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Complementary feeding practices and associated factors among mothers of children age 6-24 months of Banaskantha district

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Abstract

Malnutrition during early childhood remains a pressing public health issue in many developing regions, including India. One of the primary contributors to under nutrition among children aged 6-24 months is inappropriate complementary feeding practices. Although the World Health Organization (WHO) recommends the timely introduction of safe and nutritionally adequate complementary foods in conjunction with continued breastfeeding, adherence to these guidelines remains poor in several parts of India. This study was conducted to assess the prevalence and determinants of complementary feeding practices among children aged 6-24 months in Banaskantha district, Gujarat, and to examine their associations with maternal socio-economic characteristics.

A descriptive cross-sectional design was employed, involving 368 mother-child pairs selected through proportionate simple random sampling. Data collection included structured interviews with mothers to gather socio-demographic information and feeding practices, along with anthropometric measurements of children.

Findings revealed a significant gap in adherence to WHO-recommended complementary feeding practices. Only 11.1% of children received appropriate complementary feeding, while 88.9% exhibited poor practices. Timely initiation of complementary feeding was observed in just 43.5% of children, and only 36.1% met the minimum dietary diversity (MDD). While dairy products (100%) and grains/tubers (95%) were widely consumed, intake of protein-rich foods such as flesh foods (0.54%) and eggs (0.81%), as well as vitamin A-rich fruits and vegetables (17%), was notably low. Furthermore, 39.9% of children consumed processed or packaged foods, and 25% consumed sweetened beverages. Only 28.8% of children achieved the minimum acceptable diet (MAD), and 58.2% met the minimum meal frequency (MMF).

These findings underscore the urgent need for targeted nutritional interventions and behavior change communication strategies to improve complementary feeding practices in the region.

Keywords: Complementary feeding, malnutrition, dietary diversity, infant nutrition

Introduction

Malnutrition in early childhood remains a major public health concern in India, particularly among children under five, with high rates of stunting (35.5%), wasting (19.3%), and underweight (32.1%) nationally, as per NFHS-5 (2019-21). One of the most direct and preventable contributors to under nutrition is inappropriate complementary feeding introducing solid or semi-solid foods after six months of exclusive breastfeeding. The critical 6-24-month window is essential for growth, cognitive development, and immune function. Inadequate feeding during this period raises the risk of stunting, micronutrient deficiencies, and long-term health issues.

The WHO recommends timely introduction of complementary foods at six months, continued breastfeeding up to two years or beyond, and adherence to key indicators Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD). However, in India, particularly in rural and socioeconomically challenged areas, these practices remain suboptimal. Cultural beliefs, low maternal education, poverty, food insecurity, and limited awareness all contribute to poor feeding habits.

In Gujarat, the nutritional situation is more alarming: 39.0% of children under five are stunted, 25.3% wasted, and 39.7% underweight, with 79.7% of children aged 6-59 months anemic exceeding national averages. Within Gujarat, Banaskantha district exemplifies these challenges due to its rural landscape, dependence on agriculture, limited health services, and socio-cultural barriers. Issues such as early marriage, low maternal literacy, food taboos, and the growing presence of processed foods worsen the scenario.

District-level data on complementary feeding are limited, necessitating localized research. Understanding the prevalence of WHO-recommended indicators and the maternal socio-economic and demographic factors influencing them is vital. This knowledge can inform tailored, community-driven nutrition interventions that are more effective than broad, top-down strategies.

This study aims to assess the prevalence and determinants of complementary feeding practices among children aged 6-24 months in Banaskantha. By generating district-specific evidence, the study will help guide nutrition education, integrate findings into existing schemes like ICDS and Poshan Abhiyaan, and contribute to achieving Sustainable Development Goals related to hunger, health, and well-being.

Materials and Methods

A Descriptive Research Design was adopted to conduct the present study. The present study was conducted at ASPEE College of Nutrition and Community Science, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Banaskantha, Gujarat. Proportionate Simple Random Sampling was used for respondent selection. The total sample size was 368, which is determined by the use of sample size estimation formula given by Abramson and Abramson, 1999 and the estimation is based on complementary feeding rate that is children age 6-8 months receiving semi-solid or solid food and breast milk in Gujarat. The data is taken from 5th National Family Health Survey, 2019-20. The study included a total of

15,848 respondents across four talukas: Deesa, Lakhani, Kankarej, and Deodar. The highest number of respondents came from Deesa (6,536), followed by Kankarej (4,468), Lakhani (3,432), and Deodar (1,412). A proportional sampling method was applied, with each taluka contributing 2.32% of its total respondents to the final sample. Consequently, 151 respondents were selected from Deesa, 104 from Kankarej, 80 from Lakhani, and 33 from Deodar, resulting in a total of 368 selected respondents for the study. The interview schedule was developed by the researcher to collect the following data Background information performed to assess personal characteristics of the respondents, socio economic status scale of Udai Pareek and Trivedi with slight modification and performed on complementary feeding practices. An interview technique was used for data collection. The information was collected by direct observation and personal interview method on their permission. Collected data were analyzed with frequency distribution, Chi-square test and Z-test by Gupta and Kapoor (2002) [5].

Results and Discussion

The personal characteristics of the mothers of children in the study reveal that nearly half (49.2%) were between 20 to 25 years of age, with the majority falling within the 20-30 year age range. The population was predominantly Hindu (94.6%), with very few Muslims (5.4%) and no Christians. In terms of education, most mothers had attained secondary education (36.1%), followed by primary education (25.5%), while a small proportion were illiterate (9.5%) or had pursued higher studies (graduate and above, 19.3% combined). Regarding occupation, a significant majority were homemakers (62%), while others were involved in labour (10.9%), farming combined with livestock (17.7%), or government and private sector jobs (5.7% combined). When assessing the nature of work, 44.8% of the mothers engaged in sedentary activities, while 36.7% were involved in heavy physical work and 18.5% in moderate activity levels (Table 1).

Table 1: Personal characteristics of the mothers of children

Variables	Sub-variables	Frequency	Percentage
Age (Years)	20-25	181	49.2
	26-30	95	25.8
	31-35	63	17.1
	36-40	29	07.9
Religion	Hindu	348	94.6
	Muslim	20	05.4
	Christian	00	00
Education	Illiterate	35	09.5
	Primary	94	25.5
	Secondary	133	36.1
	Higher secondary	35	09.5
	Graduate	39	10.6
	Post Graduate and Above	32	08.7
	Government Service	19	05.2
Type of Work	Private Job	02	00.5
	Labour	40	10.9
	Farming	14	03.8
	Farming + Livestock	65	17.7
	Homemaker	228	62
	Sedentary	165	44.8
Nature of Work	Moderate	68	18.5
	Heavy	135	36.7

The majority of respondents belonged to the Scheduled Caste category (53.3%), followed by other Backward Classes (33.4%) and General Caste (13.3%). Regarding occupation, most were labourers (38.6%) or engaged in caste-specific occupations (27.2%), with smaller proportions involved in independent professions (19.8%), business (7.6%), and service (6.8%). Family income was predominantly between Rs. 5,000 and 10,000 per month (50.8%), with no respondents earning below Rs. 1,000 monthly. Education levels showed that over half (52.2%) had completed middle school, while a small percentage were illiterate (0.8%) or graduates and above (7.6%). Social

participation was very low, with 87.8% not involved in any organization and only 12.2% being members of one organization. More than half (54.6%) did not own land, while 45.2% owned up to 2 hectares. Housing conditions varied, with 45.9% living in PACCA houses and 41.6% in mixed houses, while 12.5% rented their homes. Material possession reflected moderate assets, with 43.2% owning a combination of motor cycle, mobile, television, and refrigerator or agricultural implements. Family structure was mainly joint families (64.9%), compared to 35.1% single families (Table 2).

Table 2: Distribution of families according to their socio-economic status, N=368

Components	Sub Components	Frequency	Percentage
Caste	Scheduled Caste	196	53.3
	Other Backward Class	123	33.4
	General	49	13.3
Occupation	Labour	142	38.6
	Caste Occupation	100	27.2
	Business	28	07.6
	Independent Profession	73	19.8
	Service	25	06.8
	< 1000	00	00
Family Income (Rs./month)	1000-5000	97	26.4
	5000-10,000	187	50.8
	10,000-15,000	38	10.3
	15,000-20,000	13	03.5
	> 20,000	33	09.0
Education	Illiterate	03	0.8
	Can read only	00	00
	Can read and write	13	03.5
	Primary	62	16.8
	Middle	192	52.2
	High School	65	17.7
	Intermediate	05	01.4
Social Participation	Graduate and above	28	07.6
	None	323	87.8
	Member of one Organization	45	12.2
	Member of more than one organization	00	00
	Office holder	00	00
Land	Wider public leader	00	00
	No land	201	54.6
	Up to 2.00 ha	166	45.2
	2.01 to 4.00 ha	01	0.3
	4.01 to 10.00 ha	00	00
House	Above 10.00 ha	00	00
	No House (Rented)	46	12.5
	Hut	00	00
	Kaccha house	00	00
	Mixed house	153	41.6
Material possession	Pacca house	169	45.9
	Motor Cycle/Mobile	95	25.8
	Motor Cycle+Mobile	00	00
	Motor Cycle+Mobile+Television	114	31.0
	Motor Cycle + Mobile + Television+Refrigerator/Tractor /Improved/Agriculture Implements	159	43.2
Family type	Single	129	35.1
	Joint	239	64.9

Table 3: Class categorization of families according to their socio-economic status, N=368

Category	Frequency	Percentage	Mean	SD
Upper class (≥ 24.08)	58	15.8	18.71	5.366
Middle class (13.35-24.07)	221	60.1		
Lower class (≤ 13.34)	89	24.2		

Table 3 demonstrates that the majority of mothers (60.1%) were categorized as belonging to the middle socio-economic class, followed by 24.2 per cent in the lower class and 15.8 per cent in the upper class. The mean score was 18.71 (SD=5.366). Appropriate complementary feeding (ACF) indicator is computed from the WHO/UNICEF 2021 indicators such as child is currently breastfeeding, commenced complementary feeding at age 6 months and meets minimum meal frequency and minimum dietary diversity. Inappropriate complementary feeding on the other hand was defined as when a child did not meet these criteria. When assessed for overall complementary feeding, only 11.1 per cent of children received appropriate

complementary feeding, whereas the remaining 88.9 per cent were categorized under poor complementary feeding practices (Table 4). The present study slightly exceeds this national figure. Tiwari *et al.*, (2022) ^[24] in Madhya Pradesh, India, reported that only 9.7 per cent practicing appropriate complementary feeding. Their study emphasized that maternal education and ANC visits were significantly associated with better feeding practices. Kundu *et al.*, (2020) ^[12] in West Bengal found that only 13.5 per cent of children had adequate complementary feeding. They also noted a strong correlation between low socio-economic status and poor feeding behaviors.

Table 4: Distribution of children based complementary feeding practices, N=368

Indicators	Categories	Frequency	Percentage
Complementary feeding practices	Appropriate complementary feeding	41	11.1
	Poor complementary feeding	327	88.9

Among the total children aged 6-24 months, complementary feeding practices show several critical gaps (Table 5). Only 45.9% of eligible infants aged 6-8 months received solid, semi-solid, or soft foods in the past 24 hours, indicating poor initiation of complementary feeding. Overall, 35.9% of children met the Minimum Dietary Diversity (MDD) requirement, while 64.1% did not receive at least five food groups, suggesting limited variety in diets. Minimum Meal Frequency (MMF) was met by 58.2%, but 41.8% still failed to receive adequate meals per day. Only 28.8% of children met the Minimum Acceptable Diet (MAD), which combines both MDD and MMF, reflecting that the majority (71.2%) are not receiving adequate and diverse nutrition. Alarming, consumption of animal-source foods like eggs or flesh food was extremely low at just 1.4%. A significant 25% consumed sweet beverages, and 65.8% consumed unhealthy foods, both of which are concerning for child nutrition and health.

Among currently breastfed children, 48.8% of those aged 6-8 months had received solid or semi-solid foods, while 51.2% had not, indicating delayed or missed introduction of complementary feeding for half of this group. Dietary diversity was especially low, with only 27.4% meeting the MDD standard, and 72.6% not receiving a variety of foods. On the other hand, meal frequency was relatively better, with 64.6% meeting MMF. However, only 23.6% met the MAD criteria, suggesting that while meals may be frequent, they lack adequate variety and nutritional quality. Very few breastfed children (2.1%) consumed egg or flesh foods, which are critical sources of protein and micronutrients. Intake of sweet beverages was lower (12.7%), but a vast majority (95.8%) consumed unhealthy foods, highlighting a serious issue with food quality despite continued breastfeeding.

For currently non-breastfed children, the nutritional situation presents different challenges. None of the eligible children aged 6-8 months were reported to have received solid, semi-solid, or soft foods in the past 24 hours, indicating a complete lack of appropriate complementary feeding at the critical weaning stage. However, dietary diversity was relatively better in this group, with 51.1% meeting the MDD criteria, compared to 27.4% among

breastfed children. Meal frequency was lower, with only 46.6% meeting MMF. Consequently, 38.2% met the MAD standard better than the breastfed group but still suboptimal. Notably, none of the non-breastfed children consumed eggs or flesh food. There was a high intake of sweet beverages (47.3%), indicating increased reliance on sugary drinks possibly in place of milk or nutritious food. Additionally, 83.2% consumed unhealthy foods, which is slightly lower than among breastfed children but still very concerning.

The findings indicate a significant gap in adherence to optimal complementary feeding practices, particularly concerning dietary diversity and acceptable diet standards. Despite WHO recommendations for timely introduction of solid and semi-solid foods and achieving minimum dietary standards by 6-8 months (WHO, 2021) ^[29], more than half the children in present study did not meet the recommended initiation period. The low percentage (35.9%) of children meeting MDD is comparable to findings from the National Family Health Survey (NFHS-5, 2021), which reported that only 25.5 per cent of Indian children aged 6-23 months consumed the minimum number of food groups.

Interestingly, non-breastfed children in this study had higher rates of MDD and MAD than breastfed children. This trend aligns with research by Khan *et al.*, (2019) ^[9], which suggested that non-breastfed children often receive more varied complementary foods to compensate for the absence of breast milk. However, these same children were more likely to consume sweetened beverages, as observed in similar studies conducted in rural Bangladesh and Nepal (Senarath *et al.*, 2012; Joshi *et al.*, 2020) ^[22, 6], highlighting the risk of introducing less nutritious, high-sugar items as breast milk substitutes.

The high prevalence of unhealthy food consumption, especially among breastfed children, is concerning. This could be due to a misconception among caregivers that breast milk alone compensates for poor quality complementary foods, as noted in a study by Nguyen *et al.*, (2013) ^[18] across multiple South Asian countries. The minimal consumption of animal source foods (1.4%) also reflects limited access or cultural dietary restrictions; a common barrier identified in low income settings (Black *et al.*, 2013) ^[3].

Table 5: Distribution of children 6-24 months based on complementary feeding practices and current breastfeeding status, N=368

Complementary feeding practice	Total (N=368)		Currently breastfed children (n1=237)		Currently non-breastfed children (n2=131)	
	F	%	F	%	F	%
Introduction of solid, semi-solid or soft foods 6-8 months (ISSSF) (N=85) (in past 24 hrs.)						
Yes	39	45.9	39	48.8	00	00
No	46	54.1	41	51.2	05	100
Minimum Dietary Diversity (MDD), (in past 24 hrs.)						
Yes	132	35.9	65	27.4	67	51.1
No	236	64.1	172	72.6	64	48.9
Minimum Meal Frequency (MMF), (in past 24 hrs.)						
Yes	214	58.2	153	64.6	61	46.6
No	154	41.8	84	35.4	70	53.4
Minimum Acceptable Diet (MAD), (in past 24 hrs.)						
Yes	106	28.8	56	23.6	50	38.2
No	262	71.2	181	76.4	81	61.8
Consumption of egg and/or flesh food (in past 24 hrs.)						
Yes	05	01.4	05	02.1	00	00
No	363	98.6	232	97.9	131	100
Consumption of sweet beverages (in past 24 hrs.)						
Yes	92	25.0	30	12.7	62	47.3
No	276	75.0	207	87.3	69	52.7
Consumption of unhealthy food (in past 24 hrs.)						
Yes	242	65.8	227	95.8	109	83.2
No	126	34.2	104	43.9	22	16.8

As per WHO-UNICEF (2021) indicators assessing IYCF practices

Table 6 highlights the frequency and percentage of children aged 6-24 months who consumed different types of sentinel unhealthy foods. These foods are commonly associated with poor dietary quality, early exposure to high fat, high sugar, and high sodium foods, and risk of non-communicable diseases (NCDs). The most consumed items were baked and fried confections (27.7%) and sugar-sweetened beverages (25%). Notably, processed meats and fast foods were not consumed at all, while 126 children (34.2%) had no exposure to any of the listed unhealthy foods. The results reveal significant early exposure to unhealthy foods, particularly baked/fried items and sweetened beverages, which can influence long-term dietary preferences and health outcomes. Poti *et al.*, (2017) ^[20] emphasized that early introduction to unhealthy processed foods increases risk of childhood obesity and poor diet quality later in life. In India,

a study by Agarwal *et al.*, (2020) ^[2] found that 42 per cent of urban children under 2 years regularly consumed packaged snacks, including fried foods and sweets. Pries *et al.*, (2019) ^[21] conducted a multicountry analysis and found that sugar sweetened beverages and snack foods are increasingly consumed by children aged 6-23 months in low and middle income countries, particularly due to marketing and availability. Monteiro *et al.*, (2023) ^[14] warned about the rise in ultra-processed food consumption among toddlers in urban areas and its association with nutrient displacement and risk of metabolic diseases. A study in Mumbai highlighted that many mothers introduced packaged infant cereals, fruit juices, and biscuits before 12 months of age, due to aggressive marketing and lack of awareness about appropriate feeding.

Table 6: Distribution of children based on sentinel unhealthy foods, N=368

Sentinel unhealthy foods ^a	Frequency	Percentage
Sweet and sugar confections	28	07.61
Frozen treats	21	05.7
Baked and fried confections	102	27.7
Chips and crisps	41	11.14
Sugar and sweetened beverages	92	25.0
Processed meats	00	00
Fast foods	00	00
Not consumed	126	34.2

^a Dichotomy group tabulated at value 1

The data shows that 66.8 per cent of mothers stayed with the child during feeding, while 33.2 per cent do not (Table 7). This indicates that a significant proportion of mothers actively supervise or assist feeding, a practice considered beneficial for both nutritional intake and mother child bonding. During episodes of illness, 75 per cent of mothers reported feeding the child slowly and patiently, while 25 per cent offered the child's favorite foods. Notably, no mothers reported force feeding the child, which reflects a positive and responsive feeding approach (Table 8). These findings

align well with the World Health Organization (WHO, 2021) ^[30] recommendations, which emphasize responsive feeding practices such as being patient, encouraging but not forcing, and modifying food preferences during sickness. A study by Nguyen *et al.*, (2013) ^[18] in South Asia found that caregivers who stayed with the child during meals and practiced patient feeding were more likely to have children with better growth indicators. Similarly, Abeshu *et al.*, (2016) ^[1] in Ethiopia reported that responsive feeding during illness improved nutrient intake and reduced the risk of

malnutrition. The absence of force-feeding in this sample may be attributed to increased awareness or changing cultural attitudes towards child autonomy during feeding. This is encouraging, as force-feeding has been linked to

negative outcomes such as food aversions, poor appetite regulation, and long-term eating disorders (Ventura and Birch, 2008) [26].

Table 7: Distribution of mothers based on ways of complementary feeding, N=368

Ways of complementary feeding	Categories	Frequency	Percentage
Stay with child	Yes	246	66.8
	No	122	33.2
Feeding child during sickness	Feed slowly and patiently	276	75.0
	Give favorite foods	92	25.0
	Feed the child forcefully	00	00

The data in table 8 provides insights into feeding hygiene practices among mothers of children. Three key areas were assessed: type of feeding utensils used, sterilization practices, and hand hygiene before feeding. Bowl and spoon feeding were the most common method (42.4%), followed closely by hand feeding (40.2%). Feeding bottles were used by only 17.4 per cent of mothers. A study by Taneja *et al.*, (2015) [23] in India similarly observed that bottle feeding was used by 20-25 per cent of mothers, while spoon and hand feeding remained more common in rural and semi-urban areas. Bottle-feeding, while convenient, is often linked with increased risks of diarrheal diseases due to difficulties in maintaining sterility.

Only 11.1 per cent of mothers sterilized feeding utensils, while a striking 88.9 per cent did not. This finding raises concern, especially considering that poor utensil hygiene is a major contributor to infant gastrointestinal infections. Black *et al.*, (2013) [3] found that inadequate sterilization of

feeding tools was significantly associated with higher incidence of diarrhea and stunting in children under two years in low-income settings. This emphasizes the urgent need for community education on basic food hygiene, especially when animal milk or semi-solid complementary foods are used. Majority of mothers (71.5%) washed their hands with soap before feeding, whereas 28.5 per cent did not. This represents a moderately good practice, though the gap suggests continued room for improvement. According to Curtis *et al.*, (2000), hand washing with soap can reduce the risk of diarrheal disease by up to 47 per cent, making it one of the simplest yet most effective public health interventions for children under five. The findings suggest generally appropriate feeding utensil choices, but highlight critical gaps in sterilization and hand hygiene practices. Given the vulnerability of infants to foodborne pathogens, especially during the weaning period, improved mother education on hygiene protocols is essential.

Table 8: Distribution of mothers based on hygiene during feeding, N=368

Hygiene during feeding	Categories	Frequency	Percentage
Type of feeding Utensils	Feeding bottles	64	17.4
	Bowl and spoon	156	42.4
	Hand feeding	148	40.2
Sterilization of utensils	Yes	41	11.1
	No	327	88.9
Hand wash with soap before feeding	Yes	263	71.5
	No	105	28.5

The socio economic status (SES) of mothers is a significant determinant of complementary feeding practices among children aged 6-24 months. In the current analysis, a positive association was observed between higher SES and improved complementary feeding behaviors (Table 9).

The analysis revealed a statistically significant association between the socio economic status of mothers and complementary feeding practices among children, as indicated by a chi-square value of 34.464 ($p < 0.001$). This suggests that complementary feeding practices significantly vary with maternal socio-economic status (Table 9).

Among mothers from the upper socio economic class, 40 per cent practiced appropriate complementary feeding, which includes timely initiation (at 6 months), adequate meal frequency, and dietary diversity. In contrast, no mothers from the lower socio economic class were found to follow appropriate feeding practices 100 per cent had poor feeding practices. A large proportion of mothers from the middle class (198 out of 221) also demonstrated poor

practices, with only 23 following appropriate guidelines. These findings highlight that higher socio economic status is positively associated with better complementary feeding behaviors. Mothers in upper income households are more likely to be educated, have better access to health information and services, and can afford a diverse range of nutritious foods. On the other hand, mothers from lower socio-economic groups may face constraints related to poverty, food insecurity, and lack of awareness, which severely impact their ability to adhere to WHO recommended feeding practices.

This association supports existing literature, where maternal education, income, and living conditions are found to influence infant and young child feeding behaviors (Senarath *et al.*, 2012; Kanjilal *et al.*, 2020) [22, 7]. The findings underscore the need for targeted nutrition education and food support interventions for economically disadvantaged families to bridge the gap in feeding practices and improve child nutritional outcomes.

Table 9: Association between socio economic status (SES) and appropriate complementary feeding practices, N=368

Variable	Complementary feeding practices					
	Appropriate		Poor		Chi-square test	P-Value
Socio Economic Status	F	%	F	%	34.464***	<i>p</i> < 0.001
Upper class	18	4.89	40	10.88		
Middle class	23	6.25	198	53.80		
Lower class	00	00	89	24.18		

***Level of significance of effects

The analysis of complementary feeding practices in relation to maternal education revealed a highly significant association (Chi-square=62.488, $p < 0.001$), indicating that the level of maternal education greatly influences children feeding behavior. Among illiterate mothers, none practiced appropriate complementary feeding, and 9.51 per cent followed poor practices. A similar trend was noted among those with only primary or secondary education, where poor practices were predominant (22.28% and 34.51%, respectively), while appropriate practices were minimal. However, as the education level increased, the proportion of appropriate feeding practices also improved. Notably, mothers with postgraduate education and above showed the highest percentage of appropriate feeding practices (4.35%) and an equal proportion with poor practices, reflecting a more balanced and informed approach. This trend underscores the role of maternal education in enhancing knowledge and adoption of recommended infant and young child feeding (IYCF) guidelines (Table 10).

The findings are consistent with several other studies that highlight maternal education as a key determinant of child nutrition. For instance, Nguyen *et al.*, (2017) ^[17] reported a strong positive correlation between maternal education and dietary diversity among children in Bangladesh, Vietnam, and Ethiopia. Educated mothers were more likely to introduce a variety of food groups, improving overall dietary quality. Similarly, Kumar *et al.*, (2019) ^[11] emphasized that mothers with higher education levels are better positioned to translate nutritional knowledge into practical feeding behaviors, particularly in resource constrained settings. In the Indian context, Patel *et al.*, (2021) ^[19] found that maternal education significantly influenced the adoption of appropriate complementary feeding practices, especially in rural areas. These studies collectively support the current findings, reinforcing that improving women's education may serve as a long-term strategy to combat under nutrition and poor feeding practices in low-and middle-income countries.

Table 10: Association between education of mother and complementary feeding practices, N=368

Variable	Complementary feeding practices				Chi-square test	P-Value
	Appropriate		Poor			
Education	F	%	F	%	62.488***	<i>p</i> <0.001
Illiterate	00	00	35	9.51		
Primary	12	3.26	82	22.28		
Secondary	06	1.63	127	34.51		
Higher secondary	01	0.27	34	9.24		
Graduate	06	1.63	33	8.97		
Post graduate and Above	16	4.35	16	4.35		

Table 11 presents the relationship between the type of maternal occupation and the quality of complementary feeding practices among children. Overall, complementary feeding practices were found to be significantly associated with maternal occupation, as evidenced by a chi-square test value of 101.594 and a $p < 0.001$, indicating highly statistical significance. Among homemakers only 1.90 per cent children received appropriate complementary feeding, while a staggering 60.05 per cent received poor feeding. Mothers engaged in farming combined with livestock rearing showed better outcomes, with 7.33 per cent children receiving appropriate feeding and 10.33 per cent receiving poor feeding. Those solely involved in farming reported 1.08 per cent cases of appropriate and 2.72 per cent of poor feeding. In stark contrast, none of the children of laborer mothers received appropriate feeding; all 10.88 per cent had poor complementary feeding practices. Mothers in government service had only 0.27 per cent child receiving appropriate feeding and 4.89 per cent receiving poor feeding, whereas private job holders had 0.55 per cent children with appropriate practices and none with poor feeding. The findings strongly indicate that maternal occupation is a critical determinant of complementary feeding practices, with homemakers and laborers showing significantly poorer

outcomes. Although homemakers theoretically have more time to care for children, the data suggests that this group may lack nutritional knowledge, empowerment, or decision-making power related to child feeding. The complete absence of appropriate feeding among laborers' children is particularly concerning and highlights how economic hardship and long working hours negatively impact feeding practices.

Mothers engaged in farming with livestock performed better, possibly due to access to homegrown and animal-based food sources, which facilitate better feeding diversity and frequency. Conversely, mothers in formal employment (government/private) showed a mixed picture. Private job holders had a small sample but fared relatively well, potentially reflecting better education and nutritional awareness.

These results align with findings from Senarath *et al.*, (2012) ^[22], who reported that mothers involved in agriculture or unskilled labor had significantly lower odds of practicing appropriate complementary feeding. Similarly, Vijayaraghavan *et al.*, (2020) ^[27] found that maternal knowledge and employment status were key determinants of child feeding behaviors in rural India. Another study by Khan *et al.*, (2017) noted that mothers with greater exposure

to nutrition education and health services often linked with formal jobs-were more likely to meet complementary feeding standards. This study underscores the importance of targeted nutrition education programs, particularly for

homemakers and informal workers, and highlights the need to improve livelihood opportunities and health awareness for better child nutrition outcomes.

Table 11: Association between type of work and complementary feeding practices of children N=368

Variable	Complementary feeding practices					Chi-square Test	P-Value
	Appropriate		Poor				
Type of work	F	%	F	%	101.594***	p<0.001	
Government Service	01	0.27	18	4.89			
Private job	02	0.55	00	00			
Labour	00	00	40	10.88			
Farming	04	1.08	10	2.72			
Farming + Livestock	27	7.33	38	10.33			
Homemaker	07	1.90	221	60.05			

Conclusion

This study reveals critical gaps in complementary feeding practices among children aged 6-24 months, with most failing to meet WHO standards. Poor dietary diversity, delayed feeding, and high intake of unhealthy foods were common, despite continued breastfeeding. Socio-economic status, maternal education, and occupation significantly influenced feeding behaviors mothers from higher-income or educated backgrounds practiced better feeding. Hygiene practices, especially utensil sterilization, were also inadequate. These findings highlight the need for targeted nutrition education and support programs for low-income, less educated, and informal working mothers to improve child nutrition and health outcomes.

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