Dietary Diversity Practice and its Influencing Factors Among Pregnant Women in Afar Region of Ethiopia: A Cross-sectional Study Design Supplemented by Qualitative Study.

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Research Article

Keywords: Dietary, diversity, factor, pregnant, women

Posted Date: November 19th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-1080595/v1

Dietary diversity practice and its influencing factors among pregnant women in Afar region of Ethiopia: A cross-sectional study design supplemented by qualitative study.

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Abstract

Background: Women in low-income countries are frequently malnourished when they become pregnant, and the demands of pregnancy can exacerbate nutritional deficiencies, particularly micronutrient deficiencies, with serious health effects on the fetus. Antenatal nutritional supplements can help to improve birth outcomes and maternal health. As a result, determining the magnitude of dietary diversity and its influencing factors among pregnant women in the pastoral region of Afar, where no study has been conducted, is an essential in order to establish an intervention program in the region.

Method: A mixed study comprising 241 pregnant women and six focus group discussions was conducted from October 1 to November 10, 2018. Participants in the quantitative study were selected by a systematic sampling method, whereas those in the focus group discussions were chosen by using purposive sampling method. The data was collected using pretested questionnaires administered via face-to-face interviews. The relationship between dietary diversity practice and its affecting factors was investigated using logistic regression analysis. The strength of the association was determined by odds ratio with a 95 % confidence interval. Thematic framework was used to analyse the qualitative data.

Results: Seventy-three percent of pregnant women had poor dietary diversity. Dietary diversity was higher in younger pregnant women who were under the age of 20 years (AOR=5.8; at 95% CI: 1.6-13.5) and aged between 21-25 years (AOR=3.9; at 95 percent CI:1.1-12.2) than in older pregnant women with over the age of 30 years. Those participants with a high average family income (above 4500 birr) had a good dietary diversity when compared to those with family income less than 1500 birr (AOR=0.1:95% CI;0.02-0.7) and between 1500-3000 birr (AOR=0.05:95% CI;0.01-0.2). Pregnant women

who had one antenatal care visit practiced less dietary diversity than those who had four or more (AOR=0.18: 95 percent CI; 0.04-0.8). Protein-rich foods (meat and eggs), semisolid foods (porridge and cereal soup), milk, fruit (banana) and vegetable (cabbage) were the most commonly avoided foods by pregnant women. These meals were commonly avoided since they produced large babies and were attached to the fetus's body.

Conclusion: The majority of study participants had a poor dietary diversity. Pregnant women with a low family income and only one prenatal care visit were less likely than those with a high family income and four or more antenatal care visits to practice dietary diversity, respectively. Most pregnant women avoided high-protein diets, semi-solid foods, milk, vegetable and fruit. Due to the presumptions of producing large fetus and attached to the fetus's body, these foods were avoided.

Key words: Dietary, diversity, factor, pregnant, women

Background

Nutrition is critical in reducing pregnancy risks such as maternal and child mortality, intrauterine growth retardation, low birth weight and early births, birth abnormalities, cretinism, poor brain development, and infectious risk. Pregnant women require a diversified diets and increased nutritional intake to cope with the increased demand during pregnancy (1). In a study of low and middle-income countries, women from the Caribbean and Central/South America had higher mean calorie, fat, protein and carbohydrate consumption than women from Africa and Asia. Cereal-based foods constituted the majority of people's diets across the region (2). Based on a study in Eastern Nigeria, around 37% of respondents avoided certain foods during pregnancy owing to food taboos. Snail and grass-cutter meat were the most common foods to avoid during pregnancy, whereas egg was the most common foods avoiding in children under the age of two-years. Some women thought that consuming snail and grass-cutter meat makes a foetus sluggish and makes a labor more difficult. Food avoidance was not associated with maternal educational status, parity and occupation (3). A study in Kenya showed that cereals were the most consumed food group (99%), with a mean and standard deviation dietary diversity score of 6.84 and 1.46, respectively. A minimum of dietary diversity was acquired by the majority of responders (98 percent). Only about 2% of pregnant women did not receive the minimum required amount of dietary diversity. Pregnant women's dietary diversity was influenced by education level, employment status and monthly income (4). 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. 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. The taboos were more practiced by older women from rural communities and those with no formal education than those of younger and formal educated mothers, respectively. Fear of weight gain during pregnancy, which is linked to the difficulty of delivering a large baby, was one of the reasons for avoiding these foods (5). According to a study conducted in Wondo Genet district of Southern Ethiopia, most pregnant women's nutrient intakes (energy, vitamin A, and protein) were below the recommended levels. Furthermore, almost all micronutrient intakes were below the recommended levels, with the exception of iron. Multiple pregnancies and a lack of cereal-based diets were also risk factors for malnutrition (6). Dietary diversity score was a mean score of 4.45± (SD=1.32) in a study done in North-east Ethiopia. The study found that 43% of pregnant women had the minimum of dietary diversity score, while the remaining participants did not. All of the study participants ate grains, white roots, and tubers, all of which were highlighted in staple foods. Other vegetables were consumed by almost all of the respondents (98.7%). About 66.3% of the women ate plant-based foods from nuts and pulses, 55.3% consumed other vitamin A-rich fruits and vegetables, and 46.6% took milk and milk products (7). A qualitative study was done in the Afar region of Ethiopia, consisting of four focus group discussions and eight key informants with an in-depth interview. Pregnant women were prohibited from consuming large amounts of any food, as well as meat, milk products, bread and cold water. Gastritis, diarrhoea, typhoid and skin discoloration of the foetus were among the reasons stated for sticking to the dietary banned during pregnancy (8).

Although few studies have been conducted in other parts of Ethiopia, the practice of dietary diversity and its associated determinants among pregnant women was not studied in the context of Afar pastoral region, where sociocultural and economic realities are considerably different. In order to address this knowledge gap, a study was established to assess the magnitude of dietary diversity practiced and its influencing factors among pregnant women residing in Awash seven district, Afar region of Ethiopia.

Methods

Study area

The study was conducted at Awash seven health facility in Afar region of Ethiopia. A large extent of Afar people are a pastoral and follow the Muslim religion. The region's climate is dry and hot, and food shortages occurred on a yearly basis. Aid organizations assisted almost all of the people (under safety net). Cattle, goats, sheep, and camels are the most common livestock used by households. During the dry season, migration of livestock to the major river for pasture and water is common. The Afar social structure is based on descent and affine relationships. The Afar has a patrilineal descent system that assigns a person to a certain clan (the society called mela). Clan members are supposed to share resources and assist one another in the event of an emergency. Cross-cousin marriages are compulsory under Islamic rule. Engagement for marital commitments can start as early as childhood (locally called Absuma). The real wedding usually takes place when girls are in their mid-teens. The boy's father arrives with two camels loaded with butter (locally known as subah), wheat flour, and mat (locally called Senan), and transports the couple to the location where they would build their own home. When a wife becomes pregnant, the husband usually returns her to her family to give birth. Afar people have a strong desire to have as many children as possible. This is because children are viewed as a way of increasing household income by engaging in a variety of activities such as trade, salt caravans, labour migration, and herding (9). Female genital mutilation is a common practiced in the Afar society. Women, men, religious leaders and traditional birth attendants are a key role in the continued practice of female genital mutilation (FGM) (10).

Study design and sample size determination

A quantitative cross-sectional study complemented by qualitative study design was used to determine dietary diversity practice and its influencing factors among pregnant women from October 1 to November 10, 2018. The sample size for quantitative data was calculated using a single proportion formula with the assumption of a small total population (512). Thus, considering 95% confidence level with a 5% precision, and taking 57% inadequate dietary diversity from a prior study in Dire Dawa, Eastern Ethiopia (7), The sample size was found to be 217. After adding for 15% non-response rate, the final sample size was 250. Focus group discussions (FGDs) with groups of pregnant women were conducted until the qualitative data was saturated.

Inclusion and exclusion criteria

All pregnant women who agreed to take part in the study and had lived in the study area for at least one year prior to the study period were included. The study did not include pregnant women who had chronic conditions like cancer or diabetes. This was due to the fact that these illnesses are known to have an impact on a person's food consumption and nutritional status. The respondents' health information was used to compile this data. Pregnant women who had consumed special diets in the previous 24 hours owing to holidays or celebrations were also excluded.

Sampling technique and procedures

The sampling interval was calculated by dividing the total number of pregnant women who attended antenatal care in the health facility three months ago by the total sample size. Then, using systematic sampling technique, the required study subjects were

recruited. From the first two study subjects, the first study subject was selected by lottery, and then every second study subject was selected until the required sample size was achieved. But, pregnant women who had previously participated in the study did not re-interview. Purposive sampling was used to select focus group discussants (FGD) for the qualitative study. The FGD participants, on the other hand, were not the same as those who were sampled for quantitative data.

Data collection instruments and procedures

For quantitative data: Data on demographic, socio-cultural, and economic factors, as well as maternal health service utilization factors were constructed from previous literature and collected by face-to-face interview using pre-tested structured questionnaires. Three data collectors (two midwives and one nurse) were trained to collect quantitative data, whereas two data collectors (two nurses) were recruited and trained to collect qualitative data. The training allowed them to become familiar with the food groups and particular foods within each food groups in order to place recalled foods into the appropriate food groups. Data on dietary diversity was collected using a modified individual dietary diversity Score (IDDS) questionnaire developed from food and agriculture organization (FAO) (11). Individual dietary diversity Score (IDDS) questionnaire consisted of nine food groups. All of the data collectors were fluent in Afar language (native). The questionnaires are first written in English and then translated into the Afar language by a third person who is a native Afar speaker with translation experience. Health extension workers in the community and midwives at the Awash seven health centre's antenatal care (ANC) clinic were also consulted to amend the food list in the food groups, whether or not they matched with local names of foods, and acceptable terminology was agreed upon

(modification was carried out based on local language). The respondents were asked to recall all foods (meals and snacks) consumed the previous day and night (24-hour recall). After recalling all foods and beverages consumed, these food items were recorded. The interviewers underlined the corresponding foods in the list under the appropriate food categories and entered “1” in the column next to the food group if at least one food was consumed. Once the recall was completed, look for food groups that were not consumed by respondents. After ensuring that no meals from that food group were eaten, “0: was filled in the right-hand column corresponding to the food group.

Qualitative study: The qualitative data was collected by focus group discussion using open-ended guiding question which was developed based on the study objective. The purpose of study was explained for each study participant before data collection started for both quantitative and qualitative data. Those who agreed to take part in the study were then interviewed face-to-face in a quiet, comfortable and convenient location in order to better understand each other and ensure confidentiality. The handwritten field notes from all of the focus groups were transcribed into Microsoft Word 7, and everything was translated from Afar to English, including certain key Afar words in brackets. On a daily basis, the supervisor checked the collected data for completeness and accuracy. The guiding questions used to interview focus group discussions was shown (Table 1).

Table 1: Shows the key questions used in focus group discussion interviewing guidelines.

Participants	Key questions

Pregnant women	Are there any food taboos or foods that a pregnant woman should avoid eating for the welfare of the mother or the unborn child? What exactly are these dietary taboos?

Variables and operational definition

Independent variables were age, religion, ethnicity, marital status, residence, family size, educational status, occupation, average monthly income, birth interval, parity, month of pregnancy, antenatal care visits, food restriction and frequency of eating per day. The dependent variable was dietary diversity (poor/good).

Good dietary diversity: Pregnant women who consumed four and above food groups out of a total of nine food groups.

Poor dietary diversity: For those pregnant women who did not meet the minimum dietary diversity requirement (consumption of less than four food group).

Data analysis

SPSS Version 23 was used for the analysis. Tables with frequency were used to present the results. Binary logistics regression was used to find significant associations between dietary diversity practice and independent variables. Variables having a p-value less than 0.05 in binary logistic regression were included in multivariate logistic regression. The

regression analysis' results were provided as odd ratios (OR), with 95% CI and a significance level of less than 0.05. When respondents consumed four or more food groups, their responses were categorized as good, and if they consumed less than four food groups, they were categorized as poor. The qualitative data was manually analysed using the framework techniques in multidisciplinary research (12) The results of the thematic analysis are presented in the form of narrative with supporting quotes. Finally, the qualitative study's findings were triangulated with the quantitative findings.

Ethical consideration

The Ethics Committee at Samara University's Health Science College gave ethical clearance. Before recruiting, informed consent was obtained from each mother after explained about the study's objectives. Participation in the study was entirely voluntary. All information was kept in strict confidence.

Results

Quantitative study results

Socio-demographic characteristics of pregnant women reside in Awash seven district, Afar region of Ethiopia.

The response rate of the study was 96.4% (241/250). About 29.9% of participants were in the age range of 21-25 years. Ninety-five percent of participants were married. Majority of pregnant women (72.2%) follows Muslim religious. More than half (58.5%) of study participants were Afar ethnicity. Almost three-fourth (75.9) of participants were urban residents. Illiterate pregnant women represented 35.3% of study participants. Moreover, around three-fourth (75.5%) of pregnant mothers were housewives. Twenty-seven percent of pregnant women lived in extended family members (above four family members). Nearly half (50.6%) of study participants had average family income between 1500-3000 birr (Table 2).

Table 2: shows socio-demographic characteristics of pregnant women reside in Awash seven district, Afar region of Ethiopia.

Variables	Categories	No (%)
Age	=< 20	51 (21.2)
	21-25	72 (29.9)
	26-30	66 (27.4)

	>= 31	52 (21.6)
Marital status	Married	229 (95%)
	Unmarried	12 (5%)
Religious	Orthodox	55 (22.8)
	Protestant and catholic	12 (5)
	Muslim	174 (72.2)
Ethnicity	Others	39 (16.2)
	Amara	61 (25.3)
	Afar	141 (58.5)
Residence	Urban	183 (75.9)
	Rural	58 (24.1)
Educational status	Illiterate	85 (35.3)
	Primary school	68 (28.2)
	Secondary school	63 (26.1)
	College and above	25 (10.4)
Occupation	Housewives	182 (75.5)
	Government employed	23 (9.5)

	Merchants	36 (14.9)
Family size / members	Four and below	176 (73%)
	Above four	65 (27%)
Average monthly income (Ethiopian birr)	< 1500	53 (22)
	1500-3000	122 (50.6)
	3001-4500	33 (13.7)
	> 4500	33 (13.7)

Others represent Oromo, southern nation and nationalities peoples, and Tigray peoples

Obstetric and health service utilization characters of pregnant women reside in Awash seven district, Afar region of Ethiopia.

About 67.3% of multiparous pregnant women had a birth interval of more than two years. Nulliparous participants accounted for 32.4% of the total study participants. Almost half of the study participants (49.8%) were more than six months pregnant. Only 7.1% of study participants had four antenatal care visit, while 49% of pregnant women had once antenatal care visits (Table 3).

Table 3: Shows obstetric and health service utilization characters of pregnant women reside in Awash seven district, Afar region of Ethiopia.

Variables	Categories	No (%)
Birth interval	Two year and below	53 (32.7)

	Above two year	109 (67.3)
Parity	Nulliparous	78 (32.4)
	Multiparous	163 (67.6)
Month of pregnancy	Less than 3 months	38 (15.8)
	3-6 months	83 (34.4)
	Greater than 6 months	120 (49.8)
Antenatal care visits	One	118 (49)
	2-3 times	106 (44)
	Above three	17 (7.1)

Dietary habit of pregnant women reside in Awash seven district, Afar region of Ethiopia.

Individual dietary diversity scores of study participants had mean and standard deviations of 3.1 and 1.38, respectively. Twenty-seven percent of study participants had good dietary diversity practice, whereas the remaining participants had poor dietary diversity practice. Only 9.5% of pregnant women consumed meals five times a day, whereas 74.2% of study participants ate three times a day. Nearly thirty-seven percent (37.3%) of pregnant women avoided certain types of meals during their pregnancy. During pregnancy, 58.9% and 13.3% of pregnant women avoided at least one of the protein foods (meat and eggs) and semi-solid foods (cereal soup and porridge), respectively, out of the total food restricted participants. (Table 4).

277 Table 4: Dietary habit of pregnant women reside in Awash seven district, Afar region of
278 Ethiopia.

Variables	Categories	No (%)
The mean of individual dietary diversity score (IDDS)= 3.1±1.38		
Dietary diversity	Poor	176 (73)
	Good	65 (27)
Frequency of food taking per day	Three times	178 (74.2)
	Four times	40 (16.7)
	Five times	22 (9.2)
Is there certain types of food taboos?	Yes	90 (37.3)
	No	151 (62.7)
Types of foods avoided during pregnancy	Reason for prohibition	
Protein (meat and egg)	Producing big fetus	53 (58.9)
Semi-solid foods (porridge and cereal made soup)	Attached to the fetus body	12 (13.3)
Milk	Producing Big fetus and attached to the fetus body	11 (12.2)
Fruit and vegetable (banana and cabbage)	Attached to the fetus body	7 (7.8)
Carbohydrate (bread and other sweet foods)	Producing Big fetus	7 (7.8)

Pregnant women consumed food groups in the previous 24 hours in Awash seven district, Afar region of Ethiopia.

Over ninety percent of participants (91.3 percent) ate starchy staple foods (teff, wheat and maize). About 61.8% of pregnant women consumed legumes, nuts and seeds. Milk and milk production were taken by more than half of the participants (57.7%) (Table5).

Table 5: The types of food groups consumed by pregnant women in the previous 24 hours in Awash seven district, Afar region of Ethiopia.

Starchy Staple (cereal based like teff, wheat and maize)	220 (91.3)
Dark green leafy vegetables (kale and spinach)	44 (18.3)
other vitamin A rich foods and vegetables (mango, papaya and orange)	61 (25.3)
Other fruits and vegetables (avocado, lemon, cabbage, banana and apple	61 (25.3)
Organ meat	5 (2.1)
Meat and fish	35 (14.5)
Eggs	41 (17)
Legume, nuts and seeds	149 (61.8)
Milk and milk products	139 (57.7)

Influencing factors associated with dietary diversity practice among pregnant women reside in Awash seven district, Afar region of Ethiopia.

When confounding factors were adjusted, participants under the age of 20 years (AOR=5.8; at 95% CI: 1.6-13.5) and aged between 21-25 years (AOR=3.9; at 95%CI:1.1-12.2) had higher good dietary diversity consumption than those over the age of 30 years.

Participants with a monthly average family income of less than 1500 birr (AOR=0.1; at 95% CI:0.02-0.7) and 1500-300 birr (AOR=0.05; at 95% CI: 0.01-0.2) had less dietary diversity consumption than those with a monthly average family income of more than 4500 birr. Pregnant women who had once antenatal care visit were 0.18 times more likely to have a minimum dietary diversity consumption than those who had four or more antenatal care visits (AOR=0.18; at 95% CI:0.04-0.8) (Table 6).

Table 6: Shows influencing factors associated with dietary diversity practices among pregnant women reside in Awash seven district, Afar region of Ethiopia.

Variables		Dietary diversity		COR with 95% CI	AOR with 95% CI
		Poor No (%)	Good No (%)		
Age	=< 20	31 (12.9)	20 (8.3)	**3.1 (1.2-7.7)**	**5.8 (1.6-13.5)**
	21-25	49 (20.3)	23 (9.5)	2.2 (0.9-5.4)	**3.9 (1.1-12.2)**
	26-30	53 (22)	13 (5.4)	1.2 (0.5-3.0)	1.6 (0.4-6.1)
	>= 31	43 (17.8)	9 (3.7)	1	1
Religious	Orthodox	32 (13.3)	23 (9.5)	**2.5 (1.3-4.7)**	
	Protestant & catholic	9 (3.7)	3 (1.2)	1.2 (0.3-4.5)	
	Muslim	135 (56.2)	39 (16)	1	

Residence	Urban	125 (52)	58 (24)	**3.4 (1.5-7.9)**	
	Rural	51 (21.2)	7 (2.9)	1	
Educational status	Illiterate	75 (31.1)	10 (4.1)	**0.1 (0.03-0.3)**	
	Primary school	51 (21.2)	17 (7.1)	**0.2 (0.1-0.6)**	
	Secondary school	40 (16.6)	23 (9.5)	0.4 (0.1-1.0)	
	College and above	10 (4.1)	15 (6.2)	1	
Occupation	Housewives	143 (59.5)	39 (16)	**0.4 (0.2-0.9)**	
	Government employed	11 (4.6)	12 (5)	1.7 (0.6-4.9)	
	Merchants	22 (9.1)	14 (5.4)	1	
Monthly family income (ETB)	< 1500	43 (17.8)	10 (4.1)	**0.1 (0.03-0.3)**	**0.1 (0.02-0.7)**
	1500-3000	107 (44.4)	15 (6.2)	**0.1 (0.02-0.1)**	**0.05 (0.01-0.2)**
	3001-4500	17 (7.1)	16 (6.6)	**0.3 (0.1-0.9)**	0.6 (0.1-2.4)
	> 4500	9 (3.7)	24 (10)	1	1
Antenatal care visits	One	99 (41.1)	19 (7.9)	**0.17(0.1-0.5)**	**0.18 (0.04-0.8)**
	2-3 times	69 (29)	37 (15)	0.5 (0.2-1.3)	0.9 (0.2-3.9)
	Four and above	8 (3.3)	9 (3.7)	1	1

Frequency of eating per day	Three times	147(61)	31 (13)	**0.12 (0.1-0.3)**
	Four times	21 (8.8)	19 (7.9)	0.5 (0.2-1.5)
	Five times	8 (3.3)	14 (5.8)	1
Food prohibition	Yes	79 (32.8)	11 (4.6)	**0.25 (0.1-0.5)**
	No	97 (40.2)	54(22.4)	1

300

301 **Qualitative study results**

302 In the qualitative study, a total of 38 pregnant women involving in six focus group
303 discussions, four of which were held with urban residents and two with rural inhabitants.

304 In urban residents, seven pregnant women participated in each of the two focus group
305 discussion and six study participants involved in the remaining each two focus group
306 discussion. In rural residents, each of the two focus group discussion had six participants.
307 The majority of participants (44.7%) were between the ages of 21-30 years, with the
308 remaining 15.8% and 39.5% were under and over the age of 20 years, respectively. About
309 28.9% and 44.7% of participants were illiterate and in primary school, respectively, while
310 18.4% and 7.9% of pregnant women were in secondary school, and college and above,
311 respectively. Nearly ninety percent (89.5%) of pregnant mothers were multiparous. More
312 than half of the participants (55.3%) were pregnant for 3-6 months, and 34.2% were
313 pregnant for over six months. Half of the study participants had one prenatal care follow-
314 up, while 42.1% had 2-3 antenatal care follow-ups. In this qualitative study, dietary taboos
315 during pregnancy was investigated among pregnant women. According to focus group

discussants, the most commonly avoided foods during pregnancy were semi-solid and solid cereal-based foods, fruit and vegetables, animal products and soft drinks. A key theme, food taboos, was developed using codes and categories (Table 7).

Table 7: Shows the development of a key theme, food taboos during pregnancy, using codes and categories based on reports from pregnant women reside in Awash district, Afar region of Ethiopia.

A major theme	Categories	Codes
Food taboos during pregnancy	Semi-solid and solid foods	Porridge, soups, bread
	Fruits and vegetable	Banana, cabbage
	Animal products	Milk, meat, eggs
	Soft drink	Coca cola, sprit

The following are the details of the qualitative study's participant interviews.

During pregnancy, the majority of the participants believed that semi-solid foods, as well as some fruits and vegetables, should be avoided due to they thought these foods were stick with the fetus's body. *A 35-years-old women explained that "porridge, cereal soup (locally known as atimt), banana and cabbages were not consumed during pregnancy since they can cling with the fetus body" (a 35-years pregnant woman in FGD1).*

The majority of the group members reflected their opinion that sweat foods and animal products should not be consumed by pregnant women since the fetus would grow large

and difficult to deliver. A 28-years-old pregnant women stated that "in our society, most pregnant women do not consume meat, egg and milk since it is believed that these foods produced big fetus and cause delivery to be delayed" (a 28-years pregnant woman in FGD2).

Participants in the focus group discussion (FGD) also avoided milk, fruits and semi-solid foods when pregnant. A pregnant 29-year-old woman expressed her belief that "yogurt, bananas and porridge were adhering to the unborn fetus' body, resulting in an abnormal child. Thus, I did not eat these foods" (a 29- years old pregnant woman in FGD3).

Almost all of the participants in the focus groups discussion said that protein and carbohydrate diets were forbidden during pregnancy. This was explained by a 37-year-old woman who stated that "I did not consume meat, eggs and bread because they increased the weight of the fetus, caused prolonged labor and bleeding" (a 37-years old pregnant woman in FGD4).

Coffee with milk and sugar was not allowed to take pregnant women to prevent fetal obesity and facilitate delivery. A 39-year-old pregnant woman clarified this, "in Afar culture, a mixture of coffee, milk and sugar (locally known as ashara) is not taking during pregnancy since it is believed that it increased fetus weight and difficulty to easily deliver" (a 39-years old pregnant woman in FGD5).

The majority of group respondents avoided soft drinks and semi-solid foods during their pregnancy due to concerns about a thin baby bone caused by soft drinks and the attachment of semi-solid foods to the fetus body. A 30-years-old woman noted that "Coca-Cola and Sprite made the fetus bone thin, and porridge and cereal soup (locally

called atmit) stick to the fetus body. So, we did not consume these food items" (a 30-years old pregnant woman in FGD6).

Discussions

Inadequate dietary diversity can harm both the mother and the fetus, with the effects on the fetus perhaps persists to childhood. To promote maternal nutrition, health, and child development, it is vital to recognize the dietary diversity practices of pregnant women (1).

There is no study on the dietary diversity among pregnant women in Afar region of Ethiopia. Thus, identifying the magnitude of dietary diversity practice and its influencing factors among pregnant women in pastoral region of Afar, is merit for policy and program consideration. The average dietary diversity score in the study was 3.1± (SD=1.38). Furthermore, 73% of study participants exhibited poor dietary diversity. These findings were higher than that of a study in Kenyan (4) and North East Ethiopia (7). The discrepancy in dietary diversity scores could be attributable to the study area, where more cultural practice might influence food intake during pregnancy, as opposed to study settings in North East Ethiopia, where urban inhabitants could have more nutrient diversity. According to the current survey, 37.3 % of pregnant women avoided certain types foods. This finding is consistent with the finding in Eastern Nigeria (3). According to international food policy research institutions, there is a positive relationship between dietary diversity and nutrient adequacy (diet meeting requirement of energy and essential nutrients). Furthermore, according to the food and agricultural organization (FAO), the individual dietary diversity score (IDDS) shows the nutrient adequacy of the diet and the food groups analysed in this score place a greater focus on micronutrient consumption. Therefore, lack of adequate dietary diversity in the majority of pregnant women in the current study suggested nutrient deficiency, implying that the requirement for sufficient energy and key nutrients was not met. This evidence supports prior study in Wondo Genet

district of Southern Ethiopia, which found that most pregnant women's nutritional intakes were below recommended levels (6). The majority of the participants in this study (91.3 %) ate cereal-based diets. This result is consistent with a research in low and middle-income countries (2), but lower than a study in Kenya (4) that found cereal-based foods were the most popular (99%). Furthermore, all food groups consumed by pregnant women in the current study were lower than in a study done in north east Ethiopia (7), with the exception of milk and milk products, which were common in the pastoral region of Afar. Meat and eggs were the most avoided foods during pregnancy and the least consumed food groups out of nine food groups. These findings were strengthening the qualitative finding, which revealed that animal products (meat and eggs) were the most popular avoided foods during pregnancy. Moreover, Semi-solid foods (porridge and cereal soup), milk, some fruits and vegetables, and carbohydrate-rich foods (bread and sweet foods) were also forbidden during pregnancy, according to study participants in both quantitative and qualitative investigations. Fear of fetus weight increase, which is linked to delivery difficulty, and the assumption that semi-solid meals, fruit, and vegetable attachments to the fetus body were the reasons for avoiding eating these foods. These findings are consistent with those of a prior study conducted in Eastern Nigeria (3), Ethiopia's Oromia area (5) and Afar region Ethiopia (8). Participants under the age of 20 years and those between the ages of 21-25 years consumed better dietary diversity than those over the age of 30 years. This could be due to the fact that older women are more likely to adhere to food taboos. This evidence is related with a study in Oromia region of Ethiopia, which found that elderly women were more likely to practice dietary taboos than younger women (5). Pregnant women with a low monthly average family income (under

3000 birr) were less likely than those with a higher average monthly family income (over 4500 birr) to practice the minimal dietary diversity. This finding is similar with a study finding in Kenya (4). Pregnant women who had once antenatal care visit were also less likely to consume the minimum dietary diversity than those who had four or more. The minimum dietary diversity did not have a significant association with educational level and occupation. This is contradicting with a study in Kenya (4). This could be more antenatal care visits are linked to increased awareness of the benefits of nutritional diversity.

This study is cross-sectional study, so, it is difficult to infer a causal association. Adding an exploratory study with a quantitative study, on the other hand, aids in the discovery of additional information not available from the quantitative study. The open-ended questionnaire allowed participants to report any foods or beverages they had consumed or not consumed without restriction. Thus, these questionnaires allowed women to describe their experiences in their own words, but they were vulnerable to social desirability. Using a single 24-hour recall period did not reveal an individual's habitual diet, and the amount of food consumed is not indicated by the dietary diversity score. Attainment of pregnant women at antenatal clinics was low, particularly in rural areas, resulting in a smaller number of participants being recruited from these areas. The fact that the sample was limited to a single season may restrict the generalizability of the results to subsequent seasons. However, the study provided a new perspective on factors that influence dietary diversity among pregnant women, particularly in the pastoral community of Afar, which is novel and interesting. Therefore, the findings can give useful information for nutrition-sensitive intervention.

Conclusion: The majority of study participants consumed below the minimum dietary diversity. Younger pregnant women had good dietary diversity than elder pregnant women. Having a high average family income was associated with good dietary diversity. Those pregnant women with once antenatal care visits had less minimum dietary diversity than those who had four or more antenatal care visits. Protein-rich foods (meat and eggs), semisolid foods (porridge and cereal soup) and milk were the most commonly avoided foods by pregnant women. The most common reason for avoiding these meals was delivery difficulties and the fear that they might stick to the fetus's body.

List of abbreviation: FGD: focus group discussion, SPSS: social science statistical package, COR: crude odd ration, AOR: adjusted odd ratio, CI: confidence interval, SD: standard deviation.

Declaration

Ethical approval and consent to participate: Ethical clearance was obtained from a research and ethics review committee of health science college, Samara University. All methods were performed in accordance with the relevant guidelines and regulations. Informed consent was obtained from each study participant after explanation of the study's aim. No one was harmed as a result of participating in this study. By eliminating any identifier from questionnaires, confidentiality was respected.

Consent for publication: Not applicable

Availability of data and material: Based on author request.

Competing interest: The author declared that no conflict of interest for these work.

Funding: No funding source

Acknowledgement: The authors like to thank all study participants and other individuals involving in any process of this study.

Author contributions: Conceive and design the study: T.G.W, Perform the study: T.G.W, Analysis the data: T.G.W, Wrote the paper: T.G.W.

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