

Research Article

Complementary Feeding Practice and Associated Factors among Mothers Having Children 6–23 Months of Age, Lasta District, Amhara Region, Northeast Ethiopia

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Introduction. The first two years of life are a critical window of opportunity for ensuring optimal child growth and development. Nutritional deficiencies during this period can lead to impaired cognitive development, compromised educational achievement, and low economic productivity. Improving infant and young child feeding (IYCF) practices in children aged 0–23 months is therefore critical to improved nutrition, health, and development. **Objective.** The aim of the study is to assess the prevalence of complementary feeding practice and its associated factors among mothers with children aged 6–23 months in Lasta District, Northeast Ethiopia, 2015. **Methods.** A community based cross-sectional study design was conducted among 476 mothers who had children aged 6–23 months in the study area. Simple random sampling technique was used to select the required sample. A face-to-face interview was done to collect data using structured questionnaire. Data were entered with EPI info version 3.5.1 and cleaning and analysis were done using SPSS version 16. Frequencies distribution and binary and multiple logistic regressions were done. **Results.** In this study only 56.5% of children aged 6–23 months received appropriate complementary feeding, considering timely introduction, minimum dietary diversity, and meal frequency. Exposure to public media [AOR = 2.50; 95% CI: 1.44, 4.35], occupation of mother [AOR = 9.50; 95% CI: 1.02, 14.25], mothers decision making role on how to use family income [AOR = 5.54; 95% CI: 1.19, 11.74], and use of postnatal care service [AOR = 5.98; 95% CI: 1.49, 13.96] were found to be independent predictors of complementary feeding practice. **Conclusion and Recommendation.** About 43.5% of mothers were not feeding their children complementary food appropriately, which would have negative implication on the health of infants and young children. There was a statistically significant association of inappropriate complementary feeding practices with mothers' occupation, postnatal care service, media exposure, and mothers' decision making role on how the money is used. Health professionals should focus on advising and counseling mothers on appropriate complementary feeding during prenatal, delivery, postnatal, and immunization services.

1. Introduction

An appropriate diet is a critical component for proper growth and development of children. The first two years of life are a critical window for ensuring optimal child growth and development [1, 2]. Nutritional deficiencies during this period can lead to impaired cognitive development, compromised educational achievement, and low economic productivity which become difficult to reverse later in life. Improving infant and young child feeding (IYCF) practices in children

aged 0–23 months is therefore critical to improved nutrition, health, and development [3–5].

Scientific evidence indicates that various inappropriate complementary feeding practices such as untimely introduction of complementary food, improper feeding frequency, and low dietary diversity of complementary food have been shown to have numerous negative effects on children's health [6]. Appropriate complementary feeding entails introduction of complementary foods at 6 months with continued breastfeeding up to at least 2 years and beyond, feeding frequency

for age, and consumption of a diverse diet [2, 5, 6]. For this study the following definitions were considered: introduction of solid, semisolid, or soft foods and proportion of infants aged six months who receive solid, semisolid, or soft foods during the previous day. Minimum dietary diversity was assessed by proportion of children of 6–23 months who receive four or more food groups during the previous day. Food groups used for tabulation of this indicator were cereals, legumes, dairy products (milk, yoghurt, and cheese), flesh foods (meat, fish, poultry, and liver/organ meats), eggs, vitamin A-rich fruits and vegetables, butter/oil, and sugar/honey. Minimum meal frequency was assessed by proportion of children aged 6–23 months who receive solid, semisolid, or soft food three times or more in the previous day. Complementary feeding practice was considered appropriate if the mother practices all the above three indicators, as recommended and inappropriate complementary feeding practice if at least one indicator was not fulfilled.

2. Methods

2.1. Study Area. Community based cross-sectional study design was used to determine complementary feeding practices of children aged 6–23 months in Lasta District, Amhara Region, Ethiopia. Lasta District is found in North Wollo zone 300 km away from Bahir Dar town which is the capital city of the region and the district has a total population size of 115,880 people of which 56,781 females (49%), 15,690 children of 0–59 months (13%), 5,852 <2 years (5%), 4165 6–23 months (district health office report 2015). The district has 24 health posts and 6 HCs. It is the fourth largest district in North Wollo zone and ranked among the most food insecure districts in the region (Lasta Woreda Health Office Data 2015). And the woreda has exposed for drought and degraded land. The main economic activities are small scale trading and farming (CSA, 2013). The area was chosen because most of the children were likely to be predisposed to suboptimal complementary feeding practices due to unknown factors that cause improper complementary feeding practices.

The district has 23 rural kebeles and of these 5 such as Yemrehanna-kristos, Bilballa, Geter Meda, Tilasefere, and Shimsha kebeles (21%) were selected randomly based on the rule of thumb for community based research. The lists of all study participants (mothers) were obtained from beneficiary folder of Food for Hungry Ethiopia (FHE) that provides food support for the area. Sample size was computed based on single population proportion formula assuming the prevalence (p) 0.10 which was taken from a previous community based study at Abyi Adi town, Tigray, Ethiopia [7]. A z -value of 1.96 was used at 95% confidence level and margin of error of 4% with 10% nonresponse rate and design effect of 2. Thus the total sample size was 476. Then the study participants from selected five kebeles were taken by considering proportional to size.

Seven diploma nurses and one BSC nurse were recruited in data collection and supervision, respectively. A structured and pretested questionnaire was used to collect the data. The questioner was prepared in English and translated to local language “Amharic” and back to English by two language

experts to check consistency. Pretest of the questionnaire was made on (5%) of the sample size in kebeles out of the main study area, two days’ training for data collectors and the supervisor on how to approach the respondents and how to conduct interview based on the objective of the study. In addition the filled questionnaires were also checked daily by the supervisor for completeness and missing data to maintain the data quality. The collected data were coded and entered into Epi info version 3.5.1 and analyzed using SPSS version 16. Descriptive statistics (frequency, mean, median, standard deviation, range, and percentage) was used for sociodemography and economic characteristics, maternal health care services of the population, knowledge, and complementary feeding practices. Bivariate and multivariable logistic regression was used in order to identify predictive variables and odds ratio (OR) with 95% confidence interval and p value was used as measure of the strength of association. Finally the variables which have significant association were identified on the basis of OR, 95% CI, and p value < 0.2 to identify eligible variables to fit into the final regression model and p value < 0.05 was used to identify predictor variables.

3. Results

3.1. Sociodemographic Characteristics of Study Participants. Among 476 sampled mothers, 470 participated in the study, making the response rate (98.7%). Biological mothers accounted for 471 (99%) whereas the remaining 5 (1%) were caregivers such as grandmothers and sisters. The median age of mothers/caregivers was 29 ± 6.7 years with age range between 15 and 70. Four hundred seventy two (99%) were Orthodox and four (1%) were Muslim by religion and four hundred sixty six (98%) belong to Amhara ethnic group and ten (2%) were Tigre. Concerning the educational status of the mothers, 126 (26%) had attended formal school. The majority of the mothers, 418 (88%), were married and 310 (65.1%) of mothers were farmers by occupation. More than three-fourths, 435 (91.4%), of mothers earned an average monthly income of less than or equal to 999 Ethiopian Birr (<47 USD). Husbands of 153 (32%) mothers had attended formal education. The median age of children was 16 months ± 5.7 with age range between 6 and 23 (Table 1).

3.2. Obstetrics and Health Service Related Variables. Almost all, 463 (97%), mothers had history of antenatal care follow-up at least once during their last pregnancy. About, 51% of mothers gave birth to their youngest child at health institution. Majority of the mothers (95%) had received postnatal care (PNC) at least once.

3.3. Complementary Feeding Knowledge and Practices. Approximately, 97% (462/476) of mothers had satisfactory knowledge and the remaining 1.6% (8/476) had poor knowledge about complementary feeding. However 56.5% of mothers had appropriate complementary feeding practice. Three hundred forty two (71.8%) mothers were inaccessible for complementary foods. Cereals (96.6%), legumes (93.3%), oil/butter (87.7%), and honey/sugar (79.6%) were the most commonly taken food item by the children in 24 hours

TABLE 1: Sociodemographic, obstetric, and health related variables of mothers who had children aged 6–23 months ($n = 476$) in Lasta Woreda, Amhara, Northeast Ethiopia, April 2015 to October 2015.

Variable	Categories	Frequency	Percentage
Mothers' age	<20	46	9.7
	20–24	64	13.4
	25–29	125	26.3
	30–34	113	23.7
	≥35	128	26.9
Marital status	Married	419	88.0
	Single	16	3.4
	Divorced	35	7.4
	Widowed	6	1.3
Religion	Orthodox	472	99
	Muslim	4	1
Mothers' educational status	Illiterate	307	64.5
	Read and write	43	9.0
	1–4	29	6.1
	5–8	51	10.7
	9–12	43	9.0
	College/university	3	.6
Mothers' occupation	Government employed	9	1.9
	Private employed	4	.8
	Merchant	26	5.5
	Housewife	105	22.1
	Farmer	310	65.1
	Daily laborer	6	1.3
	Student	2	.4
	Housemaid	14	2.9
Monthly income (ETB)	≤999	435	91.4
	1000–2999	35	7.4
	3000–3999	4	.8
	≥4000	2	.4
Child's age in months	6–11	98	20.6
	12–17	129	27.1
	18–23	249	52.3
Number of children	1–3	473	99.4
	4–9	3	.6
ANC follow-up	Yes	456	95.5
	No	20	4.2
Place of delivery	Home	232	48.7
	Health institution	244	51.2
Postnatal care	Yes	454	95.4
	No	22	4.6

preceding the survey. However, the consumption of different food types in 24 hours preceding the survey was uniformly lower in 18–23 months age group, with the lowest rates reported for flesh foods (2.1%) (Table 2). In addition about 57.7% of mothers had introduced complementary feeding at the age of six months as per the recommended (Figure 1). And 60.7 mothers offered four or more food groups (the minimum recommended diversity) to their child and only

50.4 mothers fed their children \geq three times a day (the recommended frequency) (Figure 2). The overall prevalence of appropriate complementary feeding practice combining the three mentioned indicators was 56.5%.

3.4. Factors Associated with Complementary Feeding. This section includes the results of multivariable analysis done between the independent variables (sociodemographic and

TABLE 2: Types of food given to children aged 6–23 months in the past 24 hours by age groups ($n = 476$) Lasta Woreda, Amhara, Northeast Ethiopia, April 2015 to October 2015.

Food groups	Age of the child in months					
	6–11		12–17		18–23	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Cereals	94.9	5.1	96.9	3.1	97.2	2.8
Legumes	93.9	6.1	93.8	6.2	93.2	6.8
Milk/milk product	13.3	86.7	10.1	89.9	9.6	90.4
Meat/fish/chicken	5.1	94.9	3.9	96.1	2.1	98.0
Egg	52.0	48.0	41.1	58.9	34.9	65.1
Other fruits and vegetable	43.9	56.1	49.6	50.4	35.7	64.3
Honey/sugar	87.8	12.2	77.5	22.5	77.5	22.5
Butter/oil	89.8	10.2	91.5	8.5	84.7	15.3

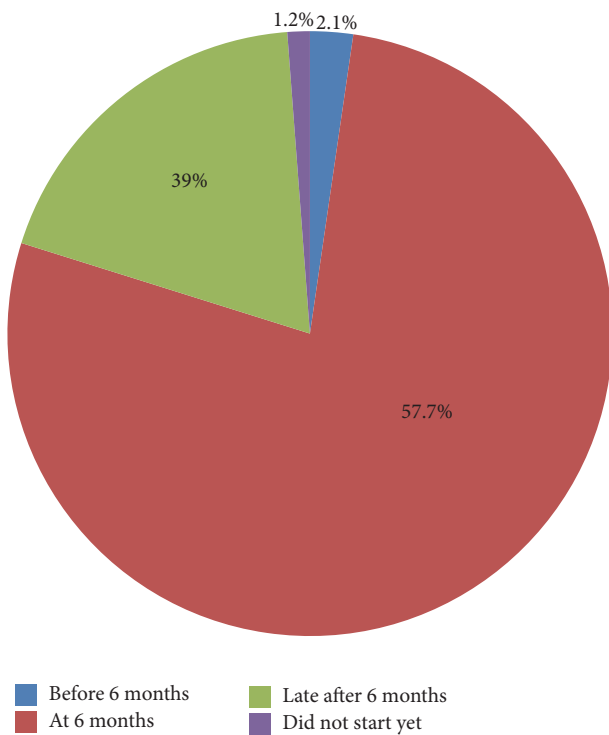


FIGURE 1: Time of starting complementary feeding for their children by study participants, Lasta District, Amhara region, Ethiopia, 2015.

other variables) and the outcome variables of interest (complementary feeding practice). p value of <0.05 at 95% confidence level was taken as significant.

4. Discussion

The result of the study revealed that the prevalence of appropriate complementary feeding was 56.5% which is higher than research finding at Abyi Adi town, Tigray, Northern Ethiopia (10.75%) [7], Ethiopian National prevalence (4%) [5], Enemay district, Northwest Ethiopia (40.5%) [8], and India (17.5%) [2] and smaller than a study in Mekele

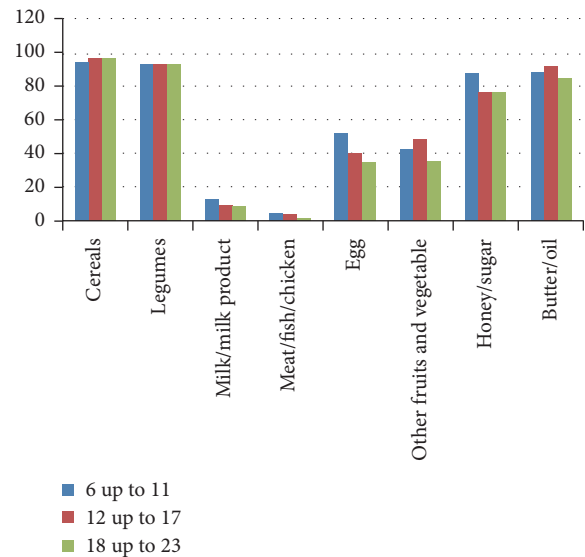


FIGURE 2: Varieties of foods used for complementary feeding by age groups, Lasta District, Amhara region, Ethiopia, 2015.

(62.8%) [9], but it is consistent with a study done in Harar (54.4%) [10]. This relatively higher prevalence might be due to practices change with time, the presence of nutrition intervention program by nongovernmental organization in the study area, and the efforts of health extension workers, health professionals, and nutrition animators in the study area.

Findings of this study also showed that postnatal follow-up, occupation of mothers, exposure to public media (like radio, television), and mothers' decision making role on family income were predictors of complementary feeding practice. In this study mothers who had postnatal care follow-up were 5.9 times more likely to practice appropriate complementary feeding than those who did not follow the service [AOR = 5.98; 95% CI: 1.49, 13.96]. This might be due to the fact that health professionals have been educating and advising mothers on child nutrition (complementary feeding practice) during postnatal care. Postnatal care is a

good platform for educating and advising mothers about feeding of children.

In South Asian countries, like in Bangladesh, India, Nepal, Pakistan, and Sri-Lanka, the most consistent determinants of complementary feeding practices across all countries including inadequate antenatal care, mode of delivery, and lack of postnatal contacts by health workers were among predictors of inappropriate feeding [11–17]. Another community based cross-sectional study conducted in Tigray at Abi-Adi town showed that mothers who followed postnatal care service were 2.8 times more likely to practice appropriate complementary feeding than those who did not follow the service [AOR = 2.86; 95% CI: 1.10, 7.46] [7]. And a study conducted at Enemay district, Northwest Ethiopia, found that maternal healthcare services (postnatal care) utilization was associated with optimal complementary feeding practice (OCFP) [8]. In line with this study another study conducted in Tanzania also showed that the main risk factor for inappropriate complementary feeding practice was lack of postnatal check-ups [18].

Profession of mothers was also another predictor for affecting the feeding practices of IYC (infant, young child). Housewife mothers were found to be about 9.5 times more likely to practice appropriate complementary feeding in comparison to government employees [AOR = 9.50; 95% CI: 1.02, 14.25] (Table 3). A study conducted in Addis Ababa found that employed mothers were more likely to introduce complementary foods before 6 months (AOR = 0.37) compared with mothers who stayed at home [11]. Similarly a study conducted at Enemay district supports this finding that mothers' occupation was significantly associated with complementary feeding practice [8]. Another study conducted in South West Ethiopia consistent with this study found that mothers who work as daily workers, farmers, merchant, and government employees were less likely to practice complementary feeding than housewife [19].

This study revealed that women whose husbands only decide on family income were more likely to have inappropriate complementary feeding practice than the women who are involved in decision making about how to use family income [AOR = 5.54; 95% CI: 1.19, 11.74] (Table 3). This might be due to the reason that mothers are more likely to purchase food items in the household and more responsible for care of children than fathers. In line with this finding a study done in Kenya also reported children belonging to families where mothers decide on how to use family income were more likely (chi square test; p value = 0.045) to have appropriate complementary feeding practice compared with children belonging to families where mainly husbands were deciding on family income (36.7%) [20].

This study also revealed that mothers who were exposed to public media were 2.5 times more likely to practice complementary feeding than mothers who were not [AOR = 2.50; 95% CI: 1.44, 4.35] (Table 3). This result is similar to another finding of the study done in Kenya which showed significant association between public media exposure and appropriate complementary feeding practice [20]. Another study conducted in Tanzania also indicated that one of the main risk factors for inappropriate complementary feeding

practices was limited access to mass media [18]. On the contrary community based studies conducted at Abyi Adi town, Tigray, Northern Ethiopia, and at Kamba woreda South West Ethiopia found that there is no significant association between media exposure and complementary feeding practice [7, 19]. The difference might be due to time difference of the study conducted.

This study did not find any statistically significant association between complementary feeding practice and sex of children, education of parents, income, child birth order, family size, maternal marital status, antenatal care, and place of delivery. The possible limitation of this study might be recall bias and social desirability bias as the data was based on self-report.

5. Conclusion and Recommendation

5.1. Conclusion

- (i) Near half of mothers were not practicing appropriate complementary feeding practice, considering timely introduction, minimum dietary diversity, and frequency.
- (ii) Mothers' occupation, postnatal care service utilization, media exposure, and mothers decision making role on family income were the independent predictors for appropriate complementary feeding practice.
- (iii) Majority of mothers/caregivers were not using meat/fish/chicken and milk/milk products when they prepared complementary foods like porridge to their children.

5.2. Recommendations

For Mothers and Caregivers

- (i) Mothers who work outside home had better to adopt workplace breastfeeding practices and breast milk expression in cup to feed the child when they spend long time outside their home due to different tasks.
- (ii) Mothers should not miss meat/fish/chicken, milk/milk products, and vegetables diversification while preparing infants' and young children's porridge.

For Health Extension Workers and Health Professionals

- (i) Health professionals should focus on advising and counseling mothers on appropriate complementary feeding during prenatal, delivery, postnatal, and immunization services.

For Government (Policy Makers)

- (i) Developing motivational factors for mothers who practice complementary feeding appropriately could be promotion (advertising) of complementary feeding.

TABLE 3: Factors associated with inappropriate complementary feeding practice among mothers who had 6–23-month-old children at Lasta Woreda, Amharra, Northern Ethiopia, April to October 2015.

Variables (<i>n</i> = 476)	Appropriate <i>N</i> (%)	Inappropriate <i>N</i> (%)	COR (95% CI)	AOR (95% CI)
<i>Sex of children</i>				
Male	175 (75.4%)	57 (24.6)	1	1
Female	199 (81.6)	45 (18.4)	1.44 (.93, 2.24)	1.32 (.78, 2.22)
<i>Child birth order</i>				
1–3	273 (82.0)	60 (18.0)	1	1
4–6	97 (72.4)	37 (27.6)	5.69 (1.48, 21.81)	.27 (.13, .55)
7–10	4 (44.4)	5 (55.6)	3.28 (.83, 12.87)	.25 (.02, 2.60)
<i>Public media exposure</i>				
No	36 (35.3)	66 (64.7)	1	1
Yes	158 (42.2)	216 (57.8)	2.44 (1.53, 3.90)	2.50 (1.44, 4.35)**
<i>Mothers decision making role on family income</i>				
Mainly husband	29 (87.9)	4 (12.10)	1	1
Only husband	6 (60.0)	4 (40.0)	.20 (.04, 1.07)	5.54 (1.19, 11.74)*
Mainly wife	4 (40.0)	6 (60.0)	.09 (.02, .48)	.01 (.00, .14)
Only wife	32 (68.1)	15 (31.9)	.29 (.089, .99)	.20 (.02, 2.61)
Both jointly	303 (80.0)	73 (19.4)	.57 (.19, 1.68)	.15 (.03, .72)
<i>ANC follow-up</i>				
No	363 (80.1)	90 (19.9)	1	1
Yes	4 (40.0)	6 (60.0)	.29 (.10, .84)	.51 (.22, 1.20)
<i>PNC follow-up</i>				
No	90 (80.2)	12 (42.9)	1	1
Yes	364 (19.8)	10 (57.1)	.19 (.08, .45)	5.98 (1.49, 13.96)*
<i>Mothers educational status</i>				
Cannot read, write	242 (78.7)	65 (21.3)	1	1
Read & write	32 (74.4)	11 (25.6)	.79 (.37, 1.63)	.51 (.22, 1.22)
1–4	25 (86.2)	4 (13.8)	1.68 (.56, 4.99)	1.35 (.36, 5.01)
5–8	38 (74.5)	13 (25.5)	.79 (.39, 1.56)	.60 (.25, 1.46)
9–12	34 (79.1)	9 (20.9)	1.02 (0.46, 2.22)	1.33 (.41, 4.29)
College/university	3 (100.0)	0 (0)	4.34 (.00, ...)	1.37 (.00, .00)
<i>Mothers occupational status</i>				
Government employed	7 (77.8)	2 (22.2)	1	1
Private employed	2 (50.0)	2 (50.0)	.29 (.02, 3.52)	.44 (.00, 7.45)
Merchant	18 (69.2)	8 (30.8)	.64 (.10, 3.80)	1.91 (.19, 8.84)
House wife	89 (84.8)	16 (15.2)	1.59 (.30, 8.35)	9.50 (1.02, 14.25)*
Farmer	242 (78.1)	68 (21.9)	1.02 (.20, 5.00)	3.56 (.42, 10.45)
Daily laborer	4 (66.7)	2 (33.3)	.57 (.06, 5.76)	1.90 (.08, 4.92)
Student	1 (50.0)	1 (50.0)	.27 (.01, 6.91)	.42 (.01, 7.00)
House maid	11 (78.6)	3 (21.4)	1.05 (.14, 7.93)	2.69 (.22, 3.68)
<i>Maternal marital status</i>				
Married	334 (79.9)	84 (20.1)	1	1
Single	11 (68.8)	5 (31.2)	0.55 (0.19, 1.63)	1.87 (.24, 13.73)
Divorced	24 (68.6)	11 (31.4)	0.55 (0.26, 1.16)	.92 (.11, 7.83)
Widowed	4 (66.7)	2 (33.3)	0.50 (0.09, 2.79)	.23 (.01, 4.29)
<i>Family size</i>				
1–4	176 (78.2)	49 (21.8)	1	1
5–8	195 (79.6)	50 (20.4)	1.09 (.68, 1.69)	1.79 (.85, 3.79)
9–11	3 (50.0)	3 (50.0)	.28 (.05, 1.42)	1.28 (.08, 2.79)

TABLE 3: Continued.

Variables ($n = 476$)	Appropriate N (%)	Inappropriate N (%)	COR (95% CI)	AOR (95% CI)
<i>Place of delivery</i>				
Health facility	200 (82.0)	44 (18.0)	1	1
Home	173 (74.9)	58 (25.1)	.66 (.42, 1.03)	.74 (.43, 1.29)

* p -value < 0.05, ** p -value < 0.01, COR (Crude odds ratio) AOR (Adjusted odds ratio), CI (confidence interval)

Hosmer and Lemeshow's goodness-of-fit test was found to be chi-square of 8.147 with p -value of 0.232 hence the model was good because its p -value > (0.05).

- (ii) Special emphasis should be given in empowering women to have a decision making role on family income using different strategies like public media.
- (iii) Declaring six-month maternal leave after delivery for government employed mothers could be an alternative solution to improving complementary feeding practice.
- (iv) It is better to assign nutrition professionals at health institution and woreda health office level.
- (v) It is better to strengthen intersectorial involvement of organizations working on nutrition promotion to realize nutrition interventions.

For Researchers

- (i) Further research should be conducted by using qualitative study design to understand deeply sociocultural and behavioral related factors toward complementary feeding to develop and implement better strategy on improving complementary feeding.
- (ii) Researchers had better to use cohort study design in addition to cross-sectional one in assessing IYCF indicators.

Abbreviations

AOR: Adjusted odds ratio
 COR: Crude odds ratio
 FHE: Food for Hungry Ethiopia
 IYCF: Infant and young child feeding
 ORDA: Organization for Rehabilitation and Development in Amhara
 DFAP: Development Food Aid Program
 CSA: Central Statistical Agency.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

Menberu Molla, Tadese Ejigu, and Girma Nega have been involved in the conception, design, analysis, interpretation, report, and manuscript writing.

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