Dietary Practices and Associated Factors Among Pregnant Women in Haramaya District, Eastern Ethiopia

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Short Title: Dietary Practices and Associated Factors Among Pregnant Women

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Keywords: Prevalence; Dietary Practice; Pregnant Women; Haramaya; Ethiopia

Abstract:

Introduction
Dietary practice in pregnancy has continued to get global attention as pregnancy is considered a critical period in the life-cycle owed to increase the metabolic and physiological demand. However information on dietary practice among pregnant women in Ethiopia, particularly of those resident of rural area is limited. Therefore, this study aimed to assess dietary practice and its determinants among pregnant women in Harmaya district.

Methods
Sectional study design was conducted involving 448 pregnant women from January 5 to February 12, 2021. Data was collected with interviewers-administered questionnaires by well-trained health professionals. Validated Food frequency questionnaires was used to assess dietary practice. Four measures including; dietary diversity, food variety, consumption of animal source foods and frequency of meal were used to measure the dietary practices of pregnant women. A Poisson regression model with robust variance estimation was used to investigate the independent variable’s association with dietary practice. An adjusted prevalence ratio with 95% confidence interval was reported to show associations.

Results
The prevalence of dietary practice among pregnant women was 15.18% (95% CI=11.96-18.84). From total respondents 29.46%, 37.5% and 24.7% of them had high dietary diversity, high food variety score and high consumption of animal source food respectively. Dietary practice was more prevalent among merchant women (APR=2.07; 95% CI 1.071-4.016) and those whose husband have high school and above educational level (APR=1.96; 95% CI=1.1.063-3.460). However, the prevalence of dietary practice was significantly lower among those who reported chat chewing (APR=0.58; 95% CI=0.370-0.901) and avoiding food intake (APR=0.36; 95% CI=0.200-0.651).

Conclusion
The present study showed that dietary practice of pregnant women is sub-optimal. Lower prevalence was observed on women who reported chat chewing and restricted dietary consumption during pregnancy. Nutrition policy, programs and interventions should aimed at encouraging prenatal dietary guidance and counselling are recommended.

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**Additional Information:**

| Question                | Response                                                                                                                                                                                                 |
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** Additional data availability information:**
Dietary Practices and Associated Factors Among Pregnant Women in Haramaya District, Eastern Ethiopia

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Introduction: Dietary practice in pregnancy has continued to get global attention as pregnancy is considered a critical period in the life-cycle, owing to increased metabolic and physiological demands. However, information on dietary practice among pregnant women in Ethiopia, particularly those residing in rural areas, is limited. Therefore, this study aimed to assess dietary practice and its determinants among pregnant women in Harmaya district.

Methods: Sectional study design was conducted involving 448 pregnant women from January 5 to February 12, 2021. Data was collected with interviewers-administered questionnaires by well-trained health professionals. Validated food frequency questionnaires were used to assess dietary practice. Four measures including dietary diversity, food variety, consumption of animal source foods, and frequency of meal were used to measure the dietary practices of pregnant women. A Poisson regression model with robust variance estimation was used to investigate the independent variable’s association with dietary practice. An adjusted prevalence ratio with 95% confidence interval was reported to show associations.

Results: The prevalence of dietary practice among pregnant women was 15.18% (95% CI=11.96-18.84). From total respondents 29.46%, 37.5% and 24.7% of them had high dietary diversity, high food variety score and high consumption of animal source food respectively. Dietary practice was more prevalent among merchant women (APR=2.07; 95% CI 1.071-4.016) and those whose husband have high school and above educational level (APR=1.96; 95% CI=1.1063-3.460). However, the prevalence of dietary practice was significantly lower among those who reported chewing (APR=0.58; 95% CI=0.370-0.901) and avoiding food intake (APR=0.36; 95% CI=0.200-0.665).

Conclusion: The present study showed that dietary practice of pregnant women is sub-optimal. Lower prevalence was observed on women who reported chewing and restricted dietary consumption during pregnancy. Nutrition policy, programs, and interventions should be aimed at encouraging prenatal dietary guidance and counseling.

Keywords: Prevalence, Dietary Practice, Pregnant Women, Haramya, Ethiopia

Introduction
Healthy and balanced diet is essential for all human beings for the appropriate working of the body system (1). Pregnancy is a critical period in the life-cycle, owing to increased metabolic and physiological demands; adequate nutrition is essential to meet these conditions. At conception many women lack sufficient micronutrients stores to meet increased requirement of pregnancy (2, 3). Inappropriate dietary practice in pregnancy is one of the factors that contribute to undernutrition and micronutrients deficiency which may also result in poor birth outcome (4). In unindustrialized world, inappropriate dietary practice fallouts as inadequate access to food sources or after poor knowledge of the essence of virtuous quality and amount diet (5-8). Imbalanced macronutrients, inadequate micronutrient intakes and predominantly plant-based diets were common features of the diet of pregnant women in developing countries (9).

In low-middle income countries good dietary diversity practice of pregnant women vary within a country ranging from 20% in the Pakistan to 70% in the India (10). Most of pregnant women in Sub-Saharan Africa have insufficient dietary consumption and do not meet their Recommended Dietary Allowances (RDA) (11). Evidences suggested that appropriate dietary practice of pregnant women in Ethiopia diverge extending from 19.9% in the Gojjam (5) and 40.1% in the Gonder (6). Most of the researches used meal frequency to evaluate the dietary practice of pregnant women, whereas some used tools on nutrient content of the foods. In developing country context where the pregnant women commonly did not identify the nutrient content food, the question on nutrient content food is not frequently used to assess dietary intake. In low-income county, where people habitually served diets from communal crossbow; dietary diversity, food Variety score, consumption of animal source score and meal frequency are measures usually applied to gauge dietary practice of pregnant women (12-17).

Women’s biological, social, physiological, economic, environmental and psychological characteristics are a complex set of determinants that affect their dietary practice in pregnancy. From these determinants, except the biological others can be modified (18). From the review of different literature, the socio-economic determinant of dietary practice of pregnant women is well covered by former investigators. However, environmental and psychological factors which influences dietary practice during pregnancy are poorly documented in Ethiopian context and the problem is undetected particularly...
in the eastern part of the county. Moreover, the current prevalence of dietary practice and it’s the socio-economic, environmental and psychological factors in pregnancy is not well-known in this setup empirically. Therefore, the problem could be undetectable to policy makers.

In the present study, we aimed to comprehensively assess dietary practice and its determinants among pregnant women. First, we examined socio-economic and obstetric characteristics of pregnant women. Then, we identified predictors of dietary practice among pregnant women.

**Methods**

**Description of study area**

The present study was conducted in Haramaya district, Eastern Ethiopia. It is 500 KM away from the capital city, Addis Ababa. The district is also, divided into 33 rural and 2 urban “kebeles” which are the lowermost unit of administrative in Ethiopia. Haramaya district is one of a few Health Demographic Surveillance and Health Research (HDS-HRC) field sites established in the country. Among all kebeles of the district, twelve (12) rural kebeles are HDS-HRC field site. The altitude of the district ranges from 1400 to 2340 meters above sea level. The district has a total population of 271,018, of which 51% were females. According to 2007 national census of Ethiopia, the number of projected pregnant women was 5252. The livelihood of the people in the district is built on mixed farming by major crop production. Chat is the dominant crop broadly produced in the area. Green cabbage, kale, tomato, cannonball cabbage and peanut are foodstuff commonly produced in the area. Goat and sheep are the are common livestock in the district. (19)

**Study design and period**

Community based cross sectional study design was conducted in January 5 to February 12, 2021.

**Source population and study population.**

All pregnant women who were resided for at least six months in the district during study period were source population of this study. Whereas, pregnant women who were randomly selected from selected kebeles and included in this study were the study population of the current study.

**Inclusion and exclusion criteria**

Participants were a part of pregnancy surveillance initiated in HDS-HRC. For the reason that dietary practice is affected by the local social and cultural value, all pregnant women who were lived minimum of six months in the district were involved in this study. However, all pregnant women with reported acute and chronic illnesses, seriously ill and unable to communicate during study period were excluded.

**Sample size determination and sampling procedures**

The sample size required and adequate for estimating the determinants of dietary practices of pregnant women was computed using single and double population proportion formula with their corresponding assumption. Nevertheless, sample size computed by double population proportion formula using the following assumption gave the largest sample size in this study: 95% Confidence Interval level, power 80%, Ratio of 1:1 between exposed and unexposed subjects, 19% prevalence of third trimester (Unexposed) stage of pregnancy, 8.9% of first trimester (Exposed) stage of pregnancy (20) 5% marginal error and 10% non-response rate. The final sample size calculated was 450. Haramaya district was purposefully selected as study area. Out of total kebeles of the district 12 of them are HDS-HRC field site. Conventionally, these kebeles were selected as HDS-HRC field site based on probability proportional to size (PPS) sampling technique. Moreover, simple random sampling method was applied to select eight (8) kebeles from HDS-HRC field site kebeles. The determined sample size was proportionally allocated to the selected kebeles. Since the participants were the parts of pregnancy surveillance of HDS-HRC, list of all pregnant women was obtained from HDS-HRC office and, then we used as sampling frame. Based on the proportional to size allocation of their respective kebeles, all eligible pregnant women were selected with simple random sampling methods/lottery methods by using their list from HDS-HRC registration. House to house survey was implemented to identify eligible pregnant women in selected kebeles. Finally, all eligible women were included in the study.

**Data collection and Measurement**

Data was collected with interviewers-administered questionnaires by well-trained health professionals. Structured questionnaires were employed to collect data on socio-economic, obstetric, maternal perception, food consumption, dietary knowledge, attitude and practices of pregnant women. These questionnaires were fist prepared in English language and then translated to local language (Afan Oromo). After translation, it’s the consistency was checked by another person.
who speaks both languages. We pre-tested the questionnaires on 10% of the sampled pregnant women of the district, that were not included in the main study and modification was done based on the pre-test observations.

Four measures including; dietary diversity, food variety, consumption of animal source foods and frequency of meal were used to measure the dietary practices of pregnant women (21-23). We used formerly validated Food Frequency Questionnaires (FFQ) which contained 27 commonly consumed food items consumed by the community of the district to assess dietary diversity (23-25). Initially, the list of food items was established grounded on wide-ranging consultation of key informants who are from the study area and who knew the culture and local language on types and food groups usually consumed. We pre-tested the Food frequency questionnaires on 10% of the sampled pregnant women of the district, that were not included in the main study and modification was done based on the pre-test observations. For the FFQ, the women were invited to talk about the consumption of each food per day, per week or per month using the past three months in consideration of the difference of dietary consumption within a day of a week into account (26-27).

Considered the greater difference of dietary practice in the local community over the day of the week, the intake of each food item per a day (6 , 23) was not taken as a cut-off point to label consumers. Nevertheless, pregnant women were defined as a “consumer” of food items if they had consumed food items minimum once over a period of a week (21, 22). Food items of food frequency questionnaires was grouped into ten food groups: cereal, white roots and tubers, pulse and legumes, nuts and seeds, dark green leafy vegetables, other vit A-rich fruits and vegetables, meat, fish and poultry, dairy and dairy product, egg, other vegetables and other fruits (26). The sum of each of food groups the pregnant women consumed over period of week were calculated to analysis dietary diversity score (DDS). Furthermore, we converted dietary diversity score into terciles and the highest tercile was used to label “high” dietary diversity score, whereas the both lower terciles combined were defined as “low” dietary diversity score. Food variety score (FVS) is the frequency of individual food items consumed in the reference period. Therefore, it was estimated by the intake of each the individual 40 food items over seven days (27), with maximum of FVS fourth. Then mean FVS was calculated ad pregnant women with FVS greater than means were labeled as having “high” food variety score, whereas, those with FVS lower than the means were defined as having “low” FVS. Consumption of animal source foods (ASF) was estimated by counting the frequency of each animal source foods the pregnant women ate over a reference period, which was seven day. We converted animal source foods score into terciles and the highest tercile was used to label “high’s, while the two lower terciles combined were defined as “low” ASF.

**Data Quality Assurance**

Two days rigorous and extensive training with the final version of the questionnaires was given for data collectors prior to pre-test. pre-tested the questionnaires on 10% of the sampled pregnant women of the district, that were not included in the main study and modification was done based on the pre-test observations. The supervisors kept the alleyway of the filed procedures and checked the completed questionnaires daily to approve the accuracy of data collected and the research team managed an overall work of data collection.

**Analysis**

Data were cleaned, coded and entered in double by using EPIDat version 3.1 software, checked for missing and outliers and analyzed using STATA version 14 (College Station, Texas 77845 USA) statistical software. The outcome variable was dichotomized as dietary Practice=1 (Appropriate) and dietary Practice=0 (Inappropriate). To assess the predictors of DDS and ASF bivariate analyses were conducted. Multivariable analyses were carried out to identify determinants of dietary practice among pregnant women. Thus, Poisson regression analysis model with robust variance estimate was fitted to identify predictors of dietary practice of women. For multivariable analyses, only variables that displayed a p< 0.2 in bivariate analyses were entered in the adjusted model. The backward regression was fitted with selected socio-economic and fertility related variables. The results are presented as adjusted prevalence ratios (APRs) with 95% CI. The statistical level of significance was set at alpha=5%. The explanatory variables were examined for multi-collinearity before taking them into multivariable models using correlation matrix for the regression coefficients, using the standard errors, and variance inflation factors value. Possible interactions between covariates were tested. Akaike’s information criterion (AIC) and Bayesian information criterion (BIC) were used to test for model fitness. To estimate the economic level of the families, wealth index was employed. The wealth dispersion was generated by applying principal component analysis. The index was calculated based on the ownership of latrine, ownership agricultural land and size, selected household asset, quantity of livestock and source of water used for drinking, that was to 41 household variables. Then, we identified five principal components having eigenvalues greater than one. The wealth index quintile was calculated from wealth score of the households. Finally, the computed quintile was used to label the households wealth status to poorest, poor, middle, rich and richest category. Nutritional Knowledge of the women was gauged through 16 nutritional knowledge questions on the feature of nutrition needed in their course of pregnancy. Therefore, nutritional knowledge score was computed by conducting principal component analysis to reduce data and
identify nutritional knowledge. Then, summing the factor scores into one composite and ranking into terciles (three parts) was performed. Lastly, the highest tercile was defined as having “Good” nutritional knowledge and the two lower tercile were labeled as “Poor” nutritional knowledge.

Maternal attitude was evaluated with 12 Likert scale questions using PCA. The factor scores were totaled and classified into terciles (three parts), and the highest tercile was defined as having “Favorable” maternal attitude and the two lower tercile were characterized as “Unfavorable” maternal attitude. In similar way, perceived vulnerability, perceived severity to malnutrition, perceived benefit to healthy nutrition, perceived barrier to healthy nutrition and perceived self-efficacy to control malnutrition during pregnancy were calculated by using their composite questions. Finally, the total scores were converted into terciles and the highest terciles were used to labeled as women were “having” perceived vulnerability, perceived severity to malnutrition, perceived benefit to healthy nutrition, perceived barrier to healthy nutrition and perceived self-efficacy to control malnutrition, else no if with both lower terciles. Women’s autonomy was evaluated by seven validated questions which were adopted from Ethiopian demographic health survey (28). For each response of a question, the response to each question was coded as “one” when decision was made by the pregnant women alone or jointly with their husband, otherwise “zero”.

Ethical consideration
This study was conducted in agreement with the Declaration of Helsinki-Ethical principle for medical research involving the human subjects. Accordingly, ethical approval letter was obtained from Haramaya University Institutional Research Ethics and Review Committee (IRERC) with a reference number of (IHRERC/266/2020) before commencement of data collection. Informed, voluntarily, written and signed consent was obtained from study participants and privacy and confidentiality was maintained. An official letter was sent to Haramaya district health office and respective kebeles. The personal identifiers were excluded, information gained was kept confidential and used for the proposed study only.

Operational definition
Dietary diversity: Is the number of foods consumed across and within food groups over seven day reference period.
Dietary diversity score: Is the sum of each of food groups the pregnant women consumed over period of week
Meal frequency: is defined as how many times a day peoples eat or a number of daily eating occasion
Appropriate dietary practice: when women had at least four meals daily, good FVS, high DDS, and high ASF consumption, whereas it was inappropriate when women had less than four meals daily or Low FVS or low DDS or low ASF consumption (23)
High DDS: Tercile calculated from food groups, and the highest tercile was considered as a high DDS, whereas the rest two lower terciles were taken as a low DDS.
High DDS: terciles were calculated from food groups, and the highest tercile was considered as a high DDS, whereas the rest two lower terciles were taken as low DDS (25)
Nutritional Knowledge: Was measured through16 nutritional knowledge questions on the feature of nutrition needed in pregnancy and the score was computed by conducting PCA. Then composite was ranked into terciles (20)
Good nutritional knowledge: Tercile computed from nutritional knowledge and the highest tercile was defined as good nutritional knowledge whereas, the two lower tercile were labeled as Poor
Wealth index quintile: Was computed from wealth score of the households by PCA and composite was ranked into quantile. Quintile was used to label the households wealth status to poorest, poor, middle, rich and richest category

Result
Socio-demographic and obstetric characteristics of pregnant women
The socio-demographic and obstetric characteristics of the respondent were shown in (table 1). In this study four hundred forty-eight pregnant women were participated, making a response rate of 99.5%. The mean (± SD) age of women were 25.68( ± 5.16) years. Almost more than three-fourth of pregnant women had no formal education. The wealth index displayed that 19.87% of the respondent were in the richest class. Only 60.49% of the households have land for agriculture

| Variables                | Frequency(n=448) | Percentage (%) |
|--------------------------|------------------|----------------|
| Age Category of Pregnant women (PW) |                  |                |
Prevalence of Dietary Practice

From total respondents 29.46% (0.25, 0.34), 37.5% mean (± SD) (9.03 ± 2.79) and 24.78% (0.21, 0.29) of them had high dietary diversity, high food variety score and high consumption of animal source food respectively. The prevalence of appropriate dietary practice of pregnant women in present study was 15.18% (95% CI=11.96-18.84) (Fig 1). The major

| Educational level of women | Can’t read and write | Informal education | Formal education* |
|----------------------------|---------------------|--------------------|------------------|
| Women                      | 331                 | 26                 | 91               |

| Educational Level of Husband | Can’t read and write | Can read and write | Elementary School (Grade 1-8) | High school and above |
|------------------------------|---------------------|--------------------|--------------------------------|-----------------------|
| Husband                     | 259                 | 61                 | 102                            | 26                    |

| Occupational status of Women | House wife | Merchants* |
|------------------------------|------------|------------|
| Women                       | 433        | 15         |

| Occupational status of Husband | Farmer | Merchant* |
|--------------------------------|--------|-----------|
| Husband                        | 420    | 28        |

| Family size | 1-5 | >5 |
|-------------|-----|----|
| Family size | 343 | 105|

| Agricultural land possession | Yes | No |
|-------------------------------|-----|----|
| Agricultural land possession | 271 | 177|

| Livestock Possession | Yes | No |
|----------------------|-----|----|
| Livestock Possession | 299 | 149|

| Wealth Index (Quintile) | Poorest | Poor | Middle | Rich | Richest |
|-------------------------|---------|------|--------|------|---------|
| Wealth index quintile   | 90      | 90   | 89     | 90   | 89      |

| Stage of pregnancy | First Trimester | Second trimester | Third trimester |
|--------------------|-----------------|------------------|-----------------|
| Stage of pregnancy | 19              | 296              | 133             |

| ANC Visit | Yes | No |
|-----------|-----|----|
| ANC Visit | 164 | 284|

| Parity | Zero | Para 1-4 | Five and more |
|--------|------|----------|---------------|
| Parity | 103  | 294      | 51            |

| Gravidity | Less than or equal five | Greater than five |
|-----------|-------------------------|------------------|
| Gravidity | 375                     | 73               |

| PW: Pregnant Women; Merchant*: include petty trading; ANC: Antenatal Care |
| Housewife: Women whose activities are in home and not participated in yielding family financial income |
| Formal education*: Refers grade 1 and above |
| Wealth index quintile: Was computed from wealth score of the households and used to label households wealth status to five categories |
| Family Size: Refers to total number of family members living together |
| Parity: Refers to the number of births the mother experienced after 28 weeks whatever the status of the newborn is (WHO,2015)|
consumed food groups were cereal (100%), Other vitamin A-rich fruits and vegetables (96.43%) and pulses and nuts (53.35%) food groups. Consumption of other fruits and other vegetables were minimal (Fig 2).

**Factors Associated with Dietary Practice**

Multivariable analysis was applied to identify factors associated with dietary practice of pregnant women using Poisson regression analysis model with robust variance estimate. From this analysis the prevalence of dietary practice was higher among merchant women ($\text{APR}=2.07; 95\% \text{ CI}=1.071-4.016$ and those whose husband have high school and above educational level ($\text{APR}=1.96; 95\% \text{ CI}=1.1063-3.460$). However, the prevalence of dietary practice was significantly lower among those who reported chat chewing ($\text{APR}=0.58; 95\% \text{ CI}=0.370-0.901$) and avoiding food intake ($\text{APR}=0.36; 95\% \text{ CI}=0.200-0.658$).

| Variables                        | Inappropriate (n=380) | Appropriate (n=68) | CPR (95%CI) | APR (95%CI) | P-value |
|----------------------------------|----------------------|--------------------|-------------|-------------|---------|
| Educational Level of Husband     |                      |                    |             |             |         |
| Illiterate                       | 287 (75.53)          | 33(48.53)          |             | 1           |         |
| Elementary School                | 76 (20.00)           | 26(38.24)          | 2.47(1.554, 3.929) | 1.99 (1.214, 3.280) | 0.00    |
| High school and above            | 17(4.47)             | 9(13.24)           | 3.37(1.806, 6.239) | **1.92 (1.063, 3.460)** | 6       |
| Occupational status of Women     |                      |                    |             |             |         |
| House wife                       | 372(97.89)           | 61(89.71)          |             | 1           |         |
| Others                           | 8 (2.11)             | 7(10.29)           | 3.31(1.837, 5.973) | **2.07 (1.071, 4.016)** | 0.03    |
| ANC visit                        |                      |                    |             |             |         |
| No                               | 147 (38.6)           | 17(25.00)          |             | 1           |         |
| Yes                              | 233(61.32)           | 51(75.00)          | 1.73(1.035, 2.898) | 1.36 (0.776, 2.394) | 0.28    |
| Perceived Venerability           |                      |                    |             |             |         |
| No                               | 313(82.37)           | 50(73.53)          |             | 1           |         |
| Yes                              | 67 (17.63)           | 18(26.47)          | 1.537412 (0.947, 2.496) | 0.82 (.469, 1.428) | 0.48    |
| Perceived severity               |                      |                    |             |             |         |
| No                               | 313 (82.37)          | 47(69.12)          |             | 1           |         |
| Yes                              | 67 (17.63)           | 21(30.88)          | 1.827853 (1.155, 2.892) | 1.31 (0.747, 2.303) | 0.34    |
| Perceived Benefit                |                      |                    |             |             |         |
| No                               | 288 (75.79)          | 39(57.35)          |             | 1           |         |
| Yes                              | 92 (24.21)           | 29(42.65)          | 2.01(1.302, 3.099) | 1.39 (0.811, 2.412) | 0.22    |
| Chat chewing                     |                      |                    |             |             |         |
| No                               | 142 (37.37)          | 38(55.88)          |             | 1           |         |
| Yes                              | 238 (62.63)          | 30(44.12)          | .5302435 (0.341, 0.824) | **0.58 (0.370, 0.901)** | 0.01    |
| Drinking water                   |                      |                    |             |             |         |
| Protected                        | 156 (41.05)          | 42(61.76)          |             | 1           |         |
| Unprotected                      | 224 (58.95)          | 26 (38.24)         | 0.49(0.312,0.771) | 0.61(0.350, 1.048) | 0.07    |
| Avoiding Food taking             |                      |                    |             |             |         |
| No                               | 246(64.74)           | 53(77.94)          |             | 1           |         |
| Yes                              | 134(35.26)           | 15(22.06)          | 0.57 (0.331, 0.974) | **0.36 (0.200, 0.651)** | 0.00    |
| Food aversion (Strong disliked of foods) |                |                    |             |             |         |
| No                               | 113(29.74)           | 21(30.88)          |             | 1           |         |
| Yes                              | 267 (70.26)          | 47(69.12)          | 0.96(0.594, 1.533) | 0.99 (0.631, 1.554) | 0.96    |
Appropriate dietary practice: is defined as the consumption of at least four meals daily, high DDS, high FVS and high ASF; otherwise, inappropriate dietary practice. 
Elementary school: Grade 1-8
CPR= Crude Prevalence Ratio; APR= Adjusted Prevalence Ratio, CI= Confidence Interval at 95%
CPR: was obtained from bi-variate of Poisson regression analysis model with robust variance estimate
APR, CI and P-Value were found from multivariable Poisson regression analysis model with robust variance estimate

Table 2: Factors associated with dietary practice among pregnant women in Haramaya district, Eastern Ethiopia, 2021
Discussion

Adequate nutrition in pregnancy is important for maternal and child health (3). There is mounting evidences that, insufficient consumption of balanced and quality diet during pregnancy has a great effect on fetus health and development and may also result to poor birth outcome (4). At beginning of pregnancy many women lack sufficient micronutrients stores to meet physiological requirement (1) and they are more vulnerable to malnutrition (29). Several epidemiological studies indicated inappropriate dietary practice is significant contributor to maternal under nutrition and micronutrients deficiency in resource limited countries (30). Therefore, the diet of pregnant women ought to supply an adequate quantity of nutrients for mother, fetus and for effective lactation . Despite this reality, in the current study only 15.18% (95% CI=11.96-18.84) of pregnant women had appropriate dietary practice and noted to be very much low. This figure is very much lower than studies conducted in Illu Aba Bor Zone, Southwest Ethiopia (31), Dessie town, northeastern Ethiopia (20) and Guto Gida district, western Ethiopia (32). The result of this study has modest deference with study conducted in Gojam in northwest Ethiopian (19.9%) (6), which was carried out on similar setup/rural residents. However, due to the differences in study area and socio-culturally conditions, it is noteworthy to memo that the direct comparison of our result with previous investigations employed in Ethiopia is impossible. Furthermore, the possible reason for the discrepancy might be due to the deference in methods and measures applied to assess dietary practice since this study used four measures; DDS, FVS, consumption of ASF and frequency of meal over a period of one week. However, most of the previous studies carried out in Ethiopia used meal frequency to evaluate dietary practice of pregnant women which could not comprehensively assess dietary practice.

Dietary diversity is correlated with the probability of nutrient adequacy, increased nutrient intake and better nutritional status of pregnant women (33). Evidences suggested that consumption of animal source foods guarantees intake of micronutrients among pregnant women in developing countries (22, 34). Though, consumption of animal source food has significant share to dietary quality, the practice is decreasing in low-income counties (35). In the present study, we observed that only 29.46%, of pregnant women have high dietary diversity score. However, 37.5% of participants have high mean food variety score. Furthermore, 24.78% of women consumed animal source foods over a period of one-week prior the survey. The current finding of dietary diversity in pregnancy is comparably lower than various studies conducted in Ethiopia (5,20,31-32), but higher than study carried out in Shashemane town, central Ethiopia (36).

Similar to reports from shashamane (36) and Egypt (37), our results also display that occupational status of pregnant women was found to have a significant association with dietary practice. Pregnant women who were merchants had higher dietary practice. Housewife women are found to be confined more to household works that have devalued financial value to and, are more rely on their family and their partner as they are compared to those women who engaged in yielding their family financial gain Nepal (38). This could be because of women who participated in yielding their family financial income have a better chance of earning income and consequently a better access to diversified foods and appropriate diet. This suggests that program to improve women nutrition would strengthen on increasing women involvement in family income generation, decision making power and their economic independency.

The current study also presented that women who have partners of high school and above educational level had higher appropriate dietary practice, which is consistent to results of the former studies done in wachamo (39) Shashamane (36). This might be due to the reality that literate partners have better understanding about the importance of consuming quality diet in pregnancy and could positively influence their wife to have appropriate dietary practice. Pregnant women who received dietary guidance are more expected to intake diversified diet than those women who do not received nutritional guidance.

In this study, diet of pregnant women who were frequently involved in avoiding the intake of food was negatively associated with appropriate dietary practice which is inline with study carried out in Nepal (40) and China (41). Pregnant women practiced food avoiding have higher odd of insufficient dietary practice. Our result may indicate that the practice of food avoidance could lead to declined dietary consumption and then micronutrient deficiency. The possible rationale of the deference might be mainly in the present study most of the pregnant women who did avoiding of food intake did so in the third trimester of their pregnancy and at the time of interview.

Although, chewing khat is a intensively disseminating act in Ethiopia and in developed countries, comprising America and Europe (42-44) its consequence on health is not so far richly understood. The result of the current study recommends the importance of reducing the high level of inappropriate dietary practice during pregnancy with the proper intervention in the related discourse factors. Pregnant women should be advised the negative consequence of chat chewing frequently and supported to rise their dietary consumption in pregnancy.
Validated Food frequency questionnaires was used to asses dietary practice. Food items was established based on wide-ranging consultation of key informants who are from the study area and who knew the culture and local language on types and food groups usually consumed, which is the strength of this study. Various limitations required to be considered when interpreting our results. The cross-sectional nature of the data limits causal inference between dietary practice and the correspond. Since there is within individual difference of dietary consumption in the study setup over the period of seven days, we establish our definition the reference time period of seven day. Women who could have eaten a food items more than one in seven day were also tagged with those who consumed one time over seven day could underrat the amount used-up is another limitation. The cross-sectional nature of the data limits causal inference between dietary diversity and the correlates. Also confinement of sample to a single season may limit the generalizability of result to other seasons.

Conclusion

The study showed that dietary practice of pregnant women in Haramaya district is sub-optimal. It can be concluded that greater access to resources through: involvement of women in yielding their family financial income, partners education, dietary restriction and chewing chat, as gauged by the study, was noted to be significantly associated with dietary practice during pregnancy. Thus we suggest nutrition policy, programs and interventions should aimed at encouraging prenatal dietary practice focusing on women empowerment in generating their family income and raising partners awareness on the benefit of quality diet in pregnancy both for the mother and the newborn. Partners nutritional counselling and intervention should be tailored to meet the need of pregnant women and to improve their dietary practice. To reduce the habit of chat chewing during pregnancy dietary guidance and counselling are suggested.

Abbreviations

ANC, Antenatal Care; ASF, Animal Source Food; DDS, Dietary Diversity Score; EDHS, Ethiopian Demographic and Health Survey; FVS, Food Variety Score; HDS-HRC, Health Demographic Surveillance and Health Research Center; PCA, Principal Component Analysis; WHO, World Health Organization

Consent for publication
Not applicable

Competing interests
The authors declare no conflicts of interest in this work.

Authors’ contributions
All authors made momentous involvement to the conception, design of the study, and statistical analysis and result interpretation. MBF, KTR, LO, AKT and TAY drafted the manuscript, reviewed critically, revised the work briefly, gave final approval of the version to be published and agreed to be accountable for all aspects of the article

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Figure 1: Dietary practices of pregnant women in Haramaya district, eastern Ethiopia, 2021

Figure 2: Percentage of different food groups consumed by pregnant women in Haramaya district, eastern Ethiopia, 2021