow's/buffalo's/other animal's milk. ☐ Rice porridge (kanji)☐ Fruit juice☐ Formula feed☐

☐ Others.(specify). ________________________________

D 1.5 What semi solid food did you give initially?

☐ Rice dhal mix ☐ Rice vegetable mix☐ Animal food mix ☐ others (specify).

____

D 2. Do you avoid giving pulses till one year of age? ☐ Yes / No ☐

If yes, (reason) ________________________________

D 3. Do you avoid giving vegetables till one year of age? ☐ Yes / No ☐

If yes, (reason) ________________________________

D 4. Do you avoid giving animal food till one year of age? ☐Yes / No ☐

If yes, (reason) ________________________________

D 5. Was the child given any commercial snacks and beverages (junk foods)? ☐ Yes / No☐

If yes, (frequency) ________________________________

D 6. Has the child ever been bottle fed? ☐ Yes / No ☐

If Yes ☐Always ☐ Most frequently ☐ Less frequently

D 7. Food hygiene: Time taken between cooking to feeding: ____hours minutes. ____

Does the cooked food stored in a safe container/vessel before consumpti☐Yes / No ☐

Does the caregiver wash hand before preparing food / before feeding the child?☐ Yes / No☐

D 8. Continued breast feeding: At 1year : ☐ Yes / No ☐ At 2years : ☐ Yes / No ☐

If stopped, at what age?________ Months.

Reason?________________________________

D 9. 24 Hour dietary recall:

	Time	**Food**	**Quantity**
Morning			
After noon			
Evening			
Night			

E. NUTRITIONAL STATUS ASSESSMENT by ANTHROPOMETRY:

Height / length in centimeters	________ cm. (Standing / supine).
Weight in Kilograms	________ Kg.
Mid arm circumference	________ cm.
Head circumference	________ cm.
Chest circumference	________ cm.

F. ILLNESS IN THE PAST

History of any illness in the past 15 days:	☐ Yes / No☐ If yes , (specify)_________________________________

……………………………………………………………………………………………

Diet diversity: (Please describe the foods (meals and snacks) that the child ate or drank yesterday)

Food/drink	**Yes / No**	**Food group**	**Frequency**
Breast milk	☐ Yes / No☐		
Water	☐ Yes / No☐		
Formula feed	☐ Yes / No☐		
Other milk source (powdered / animal)	☐ Yes / No☐		
Juice	☐ Yes / No☐		
Broth (rice broth / chicken broth etc.)	☐ Yes / No☐		
Yogurt/curd	☐ Yes / No☐		
Thin porridge	☐ Yes / No☐		

Other foods	**Food group(code)**	**Frequency**

Minimum acceptable diet:

Minimum meal frequency:
6-8 months – 2
>9months – 3
If not breastfed - >4

Minimum diet diversity:
At least four food groups.

Minimum meal frequency:	☐ 1	☐ 2	☐ 3	☐>3	-
Minimum diet diversity: (number food groups)	☐ 1	☐ 2	☐ 3	☐ 4	☐>4

Minimum acceptable diet: ☐ Yes/ ☐ No

Remarks: ______________________________