

Research Article

Practice of Essential Nutrition Action Messages and Associated Factors Among Mothers of Children Aged 0-24 Months in Rural and Urban Kebeles of the Southern Zone, Sidama Region, Ethiopia

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Abstract

Background: Essential Nutrition Actions (ENA) is a comprehensive nutrition program during the first 1,000 days of life, from conception to age two. One-fourth of nutrition-related morbidity and mortality rates are caused by inadequate implementation practice of essential nutrition actions. However, some studies conducted predominantly emphasized only rural settings or only urban settings but no studies show the prevalence of ENA practices by comparing urban and rural setting for prioritization of intervention purpose. Therefore, this study sought to close this gap by assessing adherence to essential nutrition action messages and factors associated among mothers of children aged 0-24 months in rural and urban kebeles of the Southern zone. **Methods:** A community based comparative cross-sectional study was conducted among 466 participants 233 from urban and 233 from rural. A structured interviewer administrated questionnaire was used to collect data. Data was entered into Epi Info and then transported to SPSS for analysis. Descriptive analysis was used to describe the percentages and frequency. During bivariable logistic regression analysis at P value less than 0.25 was candidate variable included in multivariable logistic regression analysis. Statistical significance was declared at P value <0.05 in the multivariable logistic regression model. **Result:** The study results were found to be 50.2% of urban mothers and 57.1% of rural mother's demonstrated poor ENA practice. Among urban kebeles prim-parous mothers [AOR=2.580, 95% CI: 1.269-5.245] were associated with poor ENA practices. Among rural kebeles mothers having nutritional counseling during ANC [AOR=0.342, 95% CI: 0.110-1.063] and mothers who are adequate in dietary diversity [AOR=0.267, 95% CI: 0.093- 0.769] was identified as a predictor. **Conclusion and recommendation:** The study shows that the prevalence of poor ENA practices higher among rural than urban kebeles. All concerned bodies should give community based education about ENA messages (maternal nutrition, breastfeeding, complementary feeding) and counseling to mothers to increase awareness about the importance of nutrition during pregnancy and increase practice of key ENA messages.

Keywords

Essential Nutrition Action Messages, Practices, Mothers, Children, Sidama, Ethiopia

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1. Introduction

Essential Nutrition Actions (ENA) is a comprehensive nutrition program and has proven successful in addressing global disease patterns and meeting people's nutritional and health needs, particularly those of mothers and newborns during the 1,000-day window [1, 2]. It consists of seven essential elements: pregnancy and lactation nutrition, vitamin A deficiency prevention, anemia prevention, iodine deficiency prevention, exclusive breastfeeding, complementary feeding, and feeding sick children [3, 4]. Key nutrition interventions are promoted by ENA during important life cycle contact points such as prenatal care, delivery, postpartum care, well and sick child care, and vaccination [5-7]. Essential nutrition actions are vital to achieving the promise of the 17 Sustainable Development Goals (SDG), which include leaving no one behind, because they help the most vulnerable, impoverished, and marginalized communities [8].

During the first 1,000 days of life, from conception to age two, is a time when nutrient requirements are higher, under nutrition is more likely to occur, and deficiencies are more likely to have long-lasting, irreversible effects on the child. It has been demonstrated that every crucial nutrition step improves nutritional status and reduced mortality [9-12]. Malnourished children during the first 1,000 days of life are more likely to suffer from disease, death, and experience long-term developmental problems, which feed the cycle of poverty and poor health outcomes [1, 7, 13].

Globally almost two billion individuals struggle to meet their daily nutritional demands, which results in a limited diet deficient in vital nutrients [8, 11, 14, 15]. An estimated 35-45% of people worldwide suffer from iodine deficiency, one of the most prevalent nutrient deficits [16-18] and It was 58% of Ethiopian school-age children have iodine deficiency overall [19]. The 2019 Ethiopia Demographic Health Survey (EDHS) found that 37% of children under five were stunted, with 12% being severely stunted and the prevalence of stunting rises dramatically with age, reaching a peak of 45% among children aged 24-35 months, and 17% among those fewer than 6 months [20]. In Ethiopia infant and young child feeding (IYCF) practice remains below the WHO standard with only 59% of infants being exclusively breastfed and 11% of children between the ages of 6 and 23 months satisfy the minimum standards with respect to all three (breastfeeding status, number of food groups, and times they were fed during the day or night [7, 15, 20].

According to National Food and Nutrition Strategy baseline survey preliminary report, 61% of children aged 0-6 months were exclusively breastfed and only 8% of children aged 6-23 months consumed the minimum recommended number of five out of eight food groups and the national prevalence of vitamin D deficiency is 34% and the prevalence of anemia among women of reproductive age (WRA) in Ethiopia is 13% and among children aged 6-59 months is 16%

[14, 21-24]. Malnutrition affects over 27% of Ethiopian pregnant women, despite the fact that maternal nutrition during pregnancy is essential for lowering the prevalence of small-for-gestational-age newborns by 21% and raising the average birth weight by 41g [25], 54.4% of mothers showed good feeding practices for their sick children [4, 26] and Forty-five percent of mothers' exhibit good feeding practices for their sick children [12, 27]. Childhood morbidity and mortality are major contributed by micronutrient deficiencies, and iron deficiency is one of the main causes of anemia, which has serious effects on the health of both mother and children [20, 28, 29].

Approximately one-fourth of nutrition-related morbidity and mortality rates are caused by poor practice of essential nutrition actions [7, 20]. Micronutrient deficits can result in clinically significant declines in energy, mental clarity, and general capacity, as well as obvious and harmful health issues. This may result in lower academic performance, decreased productivity at work, and a higher chance of contracting other illnesses and ailments [23, 30, 31].

The following factors were influence the maternal practices of ENA such us institutional delivery, having PNC services, being educated about the ENA message, being a model household, parity, place of birth, postnatal care follow-up, monthly income, mother and father's educational status, level of knowledge, and attitude [3, 32].

Implementing the ENA practices comprises establishing collaborations with all organizations that support nutrition and health initiatives for mothers and children. This is done to ensure that the messages are consistent and that all groups use the same job aids, information, and education communication materials when counseling individual mothers or during group events [20, 33]. Only few studies have been done on the practice of essential nutrition action (ENA) in Ethiopia. Furthermore, no similar study has been done before in these areas on assessing practice of key essential nutrition action messages and associated factors among mothers/caregivers of children from birth up to 24 month. Therefore, this study was aimed to assess practices of essential nutrition action messages and factors associated among mothers of children aged 0-24 months in rural and urban kebeles of the Southern zone, Sidama region, Ethiopia.

2. Conceptual Framework

Conceptual frame work for factors associated with practice of key essential nutrition action messages among mothers of children from birth up to 24 months. (Figure 1)

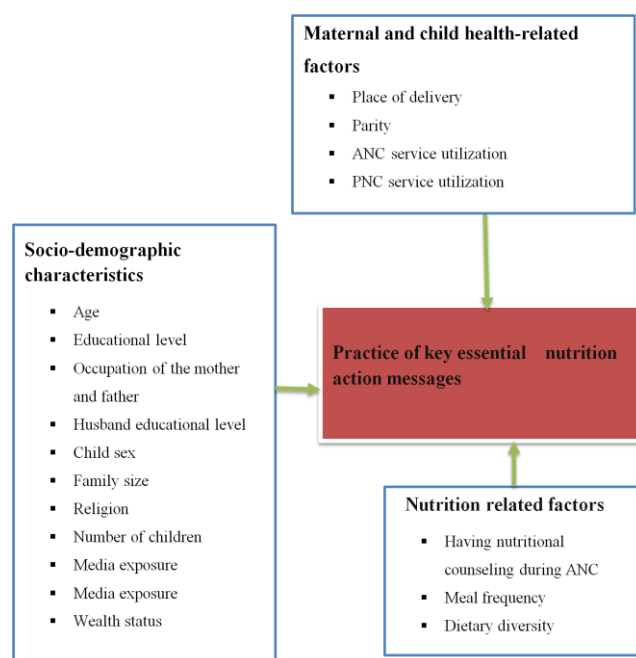


Figure 1. Conceptual Frame Work for Factors associated with Practice of Key Essential Nutrition Action Messages Among Mothers of Children from Birth up to 24 Months.

3. Method and Material

3.1. Study Area

In southern zone, Sidama regional state there are 8 woredas and 2 town administrations. Study was conducted in 4 woredas namely Teticha, Chirona, Hula and Aleta wondo woreda. The total population in 4 woredas was 459,823. *Teticha Woreda* is 361 kilometers from the nation's capital, Addis Ababa, and 88 kilometers from the regional seat, Hawassa. It has a "dega" (Cool Zone) climate. The total population is 84,850 according to data from the Teticha district health office. The Woreda has a total of 16 kebeles, including 1 urban and 15 rural. In the district, there are fifteen health posts, two health centers, and one private clinic. *Hula woreda* situated south of Hawassa at around 96 kilometers. The woreda has two urban and seventeen rural kebeles. The estimated total population in the woredas was 108,375. In woredas there is one primary hospital, 3 health centers, and 17 health posts. *Aleta wondo woreda* is located in the Sidama region in southern Ethiopia; it is surrounded by the woredas of Daara to the south, Chuko to the west, Dale and Wonsho to the north, Bursa to the east, and Hula to the southeast. A total population of the woredas was 213,559 according to woreda health office.

3.2. Study Design and Period

Community based comparative cross-sectional study was conducted from 15 December 2024 to 1 Jan 2025.

3.3. Population

3.3.1. Source Population

All mothers or caregivers of children aged from birth up to 24 months in Southern zone, Sidama region.

3.3.2. Study Population

Mothers or caregivers of children aged from birth up to 24 months in selected districts of Southern zone.

3.4. Eligibility Criteria

3.4.1. Inclusion Criteria

All mothers or caregivers who have children aged from birth up to 2 years old and who live in selected woredas for six and more months in study area were included in the study.

3.4.2. Exclusion Criteria

Mothers or caregivers who were severely ill were excluded from the study.

3.5. Sample Size Determination and Sampling Procedure

3.5.1. Sample Size Determination

Sample size for the first specific objective was calculated using double population proportion formula and assuming a 1:1 of study to reference groups.

$$N = \frac{(z_{\alpha/2} + z_{\beta})^2 \cdot p_1(1-p_1) + p_2(1-p_2)}{(p_1 - p_2)^2}$$
 (level of significance: 95% = 1.96, Power of 80%, P1-47.6% [25] - the proportion of practice of key essential nutrition action messages in rural, and P2- 64.8% [34] - the proportion of practice of key essential nutrition action messages in urban).

Final sample size was 465 after considering a 10% possible non-response rate and design effect of 1.5 = 466

For factor associated with practice of key essential nutrition action messages with determined by using epi info variables like parity, place of delivery [3] and nutritional counseling during ANC [25]. (Table 1)

Table 1. Sample Size Determination for Factors Associated with Practice of Key Essential Nutrition Action Messages Among Mothers of Children from Birth up to 24 Months in Rural and Urban Kebeles of Southern Zone, Sidama Region, Ethiopia.

Variables	Confidence level	Power	Ratio	% of Outcome unexposed group	% of Outcome exposed group	Odds ratio	Sample size
Parity [3]	95%	80%	1	59.7	36.8	0.39306	166
Place of delivery [3]	95%	80%	1	23.5	49.5	3.19085	122
Nutritional counseling during ANC [25]	95%	80%	1	24.5	63	5.24711	60

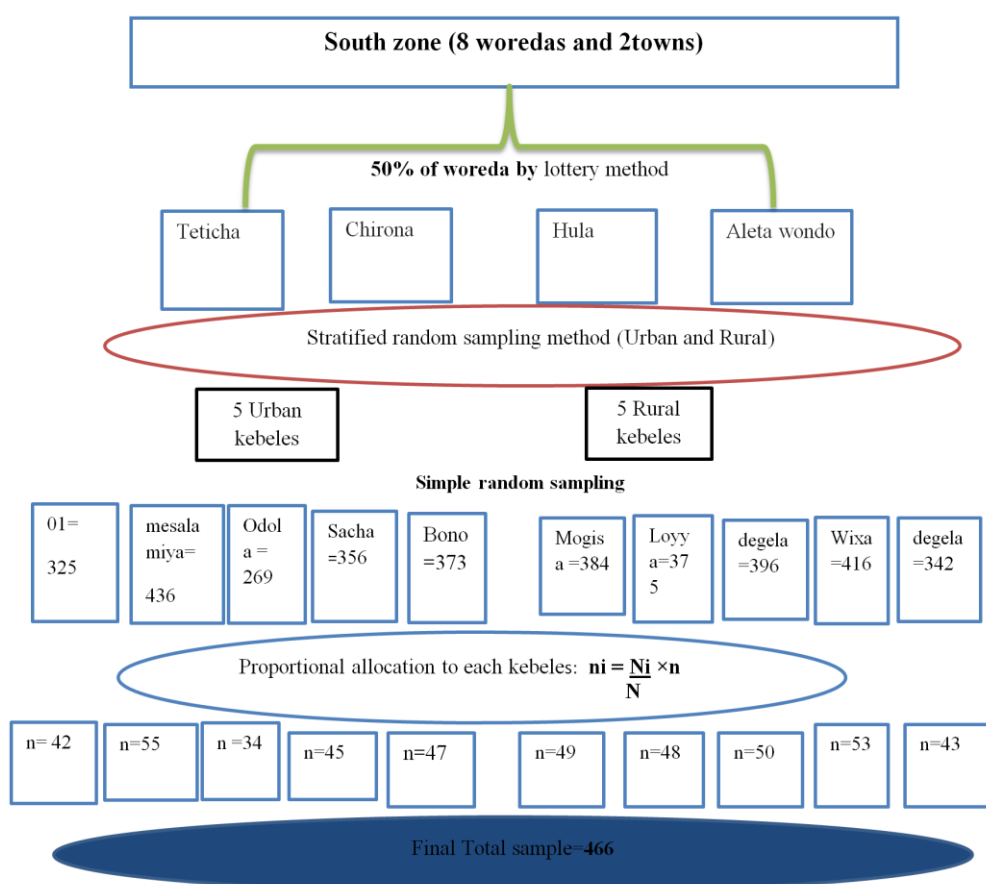
Abbreviation:- ANC; Antenatal Care

Accordingly the sample size calculated by first objective is larger which is 466 and was used as final sample size for this study.

3.5.2. Sampling Procedure

A multi-stage stratified sampling technique was employed to select study participants. From 8 woredas in Southern zone four (Teticha, Chirona, Hula and Aleta wondo) representative woredas was selected by lottery method. From those 5 urban and 5 rural kebeles was selected from a total of

woredas by lottery method. From Teticha 1 urban and 2 rural, from Aleta wondo woredas 2 urban and 1 rural kebeles, from Hula 1 urban and 1 rural kebeles and from Chirona 1 urban and 1 rural kebeles. In the selected kebeles of the woredas households having Families with mothers of children 0 -24 months of age was identified using a family folder (registration logbook) with the assistance of health extension workers. Finally the required sample size for each kebeles was allocated by using a proportional allocation. Total number of children 0 to 24 month in selected 10 kebeles was 3672. (Figure 2)

**Figure 2.** Schematic Presentation of Sampling Procedure of Practice of Key Essential Nutrition Action Messages and Associated Factors Among Mothers of Children from Birth up to 24 Month in Rural and Urban Kebeles of Southern Zone, Sidama Region, Ethiopia.

3.6. Variables

3.6.1. Dependent Variable

Practice of key essential nutrition action messages.

3.6.2 Independent Variables

Socio-demographic/economic characteristics - Age, Monthly income, Educational level, Occupation of the mother and father, Husband educational level, Child sex, Family size, Religion, number of under five children in households and media exposures.

Maternal and child health-related factors- - parity, place of delivery, ANC service utilization, PNC service utilization.

Nutrition related Factors - having nutritional counseling during ANC, meal frequency, dietary diversity.

3.7. Operational Definition

ENA, or Essential Nutrition Actions, messages are an integrated package that consists of: Nutrition of Women for Women and Adolescents, as well as During Pregnancy and Lactation, Breastfeeding exclusively, complementary feeding, Nutritional support for children who are sick or malnourished children. Preventing and managing anemia in children and women, Vitamin A deficiency prevention and control and Iodine deficiency prevention and control. A total of 25 question will be used to assess ENA practice: exclusive breastfeeding (4 question), complementary feeding (5 question), sick child feeding (4 question), nutrition for women during pregnancy and breastfeeding (3 question), prevention of vitamin A deficiency (3 question), prevention of anemia (3 question), and prevention of iodine deficiency (3 question).

Good ENA Practices: Those participants who score of practice questions mean and above and Poor ENA Practices: Those participants who scored of practice questions below mean score [25].

Exclusive breast feeding: When a baby is breastfed exclusively, they only get breast milk. No other liquids or solids—not even water—are administered. With Exception of drops or syrups, of vitamins, minerals, or medications, and oral rehydration solution [7].

Complementary feeding: defined as, which usually begins at age 6 months and lasts until age 23 months, the process of supplementing with additional nutrition when breast milk or formula is no longer sufficient to meet nutritional needs [7].

Dietary diversity: Lactating women with a dietary diversity score of five or more (>5) were classified as meeting minimal dietary diversity, while those with a dietary diversity score of less than five were classified as not meeting dietary diversity [13].

Wealth index: It is a composite metric representing a household's aggregate living standard. Based on the net score, the wealth status of respondents was classified into three poor, medium, and rich [25].

3.8. Data Collection Instruments and Procedure

A structured interview administered questionnaire was used to collect data. A questionnaire composed of socio-demographic factors, Maternal and child health-related factors and essential nutrition action practices question. The data collection tool was developed by using the previous related studies [3, 25, 32] and participants wealth status evaluated using adapted EDHS 2019 tool which consisting 28 items [20]. Data collection is carried out by nine diploma nurses with previous experience in data collecting and one public health Supervisor.

3.9. Data Processing and Analysis

Data entered by using Epi info 7 versions and was exported to SPSS version 23 for analysis purpose. The entered data was cleaned and Descriptive statistics was used to organize the data and present the responses obtained. Bivariable logistic regression was used to see the association between one explanatory variable and outcome variable. Variables that have P-value less than 0.25 in binary analysis was entered in to multivariable logistic regression models for controlling confounding factors and to identify significant factors of the practice of ENA messages in the final model. The strength of statistical association was measured by adjusted odds ratios, 95% confidence intervals, and P-value <0.05 will be considered as significant factors. The presence of multi-collinearity was assessed using the Variance Inflation Factor (VIF) Values below 10 have been considered no correlation between variable. The model fitness was evaluated using the Hosmer-Lemshow goodness-of-fit method. Data was presented using tables, graphs, and text form.

Among Urban Goodness of fit of the model was checked by Hosmer-Lemshow ($\chi^2 = 2.660$) with p value of 0.954 which indicate the model is appropriate for the given data.

Among Rural Goodness of fit of the model was checked by Hosmer-Lemshow ($\chi^2 = 1.597$) with p-value of 0.979 which indicate the model is appropriate for the given data.

Assumption of multicollinearity results is $VIF < 10$ and tolerance test > 0.1 for all independent variable.

Wealth index

The assumptions of PCA about the sampling sufficiency of individual variables were validated, encompassing the overall sampling adequacy assessment ($KMO > 0.6$) and anti-image correlations (> 0.5), and Bartlett Sphericity Test (p-value 0.05) and finally create wealth index quintiles in to 3 (poor, medium and rich).

3.10. Ethical Consideration

This study was conducted under ethical approval from Dilla University's Institutional Review Board (IRB) with the reference number of *duchm/irb/011/2024*. Letters of permission

was obtained from district health offices. Prior to conducting the interview respondents was informed about the purpose and procedure of the study and written consent was obtained from each participant.

4. Result

4.1. Socio-demographic Factors

This study interviewed a total of 466 child mothers or caregivers, with a 233 from urban and 233 from rural kebeles. More than half of the participants 51.9% were above the ages of 35 years in urban and 53.3% were between the ages of

20-29 years in rural kebeles. The majority of study participants 84.1% from urban and 85.8% from rural were married. More than half of mothers had a Completed elementary school in both kebeles. Three fourth 178 (76.4%) of mother's or caregivers occupation were house wife in urban and 165 (70.8%) in rural. For both residents, the majority of husbands were farmers 176 (75.5%) in urban and 144 (61.8%) in rural and while the lowest percentage employed in government sector. Regarding to family size, 89 (38.2) were <4 in urban and 144 (61.8%) were ≥4 majority of families. Over more percent of the respondents were no media exposure 202 (86.7%) in urban and 187 (80.3%) in rural kebeles. (Table 2)

Table 2. Socio- demographic Characteristics of the Study Participants Essential Nutrition Action Messages and Associated Factors Among Mothers of Children Aged 0-24 Months in Rural and Urban Kebeles of the Southern Zone, Sidama Region, Ethiopia.

Variables	Categories	Urban Frequency (%)	Rural Frequency (%)
Sex of the child	Male	161 (69.1)	117 (50.2)
	Female	72 (30.9)	116 (49.8)
Maternal age in year	20-24	14 (6.0)	57 (24.5)
	25-29	51 (21.9)	67 (28.8)
	30-34	47 (20.2)	32 (13.7)
	≥35	121 (51.9)	77 (33.0)
	> 6	84 (36.1)	72 (30.9)
Age of the child (month)	6-12	69 (29.6)	64 (27.5)
	12-18	50 (21.5)	74 (31.8)
	18-24	30 (12.9)	23 (9.9)
	Single	18 (7.7)	14 (6.0)
Marital status	Married	196 (84.1)	200 (85.8)
	Divorced	19 (8.2)	19 (8.2)
	Unable to read and write	34 (14.6)	68 (29.2)
	Able to read and write	90 (38.6)	50 (21.5)
Maternal level of education	Completed primary school	77 (33.0)	72 (30.9)
	Completed high school	20 (8.6)	23 (9.9)
	College and above	12 (5.2)	20 (8.6)
	Unable to read and write	62 (26.6)	61 (26.2)
	Able to read and write	93 (39.9)	92 (39.5)
Paternal level of education	Completed primary school	39 (16.7)	38 (16.3)
	Completed high school	19 (8.2)	25 (10.7)
	College and above	20 (8.6)	17 (7.3)
Occupation of the mothers	Housewife	178 (76.4)	165 (70.8)
	Civil servant	12 (5.2)	13 (5.6)

Variables	Categories	Urban Frequency (%)	Rural Frequency (%)
Occupation of the father	Employed in private sector	28 (12.1)	36 (15.5)
	Farmer	15 (6.4)	19 (8.2)
	Farmer	176 (75.5)	144 (61.8)
	Civil servant	24 (10.3)	23 (9.9)
	Merchant	15 (6.4)	47 (20.2)
	Daily laborer	18 (7.7)	19 (8.2)
Family size	< 4	89 (38.2)	112 (48.1)
	>= 4	144 (61.8)	121 (51.9)
Number of under five children in the household	One	186 (79.8)	86 (36.9)
	Two or more	47 (20.2)	147 (63.1)
Religion	Orthodox	13 (5.6)	27 (11.6)
	Protestant	193 (82.8)	123 (52.8)
	Muslim	14 (16.0)	29 (12.4)
	Catholic	13 (5.6)	54 (23.2)
Media exposure	Yes	31 (13.3)	46 (19.7)
	No	202 (86.7)	187 (80.3)
Wealth index	Poor	84 (36.1)	75 (32.2)
	Medium	72 (30.9)	46 (19.7)
	Rich	77 (33.0)	112 (48.1)

4.2. Maternal and Child Health-related Factors

From total interviewed mothers or caregivers one hundred eight three (78.5%) from urban and 201 (86.3%) from rural are Multipara. Majority of participants from both residents

had no PNC follow up. More than half of participants were 130 (55.8%) urban and 187 (80.3%) rural had 1-3 ANC visits. The majority of participants in both residents 206 (88.4%) and 218 (93.6%) was delivered in health institution. (Table 3)

Table 3. Maternal and Child Health-related Factors of the Study Participants Essential Nutrition Action Messages and Associated Factors Among Mothers of Children Aged 0-24 Months in Rural and Urban Kebeles of Southern Zone, Sidama Region, ETHIOPIA.

Variables	Categories	Urban Frequency (%)	Rural Frequency (%)
Parity	Multi Para	183 (78.5)	201 (86.3)
	Prim Para	50 (21.5)	32 (13.7)
	Zero	41 (17.6)	22 (9.4)
Antenatal care visits	1-3	130 (55.8)	187 (80.3)
	>= 4	62 (26.6)	24 (10.3)
Postnatal care follow-up	Yes	79 (33.9)	89 (38.2)
	No	154 (66.1)	144 (61.8)
Place of delivery	Home	27 (11.6)	15 (6.4)

Variables	Categories	Urban Frequency (%)	Rural Frequency (%)
	Health institution	206 (88.4)	218 (93.6)

4.3. Nutrition Related Factors

From interviewed participants majority of mothers having no nutritional counseling during ANC from those 156 (67.0%) are urban and 162 (69.5%) from rural. More per-

cent's of participants were >2 times meal frequency per day in both place of residents. Three fourth 173 (74.2%) of mothers from urban had inadequate dietary diversity and majority 196 (84.1%) of mothers from rural had inadequate dietary diversity. (Table 4)

Table 4. Nutrition Related Factors of the Study Participant'S Essential Nutrition Action Messages and Associated Factors Among Mothers of Children Aged 0-24 Months in Rural and Urban Kebeles, Southern Zone, Sidama Region, Ethiopia.

Variables	Categories	Urban Frequency (%)	Rural Frequency (%)
Having nutritional counseling during ANC	Yes	77 (33.0)	71 (30.5)
	No	156 (67.0)	162 (69.5)
Meal frequency per day	<= 2 times	69 (29.6)	15 (6.4)
	>2 times	164 (70.4)	218 (93.6)
Dietary diversity	Adequate	60 (25.8)	37 (15.9)
	Inadequate	173 (74.2)	196 (84.1)

Abbreviation:- ANC; Antenatal Care

4.4. Prevalence of Practices of Essential Nutrition Action Messages (ENA)

The study results were found to be 50.2% of urban mothers and 57.1% of rural mother's demonstrated poor practice of essential nutrition action messages (ENA). (Figure 3) (Figure 4)

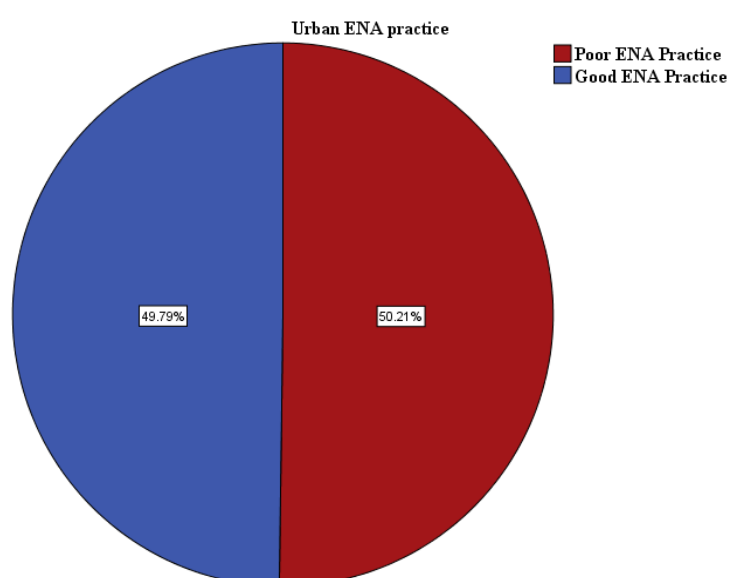


Figure 3. Practice of Essential Nutrition Action Messages (ENA) Among Mothers of Children from Birth up to 24 Months in Urban Kebeles of Southern Zone, Sidama Region, Ethiopia.

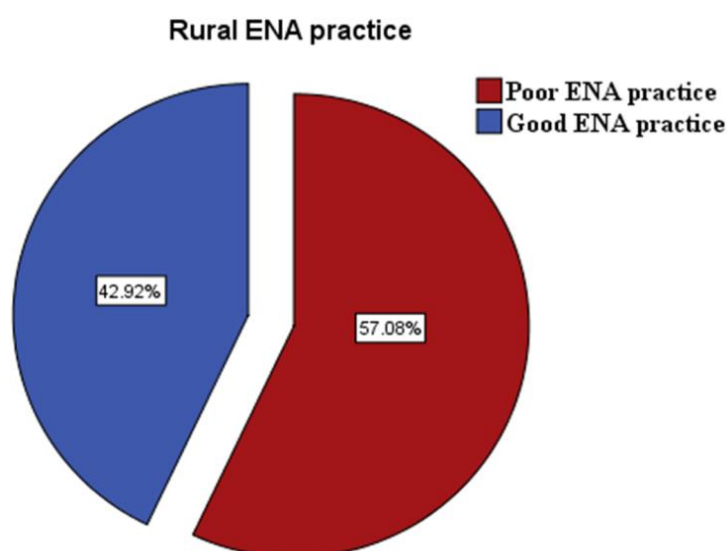


Figure 4. Practice of Essential Nutrition Action Messages (ENA) Among Mothers of Children from Birth up to 24 Months in Rural Kebeles of Southern Zone, Sidama Region, Ethiopia.

4.5. Factors Associated with Practices of Essential Nutrition Action Messages (ENA)

In the bivariable logistic analysis among urban kebeles; Family size, Number of under-five, Parity, ANC visits, Meal frequency per day and Dietary diversity were identified as

candidates at p-value less than 0.25 for multivariable logistic regression. Finally in multivariable logistic regression analysis parity was found to be significantly associated with practice of essential nutrition action messages (ENA). Being Prim Para mothers were twice more likely to practice poor essential nutrition action messages (ENA) than Multi Para mothers [AOR: 2.315 (1.154-4.643)]. (Table 5)

Table 5. Bi-variable and Multivariable Logistic Regression Analysis Determinants Associated with ENA Practices Among Mothers of Children Aged 0-24 Months in Urban Kebeles of Southern Zone, Sidama Region, Ethiopia.

Variable	ENA Practice		COR (95% CI)	AOR (95% CI)	P-value
	Poor Frequency (%)	Good Frequency (%)			
Family size (number)					
<4	51(57.3)	38 (42.7)	1	1	0.136
>=4	66(45.8)	78 (54.2)	1.6 (0.931-2.702)	1.56 (0.83-2.802)	
Number of under- five children					
One	98 (52.7)	88 (47.3)	1	1	0.173
Two and above	19 (40.4)	28 (59.6)	1.6 (.857-3.143)	1.63 (0.81 -3.28)	
Parity					
Multi Para	97 (53.0)	86 (47.0)	1	1	0.018
Prim Para	20 (40.0)	30 (60.0)	1.7 (.896 -3.196)	2.32 (1.154-4.64)	
Meal frequency per day					
<=2 times	39 (56.5)	30 (43.5)	1	1	0.242
>2 times	78 (47.6)	86 (52.4)	1.4 (.814 - 2.525)	1.37 (0.778- 2.71)	
Dietary diversity					
Adequate	26 (43.3)	34 (56.7)	0.7 (0.38-1.245)	1.56 (0.82-2.989)	0.179

Variable	ENA Practice		COR (95% CI)	AOR (95% CI)	P-value
	Poor Frequency (%)	Good Frequency (%)			
Inadequate	91 (52.6)	82 (47.4)	1	1	

Note: AOR; Adjusted Odds Ratio, COR; Crude Odds Ratio, CI; Confidence Interval

In the bivariable logistic analysis among rural kebeles; marital status, wealth index, media exposure, parity, ANC visit, PNC follow up, nutritional counseling during ANC visit and dietary diversity was identified as candidates for multivariable logistic regression. Finally in multivariable logistic regression analysis; having nutritional counseling during ANC and dietary diversity were found to be significantly associated with practice of essential nutrition action messages (ENA).

Mothers who are having nutritional counseling during ANC visit were 65.8% reduced risk of practicing poor essential nutrition action messages (ENA) as compared to counterparts [AOR: 0.342 (0.110-1.063)]. The mothers who are adequate in dietary diversity are 73.3% less likely to practice poor essential nutrition action messages (ENA) as compared to mothers who are inadequate dietary diversity [AOR: 0.267 (0.093- 0.769)]. (Table 6)

Table 6. Bi-Variable and Multivariable Logistic Regression Analysis Determinants Associated with ENA Practices Among Mothers of Children Aged 0-24 Months in Rural Kebeles of Southern Zone, Sidama Region, Ethiopia.

Variable	ENA Practice		COR (95% CI)	AOR (95% CI)	P-value
	Poor Frequency (%)	Good Frequency (%)			
Media exposure					
Yes	35 (76.1)	11 (23.9)	2.9 (1.385- 6.031)	1.38(0.489-3.894)	0.544
No	98 (52.4)	89 (47.6)	1	1	
Wealth Index					
Poor	37(49.3)	38 (50.7)	1.8 (0.982-3.221)	1.57(0.79-3.130)	0.197
Medium	25 (54.3)	21 (45.7)	1.5 (0.725-2.918)	1.16(0.548 - 2.46)	0.699
Rich	71(63.4)	41 (36.6)	1	1	
Parity					
Multi Para	121(60.2)	80 (39.8)	1	1	
Prim Para	12 (37.5)	20 (62.5)	2.5 (1.168-5.441)	1.96 (0.85-4.486)	0.113
PNC follow up					
Yes	63(70.8)	26 (29.2)	0.4 (0.223-.685)	1.38 (0.48-3.949)	0.550
No	70 (48.6)	74 (51.4)	1	1	
Nutritional counseling during ANC					
Yes	55 (77.5)	16 (22.5)	0.3 (0.143-0.51)	0.34 (0.11-1.063)	0.044
No	78 (48.1)	84 (51.9)	1	1	
Dietary diversity					
Adequate	31(83.8)	6 (16.2)	0.2(0.084-0.526)	0.27(0.093-0.769)	0.014
Inadequate	102(52.0)	94 (48.0)	1	1	

Variable	ENA Practice		COR (95% CI)	AOR (95% CI)	P-value
	Poor Frequency (%)	Good Frequency (%)			

Note: AOR; Adjusted Odds Ratio, COR; Crude Odds Ratio, CI; Confidence Interval

5. Discussion

The study's findings indicated that the overall prevalence of poor ENA practices were 50.2% in urban residents and 57.1% in rural residents. This study shows that the prevalence of poor ENA practices was higher in rural residents. This finding was in line with study conducted in Wereilu Wereda, Amhara, Ethiopia which revealed that prevalence of poor ENA practices is 53.5% among rural residents [32] and study conducted in southern Ethiopia the findings shows that prevalence of poor ENA practices is 52.6% among urban residents [3]. This might be due to similarity in socioeconomic status, study population, and study design of the two study population groups.

Our study revealed that parity was significantly associated with practice of essential nutrition action messages (ENA) among urban residents. Being Prim Para mothers were twice more likely to practice poor essential nutrition action messages (ENA) than Multi Para mothers. This finding was consistent with studies conducted in Ethiopia Wereilu woreda have shown that multiparous mothers were more likely to practice good ENA practices than prim para mothers [32]. This could be as parity increased nutritional knowledge of mothers also increased.

According to this study, having nutritional counseling during ANC was significantly associated with practice of essential nutrition action messages (ENA) among rural residents. Mothers who are having nutritional counseling during ANC visit were 65.8% reduced risk of practicing poor essential nutrition action messages (ENA) as compared to counterparts. Similarly finding from another area of Ethiopia shows that ENA practices were observed to be three times more common among mothers who got dietary counseling during ANC than among those who did not [25]. This could be related to nutritional counseling increases awareness or knowledge which leads to practice of essential nutrition action messages (ENA).

Current study revealed that the mothers who are adequate in dietary diversity are 73.3% less likely to practice poor essential nutrition action messages (ENA) as compared to mothers who are inadequate in dietary diversity. A study that was carried out in Dessie town, Amhara region, Ethiopia supports this conclusion [22] and other sides of Ethiopia [35]. This could be because of lack food that is in variety will results or affects the nutritional status of caregivers/mothers and lack or inadequate diversified food affect nutritional status of children because of adequate dietary diversity for children is

crucial for mantling health and promote growth.

6. Conclusion

The prevalence of poor ENA practices among mothers in urban residents and rural residents of Southern zone Sidama region was high. The study shows that the prevalence of poor ENA practices was higher among rural residents than urban residents. Parity, having Nutritional counseling during ANC, and dietary diversity were found to be factors associated with ENA practices. Providing nutritional counseling during antenatal care (ANC) visits will raise awareness about the importance of nutrition during pregnancy. It will also encourage sufficient dietary diversity during pregnancy and lactation. This approach will increase the practice of essential nutrition action messages (ENA).

Abbreviations

ANC	Antenatal Care
CF	Complementary Feeding
EBF	Exclusive Breastfeeding
EDHS	Ethiopia Demographic Health Survey
ENA	Essential Nutrition Actions
IDA	Iron Deficiency Anemia
IYCF	Infant and Young Child Feeding
PNC	Post Natal Care
RUTF	Ready-to-Use Therapeutic Foods
SDG	Sustainable Development Goals
SPSS	Statistical Package for Social Science
UNICEF	United Nation Children Fund
USAID	United States Agency of International Development
VAD	Vitamin A Deficiency
WHO	World Health Organization

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Conflicts of Interest

The authors declare no conflicts of interest.

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