

## A STUDY TO ASSESS THE KNOWLEDGE, ATTITUDE AND PRACTICE ON MATERNAL NUTRITION AMONG PREGNANT MOTHERS AND ITS ASSOCIATED FACTORS WHO IS ATTENDING ANTENATAL CARE AT WOLDIA HOSPITAL NORTH WOLLO, ETHIOPIA, 2020

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### Abstract

Nutrition is a fundamental pillar of human life, health and development throughout the entire life span. Especially Pregnancy is a time of increased energy and nutrient needs for a woman in order to meet the needs of the growing fetus and of maternal tissues associated with pregnancy. However, the little has been explored about nutritional knowledge, attitudes and practices among pregnant women attending antenatal clinics in Woldia General Hospital Ethiopia. Therefore; this study conducted to describe the nutritional knowledge, attitudes and practices among pregnant women attended in Woldia general Hospital. The objective of this research was to assess the Knowledge, Attitude and Practice regarding maternal nutrition among pregnant women attending Antenatal care (ANC) clinics in Woldia General Hospital, Ethiopia. An institutional based cross sectional study was implemented to collect relevant data among 388 pregnant women attended ANC clinics in Woldia General Hospital, Ethiopia. A systematic sampling procedure was used to select pregnant mothers. The data was collected with Interview using a pre tested semi- structured questionnaire from April to May, 2020. The data were analyzed using SPSS version 23. Multiple logistic regressions were run to assess factors that were associated with the dependent variables at  $P < 0.05$  and to control the confounders. This study revealed that among 388 pregnant women only 251(64.7%), 156(48.4%) and 111(34.5%) of pregnant women had good knowledge, Positive attitude and good practices of nutrition during pregnancy respectively. There were a positive significant association between residence, family size, and practice on nutrition knowledge during pregnancy. Knowledge had no significant association with attitude of respondents towards nutrition during pregnancy. Knowledge, family income, husband education and occupation had a no association with practices of nutrition during pregnancy. The knowledge, attitude and practices of nutrition during pregnancy were relatively adequate in the study area. However the government and the concerned bodies should focus on health promotion and to eradicate poverty for better outcome.

**Keywords:** Knowledge, Attitude, Practice, Nutrition, Malnutrition, Pregnancy.

## 1. INTRODUCTION

### 1.1. Background

All human beings need a balanced amount of nutrients for proper functioning of the body system. Nutrition is a fundamental pillar of human life, health and development throughout the entire life span (1). There are about 40 different nutrients that are essential for health. If any one of these is deficient in the diet the person will not be fully healthy and able to resist the

agents of disease (2).

Malnutrition is now a problem in both poor and rich countries. In developed countries, obesity is rapidly becoming more widespread, bringing with it an epidemic of diet-related non communicable diseases (NCDs) such as diabetes and heart disease, which increase health care costs and reduce productivity. In developing countries, while widespread under nutrition and micronutrient deficiencies persist, obesity is also fast emerging as a problem (3).

In Ethiopia, nutritional disorders are among the main causes of morbidity and mortality. The major problems are protein-energy malnutrition and micronutrient deficiencies such as vitamin A, iron, and iodine (4). 27% of women in Ethiopia are undernourished with a body mass index (BMI) of less than the 18.5 cutoff point and only four percent are obese with a BMI of more than 25.0. These figures put Ethiopia among sub-Saharan countries with the highest proportion of malnourished women (5).

Pregnancy is a time of increased energy and nutrient needs for a woman in order to meet the needs of the growing fetus and of 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 (6).

The poor health and nutrition of women and the lack of care that contributes to their death in pregnancy and child birth also compromise the health and survival of the infants and children they leave behind (7). Under nutrition's most damaging effect on the fetus occurs during pregnancy and in the first two years of life, and the effects of this early damage on health, brain development, intelligence, educability, and productivity are largely irreversible (3).

The pregnant woman's diet should include a substantial increase in calories, protein, calcium, folic acid, iodine and iron. Pregnant women at particular risk for nutritional deficiencies are adolescents, underweight women, obese women, women with chronic nutritional problems, women who smoke or ingest alcohol or drugs, low income women, and women with chronic illnesses such as diabetes or anemia(8).

### STATEMENT OF THE PROBLEM

Maternal mortality is unacceptably high. About 800 women die from pregnancy or childbirth related complications around the world every day (9). In 2013, 2,89000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa (9). According to Ethiopian Demographic Health Survey (EDHS) 2011, maternal mortality in Ethiopia was 676. Twenty percent of maternal deaths in Africa have been attributed to anemia (10). In Sub-Saharan Africa, iron and folate deficiencies are the most common causes of anemia in pregnant women. Anemia has a variety of converging contributing factors but iron deficiency is the cause of 75% of anemia cases.

Many women in Africa suffer from chronic energy deficiency, inadequate weight gain during pregnancy, and poor micronutrient status. Insufficient food intake, high-energy expenditure, Micronutrient-deficient diets, infections, and the demands of pregnancy and lactation contribute to maternal malnutrition (11). Nutrition during the periconceptional period is a key component of healthy pregnancy outcomes (12). If there is maternal malnutrition on the pregnant mother, 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 (IQ) on the fetal side. It further affects the family and community socioeconomic conditions (8). Maternal malnutrition is influenced not only by lack of adequate nutrition but also influenced by factors like social and psychological factors, nutritional knowledge of mothers and biological changes that influence perceptions of eating patterns during pregnancies (13).

In Ethiopia antenatal care (ANC) coverage by skilled provider in 2011 was 34%. Prevalence of anemia among pregnant women was 22%, but only 16.8% of pregnant mothers had taken iron tablets during pregnancy (14). Now-a-days, the Ethiopian government's commitment is above all times to improve the maternal and perinatal health in particular (15). Many researches and projects focused on maternal health are common, but little attention is given to maternal nutrition in the study area (11). It is clear that maternal nutrition is crucial in reducing maternal and infant morbidity and mortality but no study has been conducted to assess nutritional knowledge, attitude and practices of pregnant mothers in the study area. So this study is aimed to assess the nutritional Knowledge, Attitude and Practices (KAP) among pregnant women attending ANC clinics in woldia general hospital, Ethiopia regarding the meaning, the importance and constituents of a well-balanced diet and practices of taking the necessary nutrients during pregnancy.

### **SIGNIFICANCE OF THE STUDY**

Even though there were studies done on the subject they have information gaps on some of the issues related to maternal nutrition during pregnancy. Therefore,

**Firstly:** this study will be useful as base line study for further study on maternal nutrition.

**Secondly:** fill the gap information related to knowledge, attitude and practice of pregnant mothers regarding their nutritional needs.

**Thirdly:** the health care providers and policy makers in Ethiopia will be able to directly use the results obtained in this study to effectively and efficiently and plan for timely and appropriate interventions for underlying mother nutritional care through identification of significant socio-demographic and socio-economic determinants and as well the geographical areas in need.

**Lastly:** Assess the prevalence of harmful traditional believes and practices related maternal nutrition during pregnancy.

### **LITERATURE REVIEW**

#### **Relevant information about micronutrients during pregnancy.**

The components of a healthy diet include plenty of fruits, vegetables, low-fat dairy, lean protein, fish, fiber, and water. These items should be the primary focus of the diet as they provide the key nutrients necessary during pregnancy - Iodine, folic acid, iron, calcium, vitamin D, and omega-3 fatty acids (17).

#### **Iodine:**

Iodine is a necessary element for the production of thyroid hormone. Iodine requirements increase approximately 50% during pregnancy to meet the higher demands caused by the increased production of thyroid hormones, fetal need of iodine supply from the mother and increased renal excretion of iodine due to physiology of pregnancy (18). The recommended dietary iodine intake for pregnant women is 220 microgram/day which is higher than the

recommended iodine intake for adolescents and adults in general 150 microgram/day (19). If iodine deficiency occur during pregnancy the following disorder may result; spontaneous abortion, stillbirths, cretinism, congenital anomalies, psychomotor effects and mental retardation (18).

#### **Folic Acid:**

Folic acid is an essential B vitamin required early in pregnancy for proper development of the baby's spinal cord in the first 28 days of pregnancy, to synthesize, repair, and methylate deoxyribonucleic acid (DNA) as well as to act as a cofactor in certain biological reactions. It is especially important in aiding rapid cell division and growth, such as in infancy and pregnancy. Maternal folate deficiency is associated with neural tube defects the water-soluble B vitamin is found in dark green leafy vegetables, meats, fish, fortified grains and cereals, legumes, and citrus fruits. The recommendation for folic acid is 400µg/day prior to pregnancy and 600 µg/day once pregnant (17, 20).

#### **Iron:**

Iron is an essential nutrient for the human body. It is required for the transport of oxygen in the blood, as well as for the proper functioning of many processes in the body necessary for good health. It is well known that iron requirements increase during pregnancy to support the expanding blood volume, growth of the fetus, placenta, and other tissues associated with pregnancy. Good food sources of iron are generally from meat or seafood iron-fortified cereals and oatmeal, beans, lentils and spinach. The recommendation for iron during pregnancy is 27 mg/day, almost double the requirement when not pregnant (17). Inadequate iron diet resulted with iron deficiency anemia which relates to negative pregnancy outcomes, such as preterm delivery, low birth weight, infections, and even perinatal death (21).

#### **Calcium & Vitamin D:**

Calcium and Vitamin D are essential for building the developing fetus' bones and teeth. Sources of calcium include milk, cheese, and yogurt; non-dairy sources include fortified juices and milk alternatives, tofu, broccoli, and spinach. Vitamin D is found in fortified milks and juices, salmon fish, tuna fish. And also Small amounts of vitamin D are found in beef liver, cheese, egg yolk, and some forms of mushrooms. Exposure to sunlight can also increase vitamin D status in the body through a chemical reaction in the skin. The recommendation for calcium during pregnancy is 1000 mg/day and Vitamin D is 600 IU (15 µg)/day (17, 22).

#### **Omega-3 Fatty Acids:**

The essential fatty acids, omega-6 (linoleic acid) and omega-3 (alpha-linolenic acid), cannot be synthesized in the human body and therefore must be obtained exclusively from food sources. Their health benefits are: increase gestational length, increase cognition and visual performance, and decrease incidence of preterm birth, preeclampsia, and depression. DHA in particular is found in large amounts in the brain and in the retina, and accumulates rapidly in the third trimester of pregnancy (17). The primary sources of omega-6s are grain-fed beef, processed foods, and liquid vegetable oils, and are abundant in the typical Western diet. In contrast, omega-3s are found in only a few foods, primarily oily fish and select nuts and seeds. Pregnant mother should consume at least 8 - 12 ounces of fish per week (23). Frequency of meal pregnant women should eat more servings of various types of food, including the

vegetables group, the milk and other dairies group, and the meat, eggs, and seafood group. In particular, pregnant women should eat less food at each meal or snack, and increase the frequency of eating to alleviate nausea and vomiting during pregnancy (24).

### **Knowledge, Attitude and practices of pregnant women towards maternal nutrition and its associated factors**

A research results from Wollega, Ethiopia in 2013 revealed that 64.4% of women had nutrition knowledge during pregnancy. This research showed a positive significant relation between information about nutrition, educational status of mothers and family income and nutritional knowledge of mothers during pregnancy (1).

Knowledgeable about nutrition during pregnancy was low in previous studies conducted in 2013 in East Wollega, Ethiopia (64.4%) and in 2012 in Malaysia (70%) (Daba et al., 2013; Mitra et al., 2012). Practices of eating fresh vegetables and daily milk consumption, is low in the previous studies conducted in America (58.9 and 42.7%) respectively (Federal Democratic Republic of Ethiopia, 2013). It is clear that maternal nutrition is crucial in reducing maternal and infant morbidity and mortality, but no study has been conducted to assess nutritional knowledge, attitude and practices of pregnant mothers in the study area. Therefore, the aim of this study was to assess nutritional knowledge, attitude, and practices among pregnant women who attend antenatal care at woldia general hospital north Wollo, Ethiopia.

### **Iodine**

A low consumption of iodized salt and poor iodine status during pregnancy may result from a lack of knowledge about the importance of iodine intake during pregnancy. In Ethiopia, where iodine deficiency disorders are a major public health problem, according to WHO/UNICEF, more than 90% of women did not know the importance of iodized salt and the causes of iodine deficiency (25).

### **Folic acid**

In the United States, Sharp, et al. (2009) reported that women of childbearing age who were from low socioeconomic backgrounds knew little about the importance of the recommended daily intake of folic acid and only 63 (25%) of the total number of women surveyed (N=250) reported consuming folic acid supplements daily(26). Similarly, a New Zealand study identified that knowledge and understanding about recommended folic acid intake among women of child bearing age was relatively poor, with only 64% of the 1000 women surveyed being aware that pregnant women needed to take recommended doses of folic acid (27). In Hail region-Saudi Arabia among 300 married women, 91.0% of the subjects were aware of folic acid, 81.0% knew that folic acid could prevent neural tube defects and 84.0% of the subjects took folic acid prior or during a certain stage of pregnancy (28).

### **Iron**

A study on 400 pregnant women admitted to the Cuza-Vodă Obstetrics and Gynaecology Clinical Hospital in Iasi, Romania, 2010 showed that 45.3% of participants had used iron supplements during pregnancy. This study had put Age, level of education, being married and low gestational age at the first prenatal check-up and total number of prenatal medical visits as a factor for folic acid, iron and multivitamin supplements (29). Women with a higher level of nutritional knowledge used folic acid, iron and multivitamin supplements more frequently. In another



Findings from cross-sectional analysis of data collected from 836 participants at Porto, Portugal, 2008, reported that Prevalence of use of supplements during pregnancy was 55.4% for folic acid, 81.9% for iron, and 76.2% for multi-vitamins (30). Similar study at rural area of India on 50 antenatal mothers showed that iron folate tablet was adequately consumed by 62% mothers among the study population (31).

### Calcium and vitamin D

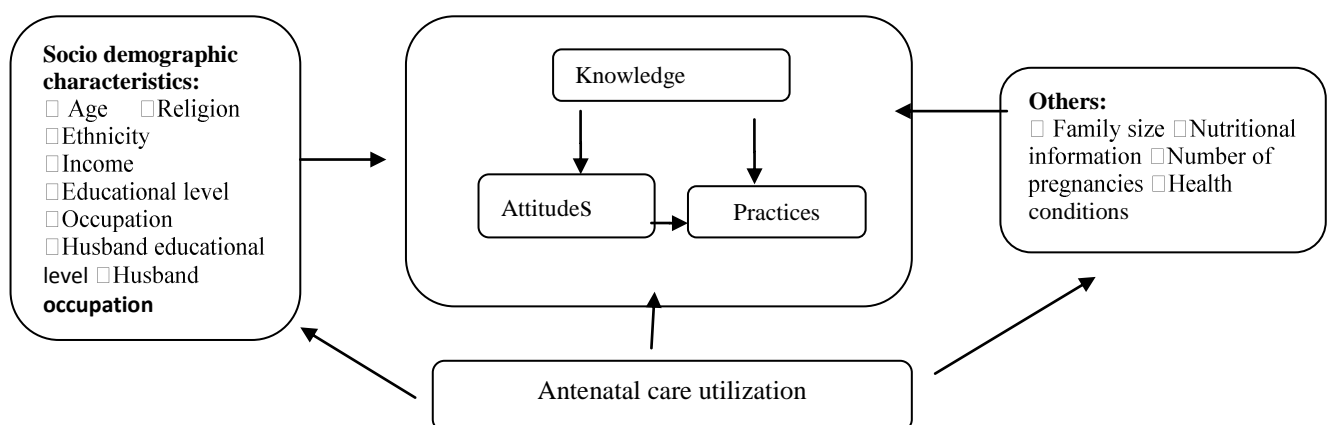
In 2014, a cross-sectional study on 116 pregnant women of Irish, Asian, Sub-Saharan African and Middle Eastern and North African origin at Ireland showed that 23% did not know any source of vitamin D and regarding their attitude 5% admitted that they did not like foods that were rich in vitamin D. 34% of women reported taking a supplement that contained vitamin D; whereas 78% reported consuming oily fish over the past month and 31% reported consuming vitamin D fortified milk (32).

### Omega 3 fatty acids

A survey conducted in Western Province, Kenya, 2011 reported that 46% of the women in the study had a moderate level of nutritional knowledge (33). In similar study at USA on 124 pregnant mothers, attending the outpatient clinics of obstetrics and gynecology, revealed that 78.2% of women had a good knowledge about the importance of milk and milk products for pregnant women and also they knew that maternal malnutrition can endanger the newborn health. 45.9% and 49.2% knew correctly neither the meaning nor the constituents of the balanced diet for the pregnant women. 61.3% had good knowledge about the sources of iron and 71.8% knew the sources of calcium. It also revealed that women aged 25-35 years had higher mean of nutritional knowledge among respondents (34).

In western Kenya, Perumal N. et al (2011) Reported that 59.6% of the pregnant women's attitude score was high (>7 out of 10) (33). Another study in USA by Latifa M. Fouda and her colligues in 2012 reported that 40.3% of women thought negatively that pregnant women should eat for two, also 44.4% thought that most of their diet (>3/4) must be of starchy food. The majority of women 88.7% had a positive attitude towards milk and milk products (34).

### CONCEPTUAL FRAMEWORK



**Figure 1: Conceptual mode**

**Source: Developed by reviewing different literatures Evidence based Research Model.**

## OBJECTIVES

### General objective

A study to assess the Knowledge, Attitude and Practice on maternal nutrition among pregnant mothers and its associated factors who is attending ANC (Antenatal Natal Care) in woldia general hospital, at Ethiopia.

### Specific objectives

1. To evaluate the knowledge of pregnant mothers on maternal nutrition who is attending ANC.
2. To determine the attitude of pregnant mothers towards maternal nutrition who is attending ANC.
3. To evaluate dietary practices among pregnant mothers on maternal nutrition who is attending ANC.
4. To find out the associated factors of ANC attendant mother regarding nutritional requirement.

## METHODS AND MATERIALS

### Study Area

The study was conducted in Woldia general Hospital in Woldia town which is a separate zone in north Wollo zone, Amhara region, north east Ethiopia. The town is about 522 km from Addis Ababa, 316 km from Bahir Dar. According to 2007 national census report the town has a total population of 71,460 of whom 36087 (50.5%) are men and 35373 (49.5%) women. This Hospital gives a service for population of town and other neighbors. Currently there are many services available in Woldia General Hospital including Antenatal care, Family planning, ART services, Abortion care, delivery services, OPD, pediatric ward, medical ward, surgical ward, Gyne ward, postoperative ward, and dental clinic. The research was conducted on pregnant women attending ANC in this Woldia General hospital.

### Study Period

The research was conducted from April to May 2020.

### Study Design

An institutional based cross-sectional study was conducted to assess knowledge, attitude and practices of pregnant women and associated factor among ANC attendants about maternal nutrition during pregnancy with quantitative data collection method from April to May 2020.

### Source population

All Pregnant women who is attending ANC visit at Woldia General Hospital from April to May 2020.

### Study population

Pregnant women who are willing to participate in the study and met the inclusion criteria while attending the ANC service at Woldia general Hospital during from April to May 2020.

### Eligibility Criteria

### Inclusion Criteria

All pregnant mothers who were attending the Hospital for ANC follow up were included in the study.

### Exclusion Criteria:

Seriously ill, laboring mothers and mothers with hearing abnormality were excluded from the study.

### Sample Size Determination

The sample size was determined by using 64.4% of the pregnant mothers had nutritional knowledge during pregnancy in Wollega, Ethiopia (1). And using the following assumption: 64.4% of mothers had good attitude and practices with 5% marginal error and 95% CI and a non response rate of 10%. Based on this assumption, the actual sample size for the study was determined using the formula for single population proportion.

$$n = \frac{z(a/2)2p(1-p)}{(d)^2}$$

Z = standard normal distribution corresponding to significance level at

a = 0.05 or confidence interval (CI), 95% = 1.96

P = expected proportion (0.644) of pregnant mothers nutritional knowledgeable, have good attitude and practices during pregnancy.

d = margin of error (5%) around P Therefore:-

$$n = \frac{(1.96)^2 \cdot 0.64(1-0.64)}{(0.05)^2} = 353$$

Sample size for the single population was 353.

10 percent (10%) non-response rate was added. Finally, 388 pregnant women were included in this study.

N.B Since the data collection method was systematic sampling method we need to calculate the intervals of sample

$$K = \frac{N}{(n)} = \frac{987}{388} = 2.54 = 3$$

Where n=sample size from the above formula

N=total pregnant mother during data collection period

### Sampling procedure

The calculated sample size was proportionally allocated to the systematic sampling method. To select study subject from the antenatal care unit, systematic sampling technique was applied by using semi structured Questionaries' at ANC care during the data collection period. Then every 3<sup>rd</sup> person was included in the sample at each antenatal care unit until the desired sample size was attained.

### Variables

#### Dependent variables

- ✓ Maternal nutritional knowledge
- ✓ Attitude towards nutrition and
- ✓ Dietary practices during pregnancy



### Independent Variables:

- ✓ Socio-demographic characteristics
- ✓ Family Size
- ✓ Nutritional information
- ✓ Number of pregnancies
- ✓ Health conditions

### Data collection procedures:

**Instrument:** A Semi-structured and structured questionnaire was prepared in English language. It was translated in to Amharic and after collection it was translated back to English to check for consistency by experts. The questionnaires were pre-tested in woldia Hospital antenatal care unit. The pre-test was done on 5% of the total sample size. Then questionnaire was assessed for its clarity, length and completeness. Some questions were re- formed and re-ordered to carry out the objectives and interview respondents smoothly.

### Operational Definitions

**Antenatal Care:** Antenatal care (ANC) is a medical and general care that is provided to pregnant woman during pregnancy based on local situation.

**Nutrition:** is the selection of foods and preparation of foods, and their ingestion to be assimilated by the body

**Malnutrition:** is refers to the less intake of food, especially in unbalanced proportions or lack of proper nutrition, caused by not having enough to eat, not eating enough of the right things, or being unable to use the food that one does eat.

**Knowledge:** it refers to an individual's understanding of nutrition, including the intellectual ability to remember and recall food- and nutrition-related terminology, specific pieces of information and facts.

**Knowledgeable:** if respondents score for knowledge questions  $\geq 70\%$  from 100%.

**Inadequate knowledgeable:** if respondents score for knowledge questions  $< 70\%$  from 100%.

**Attitudes:** are emotional, motivational, perceptive and cognitive beliefs that positively or negatively influence the behavior or practice of an individual. An individual's feeding or eating behavior is influenced by his/her emotions, motivations, perceptions and thoughts. Attitudes influence future behavior no matter the individual's knowledge and help explain why an individual adopts one practice and no other alternatives. The terms attitude, beliefs and perceptions are interchangeable (38).

**Positive attitude:** the respondents attitude score  $>$  the median

**Negative Attitude:** the respondents attitude score  $\leq$  the median

**Practices:** the observable actions of an individual that could affect his/her or others' nutrition, such as eating, feeding, cooking and selecting foods. Practice and behavior are interchangeable terms, although practice has a connection of long-standing or commonly practiced behavior (38).

**Good practices:** the respondents had practiced according to food recommendations for pregnant mother and for frequency of food, at least once per day regarding fruits, vegetables, and meat, milk and milk products. Concerning meal frequency, 4 and above meals per day.

**Poor practices:** the respondents had no practices parallel with food recommendation for pregnant women and for frequencies, less than mean score regarding fruits, vegetables, and meat, milk and milk products. Regarding meal frequency, 3 and below per day.

### Data analysis

The data were checked, cleared and entered into SPSS data sheet software and analysis was done by using SPSS version (23.0). The descriptive analysis such percentages, frequency distribution and measures of central tendency were used. Initially, bivarriable analysis was performed between knowledge Attitude and Practice of mothers on nutrition during pregnancy (dependent variable) and each of the potential factors associated with knowledge of mothers on nutrition during pregnancy (independent variables), one at a time. Their odds ratios (OR) at 95% confidence intervals (CI) and p-values was obtained. The findings at this stage helped us to identify important associations. Then multivariable analysis was performed using the logistic regression model.

### Ethical Consideration

This research activity was conducted after the approvals of Department of midwifery, and Wollo University. The informed consent was obtained from each respondent by first explaining the objectives and procedures of the study. The information was kept confidential.

## RESULTS

### TABLE1: SOCIO DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION

From the total of 388 of mothers all consented to participate in the study giving a response rate of 100%.the mean age of respondents was 26.88% (SD ± 0.604) in years with a minimum and maximum 17 and 43 respectively. Around half of the respondents 197 (50.8) fall in the age 25-34 years age group. Almost all of the study participants 384 (98.9%) were from Amhara ethnic group and 176 (45.4%) were followers of orthodox religion. Regarding the marital status of mother 321(82.7%) of them were married. Around half of them 117 (30.2%) were house wife and out of the 388 respondents 226 (58.2%) of them had a monthly family income<2500 Ethiopian birr. Assessment of the educational status of the respondent showed that 67 (17.3%) & 87 (22.4%) primary and secondary education respectively. (Table 1)

**Table1. Socio demographic characteristics of Antenatal Mother in Woldia General Hospital, South Wollo, Ethiopia, (n=388)**

Socio-demographic characteristic	Numbers	Percentage (%)
<b>Age</b>		
17-24	165	42.5
25-34	197	50.8
35 and above	26	6.7
<b>Residence</b>		
Rural	183	47.2
Urban	205	52.8
<b>Marital status</b>		
In Marital union	321	82.7
Not in marital union	67	14.4
<b>Ethnicity</b>		
Amhara	384	98.9
Tigre	4	1.03
<b>Religion</b>		
Orthodox	176	45.4
Muslim	171	44.1
Protestant	38	9.7

<b>Education status</b>		
Can't Read and write only	25	6.4
Primary	67	17.3
Secondary	87	22.4
Preparatory	98	25.3
College and above	111	28.6
<b>Occupation</b>		
Employed government	32	8.2
Employed non-government	98	25.3
Merchant	100	25.8
Daily laborer	41	10.6
Housewife	117	30.2
<b>Monthly family income of the mother</b>		
<2500	226	58.2
2500-4000	105	27.1
4000-5000	31	8.0
>5000	26	6.7
<b>Monthly family income of the husband</b>		
<2500	111	28.6
2500-4000	35	9.0
4000-5000	64	16.5
>5000	178	45.9

**TABLE2: OBSTETRICS AND MEDICAL CHARACTERISTICS**

From the total respondents (97.7%) had a history of ANC follow up for recent child birth and around 262 (69.7%) of the mothers were seen by midwife for ANC follow up. Majority 331 (85.5%) of mothers who received ANC service and 69.7% of mothers seen at governmental health facilities mainly at health centers & Hospital. more than half 221(57.1) of the respondent had at list of four visit for ANC service. More than two third 266 (68.7%) of mother had previous history of institutional delivery at list two child. More than half 232(60%) of mother gave birth through spontaneous vaginal delivery.

**Table 2. Obstetric characteristics of mother in Woldia General Hospital, north Wollo, Ethiopia. (n=388)**

Types of variable	Frequency	Percentage %
<b>Maternal ANC follow up</b>		
Yes	380	97.9
No	8	2.1
<b>Place of receiving ANC</b>		
Government health center	166	42.9
Government general hospital	164	42.4
Others*	58	14.9
<b>Health care provider conducting ANC</b>		
Doctor	62	15.9
Midwife	267	69.7
Others**	55	14.4
<b>Number of ANC</b>		
<4	146	42.9
≥4	194	57.1
<b>Total number of delivery</b>		
One	88	25.3
Two	97	27.9
Three	82	23.6

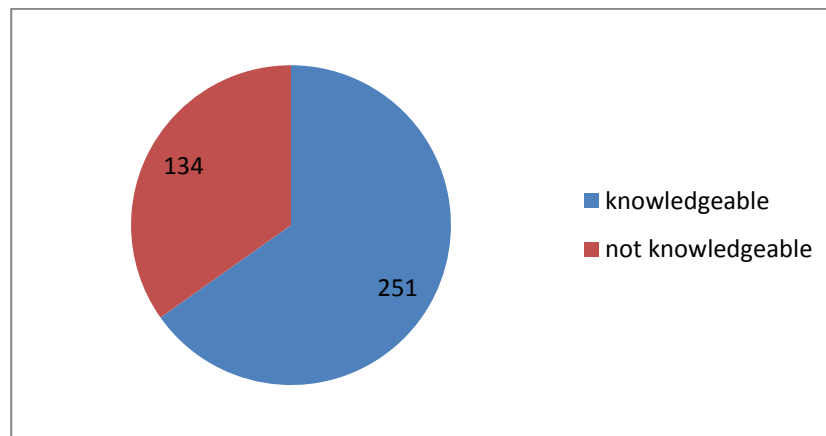
Four	43	12.4
Five and above	38	10.9

**TABLE 3: KNOWLEDGE OF MOTHERS ON MATERNAL NUTRITION DURING PREGNANCY**

Out of 388 respondents responded for quantitative study, (83.3%), (95.6%), (100%), and (89.8%) ,(24.0%),of the respondents had the knowledge that food during pregnancy is important for bodies energy and heat, proper functioning of the body, growth and development of the fetus and infection fighting respectively. However, (70.4%), (4.1%), and (39.1%) of the respondent did not know the importance of food during pregnancy for bodies energy and heat, proper functioning of the body, and infection fighting respectively as indicated in Table 3.

**Table-3: Knowledge of mothers on maternal nutrition during pregnancy**

S.no	Knowledge indicators (n=388)	Response	
		Yes	No
1	Exposure about the need for special nutrition requirements during pregnancy	388 (100%)	0(0.0%)
2	Knowledge about Importance of food for bodies heat and energy	327 (83.3%)	61 (15.7%)
3	Knowledge about Importance of food for proper functioning of the body	372 (95.9%)	16 (4.1%)
4	Knowledge about Importance of food for infection fighting	349 (89.9%)	39 (10.1%)
5	Knowledge about food sources of protein	195 (50.3%)	193 (49.7%)
6	Knowledge about food sources of carbohydrates	115 (29.6%)	273 (70.4%)
7	Knowledge about food source of iron	93 (24.0%)	295 (76.0%)
9	Knowledge about food source of vitamin A	89 (22.9%)	299 (77.1%)
10	Knowledge about food sources of iodine	88 (22.7%)	300 (77.3)
11	Knowledge about inadequate nutrition can be the cause of miscarriage Anemia and or preterm birth	388 (100%)	0 (0.00%)
12	Importance of food for growth and development of fetus	388 (100%)	0 (0.00%)



**Figure 2: Distribution of nutrition knowledge among pregnant mothers that had attended ANC woldia general hospital, north Wollo, Ethiopia. (N = 388)**

**TABLE 4: ATTITUDE OF MOTHERS ON MATERNAL NUTRITION DURING PREGNANCY**

Regarding Attitude, majority of the respondents, 191(49.2%) agreed with Inadequate dietary intake during pregnancy harm the health of the mother, 162 (41.6%) of mothers were strongly agreed, 35 (9.0%) mothers were neutral about the Inadequate dietary intake during pregnancy harm the health of the mother. There were no mothers disagreed or strongly disagreed about inadequate dietary intake during pregnancy harm the health of the mother.

**Table 4:- Attitude of mothers among ANC attendants regarding their nutritional need during pregnancy strongly disagree (1) disagree (2) neutral (3) agree (4) strongly agree (5).**

S.No	Attitudes	1(%)	2(%)	3(%)	4(%)	5(%)
1	Increasing the diet diversity is required during pregnancy	0	35 (9.0)	120 (30.9)	172 (44.3)	61(15.7)
2	Increasing the frequency of meals is required during pregnancy	0	0	119 (30.7)	214 (55.2)	55 (14.2)
3	Increasing the amount of meal taken at a time required during pregnancy	72 (19)	167(43)	145(37)	2 (0.5)	0
4	Weight gain during pregnancy is important	0	127(32.7)	89 (22.9)	94(24.2)	78(20.1)
5	Iron tablets should be taken during pregnancy	0	57(14.7)	38(9.8)	162(41.8)	131(33.8)
7	Pregnant women should sleep under ITN	0	789(20.1)	43(11.1)	157(40.5)	110(28.4)
8	Inadequate dietary intake during pregnancy harm the health of the mother	0	0	35(9.0)	191(49.2)	162(41.8)

**TABLE 5: PRACTICES OF MOTHERS ON MATERNAL NUTRITION DURING PREGNANCY**

Concerning the practice, 195(50.3%) of mothers eat cereals, greater than one fourth 115(30.9%) of women used a vitamin rich vegetables, more than half of women, 239(61.6%) had the habit of eating dark green vegetables fruits/juice, most of women, 145(37.4%) of women had the habit of taking organ meat and more than one third,302(77.9%), 204(52.6%) of women practiced daily servings of legumes, nuts and milk and milk products respectively. As regards fresh vegetable, only 87(27%) of respondents practiced daily servings. But (70.4%), (38.4), (62.4%), (71.1%), (19.1%), (47.4% )and (22.2%) of women had poor practices of daily servings of vitamin rich vegetables, dark green vegetables, organ meat ,fresh meat, eggs and milk and milk products respectively. Concerning alcohol drinking, 6 (1.5%) of pregnant women had the habit of drinking alcohol

**Table 5: Nutritional practices of pregnant mothers attending ANC clinics woldia general hospital, north Wollo, Ethiopia 2020. (N=388)**

S.no	Type	Yes (%)	No (%)
1	Cereals (corn/maize, rice, wheat, sorghum)	195 (50.3)	193 (49.7)
2	Vitamin a rich vegetables and fruits (carrot, or sweet potato that are orange inside, sweet pepper, orange, lemon mango, papaya, dried peach)	115 (29.6)	273 (70.4)
3	Dark Green Leafy Vegetables	239 (61.6)	149 (38.4)
4	Organ Meat (liver, kidney, heart or other organ meats or blood-based foods)	145 (37.4)	242 (62.4)
5	Flesh Meats (beef, lamb, goat, chicken, duck, other birds)	112 (28.9)	276 (71.1)
6	Eggs (eggs from chicken, duck, guinea fowl or any other egg)	314 (80.9)	74 (19.1)
7	Legumes, Nuts & Seeds (dried beans, dried peas, lentils, nuts, seeds)	302 (77.8)	86 (22.2)
8	Milk & Milk Products (milk, cheese, yogurt or other milk products)	204 (52.6)	184 (47.4)
9	Alcohol	6 (1.5)	382 (98.5)

**P\* < 0.25, binary regression, p\* < 0.05 multivariate**

**TABLE 6: FACTORS ASSOCIATED WITH NUTRITIONAL KNOWLEDGE OF MOTHERS DURING PREGNANCY**

In this study age, residence, family size, gravidity (number of pregnancy) and practice had strong statistical association with the knowledge of mothers on nutrition during pregnancy (p<0.05) whereas, religion, ethnicity, family income, educational status of the women and the husband, and no ANC visits had no association with the knowledge of mothers on nutrition during pregnancy (p>0.05). (Table 6)



**Table 6: knowledge level of pregnant mothers and associated factors among womens attending ANC clinics in woldia general Hospital, Ethiopia. (N=388)**

VARIABLES	KNOWLEDGE					
	KNOWLEDGEABLE	NOT KNOWLEDGEABLE	COR (95%)CI	P VALUE	AOR (95%CI)	P-VALUE
Age						
<25	113(66.5)	52(31.5)	1	0.211	0.47(2.1-15.44)	0.025
25-35	120(60.9)	77(39.1)	0.9(0.6-1.37)			
>36	18(73.1)	7(26.9)	0.45(0.18-1.09)		1	
Residence						
Rural	130(71.0)	53(29.0)	1	0.018	1	0.027
Urban	122(59.5)	83(40.5)	1.7(1.1-2.5)		0.6(0.4,0.95)	
Family size						
1-2	65(71.4)	26(28.6)	1	0.20	1	0.21
3-5	164(63.8)	93(36.2)	1.4(0.8-2.4)		0.65(0.3,2.5)	
=>6	23(57.5)	17(42.5)	1.8(.85-4.01)		1.60(0.9,3.62)	
Gravidity						
Primigravida	62	68	1.3(0.89-2.08)	0.149	1.14(0.7,1.828)	0.587
Multigravida	142	114	1		1	
Attitude						
+Ve attitude	130(63.7)	74(36.3)	0.9(0.58-1.34)	0.75		
-Ve attitude	121(66.5)	61(33.5)	1			
Practice (Good)	164(71.3)	66(28.7)	1	0.001	0.49(0.32-0.76)	0.001
(Poor)	87(34.7)	70(51.5)	1.99(1.31-3.09)		1	

**TABLE 7: ATTITUDE OF PREGNANT MOTHERS AND ASSOCIATED FACTORS AMONG WOMENS ATTENDING ANC CLINICS IN WOLDIA GENERAL HOSPITAL, ETHIOPIA. (N=388).**

Regarding attitude, the result shows that age, marital status, religion, and gravidity had significant association on maternal attitude towards nutrition during pregnancy ( $p < 0.05$ ). On the other hand Residence, family size, husband occupation, educational status, family income of and ethnicity had not association with maternal attitude.

	Attitude		COR CI 95%	P-Value	AOR CI 95%	P-Value
	Positive attitude (%)	Negative attitude (%)				
Age						
17-25	82	81	1	0.211	1	0.019
26-35	104	93	0.9(0.6-1.37)		2.3(0.9-5.8)	
>36	18	8	0.45(0.18-1.09)		2.1(0.8-5.3)	
Marital status						
Married	184(56.4)	142(43.6)	1	0.02	1	0.02
Divorce	20(33.7)	39(66.3)	2.51(0.40-4.48)		0.3(0.2-0.7)	
Religion						
Orthodox	88	87	1	0.171	1	0.158
Muslim	88	82	0.94(0.62-1.4)		2.1(0.9-4.5)	
No of ANC visit						
1 <sup>st</sup> visit	32	43	0.98(0.99-3.92)	0.145	1	0.88
2 <sup>nd</sup> visit	65	48	1.06(0.56-2.00)		0.5(0.8-0.5)	
3 <sup>rd</sup> visit	71	65	1.32(0.72-2.43)		0.9(0.5-1.5)	
Gravidity						
Primigravida	62	68	1.36(0.89-2.08)	0.149	1	0.029
Multigravida	142	114	1		1.2(0.8-1.9)	
Knowledge						
Knowledgeable	130(51.8)	121(48.2)	1	0.58	-	NA
Not knowledgeable	74(54.8)	61(42.2)	0.9(0.58-1.35)			

Practice						
Good	123(53.5)	107(46.5)	1	0.814	-	-
Poor	81(52.3)	74(47.7)	1.1(1.05-1.58)			

**TABLE 8: PRACTICE OF PREGNANT MOTHERS AND ASSOCIATED FACTORS AMONG MOTHERS WHO WERE ATTENDING ANC CLINICS IN WOLDIA GENERAL HOSPITAL, ETHIOPIA. (N=388).**

Concerning practices, in bivariate analysis all the socio demographic characteristics and obstetric factors (age, religion, educational status of women and their husbands and women's occupation, their husband occupation, monthly average income, family size, pregnancy associated diseases, number of antenatal visits,) had no statistical association with good practices of mothers on nutrition during their pregnancy ( $P < 0.001$ ). Whereas, practice related factor has (Cereals (corn/maize, rice, wheat, sorghum), Fresh Meats, Legumes, Nuts & Seeds, Milk & Milk products). (Table 8)

## DISCUSSION

This study was conducted to investigate the level of nutritional knowledge, attitudes and their dietary practices of pregnant women during pregnancy and associated factors among ANC attendant in woldia general hospital, Ethiopia.

This study revealed that 193 (49.7%) and 295 (76.0%) of the respondents hadn't Knowledge about food sources of protein and Knowledge about food source of iron respectively. This study result was in line with the study reported from Guto Gida Woreda, East Wollega Zone, Ethiopia that more than half (57.8% and 74.0%) of Knowledge about food sources of protein and Knowledge about food source of iron respectively (1). The findings of this study illustrated that knowledge about food source of protein, knowledge about food of source of iron, knowledge about food sources of vitamins A, iodine, Knowledge about Importance of food for infection fighting, and Knowledge about Importance of food for proper functioning of the body were 195 (50%), 93 (24%), 89 (22.9%), 88 (22.7%), 349 (89.9%) and 472 (95.9%) respectively those were much lower (78.2%, 68.5%, 57.3%, 62.9%, 71.8% and 61.3% respectively) than reported by Latifa et al (34). It might be due to the low nutrition information and low socio-economy of the study participants.

In general according to the answers given by the respondents to the knowledge assessing questions, only 251 (64.7%) of respondents were knowledgeable about nutrition during pregnancy. This figure is slightly corresponds to study conducted in east Wollega (64.4%) and lower than study done in Malawi (70%) of pregnant women had knowledge on nutrition (1, 39)). This high nutritional knowledge might be due to awareness creation in the study area about nutrition during pregnancy.

Regarding Attitude, majority of the respondents, 191(49.2%) agreed with Inadequate dietary intake during pregnancy harm the health of the mother and this study agreed with a study conducted in America that 88.7% of respondents like the inadequate dietary intake during pregnancy harm the health of the mother. (34).

Less than half of the respondents 172 (44.3%) agreed with that Weight gain during pregnancy is important which was lower than a study conducted in America that 82.3% of respondents. This difference may be due to different geographical area and sample size.

Concerning the practice, 195 (50.3%) of women's eat cereals, greater than one fourth

115(30.9%) of women used a vitamin rich vegetables, more than half of women, 239 (61.6%) had the habit of eating dark green vegetables fruits/juice, most of women, 145 (37.4%) of women had the habit of eating organ meat and more than one third, 302 (77.9%), 204 (52.6%) of women practiced daily servings of legumes, nuts and milk and milk products respectively. As regards fresh vegetable, only 87(27%) of respondents practiced daily servings. But (70.4%), (38.4), (62.4%), (71.1%), (19.1%), (47.4% ) and (22.2%) of women had poor practices of daily servings of vitamin rich vegetables, dark green vegetables, organ meat ,fresh meat, eggs and milk and milk products respectively. Concerning alcohol drinking, only 6 (1.5%) of pregnant women had the habit of drinking alcohol.

Further this study showed that 24 (6.2%) of respondents had 3 and more meal frequency per day, more than two third, 192 (50%) of the respondents had practiced the habit of eating snacks between meals and 203 (52.4%) of respondents had the Habit of taking rest during the current pregnancy which was higher than the study conducted in East Wollega, that revealed only 33.9% of respondents had taking rest in the past pregnancy. This might due to the difference in different geographical area and life conditions.

In general, 230 (59.3%) of the respondents were found to have good practice depending up on questions offered to them to assess practice of mothers' nutrition during their pregnancy. This figure was different from a study conducted in Wollega that 33.9% of the pregnant women had good practices on nutrition during pregnancy (11).

#### **FACTORS ASSOCIATED WITH NUTRITIONAL KNOWLEDGE, ATTITUDES AND PRACTICES OF MOTHERS DURING PREGNANCY AMONG ANC ATTENDANTS**

From the study variables Only age, Residence and family size of the mother had strong statistical association with the knowledge of mothers on nutrition during pregnancy ( $p < 0.05$ ) whereas, religion, ethnicity, family income, educational status of the women and the husband, and number of ANC visits had no association with the knowledge of mothers on nutrition during pregnancy ( $p > 0.05$ ). This result was not agreed with the study done in Wollega, the age and family size were not significant association with maternal nutrition during pregnancy. The probable reason for observed discrepancy may be the difference sample size of the study population with respect to exposure to adequate nutrition information during pregnancy.

Regarding to attitude those women who had positive attitude about nutrition were significantly greater odds on nutritional knowledge compared to the pregnant women with negative attitude about nutrition during pregnancy (AOR=4.4, 95% CI: 2.315-8.299). And also Multigravida women had positive nutritional attitude than primigravida women (AOR = 1.2) 95% CI; 0.8-1.9. This difference attributed to Multigravida mothers might have greater opportunity (through experience) to get nutrition information than primigravida women.

Concerning to practice women's who had good nutritional knowledge had good nutritional practice than women's who had poor nutritional knowledge. This study was in line with the study done in east Wollega zone (1) and Malawi (39).

#### **CONCLUSION AND RECOMMENDATION**

##### **Conclusion**

Based on the findings of the present study, it can be concluded that less than half of women in the present study lacked the basic and the essential knowledge regarding the importance,

constituents and sources of most of the types of vitamins and minerals.

This study also showed that more than half of women had a good level of knowledge and practices about nutrition during pregnancy. Furthermore, the most significant predicting factors for knowledge in this study were residence followed by family size and attitude. Again, this study presented the association between women's knowledge, attitude and practices of nutrition during pregnancy. So, it is obvious that good knowledge about maternal nutrition usually resulting in good dietary practices which are important for health of the mother and the fetus.

### **Recommendations**

#### **Health and Health related staffs:**

- It is recommended providing adequate health education about proper and balanced maternal nutrition at pre-conception care for future mothers and during early pregnancy. In addition it is better to prepare leaflets on maternal nutrition and give them for mothers for better results.

#### **Health and Health related managers:**

- Supply in the antenatal units and MCH centers with enough vitamins and minerals necessary for pregnant women and supplying them with adequate audiovisual materials that help provider in health teaching.
- Encouraging the mother for good prenatal care and nutritional counseling about supplementation of iron and folic acid.
- But it needs further study to find out the reason behind the low coverage of minerals.

#### **The Community at large**

- Should focus on education and to eradicate poverty.

### **Strength and Limitation**

#### **Strength**

- it was conducted within a good time which was free from seasonal influence

#### **Limitation**

- The experience of pregnant women attended private Hospitals was not explored.
- Due to social desirability bias respondents might respond what they didn't believe and experience
- The study was conducted in a single hospital that give Antenatal care among woldia Hospital in north Wollo zone, therefore, it cannot be generalize to different Public Hospitals of Amhara region, Ethiopia.

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