



Knowledge and Attitudes of Key Essential Nutrition Action Messages and Associated Factors among Mothers of Children Aged 6 Months to 2 Years Old in Karat Town, Konso Zone South Ethiopia, 2024. A Community-Based Cross-Sectional Study

Tsehaynew Kasse^{1*}, Addisalem Haile², Zenebe Jebero² and Yalemzer Agegnehu²

¹College of Medicine and Health Sciences, Arba Minch University, P.O. Box; 21, Arba Minch, Ethiopia.

²College of Medicine and Health Sciences, Arba Minch University, P.O. Box; 21, Arba Minch, Ethiopia.

***Corresponding author:** Tsehaynew Kasse, College of Medicine and Health Sciences, Arba Minch University, P.O. Box; 21, Arba Minch, Ethiopia.

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Abstract

Background: Essential nutrition actions (ENAs) are a proven strategy to prevent the “double burden of malnutrition” (underweight and overweight) during the critical first 1,000 days of life. However, limited data exists on the knowledge and attitudes of mothers in urban settings regarding key ENA messages.

Objective: To assess Knowledge and Attitudes of key Essential Nutrition Action messages and associated factors among mothers of children aged 6 months to 2 years old in Karat town, Konso Zone, South Ethiopia, 2024.

Methods: A community-based cross-sectional study was conducted in Karat Town, Ethiopia, from January 15 to February 29, 2024. A total of 421 mothers were selected using stratified simple random sampling. Data were collected using structured, interviewer-administered, and pretested questionnaires. Following coding and entry into Epi-Data 3.1, the data were exported to SPSS 25 for analysis. Logistic regression (bivariate and multivariable) was used to identify factors associated with mothers' knowledge and attitudes toward Essential nutrition action messages. Statistical significance was set at $p < 0.05$ with a 95% confidence interval.

Results: Nearly half (48.1%, 95% CI: 43.28-52.9) of mothers had good knowledge of key ENA messages, while a similar proportion (47.6%, 95% CI: 42.8-52.42) displayed positive attitudes. Several factors were associated with maternal knowledge and attitudes. Higher educational attainment for both mothers and fathers, delivering in a healthcare facility, receiving antenatal care (ANC) nutritional counseling, and utilizing postnatal care (PNC) services were all significantly associated with good maternal knowledge. Similarly, the educational status of the mother, place of delivery, receiving nutritional counseling during ANC, receiving PNC services, and maternal knowledge were found to be significant predictors of positive maternal attitudes.

Conclusion: This study underscores the need for multifaceted interventions to enhance maternal knowledge and attitudes regarding essential nutrition actions (ENAs). Such as implementing targeted educational programs, strengthening postnatal care services, nutritional counseling into routine antenatal care, and promoting institutional deliveries.

Keywords: Essential nutrition actions; Knowledge; Attitude; Mothers; Urban Ethiopia

Introduction

Proper nutrition is essential for survival, growth, development, and overall health at every stage of life while specific nutritional requirements vary based on age, gender, and physiological changes. The first 1000 days, from conception to a child's second birthday, are especially critical, as it lays the foundation for a child's physical and mental development, impacting their health and well-being for the rest of their life (1-3). Despite notable progress in reducing global undernutrition between 2000 and 2022 (with stunting prevalence in children under five decreasing from 32.5% to 22.3%), significant challenges persist. According to the World Health Organization (WHO), as of 2023, 52 million children suffer from wasting, including 17 million severely wasted, alongside 155 million stunted, and 41 million overweight or obese children under the age of five. These conditions contribute to 45% (2.7 million deaths) of all deaths within this age group (4). Unfortunately, the critical window of opportunity period often goes unrecognized, particularly in low- and middle-income countries (LMICs), where malnutrition rates are highest, leading to substantial child morbidity and mortality (3). Studies have underscored that malnutrition during this pivotal period accounts for 10% of the global disease burden and over 30% of childhood deaths. Consequently, millions of children worldwide fail to attain their full potential due to insufficient nutrition during their early years (5). More than 17 million children are unable to achieve their developmental potential due to inadequate nutrition in the initial months of life (6, 7).

Ethiopia faces a significant challenge with childhood malnutrition; nearly 37% of children under five are stunted, indicating chronic malnutrition. Additionally, 7.2% of children under five are wasted, reflecting acute malnutrition (8). Maternal nutrition during pregnancy is crucial for child health, adequate maternal nutrition reduces the risk of small for gestational age babies and increases average birth weight. However, nearly 27% of pregnant women in Ethiopia are malnourished (9). Poor infant and young child feeding practices (IYCF) are major contributors to malnutrition, globally as inadequate IYCF is linked to 40% of child deaths (10-12). In Ethiopia, only 59% of infants under six months are exclusively breastfed, and only 14% met the minimum dietary diversity (50%) goal set by WHO (8). Micronutrient deficiencies further worsen malnutrition in Ethiopia. Iron deficiency anemia is highly prevalent, affecting over 57% of children under five children and 40% of women of reproductive age (13). Vitamin A deficiency is also a concern, with over 33% of children under two and 29% of pregnant women experiencing deficiency (14, 15). Iodine deficiency impacting over 39.9% of children, with only 37% of households using adequately iodized salt is the other burning burden (16, 17).

The consequences of undernutrition in early childhood are severe and often irreversible; chronically malnourished children are more likely to become stunted adults and give birth to low birth-weight babies (6). To address the nutritional needs during

this critical phase, Essential Nutrition Actions (ENA) offers a holistic approach, if implemented properly it can reduce 25% of nutrition-related mortality and morbidity. It incorporates seven messages such as exclusive breastfeeding (EBF), complementary feeding, and nutritional care of sick children, nutrition for women during pregnancy and lactation, prevention of vitamin A deficiency, prevention of anemia, and prevention of iodine deficiency. Moreover, ENA focus on integrating different nutritional interventions within commonly available health facilities, to enhance the quality of nutritional services and to achieve positive changes in family-based feeding and caring behaviors (18, 19).

To address malnutrition in children, there has been a shift in focus towards improving maternal nutrition knowledge and health-seeking behaviors. Studies have shown that mothers who enhance their nutritional knowledge have children with better nutritional outcomes (20-22). Additionally, the nutritional status of a child can significantly improve when the mother or caregiver's knowledge and attitude are enhanced (23).

There is a lack of information regarding the knowledge and attitudes of mothers towards key Essential Nutrition Actions (ENA) messages in urban settings in Ethiopia. The existing research predominantly focuses on rural settings. Therefore, this study aimed to address this gap by assessing knowledge and attitudes of key essential nutrition action messages and their associated factors among mothers of children aged 6 months to 2 years old in Karat town, Konso, Zone South Ethiopia, 2024.

Methods and Materials

Study setting and period

The study was conducted in Karat town, the capital of Konso Zone, South Ethiopia. Located approximately 607.2 kilometers from Addis Ababa, Karat has a total population of 42,546, with females comprising slightly more than half (21,613) and males numbering 20,933. As per the town's statistics office report, there are 1,494 mothers with children aged 6 months to 2 years residing in 8,676 households. The town's healthcare system consists of one primary hospital, one health center, and seven health posts distributed across seven administrative units (kebeles): Garisale, Dokatu, Dara Paleta, Karate, Nalaya Segen, Etigele, and Gamole [Figure 1]. Data were collected from January 15 and February 29, 2024.

Study design

A community-based cross-sectional study was conducted

Source population

All mothers of children aged from 6 months to 2 years old in Karat town.

Study population

All mothers of children aged from 6 months to 2 years old in Karat town who fulfilled the inclusion criteria.

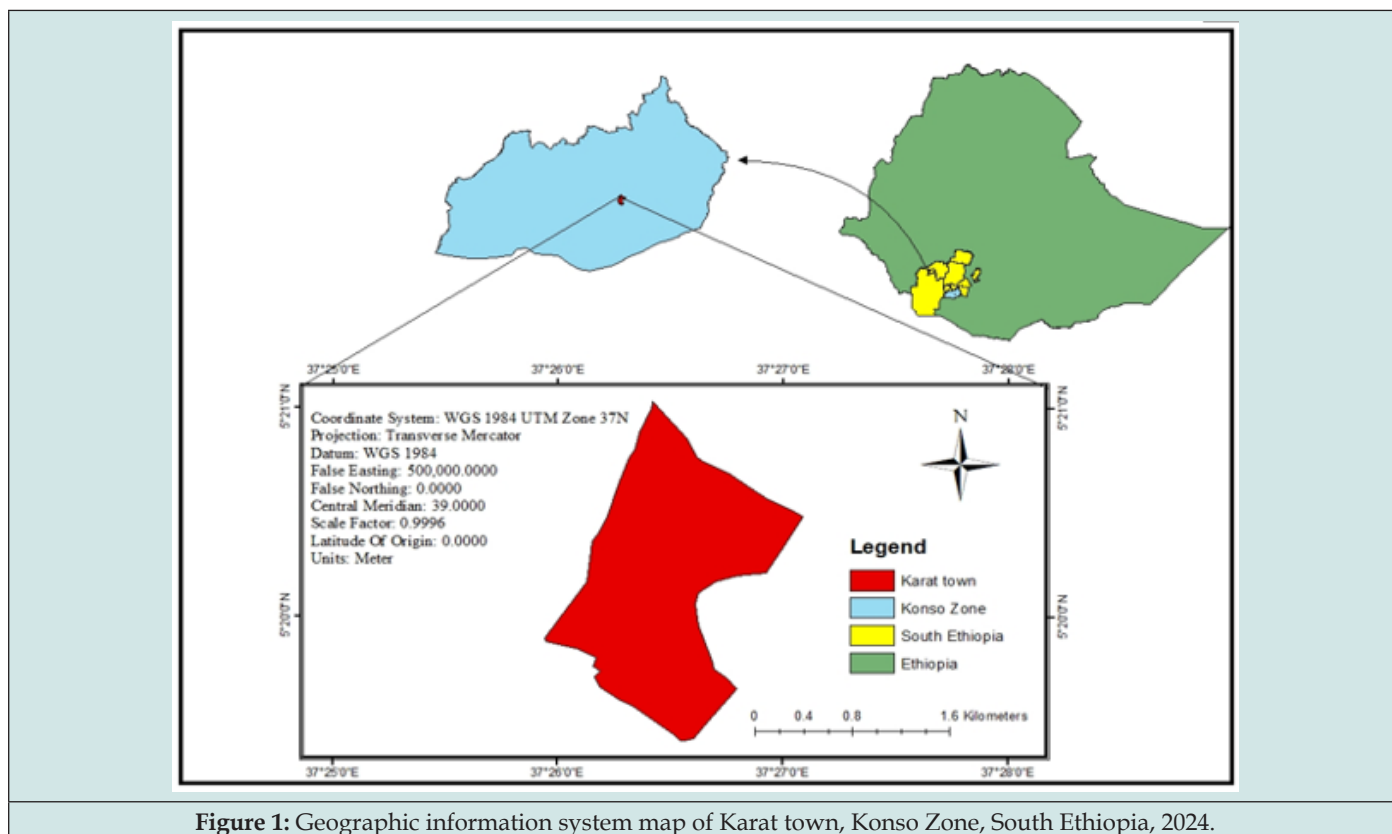


Figure 1: Geographic information system map of Karat town, Konso Zone, South Ethiopia, 2024.

Eligibility criteria

Inclusion criteria

All mothers who have children aged between 6 months to 2 years old and have lived in Karat town for more than six months were included in the study.

Exclusion criteria

Mothers who were unable to respond or were severely ill (due to different problems) were excluded from the study.

Sample size determination

The sample size for the study was determined using the single population proportion formula. Assuming a 95% confidence interval (CI) with a margin of error (d) of 5%, and considering a 10% non-response rate, the prevalence of good knowledge regarding key essential nutrition action messages among mothers in Lemo District, Southern Ethiopia, was found to be 53.8%. This yielded a larger sample size than that required for attitude (24), a 10% non-response rate, and the final sample size was found to be 421.

Sampling technique and procedure

A stratified random sampling technique was employed to select mothers with children aged 6 to 24 months. The sample

size was proportionally allocated to each kebele based on the total number of mothers with children aged 6 months to 2 years. The total number of mothers with children in the target age range (N) was determined (1,494). The desired final sample size (n) was chosen 421. A proportional allocation factor (Nh) was calculated (n / N). This factor (0.282) was multiplied by the number of mothers in each kebele (n_i) to determine the sample size allocated to each kebele (nh). To select the required sample, in each kebele, a computer-generated random number was used from the family folders registry, which was obtained from the health extension workers [Figure 2].

Data collection tools and procedures

The data for this study were collected using a structured, pretested interviewer-administered questionnaire that was adapted from previous research, participants' wealth status was evaluated using a tool consisting of 37 items adapted from the Ethiopian Demographic and Health Survey (EDHS) (24-26). The questionnaire was divided into different sections, covering socio-demographic and economic factors (Section 1), maternal health service utilization (Section 2), mothers' knowledge of essential nutrition actions, and Section (3), mothers' attitudes to essential nutrition actions, (ENAs). Four data collectors with nursing diplomas and experience in data collection were recruited for the study. Two nurses with Bachelor of Science degrees supervised the

data collection process. To ensure data quality and consistency, all data collectors and supervisors underwent a one-day training session. The training covered the study objectives, participant

confidentiality, data collection tools, and proper interviewing techniques.

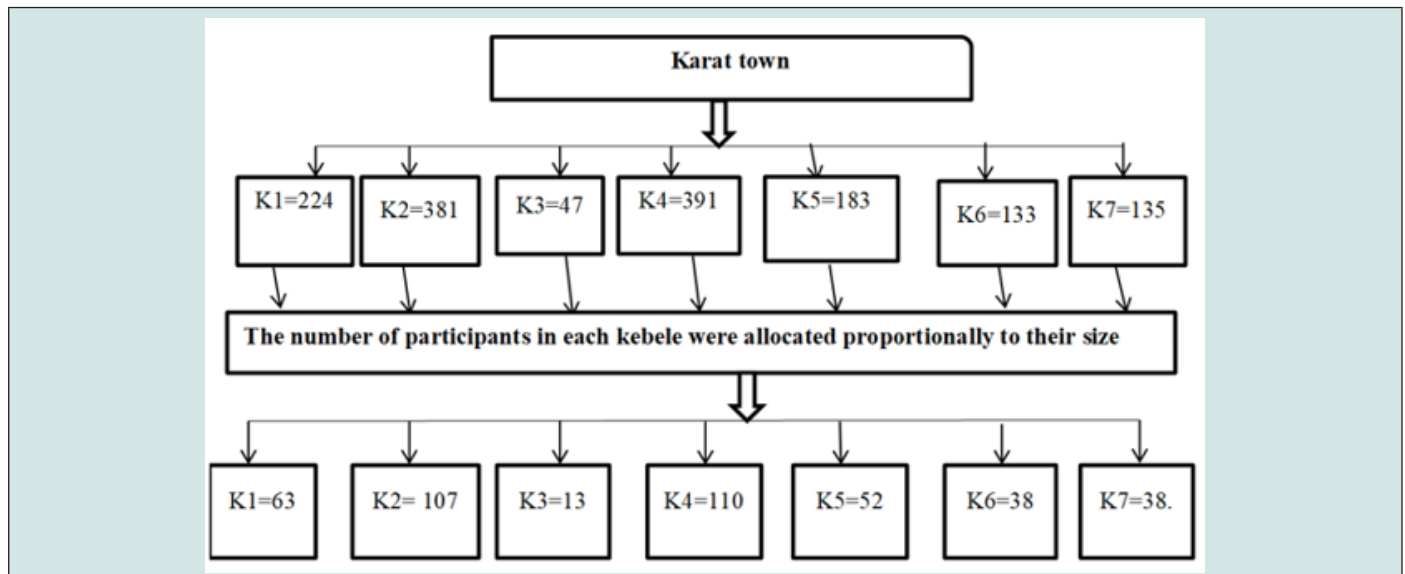


Figure 2: Schematic presentation of the sampling procedure for Knowledge and Attitudes of key essential nutrition action messages and its associated factors among mothers of children aged 6 months to 2 years old in Karat Town, Konso Zone, South, Ethiopia, 2024. The sampling involved seven kebeles, K1= Garisale Kebele, K2= Dokatu Kebele, K3= Dara paleta Kebele, K4= Karate Kebele, K5= Nalaya Segen Kebele, K6= Etigele kebele, and K7= Gamole Kebele.

Data quality control

To declare the quality, first, the questionnaire was prepared in English, then translated into Amharic and Konsogna language (local language), and then back to the English version. Appropriately designed and validated data collection tools were used, and data collectors and supervisors got one day of intensive training on data collection methods and procedures. A pre-test was made on 5% of the sample size at the Karat Zuria woreda Fasha kebele one week before the data collection period, and any ambiguity, confusion, and difficulty words were revised, the appropriateness of the tool based on the pretest experience. Supervisors and investigators closely oversee the data collection processes daily. Investigators checked the collected data for consistency, and completeness daily during the whole data collection period. Study participants were interviewed in private to reduce social desirability bias. To minimize the likelihood of recall bias, respondents were given as much time as they needed for a recall.

Operational definition

Knowledge of key ENA messages: A total of 28 items were used to assess the knowledge regarding ENAs and assessment questions were formed as ‘1 = correct response’ and ‘0 = incorrect response, and women who attained at least the mean score for the ENA knowledge assessment questions was labeled as having good knowledge, while those who did not will be labeled as poor knowledge (24, 26).

Attitudes of key ENA messages: A set of 18 items was used to evaluate attitudes using the Likert scale. Each item is assigned a score ranging from 1 to 3, where 1 indicates “not good,” 2 represents uncertainty or “not sure,” and 3 signifies “good.” Mothers who achieved a score equal to or higher than the mean score for the ENA attitude assessment questions were categorized as having a good attitude, while those who fell below the mean score were classified as having a poor attitude (26).

Wealth index: It is a composite measure of a household’s cumulative living standard. Based on the net score, the wealth status of respondents was classified into three poor, medium, and rich (24).

Data processing and analysis

After data collection, a thorough check for completeness was conducted, followed by manual coding before entry. Subsequently, the data were inputted into epi data version 3.1 statistical software and then exported to SPSS version 25 for analysis. The wealth index was derived through principal component analysis, the Keiser -Mayer Olkin measure of sample adequacy (≥0.6) used to check the PCA assumption, anti-image correlations (> 0.4), and the Bartlett Sphericity Test (p-value < 0.05)). Descriptive statistics and binary logistic regression analysis were done to analyze data. A Hosmer-Lemeshow test was used to test for model fitness, and a Multi co-linearity test was carried out to see the correlation between independent variables using variance inflation factors. Variables

with a P-value < 0.25 in bivariate analysis were entered into multivariable analysis to control the confounding effect of other variables. The descriptive results were presented as proportion through tables, text, and graphs, the output of logistic regression,

as COR to show the strength of association between independent variables and dependent variables. The adjusted odds ratio (AOR) with their respective 95% confidence interval (CI) was used and statistical significance was declared at P-values < 0.05.

Result

Socio-demographic characteristics

Table 1: Socio-demographic characteristics of mothers of children aged 6-24 months old in Karat town, Konso, Zone, South, and Ethiopia, 2024.

Variable	Category	Frequency	Percentage
Age of the mother	<20	28	6.7
	20-24	170	40.7
	25- 29	138	33
	30-34	57	13.6
	35	25	6
Religion	Protestant	288	68.9
	Orthodox	76	18.2
	Muslim	32	7.7
	Catholic	22	5.3
Marital status	Married	375	89.7
	Single	16	3.8
	Windowed	14	3.3
	Divorced	13	3.1
Ethnicity	Konso	302	72.2
	Wolita	55	13.2
	Oromo	33	7.9
	Amhara	28	6.7
Educational status of a mother	No formal education	177	42.3
	Primary education	129	30.9
	Secondary	61	14.6
	Above secondary	51	12.2
Mothers' occupation	Housewife	250	59.8
	Government employee	66	15.8
	Daily labor	16	3.8
	Merchant	22	5.3
	Private employee	64	15.3
Husband Education	No formal education	155	37.1
	Primary Education	123	29.4
	Secondary	81	19.4
	Above secondary	59	14.1
Family size	<4	114	27.3
	5-Apr	225	53.8
	8-Jun	63	15.1
	9	16	3.8

Age of the child	8-Jun	98	23.4
	11-Sep	191	45.7
	24-Dec	129	30.9
Sex of the child	Male	239	57.2
	Female	179	42.8
Household wealth index	Poor	139	33.3
	Medium	140	33.5
	Rich	139	33.3

This study included a total of 418 mothers of children aged 6-24 months, resulting in a response rate of 99.3%. The mean age of the mothers was 25.66 years (± 4.93), with a 95% confidence interval of 25.19-26.13. 40.7% of them fell within the age range of 20-24 years. The mean age of the children was 11.28 months (± 3.9), with a 95% confidence interval of 10.91-11.65. Most of the respondents were married (89.7%), and 68.9% identified as followers of the Protestant Christian religion. Furthermore, 53.8% had a family size of four to five, and 42.3% did not have formal education [Table 1].

Maternal and child health-related information of participants

Among the study participants, more than half (63.2%) were multiparous, and the majority (82.5%) delivered their child to a healthcare facility. Furthermore, 65.3% of mothers received at least one postnatal service, and 59.1% of participants received nutritional counseling during antenatal care (ANC) [Table 2].

Table 2: Maternal and child health-related information of mothers of children aged 6-24 months old in Karat town, Konso, Zone, South, and Ethiopia, 2024.

Variable	Category	Frequency	Percent
Parity	Prim para	154	36.8
	Multi para	264	63.2
Place of delivery	Home	73	17.5
	Health institution	345	82.5
Having Nutritional counseling during ANC	No	171	40.9
	Yes	247	59.1
Having PNC service	No	145	34.7
	Yes	273	65.3

Maternal knowledge of key ENA messages

Nearly half (48.1%, 95% CI: 43.28-52.9) of mothers demonstrated good knowledge. Specifically, Most of the (83.7%) mothers exhibited a strong understanding of preventing vitamin A deficiency, while 60.8% knew about preventing iron deficiency anemia. However, only 41.1% of mothers were knowledgeable about exclusive breastfeeding (Figure 3).

Attitudes of the mother toward key ENA messages

In this study, 47.6 % (95%CI: 42.8-52.42) of mothers had a good attitude regarding key essential nutrition action messages (Figure 4). Factors associated with knowledge of Mothers towards key ENA messages. In the bivariable analysis, factors such as mother’s education, husband’s education, number of family members, age and sex of the child, household wealth status, place of delivery,

receiving nutritional counseling during antenatal care (ANC), and receiving postnatal care (PNC) services were statistically significant at a P-value less than 0.25. However, in the multivariable analysis, the educational status of the mother and father, place of delivery, receiving nutritional counseling during ANC, and receiving PNC services were found to be statistically significant at $P < 0.05$. The odds of good maternal knowledge were nearly five times higher [Adjusted odds ratio (AOR) 4.58; 95% CI (1.96-10.7)] and six times higher [AOR 5.9; 95% CI (2.3-14.8)] in mothers who attended secondary and above secondary school, respectively, compared to those with no formal education. Additionally, the educational status of husbands was found to influence maternal knowledge. The odds of maternal knowledge were four times higher [AOR 3.93; 95% CI (1.86-8.3)] and five times higher [AOR 4.65; 95% CI (1.95-11)] when husbands attended secondary and above secondary

education, respectively. Compared to mothers who delivered at home, those who delivered in a health institution had three times higher odds of knowledge [AOR 3.1; 95% CI (1.6-6.2)]. Mothers who received nutritional counseling during antenatal care were three times more likely to have good knowledge [AOR 3.1; 95% CI

(1.8-5.2)] than those who did not receive counseling. Furthermore, mothers who received PNC services were two times more likely to have good knowledge than those who did not receive [AOR 2.3; 95% CI (1.3-4)] [Table 3].

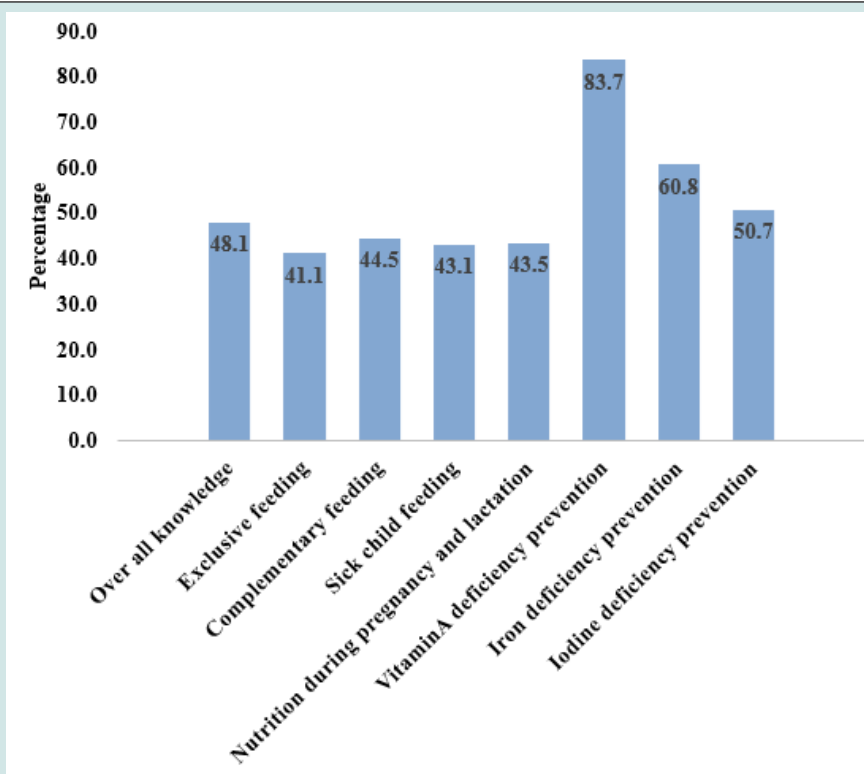


Figure 3: Good knowledge of mothers of children aged 6-24 months old towards each key ENA message in Karat town, Konso, Zone, South, and Ethiopia, 2024.

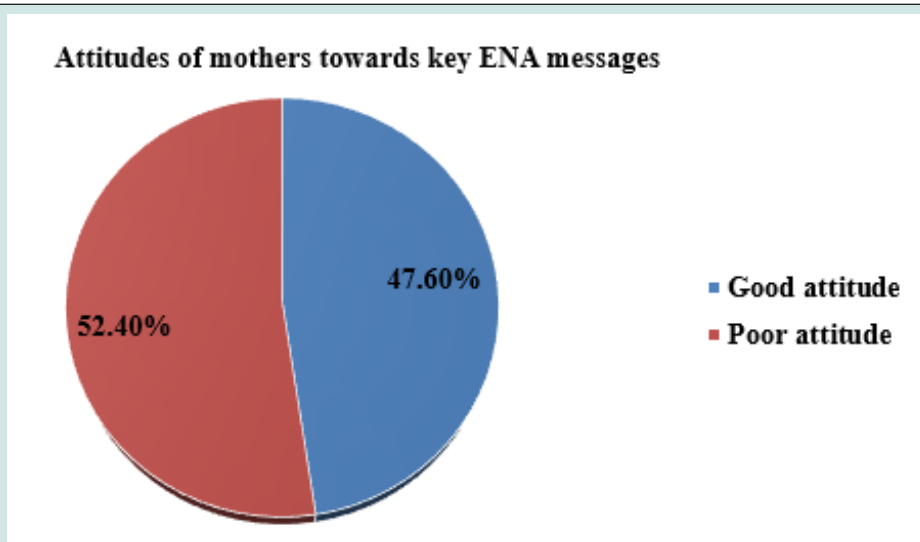


Figure 4: Attitudes of mothers of children aged 6-24 months old towards key essential nutrition action messages in Karat town, Konso, Zone, South, and Ethiopia, 2024.

Table 3: Factors associated with knowledge of key essential nutrition action messages among mothers of children aged 6–24 months old in Karat town, Konso, Zone, South, and Ethiopia, 2024.

Variable	Categories	Mothers' knowledge		COR(95% CI)	AOR= (95% CI)	P-Value
		Good (%)	Poor (%)			
Educational status of a mother	No formal education	64(31.8%)	113(52.1%)	1	1	
	Primary	50(24.9%)	79(36.4%)	1.12(0.7- 1.79)	1.005(0.54-1.86)	0.99
	Secondary	48(23.9%)	13(6%)	6.52(3.3-12.9)	4.58(1.96-10.7)**	<0.01
	Above secondary	39(19.4%)	12(5.5%)	5.74(2.8-11.7)	5.9(2.3-14.8)**	<0.01
Husbands' educational status	No formal education	57(36.8%)	98(63.2%)	1	1	
	Primary	52(42.3%)	71(57.7%)	1.26(0.78-2.04)	1.2(0.63-2.29)	0.58
	Secondary	57(70.4%)	24(29.6%)	4.08(2.3-7.3)	3.93(1.86-8.3)**	0
	Above secondary	35(59.3%)	24(40.7%)	2.5(1.4-4.6)	4.65(1.95-11)**	<0.01
Family size	<4	45(39.5%)	69(60.5%)	1.44(0.47-4.4)	1.2(0.23-6.1)	0.83
	5-Apr	119(52.9%)	106(47.1%)	2.5(0.83-7.3)	2.1(0.4-10.5)	0.35
	8-Jun	32(50.8%)	31(49.2%)	2.3(0.71-7.3)	2.9(0.6-15.9)	0.21
	9+	5(31.3%)	11(68.8%)	1	1	
Age of the child	8-Jun	32(32.7%)	66(67.3%)	0.44(0.25-7.5)	0.55(0.3-1.1)	0.09
	11-Sep	101(52.9%)	90(47.1%)	1.01(0.64-1.6)	1.2(0.7-2.04)	0.61
	24-Dec	68(52.7%)	61(47.3%)	1	1	
Sex of the child	Male	134(66.7%)	105(48.4%)	2.1(1.44-3.2)	0.65(0.48-1.1)	0.1
	Female	67(33.3%)	112(51.6%)	1	1	
Household wealth index	Poor	59(42.4%)	80(57.6%)	1	1	
	Medium	84(60%)	56(40%)	2.03(1.26-3.3)	1.6(0.9-3.1)	0.12
	Rich	58(41.7%)	81(58.3%)	0.97(0.6-1.6)	1.1(0.6-2.1)	0.72
Place of delivery	Home	20(27.4%)	53(72.6%)	1	1	
	Health institutions	181 (52.5%)	164(42.5%)	2.93(1.77-5.1)	3.1(1.6-6.2)**	<0.01
Having Nutritional counseling during ANC	Yes	158(64%)	89(36%)	5.29(3.43-8.1)	3.1(1.8-5.2)**	<0.01
	No	43(25.1%)	128(74.9%)	1	1	
Having PNC service	Yes	165(60.4%)	108(39.6%)	4.63(2.96-7.24)	2.3(1.3-4)*	<0.01
	No	36(24.8%)	109(75.2%)	1	1	0.041

Note: *p<0.05, **p<0.01

Factors associated with Attitudes of Mothers towards key ENA messages

In the bivariable analysis, factors such as mother's education, husband's education, place of delivery, receiving nutritional counseling during antenatal care (ANC), receiving postnatal care (PNC) services, and maternal knowledge were statistically significant at a P-value less than 0.25. However, in the multivariable analysis, the educational status of the mother, place of delivery, receiving nutritional counseling during ANC, receiving PNC services, and maternal knowledge were found to be statistically significant at P < 0.05. The odds of good maternal attitude were three times higher [Adjusted odds ratio (AOR) 3.3; 95% CI (1.65-

6.4)] and four times higher [AOR 4.3; 95% CI (2.0-8.9)] in mothers who attended secondary and above secondary school, respectively, compared to those with no formal education. Compared to mothers who delivered at home, those who delivered in a health institution had three times higher odds of good attitudes [AOR 2.5; 95% CI (1.4-4.6)]. Mothers who received nutritional counseling during ANC were three times more likely to have a good attitude [AOR 2.7; 95% CI (1.7-4.4)] than those who did not receive counseling. Mothers who received PNC services were two times more likely to have good knowledge than those who did not receive [AOR 2.1; 95% CI (1.3-3.4)]. Furthermore, mothers who had good knowledge were 1.75 times more likely [AOR 1.75; 95% CI (1.006-3.03)] to have a good attitude than their counterparts [Table 4].

Table 4: Factors associated with Attitudes of Mothers towards key essential nutrition action messages among mothers of children aged 6–24 months old in Karat town, Konso, Zone, South, Ethiopia, 2024.

Variable	Categories	Mothers Attitude		COR (95% CI)	AOR= (95% CI)	P-Value
		Good (%)	Poor (%)			
Educational status of a mother	No formal education	57(28.6%)	120(54.8%)	1	1	
	Primary	60(30.2%)	69(31.5%)	1.8 (1.2-2.9)	1.5 (0.91-2.5)	0.11
	Secondary	44(22.1%)	17(7.8%)	5.5 (2.9-10.4)	3.3 (1.65-6.4)*	0.001
	Above secondary	38(19.1%)	13(5.9%)	6.2(3.0-12.5)	4.3 (2.0-8.9)**	<0.01
Husbands' educational status	No formal education	59(29.6%)	96(43.8%)	1	1	
	Primary	61(30.7%)	62(28.3%)	1.6 (0.99-2.59)	1.3(0.63-2.29)	0.37
	Secondary	44(22.1%)	37(16.9%)	1.9 (1.12-3.3)	1.58(0.86-2.9)	0.144
	Above secondary	35(17.6%)	24(11%)	2.4(1.3-4.4)	1.8(0.9-3.7)	0.96
Place of delivery	Home	20(10.1%)	53(24.2%)	1	1	
	Health institutions	179(89.9%)	166(75.8%)	2.9(1.6-4.98)	2.5(1.4-4.6)**	<0.01
Having Nutritional counseling during ANC	Yes	150(75.4%)	97(44.3%)	3.9(2.5-5.9)	2.7(1.7-4.4)**	<0.01
	No	49(24.6%)	122(55.7%)	1	1	
Having PNC service	Yes	157(78.9%)	116(53%)	3.3(2.2-5.1)	2.1(1.3-3.4)**	<0.01
	No	42(21.1%)	103(47%)	1	1	
Knowledge of the mother	Good	157(78.9%)	90(41.1%)	4.26(2.7-6.65)	1.75(1.006-3.03)*	0.048
	Poor	42(21.1%)	129(58.9%)	1	1	

Note: *p<0.05, **p<0.01

Discussion

The findings from this study revealed that 48.1% [95%CI: 43.28-52.9] of mothers had good knowledge regarding key essential nutrition action, factors such as the educational status of the mother and father, place of delivery, receiving nutritional counseling during ANC, and receiving PNC services were found to significantly affect maternal knowledge. 47.6% [95%CI: 42.8-52.42] of mothers had had good attitude regarding key essential nutrition actions, factors such as the educational status of the mother, place of delivery, receiving nutritional counseling during ANC, receiving PNC services, and maternal knowledge were found to be significantly affect maternal attitudes. The prevalence of good maternal knowledge of essential nutrition actions (ENAs) in this study was higher than what was reported in previous studies conducted in Southeast Ethiopia (27), and Bahir Dar, Northern Ethiopia (28). These variations may be attributed, at least in part, to differences in the study settings. Notably, the aforementioned studies' participants were majorly daily laborers, who in our nation are less educated and far from information and education on nutritional messaging.

However, it was found to be lower than those reported in studies conducted in other regions of Ethiopia, including Southern Ethiopia

(24), Northeast Ethiopia (29), and Southwest Ethiopia (30). This discrepancy could be due to several factors, such as variations in socio-economic characteristics of the study populations, and the level of involvement and commitment of health extension workers. The prevalence of good maternal attitude towards ENA was found to be higher as compared to a study conducted in Southeast Ethiopia (27), and China (31). These variations might be due to a combination of factors, including differences in the study settings, and socio-economic and socio-demographic characteristics of the participants. However, it was found to be lower compared to studies conducted in Northeast Ethiopia (19) and Southwest Ethiopia (30).

This discrepancy could be explained by several factors, such as variations in the sampling methods employed and potential differences in the socio-demographic characteristics of the study participants. Regarding factors associated with knowledge about key ENA messages, mothers with secondary or higher education were more likely to demonstrate good knowledge compared to those with no formal education. These findings align with previous studies conducted in Northern (19), Southern Ethiopia (28), and China (31). The possible reason for this association could be higher education mothers may have greater access to nutrition-related information and a better understanding of the associated

health benefits for their children. Mothers with husbands who had higher levels of education were more likely to demonstrate good knowledge. This is in agreement with studies conducted in Bangladesh (32) and Vietnam (33). A possible explanation is that educated husbands may be more likely to actively promote family health through better nutrition and encourage their wives to seek out and understand health and nutrition-related information.

The odds of maternal knowledge were higher among those who gave birth in health institutions compared to their counterparts. This finding is consistent with studies conducted in Northern Ethiopia (19). A possible explanation could be that health institutions offer greater access to healthcare professionals, nutritional educational materials, and peer support opportunities. Additionally having nutritional counseling during antenatal care increases the likelihood of maternal knowledge. This finding is supported by studies conducted in Harari (34), and Addis Ababa Ethiopia (35). The reason could be nutritional counseling provides target information and promotes education and awareness on maternal child health and nutrition. Furthermore, the odds of knowledge increased among mothers who received postnatal care services more than those who did not. This is in agreement with a study conducted in Northeast Ethiopia (19). The possible justification might be receiving postnatal services allows mothers to have access to professional guidance, education, peer support, and continuous monitoring. The odds of Attitudes towards essential nutrition action increased among mothers with higher education than those with no formal education. This finding is congruent with a study conducted in Bangladesh (36). The possible justification could be mothers with higher educational levels are more likely to have better access to information through formal education and awareness campaigns.

Mothers who deliver in health institutions increase the odds of maternal attitudes than mothers who deliver at home. this finding is in agreement with a study conducted in Northeast Ethiopia (19). The reason behind this is due to mothers who deliver in health institutions have improved access to skilled healthcare providers, antenatal care services, postnatal support, and nutrition education programs. The likelihood of maternal attitudes was also found to increase among the mothers who receive nutritional counseling during ANC than their counterparts, which is supported by study conducted in Addis Ababa Ethiopia (35). A possible justification could be nutritional counseling increased awareness and positive reinforcement of the importance of nutrition during pregnancy and childhood. helps solidify positive attitudes. Additionally having a postnatal care service was found to increase the likelihood of maternal attitudes which is in agreement with a study conducted in Northeast Ethiopia (19). The possible reason could be a mother who receives it, could get education from health professionals regarding infant and young child feeding, which will adapt to a positive behavioral change. Furthermore, having good knowledge regarding key ENA messages increases the odds of maternal attitudes which was found to be supported by a study conducted

in Northeast Ethiopia (19). The possible explanation could be that good maternal knowledge is a fundamental determinant in shaping behavior through enhancing awareness, perception of risks, and empowering women.

Strengths and limitations of the study

Strengths: The study's strengths lie in its focus on key ENA messages tailored specifically for mothers residing in urban areas, rather than solely focusing on rural settings. Additionally, the study's ability to offer an accurate snapshot of maternal knowledge and attitude within this population without requiring long-term follow-up.

Limitations: The cross-sectional nature of this study makes causal relationships between dependent and independent variables impossible. Since the study was based on self-reports, the respondents might be prone to social desirability bias. Finally, because women were asked about incidents that had already occurred before the study period, there may be a risk of recall bias.

Conclusion and recommendation

This study identified a need for improvement in mothers' knowledge and attitudes regarding essential nutrition actions (ENAs) in Karat town. Several factors were significantly associated with both knowledge and attitudes, including mothers' and fathers' educational attainment, place of delivery, receipt of antenatal care (ANC) nutritional counseling, and utilization of postnatal care (PNC) services. To enhance improvements in maternal knowledge and attitudes, the Karat Town Health Office administrative body should prioritize education programs for mothers with lower education levels, enhance postnatal care services, provide training for healthcare providers on delivering consistent nutritional counseling, and promote institutional deliveries. Health professionals should receive training on incorporating nutritional counseling into routine antenatal and postnatal care and encourage institutional deliveries through counseling mothers.

Abbreviations

AOR: Adjusted Odds Ratio; ANC: Antenatal Care; CI: Confidence Interval; COR: Crude Odds Ratio; EDHS: Ethiopian Demographic Health survey; ENA: Essential Nutrition Action; IYCF: Infant Young Child Feeding; MCH: Maternal and Child Health; PNC: Postnatal Care; WHO: World Health Organization

Declarations

Ethics approval and consent to participate

Ethical consideration

Ethical clearance was obtained from the institution's research ethics review board of Arbaminch University (protocol No. 23113/2023) for this non-clinical trial study. In addition, permission was obtained from the Karat town health office and each kebeles administration. Before the data collection, written informed consent was obtained from the study participants

and the right to withdraw from the interview was assured. The information obtained from the respondents was kept confidential and anonymous.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

All authors (TK, AH, ZJ, and YA) equally contributed to the conception of the research problem, initiated the research, wrote the research proposal, conducted the research, made data entry, analysis, and interpretation, and wrote and reviewed the final manuscript. All authors read and approved the final manuscript.

Authors information

Tsehaynew Kasse: MSc in Pediatrics and Child Health Nursing, School of Nursing, College of Medicine and Health Science, Arba Minch University.

Addisalem Haile: MSc in Maternity and Reproductive Health Nursing, School of Nursing, College of Medicine and Health Science, Arba Minch University.

Zenebe Jebero: MSc in Pediatrics and Child Health Nursing, School of Nursing, College of Medicine and Health Science, Arba Minch University.

Yalemzer Agegnehu: MPH in Health Promotion and Behavioral Science, School of Public Health, College of Medicine and Health Science, Arba Minch University.

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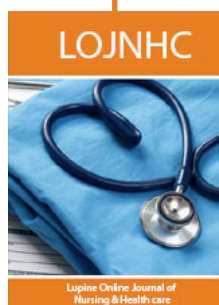
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