

Dietary Diversity Practice and Associated Factors Among Pregnant Mothers in Sebeta Awas District, Oromiya Special Zone Surrounding Finfine, Oromia, Central Ethiopia, 2022

Kena Wolde Bikila¹, Trhas Tadesse Berhe^{1,*}, Getachew Woldeyohannes Tedla¹,
Addisu Tadesse Sahile²

¹Public Health Department, Yekatit 12 Hospital Medical College, Addis Ababa, Ethiopia

²Public Health Department, Unity University, Addis Ababa, Ethiopia

Email address:

rkewoh@gmail.com (Kena Wolde Bikila), ttrhas@gmail.com (Trhas Tadesse Berhe),

gechwy2001@yahoo.com (Getachew Woldeyohannes Tedla), addisutadesse2002@gmail.com (Addisu Tadesse Sahile)

*Corresponding author

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Abstract: *Background:* Dietary diversity is defined as the consumption of a variety of food types throughout a time period that has been regarded as an indicator of nutritional sufficiency and has been accepted as a feature of dietary quality. However, there is limited information on the prevalence dietary diversity practice and associated factors among pregnant in low- income countries like Ethiopia including study area. *Objective:* - To assess the prevalence of dietary diversity practice and associated factors among pregnant mothers in Sebeta Awas district, Oromia Special Zone Surrounding Finfine, Oromiya, and Central Ethiopia, 2022. *Methods:* - Institutional based quantitative cross sectional study design was used among random sample of 639 pregnant mothers living in four selected health centers of Sebeta Awas District. Study participants were recruited by every forth interval. Data was collected using a pre-tested - structured interviewer administered questionnaires after obtaining consent from study participants. Multivariate logistic regression model to control for all possible cofounders were used to analyze the data. Odds ratios along with 95% confidence intervals was estimated to measure the strength of the association between independent variables and outcome variable. Level of statistical significance was declared at p value less than or equal to 0.05. *Result:* About 269 (42.1%) [95% CI=38.5-46.2] of pregnant women had good dietary diversity practice. Being married (AOR=3.44; 95%CI: 1.47, 8.05), being college and above (AOR=0.44; 95%CI: 0.21, 0.8), monthly income greater than 5,000 ETB, starting ANC visit at 1st trimester (AOR=0.43; 95%CI: 0.19, 0.99), were the predictor variable for good dietary diverse practice. *Conclusion:* This finding shows that the majority of study participants consumed below the minimum dietary diversity. Marriage, education, occupation of husband, household head, level of income, time of ANC started, had a positive significant with pregnant mothers' dietary diversity.

Keywords: ANC, Dietary Diverse Practice, Pregnant Women, Sebeta Awas District

1. Introduction

Dietary diversity is defined as the consumption of a variety of food types throughout a time period and is a proxy indicator of general nutritional adequacy [1, 2]. Thus, consumption of variety of food types support two lives—pregnant mothers and their fetus [3]. It promotes the health

status of the mother and her fetus. [4]. Pregnant women who eat a balanced diet have fewer complications during pregnancy and labor, and they are more likely to deliver live, normal, and healthier babies [2]. On the other hand, inadequate dietary intakes are associated with intrauterine growth retardation, low birth weight, premature, increases risks of abortion, prenatal and infant mortality, and morbidity and has long-lasting health impacts [5, 6].

Dietary diversity score (DDS) is an important measurement that uses for measuring nutrient efficiency and effectiveness. In a recent prospective cohort study involving women in Ethiopia, the risk of maternal anemia, LBW, and preterm negative relation with the women who consume \geq four (4) DDS throughout their pregnancy [4]. On the other hand, women with lower DDS during pregnancy had higher odds of delivering higher proportion of infants with LBW compared to those who had medium and higher DDS [7].

The index of diversity and balanced food consumption is called Food Consumption Score (FCS) (2). It is the core indicator of consumption hence it is a composite score based on dietary diversity, food frequency and relative nutritional importance of different food groups [8].

The guideline on Minimum Dietary Diversity for Women (MDD-W) was developed and released by the FAO of the United Nations and FHI 360 in 2016, which is called WDDS-10 [3]. Sixteen food groups were aggregated into ten groups to calculate the Minimum Dietary Diversity Score for Women (MDD-W) [8]. According to this guideline Women who eat food items from ≥ 5 of the 10 food groups are considered more likely to consume foods from animal sources, pulses, nuts or seeds, and fruits or vegetables and more likely of getting micronutrient than those who eat ≤ 4 food groups reproductive age [3].

Globally, daily 800 maternal death throughout pregnancy or delivery. As well as, 8000 neonatal death within the first month [9]. Ninety-eight Percent of newborn deaths and ninety-nine percent of maternal death occur in developing countries [9,10]. Many women in developing countries maintain pregnancies on dietary intake lower than those recommended by international agencies [7].

Pieces of evidence from local surveys in Ethiopia illustrated that undernutrition among pregnant women varies from 15.2–35.5%, and poor dietary practice women range from 39.3–66.1% [11-15]. Additionally, the analysis of the EDHS data in 2000, 2005 and 2011 also showed that women under nutrition rates in Ethiopia were 30.5%, 26.9% and 27% respectively [16-23].

Study done in North-east Ethiopia found that all of the study participants ate grains, white roots, and tubers, all of which were highlighted in staple foods, of which other vegetables were consumed by almost all of the respondents (98.7%) [13]. In contrast, lacked the basic and the essential practice to consume vegetables, fruits, egg and others which are the basic sources of most of the types of vitamins and minerals [20].

A study in Oromia region of Ethiopia among pregnant women revealed that they did not change the amount and type of foods they consumed to increase nutritional needs during pregnancy. In other ways, there were a number of taboos related to the consumption of certain food items such as consumption of green leafy vegetables, yogurt, cheese, sugar cane, and green pepper [5, 8, 20].

In a case like this, successful interventions of improving dietary diversity practice among pregnant women and

identifying the associated factors are very important and hence reducing the complication during pregnancy. Therefore, this study aimed at assessing magnitude of dietary diversity practice and associated factors among pregnant women in selected Health centers sebeta awas distnict, oromia, centaral Ethiopia.

2. Methods and Materials

Study area and period

The study area was conducted in sebeta awas district, OSZSF, Oromia, central Ethiopia. Sebeta Awas district has a total population of 143,695 estimate 73,882 males and 69,813 females and 29,937 households, out of this population 47,527 urban residences 96,168 are rural resident and 4,986 pregnant women. The district has four towns such as Lekule Geja, Awash Melka, Tefki and Kelecha. This district is 40km far from Addis Ababa to south west, and 38 rural kebele. sebeta awas district is divided into two agro-ecological conditions. Such as: 30% high land and 70% low land.

Number of Public health facilities are six health centres and 38 health posts and private health facility are 1 medium clinics, 6 small clinics, 5 drug stores (with Sebeta Awas Woreda Health Office). The study was done among pregnant women selected from four health centres (Sego, Awash Melka, Jawe and Tefki health centers) in Sebeta Awas district. Out of 2,957 pregnant women, the study was conducted on 639 participants in the selected health centers from May 6/2022 – July 20/2022.

Study design: institutional based quantitative cross-sectional study design was conducted from May 6/2022 – July 20/2022.

Inclusion and exclusion criteria: all pregnant women who attended ANC in the study facilities, being resident of Sebeta Awas Woreda for at least 6 months and willing to participate were included. Pregnant women with chronic illness like cancer (decrease frequency of meals), diabetics (increase frequency of meals) and on fasting were excluded.

Sample size: the sample size for the study was calculated using a single proportion formula by assuming 96% CL, 4% marginal error, and with the assumptions a prevalence of dietary diversity practice to be 61% (based on the previous study in Addis Abeba on the prevalence of dietary practice). Therefore, by adding a 5% non-response rate, the final sample size for this study was 639.

Sampling method: the sample size was proportionally allocated to each of the four selected health centers. Then a systematic sampling method was used to select the study participants from each of the four selected health centers. According to the available data during the study period, a total of 2,957 pregnant women were available in the four selected health centers in Sebeta Awas Distnict. Hence, by dividing the total pregnant women during the study period (2,957) with the total sample size (639), (N/n), the sampling interval (K) of 4 was obtained. The first employee was selected at random from each selected health center and consecutive participants were

selected every 4th pregnant mother.

Variables: Dietary diversity practice was the dependant variable. Sociodemographic factors (age, educational status, health status, religion occupation of mother, occupation of husband) were independent variables. Obstetric factors were number of ANC visit, parity, trimester, family size. In addition, Other factors were nutrition information, income level, food item avoidance, frequencies of meal per day.

Data collection method and instrument:

A structured questionnaire developed in English language by principal investigator (PI) by reviewing previous different literature conducted on dietary diversity practices and accessories materials like; computers, pen, eraser, binder was used to collect the data and 24 hour recall method was adapted from different literatures mainly Food and Agriculture Organization (FAO) Guidelines for measuring household and individual dietary diversity (FAO, 2016). The questions were modified by comments given from different qualified individual experts and finding obtained from pretest.

The questionnaire was Prepared in English then translated to Afan Oromo and translated back to English version by different qualified individuals who are expert in these two languages to insure the two languages are comparable. An Afan Oromo versions questionnaire was used to collect the data.

Data quality control:

The questionnaire was developed after reviewing the relevant literatures to the subjects include all the possible variables that address the objective of the study. The questionnaire was developed first in English and then translated to Afan Oromo with two or more persons.

The structured questionnaire was tested one week before the study period to test the questionnaire are appropriate for intended data collection. The respondents who participated in pre-test process were on the other health centers which not selected for actual data were collected. Gora Herkiso and Kelecha were health centers selected for pre-test. The pre-test was done on participants' number equivalent to about 5% of all the study participants. The questionnaire was assessed and improve in its clarity; completeness before actual use.

The completeness of questionnaire was checked every day during the data collection near the future its completeness, clarity and consistency by the supervisor and the principal investigators and principal supervisor. Any mistake detected was corrected in the next day.

Data processing and analysis:

The collected data was checked for its completeness and cleaned before entry into computer. Then the questionnaire was coded and data was entered into Epi data version 3.1 by two data clerk who were recruited. Then the data was exported to SPSS version 25 for further data cleaning and for analysis. Frequency was run to check for any missing values and checked accordingly for analysis of the outcome variable. To know whether there is association between the dependent variable and

each independent variables odds ratio, bivariate and multivariate regression analysis were used at a P value of 0.05.

Variables that yield p-value of < 0.25 in bivariate analysis were considered to be a candidate for multivariable logistic regression analysis (using back ward selection method) to control all possible confounders. For measuring strength of the association between the dependent and independent variables, Crude Odd Ratio (COR) and Adjusted Odd Ratio (AOR) along with 95% Confidence interval (CI) were calculated. Finally, statistical significance was declared at p-value < 0.05.

Ethical consideration

Before the start of the data collection process ethical clearance and approval for the study was obtained from the Institutional Health Research Ethics Review Committee (IHRERC) of Yekatit 12 Hospital Medical College. Permission was obtained from district health office. Then the woreda health office sent official letters to PHCUD of all selected health centers. The research presents no more than minimal risk of harm to subjects. Informed, voluntary, written signed consent were obtained from the study participants (for under 18 years from their husband or family) after informing them all the purpose, benefit, risk, the confidentiality of the information and the voluntary nature of participation in the study. The study participants those practices dietary diversity consuming were counseled after the completion of the interview.

Operational Definitions

Dietary diversity: Refers to the number of food groups consumed by pregnant women over a 24-hour period. [20]

Low or poor dietary diversity score: When pregnant women consumed less than five food groups among the 10 groups within 24 h before the survey. [20]

High or good dietary diversity score: When pregnant women consumed five or more food groups among the 10 groups within 24 h before the survey. [20]

Adequate dietary diversity represents those women meeting the minimum dietary diversity [19].

Food variety score: women who had above the mean food variety were considered as having good FVS, otherwise having poor FVS [5].

Minimum Dietary Diversity of pregnant women: Dietary diversity score of pregnant women receiving at least five food groups out of ten. [20].

Poor household: households with monthly income less than 2,000 ETB. [20]

Medium household: households with monthly income from 2,000-5,000 ETB [20].

Rich household: households with monthly income more than 5,000 ETB [20].

3. Result

3.1. Socio Demographic Characteristics of the Study Participants

All of the respondents were participated in the study with

the response rate of 100%. 47.4% were in the age range of 25-34. The mean ages were 30.573 years with ± 6.338 years SD. In addition, median ages 31.00 years, range of years 28.00, the minimum and maximum of ages were 16 and 44 years old respectively. The majority of them were Orthodox Christian (75.1%) followers. Almost all (90.3%) of them were married. Only 6.1% were learn college and above, and 5.9% were employed in government organization. Above half (54.1%) of their husband were farmers and most (90.3%)

of the household head were their husband. Family size 39.9% of them had in the range of 4-6 family members. The mean size was 4.28 with ± 1.79 SD.

Regard to monthly income 40.2% of them had in the range of 3500-5000ETB. The mean incomes were 4179.499ETB with ± 1795.406 ETB SD. The media, range, minimum and maximum of their incomes were 4000.00ETB, 9000.00ETB, 1000.00ETB AND 10,000.00ETB respectively (Table 1).

Table 1. Socio-demographic characteristics of pregnant women attending antenatal care at public health facilities in Sebeta Awas Distnict, OSZSF, Central Ethiopia, 2022.

Variables	Categories	Frequency	Percentage%
Age	16-24	123	19.2
	25-34	303	47.4
	35-44	213	33.3
Religion	Orthodox	480	75.1
	Protestant	106	16.6
	Muslim	53	8.3
	Married	577	90.3
Current Marital status	Unmarried	26	4.1
	Divorced	19	3.0
	Widowed	17	2.7
	Illiterate	219	34.3
Educational status of mother	Primary	249	39.0
	Secondary	132	20.7
	Tertiary	39	6.1
	Salaried	38	5.9
Occupation of the pregnant mother	Business	216	33.8
	Labour	76	11.9
	Housewife	309	48.4
	Farmer	346	54.1
Occupation of husband	Business	155	24.3
	Salaried	43	6.7
	Labour	40	6.3
	Respondent	62	9.7
Household head	Husband	577	90.3
	<2000	70	11.0
	2000-3500	153	23.9
	3501-5000	257	40.2
Level of income	>5000	159	24.9
	≤ 3	204	31.9
	4-6	255	39.9
	≥ 7	180	28.2

3.2. Maternal and Nutrition Characteristics of Pregnant Women

This study shows one-third (30.5%) of the study participants had third ANC visits and above half (53.2%) of them had three and below parity. Nearly half (46.2%) of them were in the third trimester and the majority (71.5%) were started ANC visits in the first trimester. Only 21.% of the respondants were ill/sick before two weeks prior to interviewed. This illness were like vomiting, nausea,

headache, heartburn and loss of appetite. Nearly half (46.5%) of them were consume meal three times within twenty-four hours. 14.1% of the participants were avoid at least one food item from their meal. It is due to cultural or personal belief. The majority group of food were Protein (meat and egg) (4.7%) and followed by Semi-solid foods (porridge and cereal made soup (3.4%), the reason of their avoidance were mainly producing big baby (3.6%) and attached to the skin of the fetus (1.6%) respectively (Table 2).

Table 2. Maternal and nutrition characteristics of pregnant women in Sebeta Awas Distinct, OSZSF, Oromia, Central Ethiopia, 2022.

Variables	Categories	Frequency	Percentage%
Number of ANC visit	1st visit	149	23.3
	2nd visit	185	29.0
	3rd visit	195	30.5
	4th and above	110	17.2
	Total	639	100.0
No of parity	≤3	340	53.2
	4-6	178	27.9
	≥7	121	18.9
	Total	639	100.0
Trimester	1st Trimester	117	18.3
	2nd Trimester	226	35.4
	3rd Trimester	296	46.3
	Total	639	100.0
Time of ANC started	1st Trimester	457	71.5
	2nd Trimester	157	24.6
	3rd Trimester	25	3.9
	Total	639	100.0
Have you been sick in the last 2 Weeks?	Yes	137	21.4
	No	502	78.6
	Total	639	100.0
How many times you eat meal daily?	Two and less than two times	103	16.1
	Three times	297	46.5
	Four times	192	30.0
	Five times	47	7.4
	Total	639	100.0
Do you avoid any food group in the Current pregnancy?	Yes	90	14.1
	No	549	85.9
	Total	639	100.0
Which group of food you avoid?	1) Protein (meat and egg)	30	4.7
	2) Semi-solid foods (porridge and cereal made soup)	22	3.4
	3) Milk	12	1.9
	4) Fruit and vegetable (banana and cabbage)	17	2.7
	5) Carbohydrate (bread and other sweet foods)	8	1.3
	Total	89	13.9
Why you avoid Protein (meat and eggs)	1) Producing big baby	23	3.6
	2) attached to baby	1	.2
	3) both	6	.9
	Total	30	4.7
Why you avoid Semi-solid foods (porridge and cereal made soup)	1) Producing big baby	1	.2
	2) attached to baby	10	1.6
	3) both	10	1.6
	Total	21	3.3
Why you avoid Milk	1) Producing big baby	5	.8
	2) both	7	1.1
	Total	12	1.9
Why you avoid Fruit and vegetable (banana and cabbage)	1) attached to baby	14	2.2
	2) both	3	.5
	Total	17	2.7
Why you avoid Carbohydrate (bread and other sweet foods)	1) Producing big baby	7	1.1
	2) both	2	.3
	Total	9	1.4

3.3. 24 Hours Dietary Diversity Practices of Pregnant Mothers Assessment

The overall proportion of good dietary practice (≥5 food group) out of ten food group among participants was 269 (42.1%) [95% CI=38.5-46.2] and about 370 (57.9%) [95% CI=53.8-61.5] of them were in low dietary practice categories (<5 food group) (Figure 1).

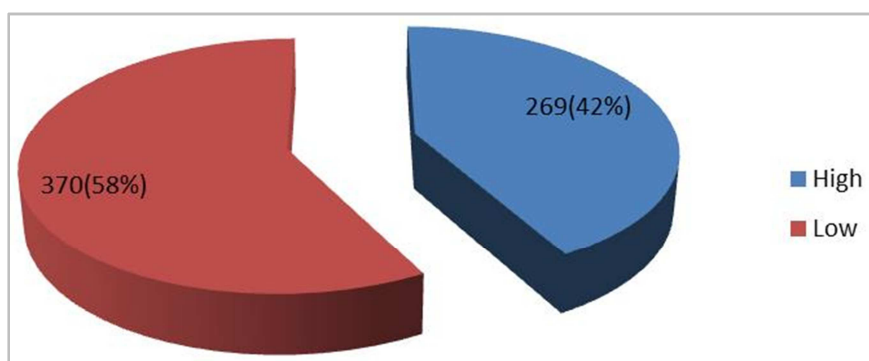


Figure 1. Minimum dietary diversity practice of pregnant women in Sebeta Awas District, OSZSF, Oromia, Central Ethiopia, 2022.

The large proportions of participants consumed seed products (90.6%) and Pulses were second most commonly eaten food group (63.2%). Meat, poultry, and fish were the least eaten food group (21%) (Figure 2).

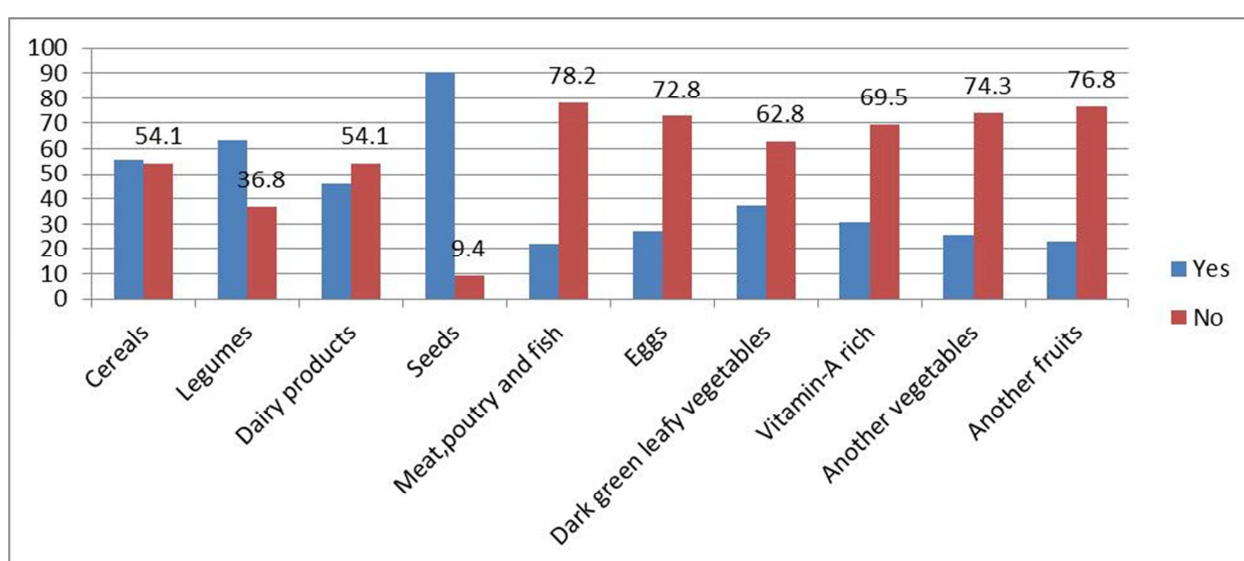


Figure 2. Food group consumptions in the last 24 hours among pregnant women attending antenatal care at public health facilities in Sebeta Awas District, OSZSF, Oromia, Central Ethiopia, 2022.

3.4. Factors Associated with Dietary Diversity Practice of Pregnant Women

The bivariate logistic regression analysis shows that marriage, education, occupation of husband, household head, level of income, time of ANC started, sick before two weeks, frequency of meal per day and food taboo were the factors associated with adequate dietary diversity among the pregnant women and candidate for the multivariable logistic regression analysis.

In multivariable analysis revealed that; pregnant women who were married 3.44 times more likely to have minimum dietary diversity than who were (AOR=3.44; 95%CI: 1.47, 8.05). Women who attended Tertiary (college and above) had 0.44 higher odds of attaining good dietary diversity as compared to those who were illiterate (AOR=0.44; 95%CI: 0.21, 0.89). Pregnant women whose husband were farmers were 0.29 times more likely to have good dietary diversity than whose their occupation were daily labour (AOR=0.29;

95%CI: 0.144, 0.60).

Furthermore, pregnant women whose household heads' husband were 0.34 times more likely to have good dietary diversity than who household head were respondents or themselves (AOR=0.34; 95%CI: 0.19, 0.58). Women who earned monthly income greater than 5000 Ethiopia birr 0.1 times (AOR=0.10; 95%CI: 0.50, 0.17) more likely to have good dietary diversity as compared to those less than 2000 Ethiopia birr. Pregnant women who were started ANC visit at the first trimester had 0.43 times more attaining minimum dietary diversity than who were started visit at the third trimester [AOR=0.43; 95%CI: 0.19, 0.99]. Pregnant women who were sick before two weeks at the time of interviewed 1.92 times likely to have good dietary diversity than who were not (AOR=1.92; 95%CI: 1.31, 2.81). In addition, women's frequency of meal 5 times per day 0.84 times (AOR=0.84; 95%CI: 0.06, 0.20)) had greater odds of achieving good dietary diversity than who had 2 and below times meal frequency per day (Table 3).

Table 3. Multivariable logistic regression analysis showed factors associated with dietary diversity practice among pregnant women in Sebeta Awas District, oSZSF, Oromia, Central Ethiopia, 2022.

Variables	Categories	Practice		COR at 95% CI	p-value	AOR at 95% CI
		≥5 (high)	<5 (low)			
Marriage	Married	349 (54.62)	228 (35.68)	1.30 (0.5-1.29)	.004	3.44 (1.47-8.05)
	Unmarried	161 (2.65)	88 (1.45)	0.28 (0.11-0.98)	.115	2.11 (0.83-53)
	Divorced	8 (1.26)	11 (1.74)	0.64 (0.02-1.62)	.016	3.67 (1.28-10.57)
	Widowed	5 (0.79)	12 (1.91)	1		1
Education	Illiterate	102 (15.98)	117 (18.32)	1		1
	Primary	161 (25.22)	88 (13.78)	(0.497-3.03)	0.00	0.48 (0.33-0.69)
	Secondary	81 (12.7)	51 (8.0)	(0.254-1.46)	0.07	0.55 (0.35-.85)
	Tertiary	26 (4.1)	13 (2.0)	(0.25-1.53)	0.023	0.44 (0.21-0.89)
Occupation of husband	Farmer	216 (33.77)	130 (20.33)	(0.24-1.57)	.000	0.29 (0.144-0.60)
	Business	99 (15.52)	56 (8.78)	(0.28-2.00)	.001	0.27 (0.130-0.57)
	Salaried	24 (3.74)	19 (2.96)	(0.36-3.87)	.035	0.38 (0.16-0.93)
	Labour	13 (2.0)	27 (4.3)	1		1
Household head	Respondent	21 (3.3)	41 (6.4)	1		1
	Husband	349 (54.62)	228 (35.68)	(0.27-7.57)	0.00	0.34 (0.19-0.58)
Level of income	<2000	17 (2.67)	53 (8.33)	1		1
	2000-3500	66 (10.31)	87 (13.59)	(1.37-11.78)	0.08	0.43 (0.22-0.80)
	3501-5000	162 (25.34)	95 (14.86)	(1.24-4.33)	0.00	0.19 (0.10-0.34)
	>5000	125 (19.58)	34 (5.32)	(0.90-2.65)	0.00	0.10 (0.50-0.17)
Time of ANC started	1 st trimester	277 (43.34)	180 (28.16)	(0.18-1.24)	.046	0.43 (0.19-0.99)
	2 nd trimester	83 (13.0)	74 (11.6)	(0.23-1.73)	.235	0.59 (0.25-1.40)
	3 rd trimester	10 (1.56)	15 (2.34)	1		1
Sick before two weeks	Yes	62 (19.37)	75 (2.03)	(0.77-1.93)	.001	1.92 (1.31-2.81)
	No	308 (48.22)	194 (30.38)		.000	0.630
	≤2 times	30 (4.69)	73 (11.41)	1		1
Frequency of meal per day	3 times	150 (23.48)	147 (23.02)	(1.29-10.84)	0.00	0.40 (0.25-0.62)
	4 times	151 (23.59)	41 (6.41)	(1.22-7.12)	0.00	0.11 (0.07-0.19)
	5 times	39 (6.14)	8 (1.26)	(0.42-2.48)	0.00	0.84 (0.06-0.20)
Food taboo	Yes	45 (12.2)	45 (12.2)	(0.80-2.33)	0.103	1.45 (0.93-2.27)
	No	325 (50.85)	224 (35.05)	1		1

4. Discussion

In the present study, about 370 (57.9%) [95% CI=53.8-61.5] of the pregnant women had consumed <5 food groups (low dietary diversity), whereas 269 (42.1%) [95% CI=38.5-46.2] had consumed ≥ 5 food groups (high dietary diversity) in the last 24 hours. This prevalence (42.1%) was Almost supported by Wachemo University referral hospital, Southern Ethiopia (42.6%) [17]. northeast Gojjam (40.1%) [11], Dessie town (45.2%) [15] and Bale town (44.8%) [18].

In contrary, this study revealed that lower than the study done by systematic review and meta-analysis in Ethiopia by 2020 (61.2%) [9] and Kolfe keraniyo, Addis Ababa city (60.9%) [20], and higher than studies done in Malawi (31%) [8] and west Gojjam (25%) [13]. These discrepancies might be due to difference in study period, geographical area, and different study period for seasonal availability of different food groups and/or socio-cultural factors.

In this study, about 90.6% and 63.2%% of the pregnant women had consumed seed products and Pulses respectively in the previous 24 hours and only 21% of them had

consumed meat, poultry, and fish in the previous 24 hours. Which was almost agree with the cross-sectional study conducted in Afar region (91.5%) [13] and, with that was done in east Gojjam (85.5%) [12] and greater than this study done in Malawi [8]. In other ways, study conducted in south Ethiopia related to the proportion of meat, poultry and fish food group eaten showed that higher figures [48.7%] [16].

Regard to food taboo, 14.1% of the participants avoided at least one food item from their meal. This is lower than that of Malawi (35%) [8]. This may be due to cultural or personal difference.

In this study, about half (54.1%) of the husband were farmers, which is lower than that reported in south Ethiopia (80.2%) [10]. This discrepancies may be due geographical distribution, socio-economical, or educational status.

The finding of this study identified that women who attended Tertiary (college and above) had 0.44 higher odds of attaining good dietary diversity as compared to those who were illiterate (AOR=0.44; 95%CI: 0.21, 0.89). Which is similar with study done in Ethiopia by 2020 maternal primary school and above educated (OR = 2.11 (95% CI: 1.10, 4.05) [9], maternal education (AOR)= 2.36, 95% CI

1.29, 4.32] had greater odds of achieving the minimum dietary diversity as compared to those who had never attended school [11].

Related to occupation of husbands. Pregnant women whose husband were salaried were 0.38 times more likely to have good dietary diversity than whose their occupation were daily labour (AOR=0.38; 95%CI: 0.16, 0.93). This is consistent with study in Alamata General Hospital government employees (AOR = 4.87, CI: 1.70–13.95) [9].

Women who earned monthly income greater than 5000 Ethiopia birr 0.1 times (AOR=0.10; 95%CI: 0.50, 0.17) more likely to have good dietary diversity as compared to those less than 2000ETB. Other study consistent with this in west Gojjam reported that, those participants with a high average family income (above 4500 birr) 0.1 times more likely to have good dietary diversity when compared to those with family income less than 1500 birr (AOR=0.1: 95% CI; 0.02-0.7) [17] and Pregnant women with monthly income more than 5,000 ETB had more dietary diversity than income less than 2,000 ETB (AOR=2.33, 95% CI: 1.234, 4.416) [20].

Pregnant women who were started ANC visit at the first trimester had 0.43 times more attaining minimum dietary diversity than who were started visit at the third trimester [AOR=0.43; 95%CI: 0.19, 0.99]. In contrary, other related study done in Addis Ababa reported that, pregnant women at second ANC visit had more dietary diversity than at first visit [AOR=2.42, 95% CI: (1.183, 4.952). This difference may be because of; the maternal health services such as: they may had got enough health investigation, screening and nutritional advice during first visit. On the other hand, at fourth visit assumed that eating protein diet at term leads the fetus big and not such important.

Women's frequency of meal 5 times per day 0.84 times (AOR=0.84; 95%CI: 0.06, 0.20)) had greater odds of achieving good dietary diversity than who had 2 and below times meal frequency per day. Similar study in Alamata General Hospital showed that, eating three meals and above 2.66 times more attaining minimum dietary diversity than who consumed below two (AOR = 2.66, CI: 1.47–4.82) [9].

5. Limitation

Limitations of the study were there will be a recall and/or social desirability bias while subjects were requested to give dietary information and monthly income. The fact that the study was limited to a single season may restrict the generalizability of the results to subsequent seasons. Food availability in the household might vary with the seasons which affect dietary diversity and the assessment of dietary intake depends on the 24-hour recall method, i.e. which may not accurately reflect their past feeding experience or may restrict the generalizability of the results to subsequent seasons. Moreover, the nature of this study was a cross-sectional design, which does not show the cause and effect relationship.

6. Conclusions

The majority of study participants consumed below the minimum dietary diversity. About 269 (42.1%) [95% CI=38.5-46.2] pregnant women had good dietary diversity practice. Seed products and Pulses were most commonly eaten food group. Meat, poultry, and fish were the least eaten food group. In this study factors such as; marriage, education, occupation of husband, household head, level of income, time of ANC started, sick before two weeks, frequency of meal per day and food taboo were the factors associated with adequate dietary diversity among the pregnant women. However, future studies should be made to cover other factors which were not included in this finding.

Authors' Contributions

KW B, TTB, GWT and ATS involved in proposal writing, designing, participated in data collection, analysis and write-up of the paper. All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Disclosure

The authors affirm that there is no conflict of interest concerning the publication of this manuscript.

Accessibility of Data and Materials

The result of this research was extracted from the data gathered and analyzed based on the stated methods and materials. There are no supplementary files. The original data supporting this finding will be accessible at any time upon request.

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