DEBRE BERHAN UNIVERSITY, ASERAT WOLDEYES

HEALTH SCIENCE CAMPUS

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF PUBLIC HEALTH

ASSESSMENT OF KNOWLEDGE,ATTITUDE AND PRACTICE OF PREGNANT MOTHERS ON MATERNAL NUTRITION AND ASSOCIATED FACTORS IN BURE DISTRICT, W/GOJJAM ZONE, AMHARA, NORTHWEST ETHIOPIA, 2022.

By:

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Table of contents

List of tables

List of figures

List of acronyms

ANC………………...Antenatal Care

AOR………………….Adjustted odds ratio

BMI………………...Body Mass Index

CI………………….Confidence interval

COR………………..Curd odds ratio

GA…………………Gestational age

HC………………...Health Center

HEW………………Health extension workers

KAP………………. knowledge, attitude and practice

MoH…………………ministry of health

W/Gojjam………………...West Gojjam

WHO………………...World Health Organization

SNNPR………………south nation nationality people region

SPSS………………statically package for social science

Abstract

Background: Nutrition is a fundamental pillar of human life and its requirement varies with respect to age, gender and during physiological changes such as pregnancy.Pregnant mother's nutritional knowledge, attitudes, and practices were vital both their good health status and effective birth outcomes.

Objective: To assess the knowledge, attitude and practice of pregnant mothers on maternal nutrition and its associated factors in Bure district, W/Gojjam zone, northwest Ethiopia.

Methods: A community based cross-sectional study was employed among 576 pregnant mothers.The study was conducted from June 8, 2022 to July 8, 2022. Multi-stage sampling technique was used to select samples for the study. Data were entered in Epi-data version 4.6 and exported to SPSS version 26 to analyses. Bi-variable and multi-variable logistic regression analyses were used to identify factors associated with knowledge, attitude and practice of pregnant women on maternal nutrition.

Results: The level of good knowledge, favorable attitude and good practiec was 30.4% (95%CI, 26.9-34.3), 37% (95%CI, 33.2-40.9) and 35.6% (95%CI, 31.8-39.2) respectively. Pregnant women, those able to read and write (AOR=2.105, 95%CI (1.027-3.409) and having 3-4 ANC follow up (AOR= 3.899, 95%CI (1.406-5.809) were more likely to be knowledgable than the resprocal respectively.Pregnant mothers those living in urban (AOR=2.422, 95CI (1.99-5.765) and had information maternal nutrition (AOR=5.163, 95%CI (1.069-6.387) were more likely to be had favorable attitude than the resprocal. Pregnant women, those living in urban (AOR=3.06, 95%CI (2.122-5.571), had information maternal nutrition (AOR=4.270, 95%CI (2.018-9.033) and those eat ≥5 varites (AOR=3.02, 95%CI (2.012-5.01) were more likely to had good maternal nutritional practice respectively.

Conclusion and recommendation: This study found that the knowledeg, atitude and practice level of pregnant mothers was poor. Since, inorder to improve maternal nutrition of pregnant mothers, Bure district health office more focus on maternal nutrition strongly integrated health professionals and community through maternal nutrition dietary diversity demonistration and routine ANC follow up.

Keywords: Attitude, Bure, Community, Knowledge, Nutrition, Practice, Pregnancy

1. Introduction

1.1. Background

All human beings need a balanced amount of nutrients for proper functioning of the body system. Proper food and good nutrition are essential for survival, physical growth, mental development, performance and productivity, health and wellbeing (1). However, the nutrition requirement varies with respect to age, gender and during physiological changes such as pregnancy (2).

At the time of pregnancy women's bodies undergo changed anatomical, physiological and biochemically. The biological changes will increase women's nutrient requirements. Thus, pregnant women should eat diversified food stuffs that contain an adequate amount of energy, protein, vitamins, minerals, and water (3). Pregnancy is the most crucial nutritionally demanding period of every woman's life. The high demand of nutrients to deposit energy in the form of new tissue, growth of existing maternal tissues such as breast and uterus and increased energy requirements for tissue synthesis makes pregnant women more vulnerable to malnutrition (4).

According to the World Health Organization (WHO), globally many pregnant women do not get enough micronutrients in their diets during their pregnancy and reproductive-age period which influences future generations (5). Lack of knowledge, attitude and inappropriate practice of nutrition, such as consuming nutrient-deficient food, and a lack of proper eating patterns, are understood to cause various health problems and nutritional deficiencies (6).

Nutrition throughout the life cycle has a major effect on health. Pregnant women need the most nutritionally variety demand in their life (7). Lack of knowledge, attitude and practice about appropriate nutrition and failure to receive essential nutrients in both quality and quantity during this physiologically demanding period would result in adverse pregnancy outcomes (1). In Ethiopia, nutritional KAP disorders are among the main causes of morbidity and mortality of pregnant women. The major problems are protein-energy malnutrition and micronutrient deficiencies such as vitamin A, iron, and iodine (8).

Socio-demographic factors, residence, nutrition information are the factors that influence the knowledge, attitude and practice of pregnant mother's nutrition (8). Nutritional knowledge and attitude are important factors of dietary practices and are, thus, potential targets for appropriate

planning of nutrition interventions for vulnerable population groups like those lactating and women that are pregnant (9).

Ethiopia's ministry of health (MoH) has used different strategies, such as nutrition education via social media. Likewise, the health extension workers (HEWs) have also been striving to mitigate the deficiency in nutrition knowledge, attitude and practice among pregnant women, especially in the rural community. However, about 47% of women lacked knowledge of balanced and diversified diets during the antenatal period (10).

1.2. Statement of the problem

Pregnancy is a time of increased energy and nutrient needs for a woman in order to meet the needs of the growing fetus and maternal tissues associated with pregnancy, proper dietary balance is necessary to ensure sufficient energy intake for adequate growth of fetus without drawing on mother's own tissues to maintain her pregnancy (2). Inadequate maternal nutrition results in increased risks of short term consequences such as; Intra Uterine Growth Restriction (IUGR), low birth weight, preterm birth, prenatal and infant mortality and morbidity and early damage on health, brain development, intelligence, educability, and productivity was largely irreversible (11).

According to the world health organization (WHO), many women do not get enough micronutrients in their diets during their reproductive-age period, which influences future generations (12). The study in Sri Lanka food and Nutrition-Related Knowledge, Attitudes, and Practices among reproductive and pregnant women result showed, majority 71.75% did not know about vitamins and minerals, 80.5% responded incorrectly to food and nutrition diseases, and the majority 57.2% did not know what a balanced diet (6).

In Ethiopia, macronutrients and micronutrient deficiency are the most common public health problems of pregnant women. Around 13%, 50%, and 82% of women in Ethiopia had inadequate consumption of iron, Zink, and vitamin A, while in the south nation, nationality and people's region (SNNPR), 32.6%, 75.1%, and 41.3% of women had inadequate intake of iron, Zink, and vitamin A respectively (13).

The study that conducted in Guto Gida, East Wolega Zone, the finding show that 60.7% had poor dietery practice and the nutritional knowledge about some common food sources of nutrients, most respondents 70.6%, 79.0%, 80.7%, 78.3%) and 88.1% had no knowledge about common food sources of protein, carbohydrate, iron, vitamin A and iodine respectively and 65.2% respondents did not know inadequate nutrition during pregnancy can be the cause of miscarriage or preterm birth (4).The study that conducted in Addis Ababa, Ethiopia,the finding show that only 27%,48.4% and 34.5% of respondantes were good knowledge,favorable attitude and good practice of towards maternal nutrition respectively(8).

Inadequate nutrition due to lack of good KAP on maternal nutrition during pregnancy, it will have consequences like: increased infection, anemia, decreased immune function, lethargy and

weakness, low productivity, obstructed labor, high maternal mortality on the mother, and increased fetal and neonatal death, intrauterine growth retardation, low birth weight, preterm delivery, decreased immune function, birth defects, cretinism and decreased intelligent quotient on the fetal side (14). KAP of maternal nutrition is influenced by factors like socio demographic factors (15), such as age, income, religion, occupation, marital status, nutritional information of mothers and ANC attendance during pregnancies and determines the birth outcome (14).

Even if, maternal nutrition during pregnancy is crucial in reducing maternal mortality and infant mortality which is the target area in Ministry of health, there is a gap on previous researches to assess the knowledge, attitude, practice and associated factors of pregnant mothers on maternal nutrition, those were done at institution level (2, 8, 11). They did not address pregnant mothers who didn't come to health institution. Therefore, to address this gap, community based cross-sectional study was planed to assess the knowledge, attitude and practice of pregnant mothers on maternal nutrition and associated factors in Bure district.

1.3 Significance the study

Pregnancy is a critical period and KAP of pregnant mothers on maternal nutrition is an important factor that affects both the health of the mother and the child (8). The ability of mother to provide nutrients and oxygen for her baby is critical for fetal health and its survival. Failure in supplying the adequate amount of nutrients to meet fetal and maternal demand can lead to fetal and maternal malnutrition (2).

Assessment of KAP of nutritional status during pregnancy and identifying factors that affect it is important to monitor and quantifying risks that lead to design appropriate interventions at several levels. This study was provide a cue regarding the level of KAP of pregnant mothers on maternal nutrition in Bure district and it serve as baseline data for further studies that will be conducted on similar area.

In addition this, It could be used as an input to the health extension worker (HEW), health center (HC), woreda health office, W/Gojjam zone health offfice, Amhara region health office and NGO that done on maternal nutrition to design Sustainable nutrition interventions for improving maternal diet during pregnancy.

2. Literature Review

2.1 Knowledge, Attitude and Practice of pregnant mothers on maternal nutrition

2.1.1 Knowledge of pregnant mothers on maternal nutrition

Adequate nutrition knowledge of women prior to pregnancy is of importance in improving the dietary practices. Studies have shown that nutrition knowledge relates to the quality of food consumed (16). Nutrition knowledge is necessary in creating cognizance of ample nutrition intake among pregnant women. Lack of knowledge of sufficient nutrition is stated as an instant cause of undernourishment (8). Evidence has shown that nutrition knowledge is predictive of change in dietary habits and is one of the contributing factors to having a better nutritional practice. Thus, pregnant women are expected to have adequate knowledge to meet their increased dietary demands and obtain optimal nutritional status during pregnancy (20).

In different parts of the world and some areas of Ethiopia researches were done on knowledge, attitude and practices of pregnant mothers regarding to maternal nutrition. The study conducts in Pune, India knowledge of pregnant mother towards poor nutritional knowledge was 8.5% this was under the suboptimal (18). Almost similar research outcomes occurred in Iran where study shows that 10.6 % of pregnant mothers had poor nutritional knowledge (27). Meanwhile the neighboring country Sudan, Igbo-Eze knowledge of pregnant mothers towards good nutrition was observed 45.2%, this result was better than the above two studies (29). The study that done on the knowledge, attitude and practice of pregnant mothers on maternal nutrition in Mandera County (Kenya) shows that 61.1% had good nutritional knowledge which is far better result than the others studies so far (28).

In Ethiopia the KAP researches not done in vast way, most studies were conducted in the southern parts of the country. A research results from Gedeo Zone, Ethiopia in 2018 revealed that 45.6% of women had good nutritional knowledge during pregnancy (7). A community-based cross-sectional study was also conducted in Illu Aba Bor Zone, Southwest Ethiopia, 2020 and the result shows that 37.2% of the pregnant mothers had good nutritional knowledge (30). Whereas the study that conduct at Addis Ababa on the knowledge of pregnant mothers on maternal nutrition indicate that 27% pregnant women were knowledgeable (8). Since 2018 similar study was conducted at Bahir Dar town and the result revealed that more than one third, 38.6% of the pregnant mothers had poor knowledge (4).

The study that done on the knowledge, attitude and practice of pregnant mothers on maternal nutrition in Jiroft result show that 78.8%, 72.6%, 66.4%, 66.7%, and 53.8% of the respondents had the knowledge about food during pregnancy, meaning of food, important for bodies energy and heat, proper functioning of the body, growth and development of the fetus and infection fighting respectively (19).

A research results from Wollega, Ethiopia in 2013 revealed that 64.4% of women had nutrition knowledge during pregnancy (2). Whereas the study that conduct at Horo Guduru Wollega study on the knowledge of pregnant mothers on maternal nutrition indicate that 39.1% pregnant women were not knowledgeable (11) and Concerning the nutritional knowledge of the respondents about some common food sources of nutrients, more than half of the respondents 55.6%, 55.1%, 58.8%, 54.1% and 88.1% had knowledge about common food sources of protein, carbohydrate, iron, vitamin A and iodine respectively (11).

2.1.2 Attitude of pregnant mothers on maternal nutrition

The study that conducted in Kigeme refuge camp, Rwanda, shows that 67.2% has negative attitude towards maternal nutrition and 46.4% had moderate knowledge of about maternal nutrition (34).Attitude, one's relationship with food on pregnant mothers in relation to maternal nutrition was studied so far across the globe as like nutritional knowledge in the form of KAP. Study that conducted from Pune, India in 2022 revealed that 4.3% % of pregnant women had unfavorable attitude on their nutrition during pregnancy (18).

In the same year research also done in Ilam, Iran 2022 on attitude of pregnant mothers with respect to maternal nutrition and less than half, 42.3% pregnant mothers had unfavorable nutritional attitude (27).At Mizan Aman town, Ethiopia researches was done on public Health institution since 2021 on KAP of pregnant mothers and result revealed 46.5% of the pregnant mothers had favorable attitude (31).

Research was done on Kaffa, South Ethiopia on public hospital since 2021 and among the pregnant mothers 40.5% had unfavorable attitude with respect to maternal nutrition (20). Whereas the study that conducted at Addis Ababa, KAP of pregnant mothers on maternal nutrition almost half of the pregnant mothers (48.4%) had favorable attitude (8).

The study that conducts the KAP of pregnant mothers on maternal nutrition in public hospitals of southern Ethiopia revealed that 40.5% of pregnant mothers had unfavorable attitude towards maternal nutrition (20). Whereas the study that conduct at Horo Guduru Wollega study on the knowledge of pregnant mothers on maternal nutrition indicates that 70.6% of pregnant mother had good attitude (11). The findings that revealed in Addis Ababa on the assessment of KAP of pregnant mothers on maternal nutrition among ANC attendant pregnant women, 48.4% had favorable attitude of maternal nutrition during pregnancy (8).

2.1.3 Practice of pregnant mothers on maternal nutrition

Study that done on the assessment of KAP of pregnant mothers on maternal nutrition in Pune, India the finding showed that 6.4% had poor dietary practices and the remaining 93.6% agreed extra food practice during pregnancy is good for health of mother as well as for baby (18). Ilam, Iran cross sectional study was conducted and the finding showed that 41.7% of the pregnant mothers had poor dietary practices (27). Meanwhile similar research revealed that almost half of pregnant mothers (47.1%) had good dietary practice at Mandera, Kenya in relation to maternal nutrition practice (28).

The study that conducted at Nono Woreda, Shoa indicates that 31% of pregnant mother had good practices towards maternal nutrition (32). This clearly indicated that less than half of pregnant mother's attending antenatal care in the study area. Similar study was carried out at Farta woreda and results showed that almost quarter of pregnant mothers, 27.2% had good dietary practice (33) and similar research result also done at Mish woreda in in this study 62% pregnant moms were exhibit moderate nutritional practice (26).

The study that conducts the KAP of pregnant mothers on maternal nutrition in public hospitals of southern Ethiopia revealed that 47.7% of pregnant mothers had poor dietary practice on maternal nutrition (20). Whereas the findings that revealed in Addis Ababa on the assessment of KAP of pregnant mothers on maternal nutrition among ANC attendant pregnant women, 34.5% had good practice on maternal nutrition during pregnancy (8). The study that conducted in north western Ethiopia revealed that 60.7% of pregnant women had poor maternal dietary practices (4). The study that conducts in Dessie town 54.8% pregnant women had poor dietary practice and 19.5 % were undernourished (4).

2.2 Socio-demographic factors related to knowledge, attitude and practice of pregnant mothers on maternal nutrition

2.2.1 Factors associated to knowledge of pregnant mothers on maternal nutrition

A research results from Wollega, Ethiopia in 2013 revealed a positive significant relation between educational status of mothers and family income and nutritional knowledge of mothers during pregnancy (8). Place of residence, education and parity were significantly associated with knowledge regarding diet increase during pregnancy (21).

Educational status of both the wife and husband, monthly income, occupation are among the main factors that affecting the knowledge of maternal nutrition (8). Study that conduct in Addis Ababa on the KAP of pregnant mothers revealed that pregnant women whose educational status diploma and above, secondary school and no formal study were 53.4%, 23.4% and 5.6% knowledgeable about maternal nutrition and pregnant women whose husband educational status diploma and above, secondary school and no formal study were 48.5%, 21.5% and 11.2% had knowledge on maternal nutrition respectively. And also in this study pregnant women whose occupation employee, private business and housewives 51.9%,26.9% and 20.4% knowledgeable on maternal nutrition and average monthly income >3500,2000-3500 and <2000,46.6%,25% and 6.1% knowledgeable on maternal nutrition (8).

2.2.2 Factors associated to attitude of pregnant mothers on maternal nutrition

Food insecurity is a state or a condition in which people experienced limited or uncertain physical and economic access to safe, sufficient, and nutritious food to meet their dietary needs or food preferences for a productive, healthy, and active life (22). The study that conducted in Horo Guduru Wollega Zone, Oromia Region, Ethiopia, shows that 70.6% of pregnant mothers had good attitude about maternal nutrition (11).

Educational status of both the wife and husband, monthly income, occupation are among the main factors that affecting the attitude of maternal nutrition. Study that conduct in Addis Ababa on the KAP of pregnant mothers revealed that pregnant women whose educational status diploma and above, secondary school and no formal study were 66%, 44.1% and 36.1% positive attitude about maternal nutrition and pregnant women whose husband educational status diploma and above, secondary school and no formal study were 61.4%, 49.2% and 32.6% positive attitude on maternal nutrition respectively. And also in this study pregnant women whose

occupation employee, private business and housewives 63%,49% and 44.3% positive attitude on maternal nutrition and average monthly income >3500,2000-3500 and <2000,58.6%,50% and 34.7% favorable attitude on maternal nutrition (8).

2.2.3 Factors associated to practice of pregnant mothers on maternal nutrition

Husband's income was significantly associated with dietary practices of pregnant women. This might be due to the fact that, the more husband earns, the more he invests on family nutrition and health which in turn attributes to good dietary practices of family in general and pregnant women in particular. Furthermore, earnings can influence availability of resources which in turn improve access to a diversified diet and thus improve dietary practices (4, 23).

Age, educational status of both the wife and husband, monthly income, occupation are among the main factors that affecting the practice of maternal nutrition. Study that conduct in Addis Ababa on the KAP of pregnant mothers revealed that pregnant women whose age 15-24,25-34 and 35-44 were 14%,37,7% and 42.9% respectively and pregnant women whose educational status diploma and above, secondary school and no formal study were 56.3%,36% and 12% had good practice about maternal nutrition and pregnant women whose husband educational status diploma and above, secondary school and no formal study were 63.4%,23.5% and 18% had good practice positive on maternal nutrition respectively. And also in this study pregnant women whose occupation employee, private business and housewives 51.9%,50.7% and 24.4% had good practice on maternal nutrition and average monthly income >3500,2000-3500 and <2000,60.3%,28.7% and 10.2% had good practice on maternal nutrition (8).

2.3 Maternal related factors

According to the study on factors associated with dietary practice and nutritional status of pregnant women in Dessie town, pregnant women who did not follow ANC during the pregnancy were 3.46 times more likely to be undernourished than their counterparts(3). The study that conducted in Gedeo Zone,Southern Ethiopia,mothers who had no ANC follow up were 54% less chance of good dietary practice than those mothers with ANC follow up(AOR=0.46,95%CI,0.23-0.941)(7) and the study that conducted in Horo-Guduru,Wollega

Zone,11.9% and 27.9% of respondents were attened 4 and 3 times ANC follow-up(11).According to the study that conducted on the assessment of KAP of pregnant mothers in Addis Ababa,Ethiopia, mutigravida mothers were 2 times knowledgable than primigravida mothers (AOR=2.175,CI=1.034-4.573)(8).

2.4. Nutrition related factors

The study that conducts on the KAP of pregnant mothers on maternal nutrition, sources of information on good nutrition of the women were mostly through hospital, television, medical outreaches and internet. The others were family/friends (9.43%), school (8.20%), radio (6.67%), newspaper (5.33%), church/mosque (4.10%), and traditional birth attendants (3.28%) and a majority of the respondents (87.70%) had been taught about balanced diet (17).

The study that conducted in Dire Dawa City Administration, Eastern Ethiopia, 57% of the responadts had poor dietary diversity and those ate ≥5 item food 2.4 times good nutritional status those ate <5 food group items (24).The study on dietary Practice and Associated Factors Among Pregnant Women at Public Health Institution in Mizan-Aman Town, Southwest Ethiopia indicates that owning of television or radio were 4.2 times good dietery practice than incounter partes (13).

According to the study to assessement of KAP of pregnant mothers on maternal nutrition that conducted in Horo-Guduru Wollega Zone, Oromia region 55.3% of respondantes had information about maternal nutrition during pregnancy (11). The study that conducted in Bahir Dar town,Northern West Ethiopia, participants who own radio were 3.17 times more likely to had good maternal dietary practices than their counterparts (AOR = 3.17, 95%CI, 1.76, 5.67)(4).

2.5. Conceptual frame work

This is conceptual frame work develop by using deferent literatures (8,11,7,26) for the assessment of knowledge, attitude and practice of pregnant mothers on maternal nutrition and associated factors in Bure district, West Gojjam (W/Gojjam) zone, Northwest Ethiopia,2022.

Scio-demographic factors

- Age
- Religion
- Residence
- Family income
- Educational level of mothers
- Occupation of mothers
- Husband education level
- Occupation of husband

Knowledge, atitude and practice of pregnant mothers on maternal nutrition

Nutrition related factors

- Nutrition information
- Frequency of feeding
- Dietary diversity
- Ownership of radio

Maternal related factors

- Gestational age
- No. of pregnancy
- No. of ANC visit

Figure 1. Conceptual frame work

3. Objective

3.1. General objective

To assess the knowledge, attitude and practice of pregnant mothers on maternal nutrition and associated factors in Bure District W/Gojjam zone, Amhara region, Northwest Ethiopia, 2022.

3.2. Specific Objective

➤ To determine the level of knowledge of pregnant of mothers on maternal nutrition in Bure District, W/Gojjam zone, Amhara, Northwest Ethiopia.

➤ To determine the level of attitude of pregnant mothers on maternal nutrition in Bure District, W/Gojjam zone, Amhara, North West Ethiopia.

➤ To determine the practice of pregnant mothers on maternal nutrition in Bure District/Gojjam zone, Amhara, North West Ethiopia.

➤ To identify factors associated with knowledge, attitude and practices of pregnant mothers on maternal nutrition in Bure District, W/Gojjam zone, Amhara, Northwest Ethiopia.

3.3. Materials and Method

3.3.1. Description of the study area

The study was conducte in Bure District which is found in W/Gojjam zone, Amhara regional state, Northwest Ethiopia, Which is found at 411 km far from the capital city of Ethiopia, Addis Ababa, and about 148 km from the capital city of Amhara regional state, Bahir Dar. Geographically, it is found that, 700–2750 meters above sea level, get an average rainfall is 1750 mL and the temperature variation ranges from 17 to 27 degree centigrade. The reason to conduct this study in Bure district, among W/Gojjam zone woredas, is geographically and weather condition very productive according to W/Gojjam and Bure district agriculture office evidence. But according to the district health office evidence, malnutrition among mothers and children was high with 37.5% prevalence (22).

Based on evidences from bure woreda administration office and Bure woreda health office, the woreda is divided in to 21 rural Kebles and six urban kebeles having 6 health centers, one hospital and 21 health posts. According to the information from Bure Woreda administration office, the total population in the woreda was 202,976 in 2013 E.C out of which 66.4% of the total populations were living in rural area directly engaged their life agriculture and 33.6% living in the urban center. In 2014 E.C the total numbers of pregnant women expected are 6,840 in the woreda.

3.4 Study design and period

Community based cross-sectional study was conducted to assess knowledge, attitude and practice of pregnant mothers about maternal nutrition and factors associated with during pregnancy that employed quantitative data collection method from June 8 ,2022 to July 8,2022.

3.5 Source population

All pregnant mothers who are living in Bure district.

3.5.1. Study Population

Pregnant mothers who are living in sample Kebles in Bure district.

3.5.2. Sample population

Pregnant mothers who are living in sample kebeles and fulfil inclusion criteria.

3.6 Inclusion Criteria and Exclusion Criteria

3.6.1 Inclusion criteria

Pregnant mothers who are living in Bure district.

3.6.2 Exclusion criteria

Pregnant mothers who were very sick and unable to listen and speak.But no pregnant mothers were found in this state during the study period.

3.7. Sample size determination

The sample size was calculated using a single population proportion formula. The KAP of pregnant mothers on maternal nutrition at Horo Guduru Wollega zone was 63.5%, 70.6% and 74.6% respectively (11). Calculating by all prevalence and large sample size used to reduce error during study.

$$n = [(Z\alpha/2)^2 \times p\,(1\text{-}p)]\,/d^2)$$

S1, P = 63.5% CI, 95% α/2 =1.96, d=margin of error 5%.

Where:

S1=sample size 1

n = the desired sample size

P = Proportion of knowledge of pregnant mothers on maternal nutrition

Cl = confidence interval with 95%

Z a/2 = Critical value at 95% confidence level of certainty is (1.96)

n= [(1.96)^2 (0.635) (0.365)]/ (.05)^2=356

S2, P = 70.6%, S2=sample size 2

$$n = [(Z\alpha/2)^2 \times p\,(1\text{-}p)]\,/d^2)$$

n= [(1.96)^2 (0.706) (0.294)]/ (.05)^2 =319

S3, P = 74.6%, S3=sample size 3

$$n = [(Z\alpha/2)^2 \times p\,(1\text{-}p)]\,/d^2)$$

n= [(1.96)^2 (0.746) (0.246)]/ (.05)^2 =282

Among the three p, p=63.5% is large sample size which is **356** and using design effect 1.5 get 534.

Finally, 10% non-response rate is considered, and the total sample size based on proportion (P) becomes **587** pregnant mothers.

3.7.1 Sampling procedure

Multistage sampling was used to select samples in Bure district. First, from the total of 21 rural kebeles of Bure district 30% (6 kebeles) and from urban 6 kebels (30%) 2 kebels were selected by lottery method (7).

Second, sampling frame was prepared based on the family folder from kebeles HEWs, then the sample size was allocated proportionally to each selected kebele based on the number of pregnant women in each kebele. Then, systematic random sampling technique with K interval=5(2,803/587) was conducted to select the households with eligible study sample, until the sample size was attended.Selected study subject who refused to participate in the study was considered as non-respondent.

Selected kebeles are Kuch, Zalema, Tiyata, Gulem, Alefa, Shewun, and Bure Ketma 02 and 04. In these selected kebeles, according to Bure Woreda health office and family folder list from HEWs, 2,803 pregnant mothers are found and proportionally allocated.

Proportional allocated sample size by using the formula: ni = (Ni/N)/n
Where: ni=needed sample size in targeted Keble, Ni=total number of pregnant mothers in each Keble, N=our total pregnant and n=our total sample size

The above procedure generalized diagrammatically below
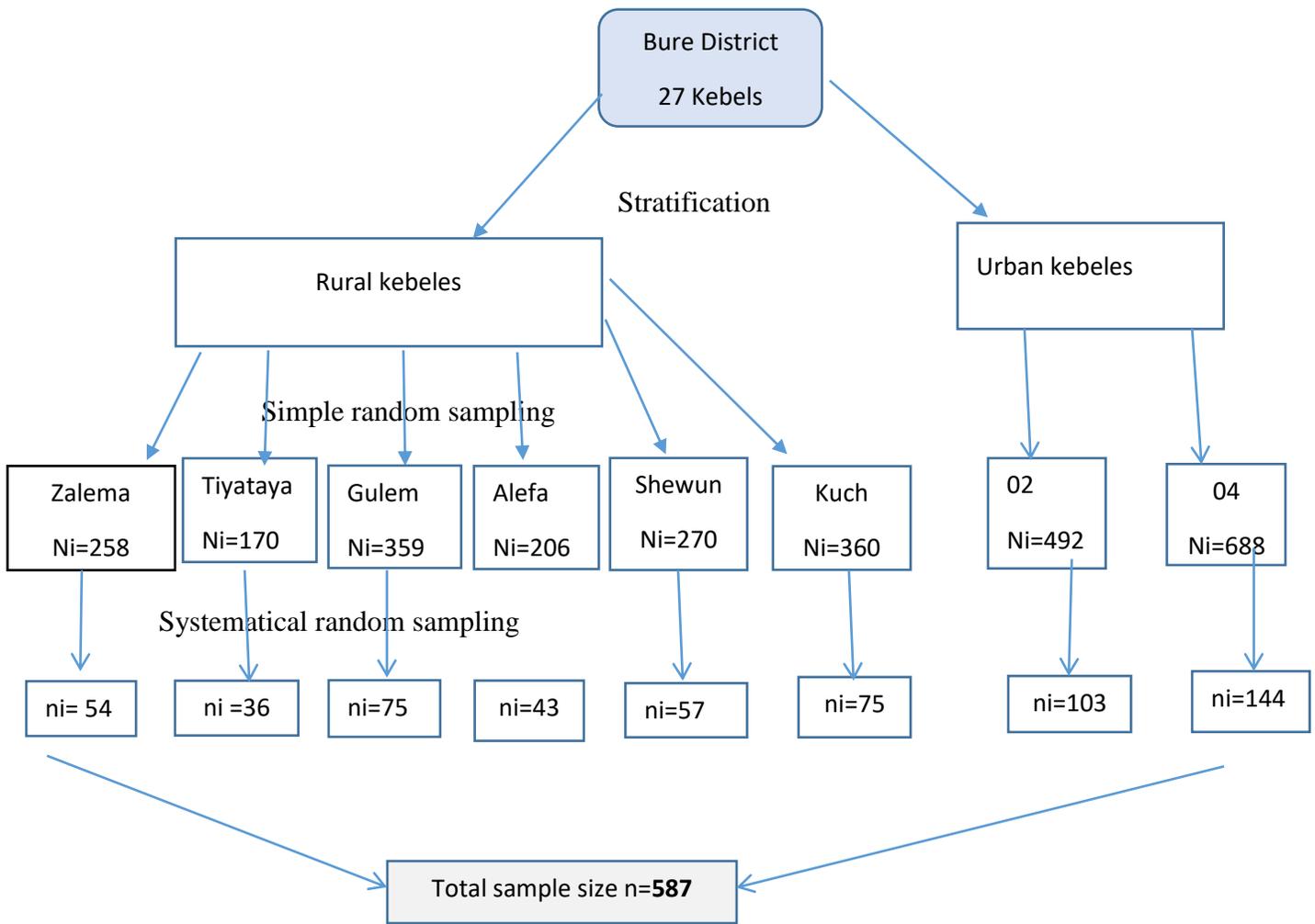
Figure 2.Diagrammatically sampling procedure

3.8 Data collection tools and procedures

A standardized structured questionnaire adopted from various previous studies (2, 4, 8, 11), first the questionnaire was prepared in English language then translate in to Amharic and then back to English to check for its consistency. The tool contains informed consent, questionnaire of knowledge, attitude, practices and associated factors of pregnant mothers on maternal nutrition.

Four degree holders and experienced health professionals were recruited to conduct the interview.Training was given for two days (including half day of pretest) on the objective, relevance of the study, confidentiality of information, respondent's right, informed consent, techniques of interview and sampling methods. One degree holder health professional assigned as supervisor to supervise the data collection process and the data collected by interviewers. A pretest was conducted on a population size equivalent to 5% of the total sample size and the questionnaire was assessed for its clarity, length and completeness.

3.9. Variables

3.9.1 Dependent variables

Knowledge, attitude and practice of pregnant mothers about maternal nutrition.

3.9.2 Independent variables

➢ Socio-demographic characteristics
➢ Nutrition information
➢ Dietary (feeding) frequency in a day
➢ Dietary diversity
➢ Gestational age
➢ Information source
➢ Number of ANC visit
➢ Number of pregnancy

3.10. Operational Definition

Knowledge: understanding that one has gained on nutrition during pregnancy through learning and practice. Pregnant women considered to be have good knowledgeable if she was correctly answered and scored greater than or equal to 70 %(9 from 13) the total knowledge assessing question (8).

Attitude: pregnant women's feeding or eating behavior which is influenced by her emotion, motivation and thoughts. The respondent's attitude score > median among eight attitude questions, consider have favorable attitude and respondent's attitude score ≤ median consider unfavorable attitude (8).

Practice: The action of the mothers that could affect her nutrition such as eating, feeding, cooking and selecting of foods. Pregnant women were considered to have good dietary practices if they scores above and equal to the median and poor dietary practice if they scores below the median among 11 dietary practice assessing questions (7).

Dietary diversity score: Dietary diversity scores were calculated by summing up the number of food groups consumed in 24 hours period by pregnant mothers. Based on FAO,the scores greater than or equal to 5 food items were coded as good dietary diversity scores and less than 5 food items were consider poor dietary diversity (24, 35).

3.11. Data Quality Management

The questionnaire was translated into local languages Amharic. Before data collection, consistency was checked by back-translation by another fluent person in those two languages experts. Supervisors and data collectors were train for two days about the purpose of the study, how to get informed consent, the technique of selecting the study Subjects from each selected kebele.

Data collectors were supervised by the principal investigator and supervisor who were trained before data collection started. A pre-test was done among 5% of study participants who live out of sampled kebeles within the study area to check whether the questionnaire was clear and understandable for supervisors, data collectors and respondents. At the end of each data collection, regular supervision was conducted to check for completeness of the questionnaire and quality of the recorded information.

Reliability of research instruments were checked by Cronbach' Alpha coefficient to measure internal consistency of the research tool.when analysis Cronbach's alpha coefficient equal to knowledge (0.965), attitude (0.952) and practice (0.841) which was greater than 0.8, thus the research instrument proven to be reliabile.

3.12 Data Processing and Analysis

After the data were checked for its completeness and accuracy, it was coded and entered to Epi Data version 4.6 and exported to SPSS version 26 for cleaning and analysis. Descriptive statistics were applied to present frequency, percentage distribution mean and standard deviation of study participants' characteristics. Before starting logistic regression chi-square assumption was checked for each independent variable.

Bi-variable logistic regression analysis was used to determine independent variables that were candidates for multi-variable logistic regression analysis. Then multi-variable logistic regression analysis was applied by selecting only those variables with P-value <0.2(4) in the binary logistic analysis to control confounding variables. Tests of interaction and multi-collinearity were checked by variance inflation factor (VIF) and all independent factors VIF value below 10, which was not multicollinearity effect to the outcome variables. Confidence interval of 95% with a p-value of <0.05 was used to declare a statistically significant association.

4. Ethical Consideration

Ethical clearance was obtained from the ethical review Board of Debre brehan University, Aserat Woldeyes health science campus and Permission letter was provided to the Woreda Health office before data collection.

After permation gained from woreda health office and kebele administration, the study was conducted after the participants were informed about the purpose of the study and both verbal and written consent was obtained from each study participant and informed there was no any risks of the study. The collected data was stored in a secure place to maintain confidentiality and there was no personal identifier during the data collection. Participants were informed about their voluntariness to participate and they can withdraw from the study at any time if they were no comfortable.

All selected sample pregnant give equal chance to participate the study. The investigator has a one-page information sheet regarding the purpose and nature of the study.

5. Result

5.1. Socio-demographic characteristics of the study participant

A total of 576 participants were enrolled in the study with a response rate of 98.1% with mean age of 27 years old (Range=15-44) with (SD=±8.01). Majority of (93.4%) participants were orthodox and (51.9%), (98.6%) and (89.9%) of respondents were found in age category of 25–34, married and house wife respectively. Above half of 355(62%) of the study participants were unable to read and write and 426(75%) of their husbands occupation was farmers.

Table 1: Distribution of socio-demographic characteristics of study participant in Bure district (n=576).

Variable	Category	Frequency	Percent
Age	15-24	134	23.3
	25-34	299	51.9
	35-50	143	24.8
Religion	Orthodox	538	93.4
	Muslim	29	5
	Protestant	9	1.6
Educational status mothers	Unable to read and write	355	61.6
	First cycle complete	152	26.4
	Second cycle complete	23	4
	Preparatory complet	10	1.7
	Diploma and above	36	6.3
Occupation of mothers	House wife	518	89.9
	Civil servant	28	4.9
	Student	3	0.5
	Marchant	20	3.5
	Daily worker	6	1.0
	Other(waiter)	1	0.1
Marital status	Married	568	98.6
	Single	7	1.2
	Divorced	1	0.2
	Widowed	0	0
Educational status husband	Unable to read and write	308	54.2
	First cycle complete	159	28

	Second cycle complete	36	6.3
	Preparatory complet	11	2
	Diploma and above	53	9.3
	Other	1	0.2
Occupation of husband	Farmer	426	75
	Marchant	79	13.9
	Civil servant	49	8.6
	Daily labor	6	1.1
	Other(driver)	6	1.1
	Student	2	0.3
Residence	Urban	144	25.0
	Rural	432	75.0
Average monthely income	<2000	20	3.5
	2000-3500	112	19.4
	>3500	444	77.1

5.2. Knowledge of pregnant mothers on maternal nutrition

To assess the knowledge of pregnant mothers on maternal nutrition 13 knowledge assessing questions used. Among 576 respondantes majority of respondantes (65%) had no information about maternal nutrition and majority of respondantes (86%) that had information about maternal nutrition, their source of information were health centers and health posts.

Most of the respondantes (71%) didn't know about the source of iron and only 29% of respondantes were know about the source of iodine. According to the findings 39.1% of respondants were know about the meaning of food and 31.4% of respondantes know about food groups.Above half of respondants(64%) did know about source of protien and only 36.1% and 29.2% of respondants were know foods that are source of carbohydrate and vit A respectively.

Among the respondantes 64.9%,66%,46.2%,24.7% and 61.1% of respondents were know about importance of food for fetus growth and development, importance of food for proper function of body, importance food for body heat and energy, inadequate nutrition causes miscarriage and importance food for protection of infection respectively.

The respondents asked to choose yes or no answers by indicating whether a given statement was there dietary knowledge or not by allowing them to list or state about it and for those correctly answered to open ended questions score 1 and incorrect answer score zero(2,7).By computed those scores,knowledge level was categorized as good (>_70%), 9 questions and above were answered from 13 knowledge assesment questions and poor knowledgable if only (<70%) of the questions were answered.According to the study 401(69.6%) participants were had poor knowledge about maternal nutrition and 175(30.4%) participantes were had good knowledge about maternal nutrition.

Table 2: Knowledge towards maternal nutrition among pregnant mothers at Bure District (n=576).

Variables	Responses	Frequency	Percent
Did you have information about maternal nutrition	Yes	200	34.7
	No	376	65.3
What are your source of information	H/C and H/P	171	85.5
	Television	20	10.0
	Radio	9	4.5
Did you about balanced diet/food group	Yes	181	31.4
	No	395	68.6
Did you know about source of Iron	Yes	166	28.8
	No	410	71.2
Did you know about source of Iodin	Yes	168	29.2
	No	408	70.8
Did you know about source of protien	Yes	205	35.6
	No	371	64.4
Did you know about source of carbohydrate	Yes	208	36.1
	No	368	63.9
Did you know about source of Vit A	Yes	168	29.2
	No	408	70.8
Did you know about importance of food for fetus growth and development	Yes	374	64.9
	No	202	35.1
Did you know about importance of food for proper function of body	Yes	388	66
	No	196	34

Did you know about food for body heat and energy	Yes	266	46.2
	No	310	53.8
Did you know inadequate nutrition causes miscarriage	Yes	142	24.7
	No	434	75.3
Did you know food for protection of infection	Yes	352	61.1
	No	224	38.9
Over all knowledge of maternal nutrition	Poor knowledge	401	69.6
	Good knowledge	175	30.38
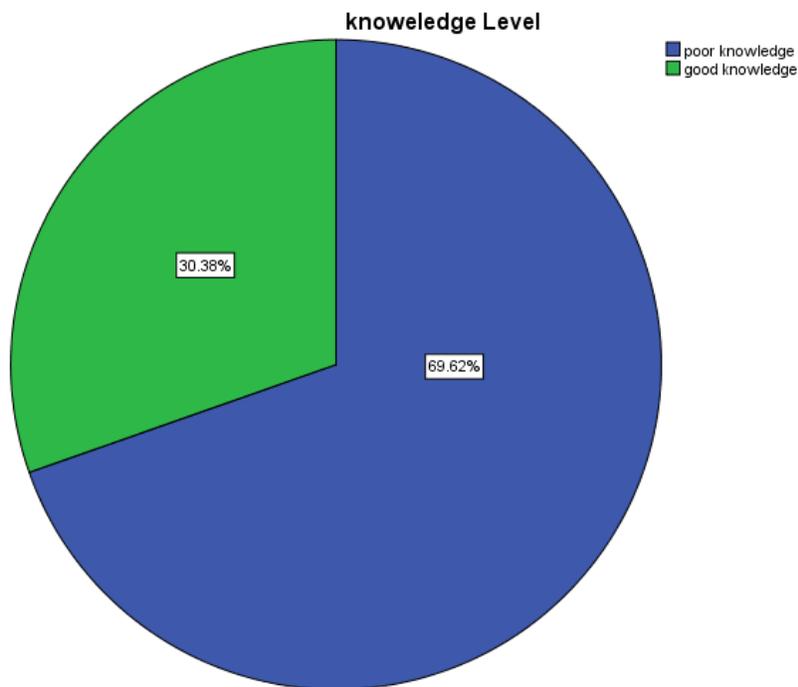
Figure 3: Level of knowledge of respondants on maternal nutrition

5.3. Attitude of pregnant mothers towards maternal nutrition

Attitude of respondants were measured using eight attitude assessing questions on maternal nutrition among pregnant women using 3 point Likert scale (1=Good, 2=note good and 3=note sure). Each variables finding presented in table 3. Nutrition attitude level was categorized as favorable attitude, if the participants' attitude score > median and as unfavorable attitude if the participants' attitude score ≤ the median. The level of attitude were calculated in consideration

with median equal to 3.00 and result indicated that 213(37%) had favorable attitude while above half of respondents 363(63.0) had unfavorable attitude.

Table 3: Attitude towards maternal nutrition among pregnant mothers at Bure District (n=576)

Variables	Responses	Frequency	Percent
How good you think eat more food during pregnancy	Good	304	52.8
	Note good	111	19.3
	Not sure	161	28.0
How good you think eat more carbohydrate than none pregnant mothers	Good	280	48.6
	Not good	93	16.1
	Not sure	203	35.2
How good you think eat more protein than none pregnant mothers	Good	282	49
	Not good	76	13.2
	Not sure	218	37.8
How good you think drink more milk and its product during pregnancy	Good	300	52.1
	Not good	96	16.7
	Not sure	180	31.3
How good do think to Prepare meals with iron rich foods, such as beef, chicken, or liver	Good	296	51.4
	Not good	52	9.0
	Not sure	228	39.6
How much do you like the test of meat and other iron rich meals	Good	229	39.8
	Not good	44	7.6
	Not sure	303	52.6
How much do you like like the test of omega-3 rich foods like, olive oils, fish	Good	194	33.7
	Not good	46	46
	Not sure	336	336
How good do you like prepare meals with iodized salt	Good	332	57.6
	Not good	40	6.9
	Not sure	204	35.4
Over all attitude of maternal nutrition	Favorable	213	36.9
	Unfavorable	363	63.0
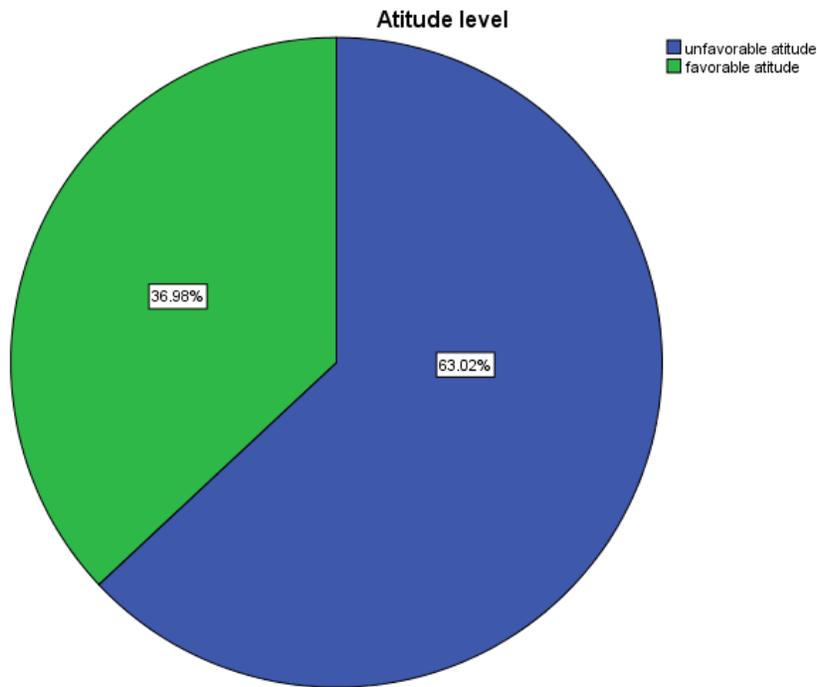
Figure 4: Level of attitude of respondants on maternal nutrition

6.4. Dietary Practices of pregnant mothers on maternal nutrition

Practice was measured using 11 dietary assessing questions on maternal nutrition among pregnant mothers. Each variables finding presented in table 4. Majority of respondants (79%) didn't have specfic dietary regimen during pregnancy and 8.7% of repondants were avoid some food during pregnacy. Among 50 participants who were avoid food during pregnancy,45(90%) participant their reason were food makes fetus big and that lead to difficult to delivery.

Above half of respondants (67%) did not have the habit of eating snacks between meals during pregnancy and 68% of respondants had poor dietary diversity score(they ate <5 food items) in 24 hours recall biased. The respondants nutrition practice levels were categorized as good practice if the participants' practice score ≥ median and as poor practice if the participants' practice score < the median. The level of nutrition practice were calculated in consideration with median equal to 2.00 and result indicate that 64.4. % (n=371) had poor nutrition practice and 35.6 %(n=205) pregnant women had good nutritional practice on maternal nutrition.

Table 4: Dietary Practices of pregnant mothers towards maternal nutrition in Bure District, W/Gojjam Zone, Ethiopia 2022. (n=576)

Variables	Responses	Frequency	Percent
Do you follow specific specific dietary regimen during pregnancy	Yes	120	20.8
	No	456	79.2
Did you avoid any food during pregnancy	Yes	50	8.7
	No	526	91.3
Reason of avoidance	Religion	4	8.0
	Difficult to delivery	45	90.0
	Other(dislikes)	1	2.0
Did you use iodized salt during cooking	Yes	192	33.3
	No	384	66.7
Did you eat fresh fruits orange, lemon, mango daily	Yes	197	34.2
	No	379	65.8
Did you eat plant source protein daily	Yes	99	17.2
	No	477	82.8
Did you eat fresh vegetables daily	Yes	236	41.0
	No	340	59.0
Did you drink milk daily	Yes	167	29.0
	No	409	71.0
Did you eat meat	Yes	308	53.5
	No	268	46.5
Do you have folic acid supplement	Yes	398	69.1
	No	178	30.9
D yo have habit of eating snacks between meals during pregnancy	Yes	190	33.0
	No	386	67.0
How money times your current diet frequency of meals per day	1-2	150	26.0
	3-4	413	71.7
	>5	13	2.3
Dietery diversity score	<5variety	391	67.9
	≥ 5 variety	185	32.1

Over all nutritional practice level	Good practice	205	35.59
	Poor practice	371	64.4

practice levele

- poor practice
- good practice

35.59%

64.41%
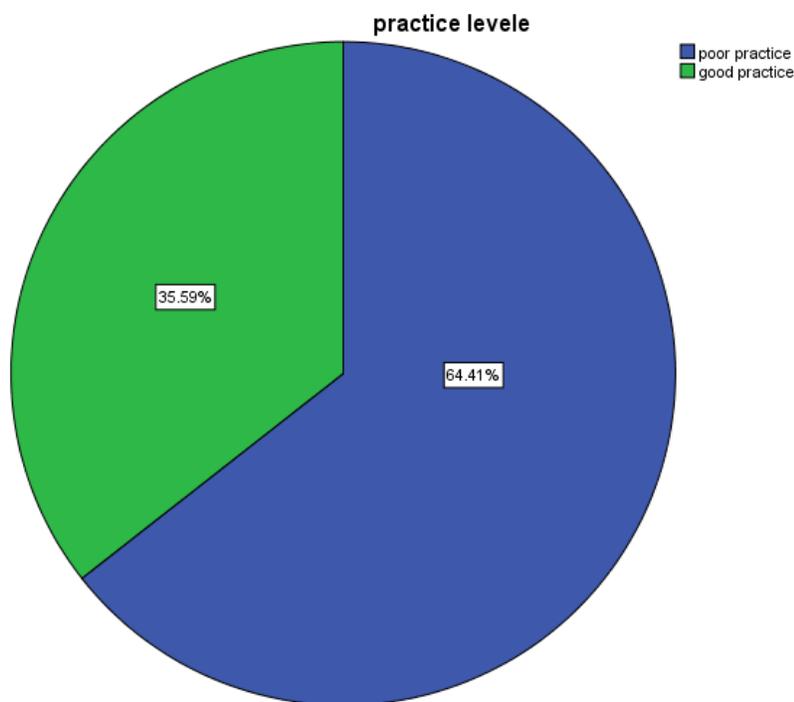
Figure 5: Dietary practice level among pregnant mothers on maternal nutrition

5.5. Factors influencing knowledge towards maternal nutrition among pregnant mothers

Logistic Regression was used to determine the set of predictor variables which predicted pregnant mothers knowledge towards maternal nutrition.Variables that entered in to bi-variable logistic regression and that showed significant association (p<0.2) (4) variables were include the multi-variable logestic regration analysis.

After controlling for the effects of potentially confounding variables using multi-variable logistic regressions,finally educational level of pregnant women, education level of husband, occupation of pregnant women,occupation of husband,residence,gestational age,information heared, owining of radio and number of ANC follow up variables were significant in the multi-variable logestic regration analysis (p<0.05).

Multi-variable logestic regration revealed that pregnant mothers those able to read and write 2.1 times (AOR=2.105, 95%CI (1.027-3.409), p<0.001) more likely to had knowledgeable than

those unable to read and write. Respondents whose occupation was civil servants were 4.7 time (AOR=4.721, 95%CI (1.566-6.082), p<0.011) more likely to be knowledgeable than those whose occupation were house wife. Respondantes husband occupation who were civil servantes 2.3 times (AOR= 2.34, 95%CI (3.575-5.664), p<0.0001) more likely knowledgable than those whose occupation were farmers.

Pregnant mothers living in urban were 3.1 times (AOR= 3.113, 95%CI (1.018-4.723), p<0.021) more likely knowledgable than thos living in rural and pregnant mothers who were heard maternal nutrition information were 8.3 times (AOR= 8.34, 95%CI (10.868-18.967), (p<0.0001) more likely knowledgable than thos who were not heard information. The respondants who had radio 2.6 times (AOR= 2.645,95%CI(1.164-3.538),(p<0.015) more likely knowledgable than who had no radio and pregnant women who were 3-4 ANC follow up 3.9 times (AOR= 3.899,95%CI (1.406-5.809),(p<0.009) more likely knowledgable than those who were attend 1-2 ANC follow.

Pregnat mothers who were ≥9 month gestational age 1.4 times (AOR=1.395, 95CI (1.283-8.625) more likely knowledgable than those whose gestational age 3-8 monthes while pregnat mothers with Hosmer and Lemeshow modele fitness test p<0.647.

Table 5: Bi-variable and multi-variable logestic regration analysis on factors associated with knowledge of pregnant mothers on maternal nutrition in Bure district, W/Gojjam zone (n=576)

Variables	Categories	Status of knowledge		COR (95% CI)	P-value	AOR(95% CI)
		Good knowledge	Poor knowledge			
Age	35-50 years	23	120	0.35(0.218-0.577)	0.000	0.265(0.063-1.111)
	15-34 years	152	281	1		1
Education level of mother	able to read and write	103	118	3.431(2.370-4.966)	0.000	2.105(1.027-3.409)**
	unable to read and write	72	283	1		
Educationlevel of husband	able to read and write	102	158	2.278(1.579-3.288)	0.000	1.235(1.060-2.824)*
	unable to read and write	68	240	1		1
Occupation	Civil servant	38	20	5.284(2.972-9.396)	0.000	4.721(1.566-6.082)*

		137	381	1		1
of pregnant women	House wife					
Occupation of husband	Civil servant	81	61	5.028(3.350-7.547)	0.000	2.34 (3.575-5.664)***
	Farmer	89	337	1		1
Residence	Urban	88	56	6.232(4.138-9.383)	0.000	3.113(1.018-4.723)*
	Rural	87	345	1		1
Gestational age	≥ 9 month	11	54	0.431(0.220-0.846)	0.014	1.395(1.283-8.625)*
	3-8 month	164	347	1		1
Information heared	Yes	127	73	9.54(1.255-10.848)	0.000	8.34(10.87-18.967)***
	No	58	318	1		1
Have radio	Yes	140	140	7.45(4.883-11.389)	0.000	2.645(1.164-3.538)**
	No	35	261	1		1
Number of pregnancy	Primi gravida	63	80	1		1
	Mulity gravida	112	321	2.257(1.522-3.347)	0.000	0.470 (0.153-1.445)
ANC-follow	3-4 follow	72	62	3.913(2.611-5.864)	0.000	3.899 (1.406-5.809)**
	1-2 follow	102	339	1		**1**

5.6. Factors influencing attitude towards maternal nutrition among pregnant women

Logistic Regression was used to determine the set of predictor variables which predicted pregnant mothers attitude towards maternal nutrition.Variables that entered in to bi-variable logistic regression and that showed significant association (p<0.2) variables were include the multi-variable logestic regration analysis.

After controlling for the effects of potentially confounding variables using multi-variable logistic regressions,finally educational level of pregnant mothers, education level of husband, ,residence,gestational age,information heared and number of ANC follow up variables are significant association towards maternal nutrition attitude in the multivariable logestic regration analysis (p<0.05).

According to multi-variable logestic regration results, pregnant mothers those able to read and write were 2 times (AOR=2.14, 95%CI (1.21-3.851), p<0.001) more likely to had favorable attitude than those unable to read and write and pregnant mothers those living in urban were 2.4

time (AOR=2.422, 95CI (1.99-5.765), p<0.022) more likely to had favorable atitude than thos living in rural. Respondents who were heard maternal nutrition information were 5 times (AOR= 5.163, 95%CI (1.069-6.387), p<0.001) more likely to had favorable atitude than thos who were not heard information and pregnant mothers who were 3-4 ANC follow up 2 times (AOR= 2.026, 95%CI (0.568-3.021), p<0.003) more likely to had favorable atitude than those who were attend 1-2 ANC follow up.

Pregnat mothers whose husband read and write 76% (AOR=0.244, 95%CI (0.108-0.55) were less likely had favorable attitude than those the counters and pregnants whose gestational age ≥9 months 70% (AOR=0.298, 95%CI (0.120-0.738) less likely to had favorable attitude than those whose gestational age were 3-8 months with Hosmer and Lemeshow model fittness test value p<0.82.

Table 6: Bi- varible and multi-variable logestic regration analysis on factors associated with attitude of pregnant mothers on maternal nutrition in Bure district, W/Gojjam zone, 2022(n=576).

Variables	Categories	Status of Atitude		COR (95% CI)	P-value	AOR(95% CI)
		favorable atitude	Unfavorable atitude			
Age	35-50 years	39	104	0.358(0.369-0.845)	0.006	1.329(.730-2.418)
	15-34 years	174	259	1		1
Education level of mother	able to read and write	109	112	2.349(1.657-3.330)	0.000	2.14(1.21-3.851)**
	Unable to read and write	104	251	1		1
Educationl evel of husband	able to read and write	100	160	1.141(0.811-1.606)	0.05	0.244(0.108-0.55)
	Unable to read and write	109	199	1		1
Occupation of husband	Civil servant	59	83	1.308(0.887-1.929)	0.176	0.982(.433-2.228)
	Farmer	150	276	1		1
Residence	Urban	61	83	1.42(0.921-1.990)	0.023	2.422(1.99-5.765)*
	Rural	152	280	1		1
Gestationa	≥ 9 month	10	55	0.276(0.137-0.554)	0.000	0.298(0.120-0.738)

l age	3-8 month	203	308	1		1
Information heared	Yes	149	51	14.243(9.391-23.6)	0.000	5.163(1.069-6.387)***
	No	64	312	1		1
Have radio	Yes	138	142	2.864(2.015-4.069)	0.000	1.367(.715-2.613)
	No	75	221	1		1
Number of pregnancy	Primi gravida	75	68	1		**1**
	Mulity gravida	138	295	2.358(1.604-3.467)	0.000	0.873 (0.49-1.697)
ANC-follow	3-4 follow	62	73	1.631(1.103-2.413)	0.014	2.026(0.568-3.021)**
	1-2 follow	151	290	1		1

5.7. Factors influencing practice towards maternal nutrition among pregnant women

Based on multi-variable logestic regration analysis result education level pregnant women, age, residence, education level of husband, information heared, owining radio, dietary diversity, number of pregnancy and number of ANC follow up have a significant relationship towards practice of pregnant mothers on maternal nutrition with $p<0.05$. Multi-variable logestic regration analysis revealed that pregnant women those able to read and write were 2.7 times (AOR=2.694, 95%CI (1.427-5.085), $p<0.002$) more likely to had good practice than those unable to read and write.

Respondents whose husband education level able to write and read were 2.2 times (AOR= 2.17, 95%CI (1.42-4.39), $p<0.003$) more likely to had good practice than those whose unable to read and write and respondantes who were live in urban 3.1 times (AOR=3.06,95CI%(2.122-5.571), ($p<0.021$) more likely to had good practice than those who live in rural. Pregnant mothers those whose heared maternal nutrition information were 4.3 times (AOR=4.270, 95%CI (2.018-9.033), ($p<0.0001$) more likely to had good practice than those whoe were not heared information and those who had radio 2.4 times (AOR= 2.365, 95%CI (1.403-3.987), ($p<0.001$) more likely to had good practice those who had not radio.

Pregnant mothers those who eat ≥5 item dietery diversity were 3 times (AOR=3.02, 95%CI (2.012-5.01), ($p<0.012$) more likely to had good practice than those who eat <5 items dietary diversity. Pregnant mothers those multigravida were 1.6 times (AOR= 1.614,95%CI(1.899-2.898),$p<0.04$) more likely to had good practice than primigravida and those who were 3-4 ANC

follow up 1.8 times (AOR= 1.82,95%CI(1.256-3.201),(p<0.031) more likely had good practice than those who attend 1-2 ANC follow up and also pregnant mothers whose age catagorey between 35-50 years old were 61% (AOR=0.392,95%CI(0.196-0.782) less likely to had good practice than those age category between 15-34 years old with Hosmer and Lemeshow modele fitness test value p<0.26.

Table 7: Bi-variable and multi-variable logestic regration analysis on factors associated with practice of pregnant women on maternal nutrition in Bure district, W/Gojjam zone, 2022(n=576).

Variables	Categories	Status of practice		COR (95% CI)	P-value	AOR(95% CI)
		Good practice	Poor practice			
Age	35-50 years	20	123	0.218(0.131-0.363)	0.000	0.392(0.196-0.782)
	15-34 years	185	248	1		1
Education level of mother	able to read and write	114	107	3.091(2.166-4.410)	0.000	2.694(1.427-5.085)**
	unable to read and write	91	264	1		1
Education level of husband	able to read and write	119	141	2.326(1.637-3.305)	0.000	2.17(1.42-4.391)**
	unable to read and write	82	226	1		1
Occupation of pregnant women	Civil servant	30	28	2.100(1.216-3.626)	0.008	1.061(0.483-2.335)
	House wife	175	343	1		1
Occupation of husband	Civil servant	76	66	1.872(1.270-2.759)	0.002	0.308(0.155-0.613)
	Farmer	291	135	1		1
Residence	Urban	49	20	5.512(3.170-9.585)	0.000	3.06(2.122-5.571)*
	Rural	156	351	1		1
Gestational age	≥ 9 month	7	58	0.191(0.085-0.426)	0.000	1.416(0.156-1.113)
	3-8 month	198	313	1		1
Information heared	Yes	139	61	10.703(7.164-15.991)	0.000	4.270(2.018-9.033)***
	No	66	310	1		1

Owinership of radio	Yes	158	122	6.861(4.64-10.145)	0.000	2.365(1.403-3.987)**
	No	47	249	1		1
Number of pregnancy	Primi gravida	66	77	1		1
	Mulity gravida	139	294	1.813(1.233-2.666)	0.003	1.614(1.899-2.898)*
ANC-follow	3-4 follow	65	70	1.996(1.348-2.957)	0.001	1.82(1.256-3.201)*
	1-2 follow	140	301	1		1
Dietery diversity	≥5 item	131	54	10.392(1.06.27-11.590)	0.000	3.02(2.012-5.01)*
	<5 item	74	317	1		1

***= p<0.001, ** = p<0.01, *=p<0.05, COR= Crude Odds Ratio, AOR= Adjusted Odds ratio (8)

6. Discussion

In this study, the level of good knowledge, favorable attitude and good practice of pregnant women was 30.4 %(95%CI, 26.9-34.3), 37 %(95%CI, 33.2-40.9) and 35.6% (95%CI, 31.8-39.2) respectively. Educational level of pregnant women, education level of husband, occupation of pregnant women, occupation of husband, residence, gestational age, information heared, owining of radio and number of ANC follow up variables were significant with the knowledge of pregnant mothers on maternal nutrition.

Educational level of pregnant mothers, education level of husband, residence, gestational age, information heared and number of ANC follow up were variables with significant associated with attitude of pregnant mothers on maternal nutrition and education level pregnant women, age, residence, education level of husband, information heared, owining radio, dietary diversity, number of pregnancy and number of ANC follow up have a significant relationship towards practice of pregnant mothers on maternal nutrition.

In this study level of good knowledge of pregnant women on maternal nutrition 30.4 %(95%CI) in line with previous research conducted in Addis Ababa (8) with 27% of good knowledge. However,the finding of this study was lower than research conducted in Horo Guduru Wolega zone(11),Somalie local government Logo state(17), Syrian Refugees(14),public hospitale of south Ethiopia(20),Igbo-Eze Enugu state(29) and Kigeme refuge camp Rwanda(34) with 63.5%,61%,44%,60.9%,45.2% and 53.6% respectively.this discrepancy may be due to the difference of method of study those conducted on institional based while this study was community based.

According to this study the level of attitude of pregnant women on maternal nutrition was found to be 37% (95%CI) nearly consistency with study that conduct in Kigeme refuge camp Rwanda(34) with good atitude of 32.7% and public hospital of south Ethiopia(20) with good attitude of 40.9% but lower than research conducted in Horo Guduru Wolega zone(11),Somali local government Logo-state(17) and Syrian refugees camps(14) with 70.6%,89% and 59.5% respectively.This difference it may be due to religion and educational level of respondants.

In this study the level of practice of maternal nutrition among pregnant women was foud 35.6% which was in line with the study in Bahir dar,North western Ethiopia(4)with level of 39.2%

good maternal nutrition practice, study conducted in Jille Tumuga,North east Ethiopia(1) with 31.4%,study conducted in Addis Ababa(8) with 34.5% and study that conducted in Gedio zone,southern Ethiopia(7) with 32.2% good diatery practice .

The study that conduct in Mizan Aman town,South West Ethiopia(13) with 25.1% and study in Farta district ,South Gonder(33) with 27.2% good nutritional practice which were lower level than in this study.This discrepancy it may be due to sample size difference and study design techniques.

How ever, the study that conducts in Horo Guduru Wolega Zone (11) with 74.6%, in Somalie local government logose state (17) with 86.89% and in Sothern Ethiopia (20) with 52.3% good dietery practice which was greter than in this study. It may be due to socio demographic factors and study design method.

The odds pregnant mothers in this study 2.105 times knowledgable than those who were note read and write. similar study that was conducted in Adis Ababa odds of those who were read and write were 3.047 times (8) knowledgable than those who were note read and write.This discrepancy may be due to residence and method of study design.In this study pregnant mothers those have radio 2.4 times good practice than those who have not and similar study in Bahir Dar (4), those owing radio 3.2 time good practices those who are not owing radio.This difference may be due to residence.

The study that conduct in Gedio Zone, Southern Ethiopia (7), educational status of pregnant women 2.7 times good practice in line with in this study 2.7 times good practice than those who are not read and write.The study that conduct in Southern ethiopia (20) pregnant mothers whose occupation was civil servants were six times knowledgable than house wife.while in this study civil servant pregnant mothers were five time more knowledgable than those house wife pregnant mothers.This discrepancy may be due to study design method.

The study conducted in North East Ethiopia(1) dietary diversity practice of pregnant women was associated with maternal education [(AOR) =2.36, 95% CI 1.29, 4.32] that was nearly similar with this study with AOR=2.6(1.4-5.0),95%CI) pregnant mothers who were read and write had good dietary practice than the resprocal. The study that conducted in Dessie town, northeastern Ethiopia (3), pregnant women that not attending antenatal care (ANC) (AOR = 3.46; 95% CI: 2.07, 5.78) had poor diatery practice than those who were attend ANC followup, while in this

study pregnant women that attend ANC follow up (AOR=1.8(1.25-3.2) time had good dietary practice than those who were ont attend ANC follow up.This discrepancy may be due to socio-demographic factors and geographically varation.

The study that conducted in Addis Ababa to the title of assesement of KAP of pregnant mothers on maternal nutrition, pregnant mothers who were multigravadia 2.175 times had good knowledge about maternal nutrition than primigravida while in this study multigravida pregnant mothers 1.6 times had good practice than primigravida(8).

The study that conducted in public hospitals of Southern Ethiopia(20) on Pregnant mothers' knowledge, attitude, practice and its predictors towards nutrition, regarding their occupation, government employees were six times (adjusted odds ratio=6.05; 95% confidence interval: 3.58, 13.05, p=0.04) more likely to be knowable than housewiv and multiparous women were 4.77 times (adjusted odds ratio=4.77; 95% confidence interval: 1.15, 8.66, p=0.002) more likely to be knowledgeable compared to primigravida women,while in this study goverement employee pregnant mothers 4.7 times knowledgable than housewives .This discrepancy may be due to study design and study time.

7. Conclusion and recommendation

7.1. Conclusion

In this study, the knowledge, attitude and practice level of pregnant mothers on maternal nutrition was poor that require special attention. According to the study educational level of pregnant women, information heared about maternal nutrition, ANC follow up and residence are variables that have significant impact on knowledge, atitude and practice of pregnant mothers.

In addition to the above variables occupation of pregnant women ,educational status of husbands,number of pregnancy and owing of radio significant impact to practice of pregnant mothers on maternal nutrition and those who ate greater or equal to five food groups had good dieatary practice. The status of KAP of pregnant mothers on maternal nutrition was poor that lead to malnutrition.

7.2. Recommendations

Based on this study finding, the researcher recommends to following responsible bodies.

For Amhara regional ministry of health
- ➢ The regional ministry of health should work closely with governmental and non-governmental organizations to increase the KAP of pregnant women on maternal nutrition.

For W/Gojjam health office
- ➢ Plan strategies to improve nutritional status KAP pregnant mothers on maternal nutrition.

For Burie District health office

- ➢ Closely work H/C ,HEW and other NGO that focus on maternal nutrition
- ➢ More focus on pregnant mothers that who live in rural kebels and give health information on maternal nutrition
- ➢ Monitor and evalution rutine ANC Follow up and the status of pregnant women about maternal nutrition
- ➢ Improve dietary diversity practice at comminity level

- ➢ Focus on farmers and their wife to disseminate information about maternal nutrition by health education and practical maternal nutrition
- ➢ Give special attention more primigravida about maternal nutrition
- ➢ Advise the pregnant women daily frequency of feeding greater equal to five times with different nutritional variety
- ➢ Advice to use media for source of information like radio about maternal nutrition program.

8. Strength and Limitation

8.1. Strength
- ✓ Conducted community based study design to adress all participants
- ✓ Use large sample size to represent the study populations

8.2. Limitation

- ✓ Didn't tell cause effect relationship because of cross-sectional study design
- ✓ The study was prone to recall bias

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10. Annexes

Annex 1. Participant information sheet and consent form

My name is _____. I am working as a data collector for the study being conducted in this kebel by Tsion Belachew, who is studying for master's degree at Debre Berhan University, Asrat weldeyes health science campus. I kindly request you to lend me your attention to explain you about the study and being selected a study participant.

The study title: To assess the knowledge, attitude and practice of pregnant mothers on maternal nutrition and associated factors in Bure District W/Gojjam zone, Amhara region, Northwest Ethiopia, 2022.

Purpose of the study: The purpose of this study will be to assess knowledge, attitude and practice of pregnant mothers on maternal nutrition and associated factors from selected kebels in Bure District/Gojjam zone, Amhara region northwest Ethiopia. The study will also serve as base line information for other similar studies that will conducted in the future. And also it will be used for woreda health office, HC, HEW and other non-governmental organization plan sustainable maternal nutrition intervention.

Procedure and duration: I will interview you using a questionnaire to provide me with pertinent data that is helpful for the study. There are 47 questions to answer where I will fill the questionnaire by interviewing you. The interviews will take 30 minutes. So, I kindly request you to spare me this time.

Risks and benefits

There is no known risk of being participant in this study except taking few minutes from your time. There would not be any direct payment for participating in this study. But the finding from this research may reveal important information for the local health planners at regional health office, woreda health office, and Health Centers.

Confidentiality

Any information you will provide us will be confidential. There will be no information that will identify you. The findings of the study will be general for the study population and will not reflect anything particular of individual. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participant to the research.

Rights

Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you otherwise are entitled. You do not have to answer any question that you do not want to answer.

Contact address

If you have any questions or inquiries any time about the study or the procedure, please contact Tsion Belachew (Principal investigator) by phone (+251-918500969).

Declaration of informed voluntary consent

I have read to the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the right of participating and the contact address for any queries. I will be informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want. Therefore, I declare my voluntary consent to participate in this study with my initials (signatures) as indicated below.

Signature of the participant_____ Signature of the data collector _____

አባሪ II፡የአሳታፊ መረጃ ሉህ እና የፈቃድ ቅፅ

ስሜ _____. በዚህ ቀበሌ ጽዮን በላቸው በደብረ ብርሃን ዩኒቨርሲቲ አስራት ወልደየስ ጤና ሳይንስ ግቢ የማስተርስ ዲግሪ እየተማረች ላለው ጥናት መረጃ ሰብሳቢ ሆኜ እየሰራሁ ነው። ስለ ጥናቱ እና የጥናት ተሳታፊ ስለመመረጥዎ ለማስረዳት ትኩረትዎን እንዲሰጡኝ በአክብሮት እጠይቃለሁ።

የጥናት ርዕስ፡ የነፍስ ጡር እናቶች በእናቶች እምጋገብ ላይ ያላቸውን እውቀት፣አመለካከት እና ተግባር እንዲሁም በእናቶች አመጋገብ ላይ ጉዳት የሚያደርሱ ነገሮችን መለየት፣ ቡሬ ወረዳ፣ም/ጎጃም ዞን፣አማራ ፣ ኢትዮጵያ።

የጥናቱ አላማ፡ የዚህ ጥናት አላማ የነፍስ ጡር እናቶችን እውቀት ፣አመለካከት እና ተግባር እንዲሁም በእምጋገባቸው ላይ የሚያደርሱትን ውሳኝ ነገሮች በመለየት ወደፊት በጤና ባለሙያ የታገዝ ቀጥይነት ያለው የአመጋገብ ለውጥ እንዲያመጡ ማድረግ።

የሂደቱ እና የቆይታ ጊዜ፡- ለጥናቱ አጋዥ የሆኑ ተዘጋጅቶ መረጃዎችን ለመስጠት መጠይቁን ተጠቅሜ ቃለ መጠይቅ አደርግልዎታለሁ። እርስዎን በመጠየቅ መጠይቁን የምሞላበት 47 ጥያቄዎች ለመመለስ አሉ። ቃለ-መጠይቁ 30 ደቂቃዎችን ይወስዳል። ስለዚህ ይሄን ጊዜ እንድትሰጡኝ በአክብሮት እጠይቃለሁ።

አደጋዎች እና ጥቅሞች

በጥቂዎ ጥቂት ደቂቃዎችን ከመውሰድ በስተቀር በዚህ ጥናት ውስጥ የመሳተፍ ምንም አይነት አደጋ የለም። በዚህ ጥናት ውስጥ ለመሳተፍ ምንም አይነት ቀጥተኛ ክፍያ አይኖርም።ነገር ግን ከዚህ ጥናት የተገኘው ውጤት በክልሉ ጤና ጥበቃ ጽ/ቤት፣ለወረዳ ጤና ጥበቃ ጽ/ቤት እና ጤና ጣቢያዎች ጠቃሚ መረጃዎችን ሊያሳይ ይችላል።

ሚስጥራዊነት

የምታቀርቡልን ማንኛውም መረጃ ሚስጥራዊ ይሆናል።እርስዎን የሚለይ መረጃ አይኖርም።የጥናቱ ግኝቶች ለጥናቱ ሕዝብ አጠቃላይ ይሆናል እናም የግለሰብን ወይም የመኖሪያ ቤትን ምንም የሚያንፀባርቅ አይሆንም።መጠየቂያው ስያሜዎችን ከማሳየት እንዲገለል ኮድ ይደረጋል።ተሳታፊውን ከጥናቱ ጋር ሊያገናኝ የሚችል የቃል ወይም የጽሁፍ ዘገባዎች ምንም አይነት ማጣቀሻ አይደረግም።

መብቶች

የዚህ ጥናት ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት ነው፡፡በዚህ ጥናት ለመሳተፍም ሆነ ላለመሳተፍ የማዉጅ መብት አልዎት፡፡ላለመሳተፍ ከወሰኑ በማንኛውም ጊዜ ከጥናቱ የመዉጣት መብት አልዎት እና ይህ እርስዎ ያለዎትን ማንኛዉንም የጥቅማጥቅም ኪሳራ አይገልፅልዎትም፡፡መመለስ የማትፈልገውን ማንኛዉንም ጥያቄ መመለስ የለብህም፡፡

የእዉቂያ አድራሻ

ስለ ጥናቱ ወይም አሰራሩ በማንኛውም ጊዜ ጥያቄዎች ወይም ጥያቄዎች ካሉዎት፣ እባክዎን ጽዮን በላቸው (ዋና መርማሪ) ስልክ (+251-918500969) ያግኙ፡፡

በመረጃ ላይ የተመሰረተ የፈቃደኝነት ፍቃድ መግለጫ

የተሳታፈዉን የመረጃ ወረቀት አንብቤ አለሁ/አንብቤያለሁ፡፡የጥናቱ ዓላማ፣አከሄዶች ጉዳቱ እና ጥቅሞቹ፣ሚስጥራዊ ጉዳዮች የመሳተፍ መብት እና ለማንኛውም መጠይቆች የመገኛ አድራሻውን በግልፅ ተረድቻለሁ፡፡በማንኛውም ጊዜ ከጥናቱ የመዉጣት ወይም የማልፈልገውን ማንኛዉንም ጥያቄ ላለመመለስ መብት እንዳለኝ ተነገረኝ፡፡ስለዚህ፣ከዚህ በታች እንደተገለጸው በዚህ ጥናት የመጀመሪያ ሆኜ ለመሳተፍ ፈቃዴን ፈርማ ላየ አዉጃለሁ፡፡

የተሳታፊዉ ፈርማ _____የመረጃ ሰብሳቢዉ ፈርማ _____

Annex III. Questioners (English version)

Part I. Questions related Socio-demographic characteristics and associated factors of respondents from Bure district, Amhara regional state, Northwest Ethiopia.

No.	Question	Answer	skip
101	How old are you?	----------------	
102	What is your Religion?	1. Orthodox Christian 2. Muslim 3. Protestant 4. Catholic 5. Other specify	
103	Marital status	1. Single 2. Married 3. Divorce 4. Widowed 5.others specify--------	
104	Educational status of mothers	1. Unable to read and write 2. first cycle complete 3.second cycle complete 4. preparatory complete 5. Diploma and above 6.others specify---	
105	Occupation of mothers	1. Housewife	

		2. Civil servant	
		3. Student	
		4. Merchant	
		5. Daily workers	
		6.others specify---------	
106	Education level of the husband	1. Unable to read and write	
		2. first cycle complete	
		3.second cycle complete	
		4. preparatory complete	
		5. Diploma and above	
		6.others specify	
107	Occupation of husband	1. Farmer	
		2. Civil servant	
		3. Student	
		4. Merchant	
		5. Daily workers	
		6.others specify-----------	
108	Average monthly household income	---------------in Birr	
109	Number of household member	-----------------	
110	Where do you live?	1. Urban 2. Rural	

No.		Answer
		3. Other specify---------

Part 2. Knowledge of pregnant mothers on maternal nutrition

No.	Question	Answer
201	Have you ever been hearing to information about maternal nutrition during pregnancy?	1. Yes 2. No
202	If you yes the above question, what is your source of information?	---------
203	Do you know about the meaning of food? If you yes, what are they?	1. Yes 2. No
204	Do you know about the main food groups or balanced diet? If you yes, what are they, list it?	1. Yes 2. No
205	Do you know the source of iron? If you yes, list some of the source of it.	1. Yes 2. No
206	Do you know the source of iodine? If you yes, list some source of iodine?	1. Yes 2. No
207	Do you know the source of protein? If you yes, what are those?	1. Yes 2. No
208	Do you know the source of carbohydrate? If you yes, list some source of carbohydrate?	1. Yes 2. No
209	Do you know the source of vitamin A? If you yes, list the source of it?	1. Yes 2. No
210	Do you know the importance of food for growth and development of fetus?	1. Yes 2. No
211	Do you know the importance food for proper	1. Yes

	functioning of the body?	2. No
212	Do you know the importance food for protection of infection?	1. Yes 2. No
213	Do know the importance food for body's heat and energy?	1. Yes 2. No
214	Do you know that inadequate nutrition is the cause of miscarriage and preterm birth?	1. Yes 2. No
215	Do you have radio?	1. Yes 2. No
216	What is your GA?	1.3-5 month 2.6-8 month 3.>9momthes
217	How money times do you attend ANC services?	1.one 2.two 3.three 4.four
218	How money times you are pregnant including the current pregnancy?	--------------

Part 3. Questionnaire of Attitude of pregnant mothers towards maternal nutrition

No.	Question	Answer
301	How good do you think to eat more food during pregnancy?	1. good 2. Not good 3. not sure
302	How good do you think to eat more carbohydrate than none pregnant mothers?	1.Good 2.Not good

		3.Not sure
303	How good do you think to eat more protein than none pregnant mothers?	1. good 2. not good 3. note sure
304	How good do you think it is to have more milk and its product during pregnancy?	1. good 2. note good 3. not sure
305	How good do think to prepare meals with iron rich foods, such as beef, chicken, or liver?	1. good 2. Not good 3. not sure
306	How do you like the test of meat and other iron rich meals?	1. good 2. Not good 3. not sure
307	How much do you like the test of omega-3 rich foods like, olive oils, fish?	1. good 2. Not good 3. not sure
308	How good do you think it is to prepare meals with iodized salt?	1. good 2. Not good 3. not sure

Part 4. Nutritional Practice of pregnant mothers

No.	Question	Answer
401	Do you follow specific dietary regimen during pregnancy?	1. yes 2. No
402	Do you avoid any food during pregnancy?	1. Yes 2. No
403	From the above question yes, what is the reason?	1. religion 2. culture 3. makes baby big 4. makes delivery difficult 5. other specify

404	Did you use iodized salt during cooking?	1. Yes 2. No
405	Did you eat fresh citrus fruits orange, lemon, and mango?	1. Yes 2. No
406	Do you eat plant source protein daily?	1. 1. Yes 2. 2. no
407	Do you eat fresh vegetables?	1. yes 2. No
408	Do you drink milk daily?	1. yes 2. No
409	Do you eat meat?	1. yes 2. No
410	Do you have folic acid supplement?	1.Yes 2. No
411	Do you have the habit of eating snacks between meals during pregnancy?	1.Yes 2.No
412	What is your current diet frequency of meals per day?	1.1-2 3. >5 2.3-4

24 hours Dietary Recall Form

	Food Item	Description	Cooking method
Breakfast			
Snack			

Lunch			
Snack			
Dinner			

Format for Summarized Women Dietary Diversity Score

	Starchy Samples	Vit A rich Fruits/Vegetables	Other Fruits/ Vegetables	Dark Green Leafy Vegetables	Organ meat	Flesh meat	Eggs	Legumes/ Nuts	Milk	IDDS
Yes=1										
No=0										

አባሪ V: መጠይቅ(የአማረኛ ቅጂ)
ክፍል I. የሶሺዮ ስነ-ሕዝብ ባህሪያት

No.	ጥያቄ	መልስ
101	እድሜዎ ስንት ነው?	---------------
102	የሃይማኖት ሁኔታ	1. ኦርቶዶክስ

		2. ሙስሊም 3. ፕሮቲስታንት
		4. ካቶሊክ
		5.ሌላ ካለ------
103	የትምህርት ደረጃ	1. ማንበብ እና መጻፍ ማይችል
		2. የመጀመሪያ ደረጃ የጨረሰ
		3.ሁለተኛ ደረጃ የጨረሰ
		4. ፕሪፓራቶሪይ የጨረሰ
		5. ዲፕሎማ እና ከዘ በላይ
		6.ሌላ ካለ------
104	የእናት የስራ ሁኔታ	1. የቤት እመቤት
		2. የመንግስት ሰራተኛ
		3. ተማሪ
		4. ነጋዴ
		5.የቀን ሰራተኛ
		6. ሌላ ካለ
105	የባል ስራ ሁኔታ	1. አርሶ ድር
		2. የመንግስት ስራ
		3. ተማሪ
		4.ነጋዴ
		5. የቀን ሰራተኛ
		6.ሌላ----------
106	የትዳር ሁኔታ	A) 1. ያላገባ 2. ያገባ
		B) 3. የፈታች 4. የሞተባት

		C) 5.ሌላ ካለ--------
107	አማካይ ወርሃዊ ገቢ	----------------ብር
108	የቤተሰብ ብዛት	-----------------
109	የት ነው ሚኖሩት?	1. ከተማ 4. ገጠር 5. ሌላ---------
110	የስንት ወር ንፍሰ ጡር ነዎት?	1.3-5ወር 2.6-8 ወር 3.>9 ወር
111	የነፍሰ ጡር ክትትል ስንት ግዜ አካሂደዋል?	1.አንድ 2.ሁለት 3.ሶስት 4.አራት

ክፍል 2. ነፍሰ ጡር እናቶች በነፍሰ ጡር እናቶች አመጋገብ ሁሪያ ያላቸው እውቀት

No.	ጥያቄ	መልስ
201	ስለ ነፍሰ ጡር እናት አመጋገብ ሁኔታ ሰምትው ያቃሉ?	1.አዎ 2.የለም
202	መልስዋ አዎ ከሆነ፣ከየትሰሙ?	
203	የምግብን ትርጉም ያቃሉ?መልስዋ አዎ ከሆነ ምን ምን ናቸው?	1. አዎ 2.የለም
204	ስለ የተመጣጠነ ምግብ ያቃሉ? መልስዋ አዎ ከሆነ ምን ምን ናቸው?	1. አዎ 2.የለም
205	የብርት ማእድን የምግብ ምን ጮች ያቃሉ?አዎ ከሆነ ምን	1. አዎ

	ምን ናቸው?	2.የለም
206	የአዮዲን የምግብ ምንጮች ያቃሉ?አዎ ከሆነ ምን ምን ናቸው?	1. አዎ 2.የለም
207	ገንቢ የምግብ ምንጮች ያቃሉ?አዎ ከሆነ ምን ምን ናቸው?	1. አዎ 2.የለም
208	ሀይልና ሙቀት ሰጭ የምግብ ምንጮች ያቃሉ?አዎ ከሆነ ምን ምን ናቸው?	1. አዎ 2.የለም
209	የቫይታሚን ኤ የምግብ ምንጮች ያቃሉ?አዎ ከሆነ ምን ምን ናቸው?	1. አዎ 2.የለም
210	ምግብ ለጽንሱ መፋፋት እና እድግት እንደሚጠቅም ያቃሉ?	1. አዎ 2.የለም
211	መግብ ሰውነታችን በትክክል እንዲሰራ ይጠቅማል ?	1. አዎ 2.የለም
212	መግብ ራሳችንን ከበሽታ እንድንከላከል ይጠቅማል?	1. አዎ 2.የለም
213	ምግብ ለሰውነታችን ሃይል ና ሙቀት እንደሚሰጥ ያቃሉ?	1. አዎ 2.የለም
214	ያለተመጣጠነ ንጥር ነገር የሌለው ምግብ መመገብ ውርጃ ያስከትላል?	1. አዎ 2.የለም
215	ሬዲዮ ቤትዎ ውስጥ አለ?	1.አዎ 2.የለም
216	የስንት ወር ነፍሰ ጡርነዎት?	----------
217	ስንት ግዜ የነፍስ ጡር ክትትል አድርገዋል?	1. 1 2. 2 3. 3 4. 4
218	ስንት ግዜ አርግዘዋል?	---------

ክፍል 3. የነፍስ ጡር እናቶች በአመጋገብ ዙሪያ ያላቸው አመለካከት

No.	ጥያቄ	መልስ
301	በርግዝና ግዜ ከበፊቱ የበለጠ መመግብ ጥሩ ነው ብለው ያስባ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
302	ነፍስ ጡር ሴት የበለጠ ሀይል እና ሙቀት ሰጪ ምግብ መመገብ ምን ያህል ጥሩ ነው ብለው ያስባሉ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
303	ከማንም በላይ ነፍስ ጡር ሴት የበለጠ ፕሮትን መብላት ም ን ያህል ጥሩ ነው ብለዉ ያስባሉ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
304	በርግዝና ወቅት ብዙ ወተት እና የወተት ውጤት መመገብ ጥሩ ነው ብለው ያስባሉ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
305	በብርት የበለጸጉ ምግቦችን ለምሳሌ እንደ ስጋቸደሮቸወይም ጉበት ያሉ ምግቦችን ማዘጋጀት ምን ህል ጥሩ ነው ብለው ያሥባሉ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
306	የስጋ እና ሌሎችን በብረት የበለጸጉ ምግቦችን መሞከር እንዴት ይወዳሉ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
307	እንደ አሜጋ -3 የበለጸጉ ፣የይራ ሀይቾችን ፣አሳዎችን መሞከር ምን ያህል ይዎዳሉ?	1.ጥሩ 2.ጥሩ አድለም 3.እርግተኛ አድለሁም
308	በአዮዲን ጨው ምግቦችን ማዘጋጀት ምን ያህል ትሩ ነው	1.ጥሩ

		2.ጥሩ አድለም
		3.እርግተኛ አድለሁም

ክፍል 4. ነፍስ ጡር እናቶች አመጋገብ ልምምድ

No.	ጥያቄ	መልስ
401	በእርገዝና ወቅት የተለየ የአመጋገብ ስራት ይከተላሉ?	1. አዎ 2. አድለም
402	በርግዝና ወቅት ተጨማሪ ምግብ ይመገባሉ?	1. አዎ 2. አድለም
403	በርግዝና ወቅት የሚያስወግዱት መግብ አለ?	1. አዎ 2. የለም
404	ከላይ ያለው ጥያቄ አዎ ከሆነ ምክኒያቱ ምንድን ነው?	1. ሃይማኖት 2. ባህል 3. ህጻኑን ትልቅ ያደርገዋል 4. ምጡን ከባድ ያደርገዋል 5. ሌላ ካለ………….
405	ምግብን በሚያዘጋጁበት ግዜ አዮዲን ጨው ይጠቀማሉ?	1.አዎ 2. አይ
406	የፍራፍሬ አይነቶችን ለምሳሌ ብርቱካን፣ሎሚ፣ማነጎ ይጠቀማሉ?	1.አዎ 2. አይ

407	በየቀኑ የጽዋት ምንጭ ፕሮቲን ያላቸውን ምግቦች ይበላሉ?	1.አዎ 2. አይ
408	የአትክልት እና ቅጠል ቅጠል ውጤቶችን ይመገባሉ?	1.አዎ 2. አይ
409	ወተት ይጠጣሉ	1.አዎ 2. አይ
410	ስጋ ይመገባሉ?	1.አዎ 2. አይ
411	ፎሊክ አሲድ ማማያ አለዎት?	1.አዎ 2. አይ
412	በእርግዝና ወቅት በምግብ መካከል መክሰስ የመብላት ልምድ አለዎት?	1.አዎ 2. አይ
413	አሁን ያለዎት የአመጋገብ ድግግሞሽ በቀን ምን ያህል ነው?	1.1-2 2.3-4 3.>5

የ24 ሰአት የምግብ ሁኔታ

	የምግብ አይነት	ያበሰሉበት ሁኔታ
ቁርስ		
ቁርስ መቆያ		

ምሳ		
መቆያ		
እራት		

የእናቶች የምግብ ስብጥር ስኮር

	ሃይል ና ሙቀት ሰጪ ምግብ ይመገባሉ	በሻታምን ኤ የበለጸገ ፍራፍሬ እና ቅጠላ ቅጠል ይመገባሉ	ሌሎች ፍራፍሬዎች እና ቅጠላ ቅጠል ይመገባሉ	አረንጓዴ ቅጠላ ቅጠል ይመገባሉ	የዉስጥ እቃ ስጋዎች (ጉበት፣ኩላሊት፣ወዘተ) ይመገባሉ	ደንዳና ስጋ ይመገባሉ	እንቁላል ይመገባሉ	ጥራጥሬ እና የቅባት ምግቦች ይመገባሉ	ወተት ይጠጣሉ	ስኮር
አዎ=1										
አይ=0										

63

VI. DECLARATION

I, the undersigned, hereby declare that the work entitled "To assess the knowledge, attitude and practice of pregnant mothers on maternal nutrition and associated factors in Bure District W/Gojjam zone, Amhara region, Northwest Ethiopia,2022" presented in this research thesis is original. It has not been presented to any other university or institution. Where the work of other people has been used, reference has been provided. In this regard, I declare this work to be my unique work.

Name of the investigator

Tsion Belachew (Bsc)

Signature

Date: 07/11/2022