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Sociodemographic Determinants of Dietary Diversity and Meal Frequency Among Mothers/Caregivers Paired with Infants and Child Age 6 to 23 Months

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Abstract: *Introduction:* optimal balancing feeding plays crucial role in fighting childhood undernutrition, infectious disease, and mortalities. Globally, just about semi of all children are doesn't received recommended meal frequency (MMF). Furthermore, only twenty-nine percent of child getting diversified diet in world wide. However, sociodemographic factors associated with recommended meal frequency and minimum dietary diversity (MDD) among infants and children aged between 6 and 23 months existing in study district is unknown. *Objectives:* this study was aimed to identify sociodemographic factors towards minimum meal frequency and dietary diversity (DD) among infants and children aged between 6 and 23 months in Gimbichu woreda East Shoa zone Oromia, Ethiopia. *Methods:* A community-based cross-sectional study was conducted among 782 mothers/caregivers paired with infants and children aged 6 to 23 month with a response rate of 97.1%. Data was collected from March 12 to April 08, 2019. Binary and multivariable logistic regression analysis were applied for both MDD and MMF to identify socio-demographic factor associated with them. *Results:* Mothers' who have attended secondary and above education [AOR=2.52, 95%CI (1.65, 8.34)], mothers' who have attended primary education [AOR=1.53, 95%CI (1.26, 4.21)], fathers who have attended secondary and above education [AOR=2.39, 95% CI (1.22, 3.75), family size from 1-3 children [AOR=3.07, 95% CI: (1.42, 6.64)], 4-6 number of children [AOR=2.93, 95%CI (1.5, 5.46)], mothers' belonged to richest [AOR=2.67, 95%CI (1.74, 3.79)] and richer wealth quintiles [AOR=1.87, 95%CI (1.33, 3.47) was positively associated with MDD. Whereas, mothers' who had age category of 35-49 years [AOR=1.54, 95%CI (1. 32, 3.29)], fathers who have attended secondary and above education [AOR=2.9, 95% CI (1.06, 5.22), mothers whose wealth status were richest level [AOR=1.47, 95%CI (1.13, 3.185)], and mothers were married and living with their husbands [AOR=4.13, (95%CI; (1.31, 13.07)] was positively associated with MMF. *Conclusion:* Unmet diversified diet was attributable to unable to read and write, family size of > 7, and household belonged to poorest one. MMF practice was attributable to mothers' who had age category of 35-49, fathers who have attended secondary and above education, and richest level household. Encouraging paternal education and promoting household wealth status on infant and child feeding are vigorously recommended to alleviate the problem.

Keywords: Sociodemographic, Factors, Ethiopia, Gimbichu Woreda, Feeding, Dietary Diversity, Meal Frequency

1. Introduction

Complementary feeding is defined as the process of initiation liquid, solid, as well as semi-solid foods beside to breast milk at the age of six months and ahead [1]. Optimum complementary feeding highly contributes in mitigating childhood undernutrition. Diversified diet is the main approach

to meet optimum growth and development [2]. Likewise, Minimum Dietary Diversity (MDD) and Minimum Meal Frequency (MMF) are among one of the elements of the eight core indicators of Infant and Young Child Feeding (IYCF) practices for 6–23 months of age [1]. MDD is defined as infants and children aged 6–23 months received four or more food groups out of seven food items [3], while, MMF is

defined as infants and children aged 6–23 months who get two, and three times per day for breastfed infants aged 6–8 and 9–23 months, respectively; whereas, four times for non-breastfed infants and children aged 6–23 months irrespective of their age category [1]. Low diversified diet and recommended meal frequency upsurge the danger of under-nutrition, illness, and mortality in infants and young children [4]. Unsatisfactory feeding practices, low nutrient content of complementary meals, declined dietary contribution to nutritional requirements and high prevalence of chronic undernutrition [5–7].

Under-nutrition accounts for about 45% of all under-five child deaths, and most deaths occur in low and middle-income countries [8, 9]. Under-nutrition has been an underlying factor of childhood killer diseases such as malaria, pneumonia, and diarrhea [10]. The prevalence of stunting is declining only by one percent per annum, which is associated with sub-optimal complementary feeding practices in Ethiopia [3, 11]. Globally, approximately 50% of all children are not getting the MMF, and the proportion of children got the recommended MMF is low even in the richest households in Africa, particularly in West, Central Africa, Eastern and Southern part, and South Asia [2]. In Ethiopia, different studies indicated that the proportions of MDD is ranged between 12.6% and 27.3%, while the MMF is from 50.4% to72.2% [11–13].

According to the 2016 Ethiopia Demographic and Health Survey (EDHS) shown, only (13.8%), and (45.1%) of infants and children have received the MDD and MMF, respectively. About a (17.8%) and (40.6%) of infants and children have met MDD and MMF in Oromia regional state, respectively [3]. The trends of children who received the Dietary diversity indicate that a small increment from 4.8% in 2011 to 13.8% in 2016 in Ethiopia [3, 14].

Some studies have revealed that infants and children at older age, attending secondary educational level and above of mothers, were positively associated MDD. Whereas head of household, and government workers were more likely to upsurge MMF [11–13, 15, 16]. Moreover, sociodemographic factors towards MDD, and MMF are unknown in the study district. For that reason, this study intended to assessing sociodemographic factors towards recommended meal frequency and dietary diversity (DD) amid infants and children aged between 6 - 23 months in Gimbichu woreda.

2. Objectives

2.1. General Objective

To assess sociodemographic determinants of Dietary Diversity and Meal Frequency among mothers/caregivers paired with infants and child age 6 months to 23 months in Gimbichu woreda, East shoa zone, Oromia, Ethiopia, 2019.

2.2. Specific Objective

1) To identify sociodemographic determinants of Dietary Diversity among mothers/caregivers paired with infants and child age 6 to 23 months in Gimbichu woreda, East shoa zone, Oromia, Ethiopia, 2019

2) To identify sociodemographic determinants of Meal Frequency among mothers/caregivers paired with infants and child age 6 to 23 months in Gimbichu woreda, East shoa zone, Oromia, Ethiopia, 2019

3. Methodology

3.1. Study Area, Design and Period

Study was done at Gimbichu woreda, Oromia Region. The woreda is placed 84 km away from Addis Ababa (capital city of Ethiopia), and 87 km far from Adama town. Administratively, this Woreda comprised of 35 kebeles (the smallest administrative unit). As data from the woreda health office revealed, the total population living in the area are estimated to be 120,725, of which 61,087 are males and 59,638 are females. Children aged between 6 and 23 months accounted for 6.4% of the total population. The woreda consists of 5 health centers and 33 health posts. A community-based cross-sectional quantitative study was conducted from March 12 –April 08, 2019. Source of population was mother/caregiver- children pairs aged between 6 and 23months living in Gimbichu woreda. However, Study population was mother/caregiver- children pairs aged between 6 to23months paired living in randomly selected kebeles and available during the data collection period.

3.2. Eligibility Criteria

3.2.1. Inclusion Criteria

Mother/caregiver- children pairs aged 6 and 23 months paired with mothers who live in randomly selected kebeles. From each family, only single entitled infant and child age 6–23 months paired with mothers/caregivers' during survey was included.

3.2.2. Exclusion Criteria

Those infants and children who were ill one week before and during the data gathering time were excluded from the study.

3.3. Sample Size Determination

The sample size was calculated using the single population proportion formula by considering the following statistical assumptions: at 95%CI level (Z (1-ɑ́/2) = 1.96, P = proportion of MMF (67.3%), and MDD (18.8%) [17], 5% margin of error, and 5% level of precision. Design effect = 2, was used to upsurge the sample size. Accordingly, the larger sample size was 732 by considering 10% of non-response rate given a final sample size of 805.

3.4. Sampling Technique and Procedures

One-stage cluster sampling technique was done. There were 35 kebeles in the district; firstly, from those kebeles, eight were nominated by means of simple random sampling. The total number of children living in these kebeles was 826.

However, the calculated sample size to each kebeles was near to the study population. Therefore, all participants residing in each kebeles were enrolled.

3.5. Variables of the Study

Outcome variables
Minimum Dietary Diversity
Minimum Meal Frequency
Independent variables
Socio-demographic characteristics: mother age, Head of household, Marital status, Educational level of the mother, mother occupation, father educational level, fathers' occupation, Family size and Wealth status.

3.6. Data Quality Control

Data quality was secured through careful plan, translation, and record of the questionnaire. The questionnaire adopted in English from different literature was decoded into local language (Afan Oromo version) and then changed to English version. To maintain the validity of the tool, the content was reviewed by a nutritionist. Moreover, pre-test was done on 5% of sample size two weeks ahead of the actual data collection period at Doobii Bosonu Kebeles. Half day training was given for data collectors and supervisors. The investigators and the supervisors were checked the collected data for entirety daily and corrective actions were taken accordingly.

3.7. Tool and Procedures

A face-to-face interviewer administered questionnaire was employed. Data were collected using structured and interviewer guided questionnaire adopted from previous studies and Food and Nutrition Technical Assistance (FANTA) and IYCF guideline [1, 18]. Data collected by eight diploma nurses and supervised by two BSc nurses.

3.8. Operational Definitions

Minimum Dietary Diversity: Infants and children who received four, or more food groups among the seven food items within the previous 24-hours [1].
Minimum Meal Frequency: Infants and children who received any solid, semisolid, or liquid (but also including milk for non-breastfed children) twice for breastfed infants aged 6–8 months, three times for breastfeeding children aged 9–23 months, and four times for non-breastfed children 6–23 months [1].
Household wealth status: In the PCA, participants who fall in 1st, 2nd, 3rd 4th, and 5th levels were defined as richest, richer, middle, poorer and poorest, respectively.

3.9. Data Processing and Analysis

The collected data were entered into Epi-data Version 4.4.3.1 and exported to SPSS version 20 for recoding and cleaning purposes. All unceasing independent variables were categorized. The income of the study participants was assessed by Principal Component Analysis (PCA). All statistical assumptions of factor analysis were checked, for instance, Keiser Meyer Olkin (KMO) was 0.863 sampling adequacy measure, Bartlett's test of sphericity with (p<0.001), which indicate the data/variables were suitable for the analysis. A communality value of >=50%, and Eigenvalues =1 were included in PCA. Next, all eligible components were pooled together to make one variable, wealth status. Then after, the loading factors were arranged in their descending order. Next to this, the loading factors were amended to be between 4 and -4. Hereafter, the final scores were ranked to five order as 1st, 2nd, 3rd 4th, and 5th levels. Ranks were coded as richest, rich, middle, poorer and poorest, correspondingly.

Descriptive statistics like frequency, percentage, and measures of central tendency with the corresponding measure of dispersion were used for the presentation of demographic variables. The results were presented by using Tables graph, and texts.

Bivariate logistic regression analysis was used for both MDD and MMF separately to identify sociodemographic factors associated with them. Finally, the variables which had independent correlations with Dietary Diversity and Meal Frequency were identified on the basis of Adjusted Odds Ratio (AOR) and a p-value less than 0.05with 95%CI were claimed as statistically significant.

4. Results

4.1. Socio-demographic Characteristics of the Study Respondents

A 782 contestants were partaken in the study, with 97.1% of response rate. About 746 (95.4%) of the house heads were males. Almost eight in every ten of study participants (76.6%) were orthodox Christian followers. Concerning the educational status, a little more than one-third 296 (37.9%) of the them were unable to read and write, while about nearly two in every ten (18.2%) of them have attended secondary and above educational level (Table 1)

Table 1. Sociodemographic characteristics of the study respondents in selected kebeles of Gimbichu district East Shoa zone Oromia, South Eastern Ethiopia, 2019 (n=782).

Variables	Category	Frequency	Percentage
Head of household	Male	746	95.4
	Female	36	4.6
Maternal age	15-24	89	11.4
	25-34	424	54.2
	≥ 35	269	34.4
mother educational level	unable to read and write	296	37.9

Variables	Category	Frequency	Percentage
	Read or Writes	199	25.4
	Primary	145	18.5
	Secondary and above	142	18.2
	Single	15	1.9
Marital status	Married	731	93.5
	Divorced	27	3.5
	Widowed	9	1.2
	unable to read and write	283	38.7
Father educational level(n=731)	Read or Writes	192	26.3
	Primary	125	17.1
	Secondary and above	131	17.9
	Farmer	623	85.4
Father occupation	Civil servant	42	5.7
	Merchant	36	4.9
	Jobless	30	4.0
	Farmer/Housewife	660	84.4
Mother occupation	Civil servant	40	5.1
	Merchant	57	7.3
	Unemployed	25	3.2
	1-3	202	25.8
Family size	4-6	454	58.1
	≥7	126	16.1
	Orthodox	599	76.6
Religion	Muslim	85	10.9
	Protestant	94	12.0
	Catholic	4	0.5
Ethnicity	Oromo	730	93.4
	Amhara	51	6.5
	Poorest	146	18.7
	Poorer	163	20.8
Wealth status	Middle	137	17.5
	Richer	181	23.1
	Richest	155	19.8

4.2. Sociodemographic Characteristics Associated with Dietary Diversity

In the bivariate analysis, age of mothers, educational level of mothers and fathers, Occupation of Mothers, occupation of fathers, family size, and wealth status, were associated with MDD. However, in the multivariable analysis, maternal educational status, educational level of fathers, family size and wealth status were the only factors that have shown association with MDD.

The odds of MDD among mothers' who have attended secondary and above educational level was almost three times [AOR=2.52, 95%CI (1.65, 8.34)] higher than those who were unable to read and write. And also the chances of met MDD among mothers' who have attended primary education was nearly two times [AOR=1.53, 95%CI (1.26,

4.21)] higher than those who were unable to read and write.

The likelihood of receiving diversified diet among fathers who have attended secondary and above education was 2.39 epochs [AOR=2.39, 95% CI (1.22, 3.75) greater as likened to their counterparts.

Odds of gaining diversified diet among children and infants whose family size from one up to three children were three times [AOR=3.07, 95% CI: (1.42, 6.64)] as well as four up to six number of children were almost three times [AOR=2.93, 95%CI (1.5, 5.46)] folds more as compare to their counterpart. Whereas, the probability of receiving diversified diet among mothers belonged to richest and richest wealth quintiles were 2.67 times [AOR=2.67, 95%CI (1.74, 3.79)] and nearly twice [AOR=1.87, 95%CI (1.33, 3.47) more as compared to their poorest respectively (Table 2).

Table 2. *Bivariable& multivariable logistic regression analysis of sociodemographic factors associated with MDD, Gimbichu district, southern Ethiopia, 2019; (n=782).*

Variables	Category	MDD		COR (CI 95%)	AOR (CI 95%)
		Met	Unmet		
	35-49	73(27.1%)	196(72.9%)	1.00	1.00
Mother age	25-34	150(35.4%)	274(64.6%)	1.47(1.05,2.05)	0.67(0.21,2.13)
	15-24	43(48.3%)	46(51.7%)	2.51(1.53,4.11)	. 636(.35, 1. 15)
	Illiterate	85(28.7%)	211(71.3%)	1.00	1.00
Educational level of	Ability of read and write	32(16.1%)	167(83.9%)	0.476(0.302,0.75)	0.79(.39,1.61)
mother	Primary	72(49.7%)	73(50.1%)	2.45(1.62,3.69)	1.53(1.26,4.21)*
	Secondary and above	77(54.2%)	65(45.8%)	2.94(1.94,4.45)	2.52(1.65,8.34)*
Occupation of	House wife	236(35.7%)	424(64.3%)	6.4(1.73,95.7)	0.196(0.012,3.12)

Variables	Category	MDD		COR (CI 95%)	AOR (CI 95%)
		Met	Unmet		
Mothers	Employee	13(32.5%)	27(67.5%)	5.53(1.34,91.2)	0.113(0.018,1.70)
	Merchant	15(26.3%)	42(73.7%)	4.1(1.01,66.2)	0.845(0.419,2.27)
	Jobless	2(8.0%)	23(92.0%)	1.00	1.00
	Illiterate	68(24%)	215(76%)	1.00	1.00
Education of father	Able to read and write	39(20.3%)	153(79.7%)	0.81(0.51,125)	1.006(0.512,1.90)
	Primary	83(66.4%)	42(33.6%)	6.24(3.94,9.903)	1.56(0.63,7.68)
	Secondary and above	59(45%)	72(55%)	2.59(1.67,4.02)	2.39(1.22,3.75)*
	Farmer	223(35.8%)	400(64.2%)	1.00	1.00
Occupation of father	Employee	22(52.4%)	20(47.6%)	1.96(1.05,3.67)	4.75(.697,32.37)
	Merchant	2(5.6%)	34(94.4%)	.105(0.025,0.44)	.157(0.018,1.37)
	Jobless	2(6.4%)	28(93.4%)	0.128(0.09,0.472)	0.545(.038,7.87)
	Richest	40(25.8%)	115(74.2%)	1.47(1.35,2.53)	1.87(1.33,3.47)*
Wealth status	Rich	93(51.4%)	88(48.6%)	4.45(2.68,7.37)	2.67(1.74,3.79)*
	Middle	56(40.9%)	81(59.1%)	2.91(1.71,4.97)	2.10(.89,4.93)
	Poor	49(30.1%)	114(69.9%)	1.81(1.06,3.08)	1.42(.59,3.40)
	Poorest	28(19.2%)	118(80.8%)	1.00	1.00
	1-3	85(42.1%)	117(57.9%)	4.36(2.46,7.72)	3.07(1.42,6.64)
Family size	4-6	163(35.9%)	291(64.1%)	3.36(1.97,5.73)	2.93(1.5,5.46)
	7 and above	18(14.3%)	108(85.7%)	1.00	1.00
Head of household	Male	256(34.3%)	490(67.7%)	1.35(0.65,2.86)	2.3(0.172,30.11)
	Female	10(27.8%)	26(72.2%)	1.00	1
	Single	8(53.3%)	7(46.7%)	1	1
Marital status	Married	249(34.1%)	482(65.9%)	0.452(0.162,1.26)	1.6(0.22,11.38)
	Divorced	5(18.5%)	22(81.5%)	0.199(0.049,0.81)	0.27(0.05,1.42)
	Widowed	4(44.4%)	5(55.6%)	0.7(0.133,3.684)	0.51(0.087,2.95)

4.3. Sociodemographic Factors Associated with MMF

In the bi-variate analysis, mothers educational level, fathers' educational status, Occupation of Mothers, occupation of fathers, marital status, family size, and wealth status, were associated with MMF. In contrast, in the multivariable analysis, age the mothers, fathers' educational status, marital status and wealth index were the factors that have shown an association with MMF.

Odds of receiving MMF among mothers' who had age category of 35-49 years was almost twice [AOR=1.54, 95%CI (1. 32, 3.29)] more as compared to age whose age category found into 15- 24 years old.

The chances of receiving minimum meal frequency among fathers who have attended secondary and above education was nearly three whiles [AOR=2.9, 95% CI (1.06, 5.22) greater as compared to their counterparts. Whereas, the probability of receiving MMF among mothers whose wealth status were richest level were 1.47 times [AOR=1.47, 95%CI (1.13, 3.185)] more as compared to the poorest one. Furthermore, the likelihood of getting recommended meal frequency among children and infants whose mothers were married and living with their husbands were four times [AOR=4.13, (95%CI; (1.31, 13.07)] higher as compared to a single one (Table 3)

Table 3. Bivariable &Multivariable logistic regression analysis of sociodemographic factors associated with MMF, Gimbichu district, southern Ethiopia, 2019; (n=782).

Variables	Category	MMF		COR (95%CI)	AOR (95%CI)
		Met	Unmet		
Age of the mother	35-49	194(72.1%)	75(27.9%)	0.9(0.523,1.55)	1.54 (1. 32, 3.29)*
	25-34	336(79.2%)	88(20.8%)	1.33(0.78,2.259)	0.885(0.54,1.45)
	15-24	66(74.2%)	23(25.8%)	1	1
	Unable to read & write	213(72%)	83(28%)	1	1
Educational level of mother	Ability read & write	131(65.8%)	68(34.2%)	0.75(0.51,1.106)	1.03(0.64, 1.69)
	Primary	120(82.8%)	25(17.2%)	1.87(1.13, 3.08)	1.2(0.53, 2.68)
	Secondary and above	132(93%)	10(7%)	5.14(2.58, 10.27)	0.82(0.25, 2.8)
	Unable to read & write	197(69.6%)	86(30.4%)	1	1
Educational status of father	Able to read and write	133(69.3%)	59(30.7%)	0.98(0.66, 1.46)	0.89(0.55,1.43)
	Primary	111(88.8%)	14(11.2%)	3.46(1.88, 6.38)	2.2(0.94,11.08)
	Secondary and above	121(92.4%)	10(7.6%)	5.28(2.64, 10.56)	2.9(1.06, 5.22)
	House wife	498(75.3%)	163(24.7%)	2.59(1.14, 5.88)	2.02(0.55, 7.36)
Occupation of mother	Civil servant	38(95%)	2(5%)	16.1(3.14, 82.30)	
	Merchant	47(82.5%)	10(17.5%)	3.98(1.39, 11.41)	3.76(0.57, 24.72)
	Jobless	13(54.2%)	11(45.8%)	1.00	1.00
	Farmer	473(75.8%)	151(24.2%)	1.00	1.00
Occupation of father	Civil servant	41(97.6%)	1(2.4%)	13.06(1.78,95.95)	
	Merchant	28(77.8%)	8(22.2%)	1.11(0.49,2.50)	0.53(0.138, 2.02)
	Jobless	20(69.0%)	9(31.0%)	0.709(0.32,1.59)	0.33(0.08, 1.42)

Variables	Category	MMF		COR (95%CI)	AOR (95%CI)
		Met	Unmet		
Wealth status	Richest	122(78.7%)	33(21.3%)	1.54(0.91, 2.61)	1.47(1.13,3.185)*
	Rich	147(81.2%)	34(18.8%)	1.81(1.08,3.02)	1.24(0.63, 2.47)
	Middle	104(75.9%)	33(24.1%)	1.32(0.76,2.23)	0.951(0.49, 1.82)
	Poor	120(73.6%)	43(26.4%)	1.17(.71,1.92)	1.18(0.66, 2.12)
	Poorest	103(70.5%)	43(29.5%)	1.00	1.00
Family size	1-3	161(79.7)	41(20.3%)	1.96(1.185,3.252)	0.92(0.271,3.11)
	4-6	351(77.3%)	103(22.7%)	1.7(1.108,2.621)	1.44(0.82,2.53)
	≥7	84(66.7%)	42(33.3%)	1.00	1.00
Head of household	Male	570(76.4%)	176(23.6%)	1.25(0.589,2.63)	1.2(0.428,3.366)
	Female	26(72.2%)	10(27.8%)	1	1
Marital status	Single	7(46.7%)	8(53.3%)	1	1
	Married	562(76.9%)	169(23.1%)	3.8(1.36,10.63)	4.13(1.31,13.07)
	Divorced	19(70.4%)	8(29.6%)	2.71(0.734,10.04)	2.7(0.71,10.37)
	Widowed	8(88.9%)	1(11.1%)	9.1(0.905,92.39)	9.5(0.91,98.68)

5. Discussion

5.1. Sociodemographic Factors Affecting Dietary Diversity

This study was accompanied predominantly to response the sociodemographic factors towards dietary diversity and recommended meal frequency the two essential IYCF core indicators among infants and children residing in Gimbichu district east shoa, zone Oromia regional state, Ethiopia.

The odds of MDD among mothers' who have attended secondary and above educational level were almost three times [AOR=2.52, 95%CI (1.65, 8.34)] higher than those who were unable to read and write. And also, the chances of met MDD among mothers' who have attended primary education was nearly two times [AOR=1.53, 95%CI (1.26, 4.21)] higher than those who were unable to read and write. This finding is supported by study conducted in Pakistan, Indonesia, and Addis Ababa [19–21]. In fact, as the level of education upsurges, the level of mothers' knowledge of about what and how to child feeding would be good. To illuminate, these segment of population are chanceful in reading and gathering information regarding nutrition from any sources that could promote child feeding. And even they might share the feeding proficiencies of their colleagues and families.

The likelihood of receiving diversified diet among fathers who have attended secondary and above education was 2.39 times [AOR=2.39, 95% CI (1.22, 3.75) higher as compared to their counterparts This is finding is agreed with study accompanied in Gorche district, Southern Ethiopia [18]. It is fact, in our country Ethiopia, the head of the household primarily are fathers so if fathers well educated, children are likely to obtain wide range of diets, as their fathers might offer money and other important things to their mothers/caregivers in order to buy the necessary food. Thus, paternal education in feeding practice should be considered as a vital contribution in optimal child feeding and government and other concerned organizations have to work jointly in this regard.

The odds of gaining diversified diet among children and infants those households' having family size of 1–3 persons' were three times [AOR=3.07, 95% CI: (1.42, 6.64)] and four up to six number of children were almost three times [AOR=2.93, 95%CI (1.5, 5.46)] folds more as compare to with those households' having > =7 family. This is consistent with study conducted in Abyi-Adi town, Dewa Chefe and Bale's studies [20, 22, 23]. This could be owing to scantiness of diet in those family unit having more number of family size; and the mothers haven't enough time to make food or to feed their children.

Whereas, the probability of receiving diversified diet among mothers belonged to richest and richest wealth quintiles were 2.67 times [AOR=2.67, 95%CI (1.74, 3.79)] and nearly twice [AOR=1.87, 95%CI (1.33, 3.47) more as compared to their poorest respectively. This finding agreed with study revealed in Adea woreda, and Addis Ababa [15]. The possible reason might be that having adequate profits supports them to afford the availability and accessibility of diet and easy to have the costs of materials which could be the source of information such as TV, newspapers, magazine, radio, books, nutritional guidelines. In fact, these could have the potential to improve diversified diet that given for infants and child age between 6-23 months.

5.2. Sociodemographic Factors Associated with MMF

The odds of receiving MMF among who had age category of 35-49 years' mothers' was almost twice [AOR=1.54, 95%CI (1. 32, 3.29)] more as compared to age whose age category found into 15-24 years old. The possible explanation could be as the mothers age increase the experience of how and frequency of feeding a child would be improved.

The chances of receiving minimum meal frequency among fathers who have attended secondary and above education was nearly three times [AOR=2.9, 95% CI (1.06, 5.22) higher as compared to their counterparts. possible explanation could be having good knowledge about child feeding can improves provision of recommended meal frequency. It is true that as the level of education increases the knowledge of mothers about child feeding would be good.

Whereas, the probability of receiving MMF among mothers whose wealth status were richest level were 1.47 times [AOR=1.47, 95%CI (1.13, 3.185)] more as compared to their poorest one. This study supported by study conducted in Dabat town [13]. The possible reason might be that having

sufficient incomes supports them to pay for the accessibility and availability of diet and easy to have the costs of materials which could be the source of information such as TV, newspapers, magazine, radio, books, nutritional guidelines. In fact, these could have the possible to improve recommended meal frequency that given for infants and child age between 6-23months. Furthermore, the likelihood of getting recommended meal frequency among children and infants whose mothers were married and living with their husbands were four times [AOR=4.13, (95% CI; (1.31, 13.07)] higher as compared to a single one.

6. Conclusions

Unmet diversified diet was attributable to unable to read and write, family size of > 7, and household belonged to poorest one. MMF practice was attributable to mothers' who had age category of 35-49, fathers who have attended secondary and above education, and richest level household. Assuring paternal education and promoting household wealth status on infant and child feeding are vigorously recommended to alleviate the problem.

Abbreviations

EDHS (Ethiopia Demographic and Health Survey), FANTA (Food and Nutrition Technical Assistance), IYCF (Infant and Young Child Feeding), MAD (Minimum Acceptable Diet), MDD (-Minimum Dietary Diversity), MMF (Minimum Meal Frequency), PCA (Principal Component Analysis).

Authors' Contributions

TST and ADW perceived idea of the research and wrote the proposal, take part in the data collection process, analyze the data and draft the paper. Both author approved the proposal and reviewed the manuscript. Finally, both authors have reviewed and ratified last version of the manuscript.

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Availability of Data and Materials

The data used to support the findings of this study are on the hands of the corresponding author.

Ethics Approval and Consent to Participate

The protocol was approved by the Institutional Review Board (IRB) of the University of Gondar. Besides, then a permission letter was obtained from Gimbichu Woreda health administrative office. Moreover, after a detailed dialogue and clarifications of the purpose, profit, and the possible risks of the study, verbal consent was secured from individually from the study participant.

Competing Interests

No authors were raised the conflict of interest.

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