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## Minimum Acceptable Diet and Positive Factors Affecting IYCF Feeding Practices Among Children Aged 6-23 Months at Tenkasi in Tamil Nadu: A Community-Based Cross-Sectional Study

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### Abstract

Suboptimal nutrition remains the main factor underlying child under nutrition. This study aimed to assess the prevalence of MAD and associated factors among children aged 6-23 months old. Community-based cross-sectional study including 260 mothers with children aged 6-23 months old was conducted in 2 Health Zones of Tenkasi. IYCF indicators were used for assessment. Logistic regression analysis was used to quantify the association between sociodemographic indicators and adequate MAD. Overall, 33% of infants had MAD. After controlling for a wide range of covariates, urban area (45.5%), attendance postnatal care (85%), education status of mother (41.4%) and household socioeconomic status (85%) were factors positively associated with MAD. Study revealed a low prevalence of MAD. Residence area, mother's education, household wealth, and HBNC were positively associated with adequate MAD. Actions targeting these factors will improve feeding practices.

## INTRODUCTION

Worldwide, 5.4 million children under-five still die each year, 80% of them in sub-Saharan Africa and<sup>[1]</sup> India. Almost half of these deaths occur among undernourished children. Although these deaths are the result of a complex set of determinants, poor breast feeding practices and inadequate complementary feeding play a major role. Therefore, optimal<sup>[2]</sup> infant and young child feeding (IYCF) practices rank among the most effective interventions to improve child health. According to<sup>[3]</sup> comprehensive National Nutritional survey (2016-18), in children 6-23 months, only 42% receive the WHO recommended minimum meal frequency and only 6% receive Minimum acceptable diet. Furthermore, the under-5 mortality rate is 70 per 1000 live births. Thus, under nutrition and suboptimal IYCF practices remain serious public health concerns<sup>[4]</sup>. Sustainable Development Goals (SDG) 2 and 3 call for an ending all forms of under nutrition and all preventable deaths under 5 years of age by 2030.

## MATERIALS AND METHODS

**Study design and setting:** This community-based cross-sectional study was conducted in August 2023 in 2 Health Zones of Tenkasi: Near District health Centre, an urban area near Kadayannallor, a rural one. A Health Area is a geographical area consisting of a group of villages (in rural areas) or streets (in urban areas) with a population size of 10, 000 inhabitants. The staple food is cassava, cereal (rice and wheat), other tubers (sweet and white potatoes) and bananas. These foods are generally served with vegetables, fish, beans and meat, which helps to balance the family dish. On average, two to three meals are consumed per day.

**Eligibility Criteria:** The study included mothers with children aged 6-23 months old with the following characteristics: (i) Infants aged between 6 and 23 months; (ii) residence in the study area, (iii) infants without chronic debilitating illnesses such as cerebral palsy, congenital heart disease, Down syndrome, cleft lip/palate and (iv) parental consent.

**Sample Size:** The sample size was based on a study by 5 Richard Mbusa *et al* 2019 in Soth Kivu, Democratic Republic of Congo on minimum acceptable diet on children of 6-23month old, the prevalence was calculated to be 50%, sample size was calculated using 95% confidence interval and absolute error 5%. Hence the sample size was found to be 250. Divided between both health zones.

**Sampling Procedure of the Study:** Children between 6-23 months from both urban and rural communities

coming to Department of Pediatrics in Tenkasi District Hospital, meeting all inclusion criteria and giving consent to participate in study was recruited in study. We determined the child's age based on the date of birth (obtained either from birth certificate, child health record booklet or baptismal card) and the date of the survey. The mother's school level was subdivided into two classes: low (for mothers un-schooled or primary school) good (for those having secondary school or university). The household socio-economic status was categorized into two classes: good (for households with medium or high socioeconomic level) low according to modified Kuppaswamy scale.

For data quality control, the questionnaire was first developed in English and translated to local language (Tamil) and then back-translated to English by an independent translator for consistency.

**Operational Definitions:** Introduction of solid, semi-solid or soft foods

Children 6-7 months who received solid, semi-solid or soft foods at least once on the day preceding the survey date.

**Minimum Meal Frequency:** Breast-feed children 6-23 months who were fed a mini-mum recommended number of times in the previous day of the survey. Minimum is defined as 2 times for breast-fed infants 6-8 months, 3 times for breast-fed children 9-23 months, 4 times for non-breast-fed children 6-23 months.

**Minimum Dietary Diversity:** Children 6-23 months who received in the previous day of the survey four or more food groups out of seven food groups: (i) grains, roots and tubers, (ii) legumes and nuts, (iii) dairy products (milk, yogurt, cheese), (iv) eggs, (v) flesh foods (meat, fish, poultry and liver/organ meats), (vi) vitamin-A-rich fruits and vegetables and (vii) other fruits and vegetables.

WHO considers the cut-off of at least 4 of the above 7 food groups above be- cause the consumption of foods from at least 4 food groups would mean that in most populations the child had a high likelihood of consuming at least one animal- source food and at least one fruit or vegetable that day, in addition to a staple food (grain, root or tuber).

**Minimum Acceptable Diet:** Children 6-23 months old who met age-specific mini-mum recommended diet diversity and minimum recommended meal frequency and consumed a source of dairy (or were breast-fed) in the previous day of the survey. The minimum acceptable diet indicator was expressed as dichotomous variable categorized as adequate

minimum acceptable diet and inadequate minimum acceptable diet. A child who met both the minimum dietary diversity and the minimum meal frequency was categorized as adequate minimum acceptable diet a child who did not meet either or both the minimum dietary diversity and the minimum meal frequency as inadequate minimum acceptable diet.

**Statistical Data Analyses:** Data were entered and analyzed using SPSS software (20.0 trial version). Data was analysed and presented as frequency and percentage for categorical data and descriptive statistics (mean, standard deviation) for continuous data. The factors influencing minimum dietary diversity is presented as percentage and 95% confidence interval.

**Ethical Considerations:** This study was conducted according to the guidelines laid down in the Declaration of Helsinki. In-formed consent was obtained from all study participants as well as from infants' parents.

## RESULTS AND DISCUSSIONS

The study included 260 mothers with children aged 6-23 months old (130 in Urban health zone near District hospital and 130 in rural areas near kadayallanoor Health Zone), yielding a 98.9% response rate. Their sociodemographic characteristics are summarized in (Table 1). Eighty percent of households had a low socioeconomic level 38% of mothers had a low educational level. Low socio-economic and maternal educational levels were more prevalent in rural areas than in urban ones. The postnatal care follow-up rate was 85.0%, higher in rural areas than in urban ones. Complementary feeding practices are summarized (Table 2). The majority, (98%) and (85%) infants received cereals-roots-tubers and legume-based foods respectively. The consumption of animal foods was low as only 31% consumed flesh foods and only 12% consumed eggs. Consumption of dairy products, eggs, fruits and vegetables was significantly lower for rural infants compared to urban ones. About 66.5 % of infants had minimum meal frequency, 34.6% had minimum dietary diversity 33.4% had minimum acceptable diet, with rates higher in urban area than in rural one for all these indicators. The analysis showed that residence area, attendance at postnatal care, household socioeconomic status maternal education status were statistically associated with minimum acceptable diet. Mothers living in urban area were 2.36 times more likely to provide minimum acceptable diet to their child when compared to their counterparts. Similarly, higher odds of receiving minimum acceptable diet were observed among mothers who had postnatal care visits. Likewise, mothers with secondary and

post-secondary education were 1.83 times more likely to give recommended minimum acceptable diet compared to their counterparts. Finally, higher odds of receiving minimum acceptable diet were observed among mothers with good household socioeconomic status. (Table 3).

Almost<sup>[6,7]</sup> half of these deaths occur among undernourished children. This study sought to assess the prevalence and associated factors of adequate minimum acceptable diet among children 6-23 months. Findings revealed that the prevalence of minimum acceptable diet was 33%. Residence in urban area, good maternal education status, good household socioeconomic status attendance to postnatal consultations were factors that may increase the minimum acceptable diet practices. In our report, urban area appeared better in several aspects of complementary feeding practices than rural areas. This might be the result of cumulative effect of a series of more favorable conditions, including better socioeconomic and educational conditions, in turn leading to better caring practices for children and their mothers. A study analyzing Demographic and Health Surveys (DHS) from 36 developing countries revealed that for the same reasons, the prevalence of malnutrition was higher in rural than in urban areas. The association between attendance at postnatal care and adequate minimum acceptable diet is consistent with study findings in India. Mothers' education on complementary feeding practices during these visits is the factor underlying this association. In DRC's health system, children's growth monitoring is conducted in every health facility according to the national nutrition program. In the outreach clinics, health workers monitor the weight of children using growth charts provide nutrition education to mothers or care givers of children. These activities also provide an opportunity to discourage harmful traditional beliefs that might inhibit child feeding practices to early recognition of signs of under nutrition, any illness and manage them accordingly.

Our findings show that more than 85% of the mothers attended at postnatal consultations. Surprisingly, the prevalence of minimum acceptable diet remained low. The low household socioeconomic status could be the main explanatory factor. Indeed, our study showed that about 65% of households had a low socio-economic status. This finding emphasizes the role of socio-economic status on feeding practices. Households with high socioeconomic status are more likely to be food secure, thus they can afford to provide the minimum acceptable diet to their children. Several studies have also shown that improved household wealth has a significant effect on adequate complementary feeding practices.

**Table 1: Sociodemographic characters**

Age in months	Total (N = 254)
6-12 MO	86(34%)
13-23MO	168(66%)
Sex of the child	
Male	139(55%)
Female	115(45%)
Child lives with both parents	
Mother only	
Age of mother (median)	26 (17-41)
Interval b/w last and before last births (mean)	29 (17)
Place of birth	
Hospital	86 (34%)
Health centre	162 (64%)
Home delivery	6 (2%)
Attendance at postnatal visits	
Yes	215 (85%)
No	39 (15%)
Household socioeconomic status	
High	25 (10%)
Medium	64 (25%)
Low	165 (65%)
Mothers educational status	
More than secondary education	157 (62%)
Less than secondary education	97 (38%)
No of household members ( median)	6

**Table 2: Proportions of children meeting who iycf feeding practices**

Variable	Total	Urban	Rural
Introduced solid semisolid or soft foods (children aged 6-7 mo)	24/33 (72.7%)	13/17 (77%)	11/15 (74.5%)
Took min meal frequency (children aged 6-23 mo)	169/254 (66.5%)	109/142 (77%)	60/112 (53.5%)
Took min dietary diversity (6-23mo)	88/254 (34.6%)	64/142 (45%)	24/112 (21.6%)
Took min acceptable diet (6-23mo)	88/254 (33.4%)	58/142 (41%)	24/112 (24.3%)
Consumed iron rich foods	128/254 (50.3%)	83/142 (58.2%)	45/112 (44.5%)

**Table 3: factors associated with no minimum acceptable diet**

Variables and categories	Minimum acceptably diet	
	Inadequate	Adequate
Residence health zone		
Rural	95/112 (85.3%)	16/112 (14.7%)
Urban	77/142 (54.5%)	51/112 (45.5%)
Place of delivery		
Home	4/6 (66.6%)	2/6 (33.3%)
Health facility	160/248 (64.4%)	88/248 (35.6%)
Attended postnatal care		
Yes	32/39 (82.1%)	7/39 (17.9%)
No	139/215 (64.7%)	76/215 (35.3%)
Socioeconomic status		
Low	123/165 (74.6%)	42/165 (25.4%)
Good	40/89 (44.9%)	49/89 (55.1%)
Maternal education		
Less than secondary	78/97 (80.5%)	19/97 (19.5%)
More than secondary	92/157 (58.6%)	65/157 (41.4%)

**Study Limitations:** Our study has several limitations. Firstly, the recall bias may be possible and affect the validity of the results. However, this bias was minimized since most data related to infant's complementary feeding practices were based on a 24-h recall method.

## CONCLUSION

Our findings reveal a low prevalence of adequate minimum acceptable diet among infants between 6 and 23 months of age. Overall, the residence area, mother's educational status, household wealth

postnatal care attendance were factors positively associated with adequate minimum acceptable diet. These findings suggest policy-makers to focus on improving and making effective behavior change, strengthening education of mothers, as well as improving complementary feeding practices for children through food security, health care utilization improved household socioeconomic status.

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