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RESEARCH ARTICLE

Dietary Practice and Nutritional Status Among Pregnant Women Attending Antenatal Care at Mettu Karl Referral Hospital, Southwest Ethiopia

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Abstract:

Background:

Sufficient maternal nutrition is paramount to ensure maternal and fetal wellbeing. It further determines the health of the offspring throughout the lifecycle and prevents adverse health outcomes of the upcoming generation. Therefore, dietary practice and nutritional status of pregnant women and contributing factors among pregnant women visiting antenatal care services at Mettu Karl Hospital, Southwest Ethiopia, were assessed.

Methods:

Facility-based cross-sectional study was conducted from March to April 2018. A systematic random sampling technique was employed to select 378 study participants. Data were collected *via* face to face interviews using semi-structured questionnaires. Women Dietary Diversity Score (WDDS) was measured using a qualitative 24- hr dietary recall and nutritional status was assessed by Mid-upper arm circumference measurements. Analyses were done using the statistical package of social science (SPSS version 20).

Results:

The prevalence of sub-optimal dietary practices was 22% and under-nutrition was 17.5%. Family size >5 [AOR=8.2, 95%CI: 12.383, 46.217] and severe food insecurity [AOR=3.661, 95%CI: 1.289, 10.394] were significantly associated with sub-optimal dietary practices. Being non married woman [AOR= 3.188, 95% CI: 1.219, 8.336], lack of formal education [AOR=9.405, 95%CI: 1.079, 81.943], lack of iron supplementation [AOR=3.189, 95%CI: 1.513, 6.720], WDDS <6 [AOR= 4.057, 95% CI: 2.157, 7.634], not taking additional meal (3+) [AOR=2.267, 95%CI: 1.211, 4.244], skipping meals [AOR=3.856, 95%CI: 1.099, 13.530) were significantly associated with under-nutrition.

Conclusion and Recommendations:

The present study revealed that there is a burden of suboptimal dietary practice and undernutrition among the studied participants. Predictors identified for suboptimal dietary practice were the family size and household food insecurity. Similarly, undernutrition was predicted by marital status, educational status, iron supplementation, additional meal intake, and meal skipping.

Strategies should be designed at different levels by concerned bodies considering dietary practice and nutritional intake of pregnant women, with possible identified factors.

Keywords: Dietary practice, Nutritional status, Pregnant women, Under-nutrition, Iron supplementation, Meal intake.

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1. INTRODUCTION

Nutrition, throughout the life of human beings, has a major effect on health. This is special for pregnant women as good maternal nutrition is one of the crucial options to safeguard maternal and fetal welfare in both developed and developing countries. A mother's nutritional status, from early conception

to lactation periods, plays a vital role in defining the well-being of the mother and child. Current findings recommend that adequate nutrition reduces the risk of contracting chronic medical illnesses later in life. As physiology demands, during pregnancy and breast-feeding, the suggested intake of different nutrition in the diet should increase [1].

The nutritional status of women during pregnancy may be based on the accessibility and availability of nutritional reserves, which include stores of some special micronutrients

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like iron and calcium, which is considered as a building block of the maternal body, starting from the consumption of diets containing these important micronutrients. Based on this scenario, keeping good dietary practice before conception is substantial for safeguarding satisfactory nutritional status during pregnancy. Underweight women and those who have shortages in some micronutrients depend on “catch-up” by improving their diet once they are pregnant and additional nutrition is demanded because of the growing baby [2].

Dietary practices have a major role in determining the continuing health status of both mother and the growing fetus. Suboptimal dietary practices of pregnant women have outwardly contributed to increased rates of stillbirths, premature birth, low birth weight, and maternal and prenatal death [3].

Reduced maternal nutrition was shown to have an association with different negative health effects at birth, including intrauterine growth retardation, which significantly upsurges the risk of newborn deaths, Low Birth Weight (LBW), (PTB), and stunting [4].

Various studies have demonstrated that an adequate nutritional intake during pregnancy has a special role in fetal growth and improved nutritional status of a mother [5]. To guarantee adequate nutrient consumption, dietary variation is one of the best recommended strategies, predominantly among pregnant women, since their nutritional demand is greater than before [6]. The prevalence of poor dietary practice varies from place to place. About 27.1% of Senegalese women reported poor dietary practice, while 22% of them were undernourished [7]. Another study showed that 54.8% of women in northern Ethiopia had poor dietary practice, of whom 19.5% were undernourished [8].

In this context, in Ethiopia, inadmissibly, there is a large burden of maternal, neonatal morbidity, and mortality rates [6]. A significant level of several deficiencies of micronutrients, underweight, early stunting, and wasting are key malnutrition correlated features suggesting the degree and seriousness of nutritional difficulties in the country. Again the encumbrance of adverse perinatal outcomes such as low birth weight, preterm, and stillbirth are also common conditions in Ethiopia [9]. Unfortunately, despite the gaps explained above and the significance of dietary practices being well recognized in Ethiopia, suboptimal practices have still been continued. The data about pregnant mothers' dietary practice and nutritional status during pregnancy is important for deciding control strategies and is used as significant indicators of major public health since the consequences are intergenerational and have cyclic effects on both mother and fetus. The main purpose of this is to plan, implement, monitor, and evaluate health service activities of maternal situation, nutritional policy, and put a ground for further studies. Therefore, the current study focused on assessing the prevalence of both sub-optimal dietary practices and nutritional status and their associated factors.

2. MATERIALS AND METHODS

2.1. Study Area and Period

The study was undertaken from March to April 2018 in

Mettu Karl Hospital, which is located in Mettu town, 600 km in the Southwest of the country's capital, Addis Ababa.

2.2. Study Design

Facility based cross-sectional study design was used.

2.3. Study Population

Randomly selected pregnant women, aged between 15-49 years who attended antenatal Clinic in Mettu Karl hospital, were included.

2.4. Sample Size Determination and Sampling Procedure

To get a sufficient sample size, the proportion of poor dietary practice in East Welega (33.9%) was obtained [8]. The single population proportion formula was used to determine the sample using the following assumptions: 95% CI, 5% marginal error, adding non-response rate of 10%, and the final sample size becomes 378.

Systematic random sampling was conducted using the list of pregnant mothers attending ANC, and the formula $(N/n = k)$ was used to determine the size of the sampling interval, Where N is the total population (800), n is sample size (378), whereas k is interval size of the sampling, $K =$ (roughly 2). Finally, respondents were selected every 2 intervals, starting from the first unit of the study (attendant mother).

2.5. Data Collection and Measurement

Initially, structured questionnaires were prepared for pre-test in the English language, which was translated into local languages, Amharic and Afaan Oromo, and back to English by an expert to check for any consistencies. Different sections of the questionnaire include the demographic data, Women Dietary Diversity (WDD), Mid-Upper Arm-Circumference (MUAC) measurement, Household Food Insecurity Access Scale, and Household wealth status. Pre-testing of the questionnaire was performed on 19 pregnant women from a nearby health center.

The household wealth status was measured with wealth constructs showing household assets, utilities, and other characteristics adopted from the Ethiopian Demographic and Health Survey. The principal components analysis was used to make latent factors representing wealth data with the first factor considered as household wealth score, which was then categorized into wealth tertiles.

Household Food Insecurity Access Scale (HFIAS) was used to analyze household food security status and has been validated and used in other African countries. The tool was composed of nine items enquiring about the household's last month experience on three areas of food insecurity, which include: feeling the uncertainty of food supply, insufficient quality and intake of food, or its physical consequences. An HFIAS score ranging from 0 to 27 was calculated for each participant and then households were classified into different levels of food security. This includes mildly or food-secure, moderately, and severely food-insecure, according to the recommendation. Of Household Food Insecurity Access Scale (HFIAS) developed and validated for Ethiopian use (2).

Households were classified based on responses to the nine severity items in the HFAS and coded “0” for “No” and “1” for “Yes.” The procedure for scoring was as follows: “0” was attributed if the event described by the question never occurred, “1” if it occurred during the previous 30 days. With regard to the occurrence, “1” was attributed if the events rarely occur, “2” sometimes and “3” often. Therefore, responses on the nine HFAS questions were summed using the SPSS 16 program to create a household food security score, with a minimum of “0” and a maximum score of “27.” Based on this, the higher the score, the more the household is vulnerable to food insecurity. The lower the score, the lesser the food insecurity a household experienced. Therefore, HFAS score of 0–1 is categorized as food secure, 2 and above were considered as food insecure. Households scoring 2–7, 8–14, and 15–27 were categorized to be mildly, moderately, and severely food insecure households, respectively [10].

Women’s Dietary diversity, from the list of 9 food groups, which include cereal, white roots and tubers; dark green leafy vegetables; vitamin a rich fruits, vegetables and tuber; other fruits and vegetables ; organ meat; meat and fish ; eggs; legumes, nuts and seeds; milk and milk products, was used as recommended [11]. Food varieties score was used to overcome the limitation of 24 hours recall method. The same food groups that are used for 24- hours’ dietary recall were used in the seven days recall method. These were actually a modified food group frequency, where the questions were asked as “How many days in the last seven days did you get [food group] [10]. Regarding mixed dishes, particular attention was given to certain ingredients that may not be spontaneously recalled, such as added fats or oils, or secondary ingredients such as small amounts of meat or vegetables. Prior to beginning data collection, the team identified commonly consumed mixed dishes and plasticized probing for and recording all ingredients in the mixed dish. The teams of data collection have agreed on a way to disaggregate mixed dishes in order to record all of the individual components in their respective food groups [10].

An index for optimal dietary practice during pregnancy was generated using information about the study participants’ Dietary Diversity Score (DDS) and their usual frequency of meals per day. Mothers were considered to have an optimal dietary practice if they had a DDS of ≥ 6 and reported consumption of additional meals during pregnancy (+3 meals per day) and otherwise considered to have a sub-optimal dietary intake.

Mid-Upper Arm-Circumference (MUAC) measurements were taken on the left arm, at half-way between the olecranon process and the acromion process of participants to the adjacent 0.1 cm using both types of *measurement* types (flexible and non-stretchable) following a standard procedure [13]. MUAC was measured using a non-stretchable tape 25 mm wide in order to increase the probability of the table covering the midpoint of the upper arm and to reduce the effect of over-pulling. Numbered, color-coded and double sided tape was used with the thresholds marked by moderate and severe wasting. For data collection, trained *BSc* Nurses helped under supervision of general practitioners and other trained supervisors. Mothers were considered under-nourished when

their MUAC value was less than 21.0 cm and otherwise well-nourished [13].

2.6. Data Analysis

Data was cleaned and checked for consistencies and completeness and entered into EpiData version 3.5.1 and exported to SPSS version 20 for analysis. Principal components analysis was used to generate latent factors representing the wealth data [14] with the first factor considered as household wealth score, which was then categorized into wealth tertiles. Data are presented in the form of frequencies, percentages, cross-tabulations, crude, and Adjusted Odds Ratios (AORs). The association between dependent and independent variables was assessed using binary logistic regression. All contributing variables with a P -value $\leq .20$ in the bivariate logistic analysis were fitted into the final model to identify independently associated factors. Odds Ratio with 95% CI was used to show the strength of association and $P < .05$ was considered statistically significant. The model’s fitness was checked.

2.7. Ethical Consideration

Ethical clearance was gained from the ethical Board of Jimma University and submitted to the Mettu town health office. Prior to data collection, respondents provided informed consent to participate in the study. Respondents were informed about the right to not participate in the study or that they can withdraw any time they want with no repercussion on the quality of ANC or other services they receive.

2.8. Operational Definition

2.8.1. Additional Meal

Consumption of one additional (3+) meal per day during pregnancy to ensure proper nourishment of both the mother and fetus.

2.8.2. Dietary Diversity Scores

Is the number of food types used up by the participant during the period of 24 hours prior to the interview. The calculation considered nine food groups with a potential score of 0 to 9. The food groups considered included cereal, white roots and tubers; dark green leafy vegetables; vitamin A rich fruits, vegetables and tuber; other fruits and vegetables; organ meat; meat and fish; eggs; legumes, nuts, and seeds; milk and milk products.

2.8.3. Meal

Food consumption in a day is considered to be a meal when prepared and served in a certain moment that takes place at a certain time .

2.8.4. Optimal Dietary Practice

A pregnant woman was considered to have an optimal dietary practice when she had a DDS of more than 6 and a usual meal frequency of more than three, and otherwise considered as having a suboptimal dietary practice.

2.8.5. Undernutrition

A pregnant woman was considered to be under-nourished if her MUAC measurement was below 21.0 cm.

2.8.6. Level of Knowledge

Scored “well knows” for pregnant mother who responded to more than 50% questions and those scored less than 50%, scored as “moderately knows”.

3. RESULTS

3.1. Demographic Characteristics

A total of 378 sample pregnant women were included in the study giving a response rate of 100%. The mean age of the study participants was 28.9 ± 5.25 years. More than half (62.4%) of the study participants fall in the age range of 25-34 years and the majority of them were married. Nearly two-third (63.8%) of the respondents were from the Oromo ethnic group and 165 (43.7%) were the followers of Islam. 37.6% of the respondents attended primary education and one hundred and nineteen (31.5%) of the mothers were housewives (Table 1).

3.2. Maternal and Pregnancy Related Characteristics

Nearly half (46.8%) of the respondents visited Antenatal care service twice and nearly two-thirds (64.6%) of them were supplemented with Iron/folate tablets.

Almost (78.3%) of the respondents reported that the pregnancy was wanted and planned. Most of the respondents (70.1%) were in their second trimester (13-28 weeks of gestation) and more than half (55.0%) of the respondents were multiparous.

Though most (84.7%) of pregnant women had latrine facilities in the compound, only 29.4% of the respondents had toilets provided with a handwashing facility. Twenty three (6.1%) of participants reported there is stagnant water in their compound and 50 (13.2%) of the respondent had a positive result of stool examination Table 2.

Regarding Household Wealth Index, the study revealed that about the three fourth (72.8%) of the households were in medium classes of wealth status.

Table 1. Demographic characteristics of study participants (N=378).

Variable	Number (%)
Age in years	
15-24	85 (22.5)
25-34	236 (62.4)
35-44	57 (15.1)
Religion	
Muslim	165 (43.7)
Orthodox	100 (26.5)
Protestant	109 (28.8)
Catholic	4 (1.1)
Ethnicity	
Oromo	242 (63.9)
Amhara	66 (17.4)
Gurage	43 (11.30)
Others	28 (7.4)
Maternal educational status	
No formal education	43 (11.4)
Primary education	142 (37.6)
Secondary education	128 (33.9)
Diploma and above	65 (17.2)
Marital status	
Currently married	350 (92.6)
Currently unmarried	28 (7.4)
Maternal occupational	
Civil servant	92 (24.3)
Farmer	54 (14.3)
Merchant	93 (24.6)
House wife	119 (31.5)
Un employed	20 (5.3)
Family size	
≤ 5	220 (58.2)
Occupation of husband	-

(Table 1) contd.....

Variable	Number (%)
Governmental worker	126 (33.3)
Farmer	54 (14.3)
Merchant	141 (37.3)
Un employed	57 (15.1)
Educational status of husband	
No formal education	23 (6.1)
Primary education	157 (41.5)
Secondary education	115 (30.4)
Diploma	83 (22)
Household Wealth Index	
Lowest class	96(25.4)
Medium class	275(72.8)
Highest	7(1.9)

* Silte, Kefa and Tigre.

Table 2. Dietary and nutrition related factors of the study participants (N=378).

Characteristics	Number (%)
ANC	
Ones	117 (30.9)
Twice	177 (46.8)
Three times and above	84 (22.2)
Took iron supplementation	329 (87%)
Frequency of iron intake (n=329)	
Daily	216 (57)
Sometimes	113 (30)
Types of pregnancy	
Wanted planned	296 (78.3)
Wanted unplanned	82 (21.7)
Gestational Age (in wks)	
First trimester (<12weeks)	13 (3.4)
Second trimester(13-28weeks)	265 (70.1)
Third trimester(>28weeks)	100 (26.5)
Number of pregnancy	
≤ 2	208 (55.0)
3-4	113 (29.9)
≥5	57 (15.1)
Birth interval	
Sub optimal (<3 yrs)	90 (23.8)
Optimal(≥ 3 yrs)	288 (76.2)
Sick during last two weeks	67 (17.7)
Sickness last six month	20 (5.3)
Substance abuse(30)	
Cigarette smoking	3 (0.80)
Alcohol drinking	11 (2.90)
Chat chewing	16 (4.20)
Knowledge of dietary related factor	
Poor knowledge	299 (79.1)
Good knowledge	79 (20.9)
Household food-security status	
Food Secure	307 (81.2)
Mildly Food Insecure Access	16 (4.20)
Moderately Food Insecure Access	23 (6.10)
Severely Food Insecure Access	32 (8.50)

(Table 2) contd.....

Characteristics	Number (%)
Have latrine facility in the compound	320 (84.7)
Have hand washing practice before meal, food preparation & after visiting toilet	111 (29.4)
Stagnant water in the compound	23 (6.10)
Stool examination result(positive ovum)	50 (13.2)

3.3. Dietary Practice and Nutritional Status of the Participants

Nearly all (98.9%) of the study participants consumed cereals in the previous 24 hours. Meat and organ meat consumption were reported by 120 (31.7%) and 50 (13.2%) of respondents, respectively. The mean (\pm SD) DDS of participants was 6.23(\pm 1.60) and 216 (59.5%) had a $DDS \geq 6$ in food groups. Consumption of additional meals (3+) during pregnancy was reported by 241 (63.8%) study subjects. The respondents that reported a habit of skipping meals and avoiding prohibited foods during pregnancy were 25 (3.96%) and 8 (2.11%), respectively.

A total of 85 (22.5%) respondents were found to have a sub-optimal dietary practice based on an individual WDDS < 6 and/or usual meal frequency of ≤ 3 . Sixty-six (17.50%) study subjects were found to be undernourished (MUAC < 21.0 cm) Table 3.

3.4. Factors Affecting Dietary Practice Status of Study Participants

In multivariable analysis, it was revealed that family size and Household food security status were significantly

associated with sub-optimal dietary. The study revealed that family size was shown to have a significant association with sub-optimal dietary practices. The study also showed a statistically significant association between Household food security status and sub-optimal dietary practice Table 4.

Table 3. Dietary practice and nutritional status of the study participants (N=378).

Category	Number (%)
Minimum acceptable diet diversity (WDDS ≥ 6)	216 (57.10)
Additional meal during pregnancy (3+ meals/day)	241 (63.75)
Skipping meal During pregnancy	15 (3.96)
Avoid prohibited foods during pregnancy	8 (2.11)
Sub-optimal dietary practice (DDS < 6 and/or meal frequency ≤ 3 /day)	85 (22.5)
Under-nourished (MUAC < 21.0 cm)	66 (17.5)

Factors affecting the nutritional status of study participants in multivariable analysis revealed that marital status, maternal education, taking iron supplementation, Dietary Diversity Score, intake of one additional meal (3+) per day, and skipping meals due to fear of gaining weight were significantly associated with undernutrition Table 5.

Table 4. Factors affecting Sub optimal dietary practice of the study participants (N=378).

Variables	Dietary practice		COR (95% CI)	AOR (95% CI)
	Sub optimal Number (%)	Optimal Number (%)		
Family size				
>5	67 (42.4)	91 (57.6)	8.26 (5.04,16.06)*	10.1 (7.14,19.2) **
≤ 5	18 (8.18)	202 (91.8)	1.00	1.00
Household food security status				
Food secure	53 (17.3)	254 (254)	1.00	1.00
Mildly food insecure	5(31.2)	11 (68.8)	0.29 (0.04,2.31)	0.15 (0.02,1.39)
Moderately food insecure	3(13.0)	20 (87)	4.11 (1.73,9.79)	2.11 (0.63,7.02)
Severely food insecure	27(84.4)	5(15.6)	5.1 (2.39,10.78)*	3.66 (1.29,10.39)**

*Candidates variable in multivariable analysis at P<0.25) ** (Statistically significant predictor at P<0.05).

Table 5. Factors affecting nutritional status (under-nutrition) of the study participants (N=378).

Variables	Under nutrition		COR (95% CI)	AOR (95% CI)
	Yes	No		
Maternal education				
No formal education	15 (34.9)	28 (65.1)	8.17 (2.84,26.86) *	9.405 (1.079, 28.943)**
Primary education	27 (19.0)	115 (81.0)	3.58 (1.19,10.7)	2.966 (0.363, 24.254)
Secondary education	20 (15.6)	108 (84.4)	2.82 (0.92,8.6)	2.770 (0.335, 22.894)
Diploma and above	4(6.2)	61 (93.8)	1.00	1.00
Marital status				
Currently unmarried	10 (35.7)	18 (64.3)	2.917 (1.28, 6.65)*	3.188 (1.219, 8.336)**
Currently married	56 (16.0)	294 (84)	1.00	1.00

(Table 5) contd....

Variables	Under nutrition		COR (95% CI)	AOR (95% CI)
	Yes	No		
Iron supplementation				
No	20 (40.8)	29 (59.2)	4.24 (2.22,8.12)*	3.189 (1.513, 6.720)**
Yes	46 (14.0)	283 (86.0)	1.00	1.00
Skip meal not to gain weight				
Yes	6(40.0)	9 (60.0)	3.37 (1.15,9.81)*	3.856 (1.09,13.53)* *
No	60 (16.5)	303 (83.5)	1.00	1.00
WDDS				
<6	46 (28.6)	115 (71.4)	3.94 (2.22,6.98)*	4.05(2.13,7.63) **
≥ 6	20 (9.2)	197 (90.8)	1.00	1.00
Yes	38 (15.8)	203 (84.2)	1.00	1.00
No	28 (20.4)	109 (79.6)	1.372 (1.099, 2.357)*	2.267 (1.211, 4.244)**

*Candidates variable in multivariable at P<0.25) ** (Statistically significant predictor at P<0.05).

4. DISCUSSION

The current study has determined the level of sub-optimal dietary practice and under-nutrition and its correlation among pregnant mothers attending antenatal care service at Mettu Karl Referral Hospital, Southwest Ethiopia. The finding of the current study showed that about 22.5% of the respondents had sub-optimal dietary practices during their pregnancy. The finding was lower than the report of study from East Wollega (33.9%)(8) and Gondar(59.9%)(2). The discrepancy might be due to different perceptions of pregnant and educational background.

The finding also showed an association of family size with dietary practices of mothers during pregnancy, which is in line with the study done in Tigray [15] and East Wollega Zone [16], where family size was a predictor of sub-optimal dietary practice in this population.

In addition, the findings of the current study showed household food security has a significant association with the dietary practices of pregnant women. Those women with severe food insecurity were more likely to have a suboptimal dietary practice compared to food secure ones, which is in agreement with a study conducted in Kenya [17].

However, the result contradicts with the 1949 (G.C) ideas of the Chinese government (Mao) who tried to urge the Chinese to produce even more children by introducing ideas of “every stomach comes with two hands attached” for ideas raised from population experts to warn that China would not be able to feed its growing masses. This study also determined the level of under-nutrition in pregnant mothers following antenatal care service at Mettu Karl Referral Hospital, Southwest Ethiopia.

A study showed that 17.5% of the respondents had undernutrition during their pregnancy, which is in agreement with the finding of the study done in Kenya (19.3) % [13]. However, the result was higher than the finding of a study from Tanzania (11%). The discrepancy may be due to the study design and cut off used to consider undernutrition (cluster random sampling, MUAC ≤ 22.5 in case of Tanzania [18].

The study conducted in Wondo Genet district of South Nation Nationalities and Peoples Regional State (SNNPRS) showed that 9.2% of the pregnant women were under

nourished [19], which was lower than the finding of the current study. The probable reason for this discrepancy might be from the difference in socio-demographic features. Again the finding of the current study was lower than finding from Central Rift Valley of Ethiopia at the community level (31.8%) with MUAC of <21 cm [16]. The difference may be related to the difference in the study area (community versus institution). The finding of this study showed that marital status, educational status, iron supplementation on current pregnancy, WDDS, taking one more additional meal (3+), and skipping meals were identified to be independently related to nutritional status.

Unmarried women were more likely to be under-nourished during pregnancy, which is similar to the study conducted in Kenya where living alone had increased risk of undernutrition [17]. Again, women with no formal education were more probable to be undernourished compared to those with diploma and above the educational level, which is in line with the study done in Gonder town where pregnant women who had no formal education were more likely to have undernutrition [20].

Iron supplementation was another factor that showed a significant association with the nutritional status of pregnant women. Mothers who were not supplemented with iron and folate were more likely to be undernourished than those who were supplemented. This result is similar to the finding from the Central rift valley of Ethiopia [21]. The study revealed that pregnant women who reported skipping a meal for fear of weight gain were more likely to be undernourished. This may be attributed to that skipping meals limits the availability of both macro and micronutrients to the body, which leads to undernutrition among pregnant women.

Women’s dietary diversity score was another factor shown to have a significant association with the nutritional status of pregnant women. Women with poor or low dietary diversity scores were more likely to be undernourished compared to their counterparts. This is consistent with the finding from Gambella, South West Ethiopia [22]. Eating additional meal during pregnancy is another factor that showed a significant association with the nutritional status of pregnant women. This finding is consistent with the finding from Finoteselam, North West Ethiopia [21].

Since the nature of the study is descriptive cross-sectional

and the tendency of recall bias introduced due to a 24hr dietary assessment, readers interpret the result of this study with care. Mothers in the first 12 weeks of gestation may not start ANC visit and therefore, they did not get an opportunity to participate in the study. Social desirability, weekend, and celebration days were concerned as limitations of the study.

CONCLUSION

The present study revealed that there is a burden of suboptimal dietary practice and undernutrition among the studied participants. Predictors identified for suboptimal dietary practice were the family size and household food insecurity. Similarly, undernutrition among the studied pregnant women was predicted by marital status, educational status, iron supplementation, additional meal intake, and meal skipping, lack of standardized instruments at the national level and inability to measure food intake in terms of specific nutrients consumed. Therefore, concerned stakeholders better inspire and enforce the local administrative and health officials for the implementation of the direction of WHO "Improving the health and nutritional status of women before conception and during pregnancy".

LIST OF ABBREVIATIONS

ANC	=	Antenatal care
AOR	=	Adjusted Odd Ratio
DDS	=	Dietary Diversity Score
HFIAS	=	Household Food Insecurity Access Scale
MUAC	=	Mid-Upper Arm-Circumference
SPSS	=	Statistical Package for Social Science
WDD	=	Women Dietary Diversity
WDDS	=	Women Dietary Diversity Score

AUTHORS' CONTRIBUTIONS

The authors' responsibilities were as follows: SS participated in the design of the study, performed the data collection and the statistical analysis and served as the lead author of the manuscript. AA and BZ designed and supervised the study, and ensured the quality of the data and made a substantial contribution to the local implementation of the study assisted in the analysis and interpretation of the data. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical clearance is obtained from Jimma University, Ethiopia. A permission request letter was written to Mettu Karl Referral Hospital, Ethiopia and permission letter was taken.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Verbal consent was taken from each study participant.

FUNDING

The study was funded by Jimma University.

AVAILABILITY OF DATA AND MATERIALS

The data sets used and analyzed during the current study are available from the corresponding author on reasonable request.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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