St PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF PUBLIC HEALTH

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING MATERNAL NUTRITION AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN SAINT PAUL'S HOSPITAL MILLENIUM MEDICAL COLLEGE , ADDIS ABABA, 2018

BY - GATLUAK JOCK (MEDICAL INTERN)

ADVISOR: MR. TSEDEKE WOLDE (MPH)

A STUDENT THESIS SUBMITTED TO DEPARTMENT OF PUBLIC HEALTH SAINT PAUL'S HOSPITAL MILLENIUM MEDICAL COLLEGE; IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF DOCTOR OF MEDICINE

AUGUST, 2018

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Acronyms and Abbreviations

ANC-Antenatal Care

BMI-Body Mass Index

CI-Confidence Interval

ECA- Economic Commission for Africa

EDHS-Ethiopian Demographic Health Survey

LBW-Low Birth Weight

MCH-Maternal and Child Health

NCDs-Non Communicable Diseases

NTDs-Neural Tube Defects

OAU- Organization of African Union

OPD-Out Patient Department

SD-Standard Deviation

SGA-Small for Gestational Age

SPSS-Statistical Package for Social Sciences

WHO-World Health Organization

Abstract

Back ground: Nutrition is fundamental pillar of human life, so without it, life could extinct at its infancy, so likewise maternal nutrition during pregnancy is very importance because pregnancy is time in which the nutrition demand is increase to meet the need of both mother and growing fetus. Any nutrition inadequacy during pregnancy could result to deleterious effect on both mother and fetus as well. So this study focused more on knowledge, attitude and practice of maternal nutrition during pregnancy and was conducted at Saint Paul's Hospital, Addis Ababa, among women who came for Antenatal Care follow up.

Objectives: The objective of this research study was to assess the knowledge, attitude and practice regarding maternal nutrition among pregnant women attending antenatal care in Saint Paul's Hospital, 2018.

Methods: An institutional based cross sectional study was done and relevant data was collected among 286 pregnant women attending Antenatal Care follow up in Saint Paul's Hospital Millennium Medical College in Addis Ababa, Ethiopia. The systemic sampling procedure was used. The data was collected with self-administer questionnaire. Data collecting mechanism was primary and individual values were confidential and SPSS 21 was used for the analysis of the data.

Result: The data were analyzed using SPSS version 21. This study showed that among 286 pregnant mother only 100(35%), 162(56.7%) and 109(38%) of pregnant women had good knowledge, favorable attitude and good practices of nutrition during pregnancy respectively.

Conclusion and Recommendation: The knowledge, attitude and practices of nutrition during pregnancy were relatively low in this study area. It is recommended providing adequate health education about proper and balanced maternal nutrition at antenatal care for future mothers and during early pregnancy especially those who come for Antenatal care.

Key words: Knowledge; Attitude; Practice; Nutrition; Pregnancy; Antenatal care.

Chapter One

1. Introduction

1.1. Background

Nutrition is a fundamental pillar of human life, health and development throughout the entire life span [1]. Nutrition plays a vital role in life. Good nutrition is an important part of leading a healthy lifestyle [2]. An adequate nutrition pattern is of major importance for one's health and well-being, especially during pregnancy when a woman undergoes major biological, physical, psychological and social transformations [3]. Pregnancy is one of the most critical and unique period in a women's life cycle. Due to higher nutritional requirement this group is considered vulnerable and critical in life span [4]. The type of food taken by women during pregnancy influences fetal development, maternal health and wellbeing .The recommended pattern is to take 5 meals or more at regular times with no extra foods in between to provide a stable level of glucose for the fetus and avoid excessive weight gain. The intake of balanced diet containing the main categories of food is essential for the health of pregnant females and for healthy development of their fetus to avoid perinatal deaths, neural tube defects, anaemia and many other problems [5]. Meanwhile nutrition during pregnancy is very importance for mother to achieve adequate metabolic need to herself and growing fetus. 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 [6]. Both deficiencies in maternal nutrition and excessive gestational weight gain are associated with poor maternal and fetal outcomes. Women with excessive weight gain during pregnancy are at higher risk for complications such as cesarean birth, surgical complications, and gestational diabetes. Furthermore, fetal outcomes such as prematurity, birth defects, macrosomia, and increased likelihood for childhood obesity are associated with excessive maternal weight gain and/or inadequate nutrition [7]. In developing countries, while widespread undernutrition and micronutrient deficiencies persist, obesity is also fast emerging as a problem undernutrition'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 [8]. 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 [9]. Malnutrition is one of the most serious health problem affecting children and their mothers in Ethiopia. Undernourished mothers face greater risks during pregnancy and childbirth, and their children set off on a weaker developmental path, both physically and mentally. A mother's nutritional status at conception, during pregnancy and lactation, plays a key role in determining her health and well-being, as well as that of her child. So does the quality and quantity of her diet. Providing a nourishing diet for pregnant and lactating women therefore results in significantly better infant health outcomes [10]. Twenty seven percent 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 .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 [11]. The most important critical strategy to reduce the maternal mortality is proper antenatal care, because it facilitates the early identification and mitigation of risk factors in pregnancy. Essential services are provided when there is timely and frequent antenatal visit. Now the WHO has increased the number of antenatal visits to eight from four to reduce the antenatal complications [2]. Antenatal care provides an opportunity to educate the pregnant woman about pregnancy and child birth. Under usage of antenatal care has been repeatedly associated with adverse maternal outcomes. Antenatal education programs are a very important component of antenatal care worldwide since it makes women contribute to the maximum for a better pregnancy outcome and care of the neonate [4].

1.2. Statement of the problem

The risk of a woman dying as a result of pregnancy or childbirth during her lifetime is about one in six in the poorest parts of the world compared with about one in 30 000 in Northern Europe. Such a discrepancy poses a huge challenge to meet the fifth Millennium Development Goal to reduce maternal mortality by 75% between 1990 and 2015. In 2013, 289,000 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 [12].

According to Ethiopian Demographic Health Survey EDHS 2016, the maternal mortality in Ethiopia is 412 [13]. Nutrition during preconception as well as throughout pregnancy has a major impact on the outcome of pregnancy. Women who eat well and avoid known risks tend to have fewer complications during pregnancy, labor and more likely to deliver live normal healthier babies. On the contrary women who are malnourished before and during pregnancy are more likely to experience adverse pregnancy outcomes. Before pregnancy the woman needs nutrients for growth and maintenance of her body. Good nutrition keeps her healthy. During pregnancy additional requirement for all nutrients occurs to enable the fetus to grow normally in the uterus. However, nutritionists, prenatal care providers and public policymakers all accept that it is the quality of the diet, not its quantity that is most important. Thus, it is argued that, pregnant women who eat empty calorie foods may gain adequate (or even excessive) amounts of weight during pregnancy but are nevertheless at nutritional risk for adverse pregnancy outcomes. Adequate maternal nutrition knowledge and dietary practice before and during pregnancy is necessary to ensure positive pregnancy outcomes [1]. 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 [2]. According to EDHS 2016, More than 6 in 10 women (62%) age 15-49 receive antenatal care (ANC) from a skilled provider (doctor, nurse, midwife, health officer, and health extension worker). The timing and quality of ANC are also important. One in five women has their first ANC visit in the first trimester, as recommended. One-third of women make four or more ANC visits. Only 42% of women take iron tablets during pregnancy. Almost half (49%) of women's most recent births are protected against neonatal tetanus. Among women who received ANC for their most recent birth, 75% had their blood pressure measured, 73% had a blood sample taken, 66% had a urine sample taken, and 66% had nutritional counseling [13].

Many researches and projects focused on maternal health are common, but little attention is given to maternal nutrition in the study area. It is very clear from those researches that there is relationship between maternal nutrition and morbidity and mortality of pregnant women and the outcomes of pregnancy. There was one study done on knowledge, attitude and practices among pregnant women attending ANC clinics in public hospitals in Addis Ababa, Ethiopia. So this study aimed at assessing the maternal nutrition Knowledge, Attitude and Practices among pregnant women attending ANC in Saint. Paul's Hospital, Addis Ababa, Ethiopia regarding the meaning, the significance and constituents of a well-balanced diet and practices of taking the necessary nutrients during pregnancy, so this research was significance because it was more specific to one hospital that is Saint Paul's Hospital.

1.3. Significance of the study

Both deficiencies in maternal nutrition and excessive gestational weight gain are associated with poor maternal and fetal outcomes [7]. Malnutrition in pregnancy is associated with a host of adverse maternal and infant outcomes, including gestational diabetes, pre-eclampsia, and preterm birth with over nutrition; small for gestational age (SGA), low birth weight (LBW), and neonatal death with undernutrition [14].

Therefore this study will contribute for filling the gap in understanding the knowledge, attitude and practices' regarding maternal nutrition among pregnant women attending ANC in Saint Paul's Hospital since the trend is changed as time goes it also will fill that time period gap of previous researches.

The results of the study informed design of the nutrition education intervention strategies targeting pregnant women due to their importance in reproductive and productive roles in the society.

Besides the health providers and Ethiopian Ministry of Health, others who are interested in the field of maternal health in general will benefit from this research as well.

Chapter Two

2. Literature Review

2.1. Good nutrition for pregnancy

The aims of healthy eating during pregnancy are to: meet your increased nutrient needs, promote the health of yourself and your baby and to achieve a healthy weight gain. Although pregnancy increases the need for many nutrients, this doesn't mean that you have to 'eat for two'. It is the quality of what you eat that is important, not the quantity and it is also suggested that pregnant mother should increase the frequency of eating to alleviate nausea and vomiting during pregnancy. It's not difficult to meet you and your baby's nutritional needs if you eat regular meals containing a variety of foods from the five food groups. You may need more kilojoules (calories) during pregnancy to meet the added needs of your growing baby. This varies depending on your weight and activity level but on average is equivalent to an extra snack each day, the importance nutrients during are of following; carbohydrate, fat, protein, folic acid, iodine, iron, calcium, vitamin D, vitamin B12 and multi vitamin supplements [15]. According to WHO healthy diet during pregnancy and lactation is essential for good nutritional health among which the national recommendations energy and nutrient intakes are folic acid, calcium, iron, vitamin D, proteins, calories, vitamin A, vitamin B and zinc [16].

2.2. Geographical distribution of literature reviews

2.2.1. World Wide

On cross sectional study done on assessment of awareness and knowledge about the maternal nutrition and complications encountered by the antenatal mothers in the rural population This study was conducted on 350 antenatal women, around 98% of women were very clear that nutrition is necessary in pregnancy and 53% of them told that the quantity of food intake should be increased. Major source of knowledge about the nutrition was obtained from the family members (81%). The common danger sign was abdominal pain (61%) followed by bleeding per vagina (22%). About 77% of mothers had an idea that minimum of 6-10 visit should be there in their antenatal period [2].

On cross-sectional study done on Nutrition awareness before and throughout different trimesters in pregnancy: a quantitative study among Dutch women: the measurement tool based on conceptualization of nutrition awareness resulted in a Cronbach's alpha of 0.84. Pregnant women are significantly more aware of their nutrition than women who are not trying to conceive. The scores on nutrition awareness do not differ significantly between the three trimester groups of pregnant women. Women who are trying to conceive do not have significantly higher nutrition awareness than women who are not trying to conceive [3].

On cross sectional study done on Awareness of Antenatal Nutritional Education among pregnant women in jodhpur revealed that 27% pregnant women were found not aware about nutrient requirement during pregnancy, 55% were partially aware and 18% were fully aware in conclusion the study revealed that the most of the pregnant woman living in the urban study region were partially aware about nutrition intake during pregnancy [4].

On cross sectional descriptive study done on knowledge and attitudes of Pregnant Mothers towards maternal dietary practices during pregnancy at the Etoug Ebe Baptist Hospital Yaounde revealed that Sixty seven percent of mothers were married. Seventy one percent were literate, 51% had no stable jobs and 39% of their husbands were unemployed. Seventy one percent of respondents belonged to families with monthly income of less than 100,000 and 56% of them had 5 or more household members. Ninety two percent of mothers had knowledge on good

maternal nutrition before pregnancy. Seventy three percent of mothers cited the correct components of a balanced diet and their food sources (81%); however, 29% had aversion towards foods rich in protein and other important nutrients. Thirty eight percent of mothers knew that they should eat 3 main meals a day, but only 22% of them practiced it. Sixty five percent of mothers were aware that 'calaba chalk' (dry clay) was harmful and prohibited in pregnancy, yet 85% consumed it. Sixty eight percent did not have Knowledge about the risk of overfeeding in pregnancy. Sixty five percent had awareness that some foods items are potentially harmful in pregnancy but did not know what to avoid. Advanced maternal age, education level, parity and monthly family income were apparently positively associated with nutrition knowledge but there was no significant difference ($p>0.05$).Cultures and taboos exempted mothers from eating meat from wild animals, chicken, sea fish, sweet things, food partly eaten by animals, sugar cane, mud fish and 'porrished' cocoyam [17].

A cross sectional study done on limited knowledge about folic acid and iodine nutrition in pregnant women reflected in supplementation practices of pregnant women residing in the Illawarra region of New South Wales revealed Eighty-two percent of women reported using supplements during their pregnancy; with the majority (67.7%) taking supplement brands containing both folic acid and iodine. Supplement use was significantly higher among women in the highest household income category (30.8% vs. 69.2%; $p=0.001$). Seventy-six percent of the participants correctly identified NTDs to be associated with inadequate intake of folic acid, whereas only 40% correctly identified health problems associated with inadequate iodine intake. Women's knowledge of dietary sources of folic acid and iodine was limited [18].

On cross-sectional study done on awareness and Knowledge Regarding Periconceptional Folic Acid Intake Among Female Patients at Iskan Primary Health Center, Makkah Al- Mokarramah Kingdom of Saudi Arabia . The study included 494 women. Their age ranged between 18 and 49 years with a mean±SD of 29.9±7.9 years. Of them, 439 (88.9%) have ever heard about folic acid, while 55 (11.1%) have never heard about it. 40.5% of the women had insufficient knowledge regarding folic acid. Higher educated women, those having information from physicians, journals or internet, and those having history of ever pregnancy were more likely to have sufficient information regarding folic acid [19].

On cross-sectional study done on assessment of awareness, knowledge and use of Folic Acid in Kansas Women Between the Ages of 18 and 44 Years revealed eighty-eight percent of childbearing age women in Kansas have a general awareness of folic acid, 20% have knowledge that it reduces birth defects, but only 25% report taking it daily. Awareness was associated with high school or greater education (P\.0001), incomes over $25,000 (P = 0.0003), being married (P = 0.0035), being white (P = 0.0135), having health insurance (P = 0.0152) and being capable of pregnancy (P = 0.0119). Knowledge that folic acid reduces birth defects was associated with being aware of the USPHS recommendation (P\.0001), being capable of pregnancy (P = 0.0043), being pregnant (P = 0.0061), and being aware of folic acid (P = 0.0379). Taking folic acid daily was associated with currently being pregnant (P = 0.0126) [20].

On cross sectional study done on assessment of knowledge, and attitude of antenatal women about maternal nutrition attending a tertiary care center. Study done among 850 antenatal women attending the antenatal clinic of UISEMH, Kanpur, it revealed only 22 % of the women had good knowledge about nutrition during pregnancy and 82% showed willingness to acquire more information about maternal nutrition. Source of information for most pregnant women were immediate family members (41%). Most women were lacking in their knowledge about common local sources of nutrition, adequate weight gain during pregnancy and effects of over and under nutrition [21].

2.2.2. Africa

On cross sectional study done on Health and nutrition knowledge, attitudes and practices of pregnant women attending and not attending ANC clinics in western Kenya. Among the 979 pregnant women in the survey, 59% had attended ANC clinics while 39% had not. The mean (±SD) nutrition knowledge was 4.6 (1.9) out of 11, health knowledge was 6.2 (1.7) out of 12, dietary diversity score was 4.9 (1.4) out of 12, and attitude score was 7.4 (2.2) out of 10. Nutrition knowledge, attitudes, and dietary diversity score were not significantly different between ANC clinic attending and non-attending women. Among women who attended ANC clinics, 82.6% received malaria and/or antihelmintic treatment, compared to 29.6% of ANC clinic non-attendees. Higher number of ANC clinic visits and higher maternal education level were significantly positively associated with maternal health knowledge [22].

On cross sectional study done on effect of nutritional health education on awareness of pregnant women attending maternal and child health care centers and private clinics in Sharkia Governorate-Egypt. The results revealed that most of our sample in public and private health care facility in rural and urban areas had 3-4 meals⁄ day with irregular time and take extra food between meals, only 53.6 % of MCH attendants got protein in previous day. In the 2nd phase the pre intervention level of knowledge and attitude was defective in both intervention and control groups with no significant difference while post intervention highly significant difference was detected between the two groups. Also, self-matching paired pre -posttest analysis of the intervention group revealed a highly significant improvement in knowledge and attitude with 86.2% satisfactory change in total knowledge and 76.92% satisfactory change in total attitude [23].

On cross-sectional study done on Assessing Folic Acid Awareness and its Usage for the Prevention of Neural Tube Defects Among Pregnant Women in Jos, Nigeria. Out of 543 pregnant women surveyed, 64.6% (351/543) reported that they were aware of folic acid as a vitamin supplement. However, only 7.4% (26/351) consistently took the vitamin during the protective periconceptional period. The common sources of information about folic acid were health workers (68.5%) and the media (14.6%). Only 26.5% (93/351) of them could correctly identify a natural source of food rich in folic acid. Multivariate logistic regression showed that maternal age >30 years (P=0.01) and higher educational status (P=0.001) were predictive factors for folic acid awareness [24].

On cross-sectional, observational study done on Knowledge of periconceptional folic acid use among pregnant women at Ain Shams University Hospital, Cairo, Egypt in the antenatal care (ANC) clinic at Ain Shams University Hospital, Cairo, Egypt revealed that among 660 pregnant women interviewed, among the respondents, 62.4% had heard of folic acid and 39.2% knew about the role of folic acid supplementation in prevention of congenital anomalies. Knowledge about using folic acid before and in the first trimester of pregnancy was highest among university-educated women and those working in professional occupations. Only 18.8% of women reported taking folic acid, and 8.8% had used it before conception [25].

On study done on Impact of Maternal Iron Deficiency and Anaemia on Pregnancy and its outcomes in a Nigerian Population. Anaemia and iron deficiency were recorded in 252 (72.2%) and 222 (63.6%) of the women, respectively, with 0.3% severely anaemic while 38.4% and 33.5% were moderately and mildly anaemic respectively. An inverse relationship was observed between anaemia and iron deficiency with lower prevalence of iron deficiency found among groups with high prevalence of anaemia. Parity and antenatal attendance have significant ($p < 0.05$) effect on maternal haemoglobin with multiparous women having higher prevalence of anaemia and more than 10 antenatal attendance being associated with lower anaemia prevalence. On the pregnancy outcomes, neither maternal iron status nor anaemia was related to birth weight. However, higher foetal head circumferences and more preterm deliveries (< 37wk) were found in anaemic than non-anaemic women (19 vs. 3, $p = 0.001$). Although no significant difference in maternal concomitant illnesses during pregnancy was found either in the iron or the anaemia groups, surgically delivered babies were significantly ($p < 0.05$) more in iron deficient than in the iron adequate group [26].

2.2.3. Ethiopia

On cross-sectional descriptive study done on Assessment of Knowledge of Pregnant Mothers on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia. This research showed only 64.4% of women had nutrition knowledge during pregnancy. There was a positive significant relation between information about nutrition, educational status of mothers and family income and nutrition knowledge of mothers during pregnancy [1].

On cross sectional study done on dietary practice and associated factors among pregnant Women in Gondar Town North West, Ethiopia. This study showed that good dietary practice was found to be 40.1% (95% CI: 36.1-44.3%) during pregnancy. Mother's education, monthly income, nutrition information and dietary knowledge had a positive significant with pregnant mothers' dietary practices [9].

On cross sectional study done on assessment of knowledge, attitude and practices among pregnant women about maternal nutrition during pregnancy in public hospitals in Addis Ababa. This study revealed that among 322 pregnant women only 87(27%), 156(48.4%) and 111(34.5%) of pregnant women had knowledge, favorable attitude and good practices of nutrition during pregnancy respectively. There was a positive significant association between educational status of women, family income, attitude, number of pregnancies and nutrition knowledge during pregnancy. Knowledge had positive significant association with attitude of respondents towards nutrition during pregnancy. Knowledge, family income, husband education and occupation had a positive association with good practices of nutrition during pregnancy [27].

2.3. Conceptual framework

By reviewing difference Literatures review studies; the conceptual model would look like this:

Figure 1.conceptual framework model

Chapter Three

3. Objectives of study

3.1. General objectives

The general objective of this study was to assess the knowledge, attitude and practice regarding maternal nutrition among pregnant women attending antenatal care in Saint Paul's Hospital, 2018.

3.2. Specific objectives

The specific objectives of this research study were:

1. To assess knowledge of maternal nutrition among pregnant women who attend antenatal care at Saint Paul's Hospital Millennium Medical College in 2018.

2. To assess attitude of maternal nutrition among pregnant women who attend antenatal care at Saint Paul's Hospital Millennium Medical College in 2018.

3. To assess practices of maternal nutrition among pregnant women who attend antenatal care at Saint Paul's Hospital Millennium Medical College in 2018.

Chapter Four

4. Methods and Materials

4.1. Study design and Period

An institutional based cross-sectional study design was employed and data were collected from March 12 to May, 07 2018.

4.2. Study Area

The study was conducted at Saint Paul's hospital millennium medical college in Addis Ababa, Ethiopia. Addis Ababa is the capital and largest city of Ethiopia. It is the seat of the Ethiopian federal government. According to the 2007 population census, the city has a total population of 2,739,551 inhabitants. As a chartered city, Addis Ababa has the status of both a city and a state. It is where the African Union is and its predecessor the OAU was based. It also hosts the headquarters of the United Nations Economic Commission for Africa (ECA) and numerous other continental and international organizations.

Saint Paul's hospital is localized at the northwest of Addis Ababa and in Gullele sub-city and it is one of the largest referral hospital in the city. It has a lot of catchment area health centers from where different complicated cases are referred to. It has well organized teaching center both for undergraduate and post graduate study and also has so many departments of specialties and subspecialty beneath it and works 24 hours per day and 7 days a week. The research was done specifically in Gynecology and Obstetrics department which gives both outpatients services (regular and emergency room) and admits patients who are in need. This research particularly was done in Antenatal care center where pregnant mothers come for follow up as a part of outpatient service of the department.

4.3. Populations

4.3.1. Source population

All Pregnant women who visited Saint Paul's Hospital in Addis Ababa for antenatal care follow up during March, 12 to May, 07, 2018.

4.3.2. Study population

Sampled pregnant women who came to Saint Paul's Hospitals in Addis Ababa for ANC follow up during March, 12 to May, 07, 2018.

4.4. Sampling size and Sample procedure

4.4.1. Sampling Size

It's important to calculate the optimum number of sample size to infer appropriate conclusion from the study. From previous study done in public hospitals in Addis Ababa which revealed that among 322 pregnant women only 87(27%), 156(48.4%) and 111(34.5%) of pregnant women had knowledge, favorable attitude and good practices of nutrition during pregnancy respectively.

From the above p values the sample size with favorable attitude was larger so by considering p value of 48.4%. By utilizing Hollander's formula with Confidence level 95% and margin of error 5%. Where:

n=sample size

d= margin of error

P=proportion

α=degree of accuracy

$$n_0 = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2}$$

So by substitution method, the n_o become **384**

However, since the average numbers of pregnant women attending ANC follow up are about 1112 women which is less than 10,000. Hence the reduction formula will be use alternatively.

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

Where **n= reduced sample size**

N=Total study population

Hence, by substitution the corrected sample size will become **286**

4.4.2. Sample Procedure techniques

A systemic random sampling technique was used in this study, meanwhile Individuals are chosen at regular intervals from the sampling frame. Since the average numbers of pregnant women attending ANC follow up are about 1112 which is sampling frame.

$K=N/n_o$ =1112/286 ~ **4**

Therefore, by choosing the first participant in the sample randomly every 4th person as they registered was included in the sample at each antenatal care unit until the desired sample size was attained.

4.5. Inclusion and Exclusion criteria

Inclusion criteria: all pregnant women those who came to the Saint Pauls' Hospital for ANC follow up at the time of data collection will be included in the study.

Exclusion criteria: that pregnant woman who were critically ill, in labor and who had hearing problem was excluded under this study.

4.6. Variables of study

4.6.1. Dependent Variables

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

4.6.2. Independent Variable

- ✓ Socio-demographic characteristics: age, marital status, religion, ethnicity, education level, husband educational level, occupation and monthly income.
- ✓ Family Size
- ✓ Nutritional information
- ✓ Number of pregnancies
- ✓ Previous delivery
- ✓ Health conditions
- ✓ Antenatal visits

4.7. Operational definition

Antenatal Care: is the care provided by skilled health-care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy [28].

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

Malnutrition: any condition caused by excess or deficient food energy or nutrient intake or by imbalance of nutrients. It is classified into under and over nutrition.

Knowledge: is 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 ≥ seventy percent from hundred.

Not knowledgeable: if respondents score for knowledge questions < seventy percent from hundred.

Attitudes: are emotional, motivational, perceptive and cognitive beliefs that positively or negatively influence the behavior or practice of an individual.

Favorable attitude: the respondents attitude score >the median.

Unfavorable Attitude: the respondents attitude score ≤ the median

Practices: are observable actions of an individual that could affect his/her or others' nutrition, such as eating, feeding, cooking and selecting foods [29].

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, 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 once per day regarding fruits, vegetables, meat, milk and milk products. Regarding meal frequency, 3 and below per day.

4.8. Data collection Method

Data collecting method was chosen to be primary data collecting system using structured questioners addressing all the needed information including socio demographic characteristics, obstetric condition, any disease during pregnancy and knowledge, attitude and practices of various maternal nutrition especially importance macro nutrient and micronutrient during pregnancy and was adopted by overviewing various literature reviews particularly the one done on knowledge, attitude and practice toward maternal nutrition in three public clinics in Addis Ababa.

4.9. Data quality control

Data were collected and by assigning code to each questionnaire, and after completion each question was being cross checked once to make sure no information was missed, and then data were entry into SPSS 21 based on those set code and then rechecked again for completeness and finally analysis was done.

4.10. Data processing and Analysis

The data was processing by checking of gathered data for accuracy, utility and completeness. After which the data managed by proper entry in to SPSS 21 and then the questionnaire responses was analyzed using Statistical package for Social Sciences (SPSS 21) software. To observe the overall trends in the data descriptive statistics such as frequency and graphics.

4.11. Ethical Consideration

Ethical clearance was obtained from Department of Public health and Institutional Review Board. The informed written consent of the participants of this study had signed to express their willingness being part of the study.

Afterwards, every information about the participants was confidential in a way it is going to be used only at the interest of the study. Every participant was registered to the study out of their willingness.

4.12. Dissemination of result

The results of the study will be presented to Saint Paul's Hospital Millennium Medical College, department of Public Health as part of degree of doctorate of medicine. Efforts will be made also in future for this study to be published and reviewed on public journal publications in the country.

Chapter Five

5. Result

5.1. Socio-demographic characteristics

Out of the 286 sampled pregnant women, 286 responded to the questionnaires making a response rate of 100%. Many different questions were asked to assess knowledge, Attitudes and practices of pregnant mothers on nutrition and socio-demographic determinant factors in the study area. The age range was 19-41, the mean is 30. About 129 (45.1%) of the respondents are in age range of 25-34 years and 89 (31.1%) are in range of 35-44 and 68 (23.8%) less than 24. Most study respondents, 278 (97.2%) were married.

Table 1 showed that the majority, 135(47.2%) of respondents were orthodox religion followers followed by Muslims 87(30.4%). Regarding the Ethnicity the high proportion of respondents were Oromo 115(40.2%) followed by Amhara 88(30.8%). Concerning family size, 114(39.9%),

77(26.9%), 67(23.4%) of women had three, two and four family members respectively. With regard to educational status about half 149(52.1%) of respondents were at the level of primary, 64(22.4%) had no formal education and only 12 (4.2%) of the women had Diploma and above education. In the other way almost two third 188(65.7%) of their husbands had secondary school, college and above. Almost the half of respondents, 153 (53.5%) were house wives and again the majority of respondents' husbands, 181(63.3 %) were employee.

Regarding to estimated income of women family up to 233 (81.5%) earned between 2000-3500 birr and more than 3500 the rest 53(18.5%) of respondents earned less than 2000 birr.

Table 1: Distribution of Socio-Demographics characteristics of pregnant mothers attending ANC follow up at SPHMMC, 2018 (N= 286)

Variables	**Categories**	**Number**	**Percent**
Age(in years)	≤ 24	68	23.8
	25-34	129	45.1
	35-44	89	31.1
Marital status	Married	278	97.2
	Single	8	2.8
Religion	Orthodox	135	47.2
	Muslim	87	30.4
	Catholic	9	3.1
	Protestant	43	15
	Others	12	4.2
Ethnicity	Amhara	88	30.8

	Oromo	115	40.2
	Tigrie	48	16.8
	Guragie	24	8.4
	Others	11	3.8
Family size	One	11	3.8
	Two	77	26.9
	Three	114	39.9
	Four	67	23.4
	Five and above	17	5.9
Educational level	No formal Education	64	22.4
	Primary School	149	52.1
	Secondary School	61	21.3
	College Education	12	4.2
Husband's Educational level	No formal Education	48	16.1
	Primary School	52	18.2
	Secondary School	109	38.1
	College Education	79	27.6
Occupation	Housewife	153	53.5
	Private Business	101	35.2
	Employee	32	11.2
Husband's occupation	Private Business	92	32.2
	Employee	181	63.3
	Others	13	4.5

Monthly income	<2000 birr	53	18.5
	2000 - 3500 birr	112	39.2
	>3500 birr	121	42.3

Continuation of Table 1

5.2. Obstetrics and Medical Characteristics

As far as the obstetric score, most of the respondents were multigravida 193(67.5%) and the rest were primigravida 93(32.5%). From those who had history of delivery, 64(33.2%) had experience of abnormal previous delivery. In medical status, 42(26.9%) of women who came for follow up had associated diseases with pregnancy. Most of women 127 (44.4%) had three antenatal visits on the current pregnancy and more than half 162(56.6%) of women who had follow up said they had gotten pregnancy related nutritional information and 91(56.2%) of them got their information from Health providers.

Table 2: Distribution of Obstetrics and medical characteristics of pregnant mothers attending ANC follow up at SPHMMC, 2018 (N= 286)

Variables	**Categories**	**Number**	**Percent**
Obstetrical score	Primigravida	93	32.5
	Multigravida	193	67.5
Previous delivery	Normal	129	66.8
	Abnormal	64	33.2
Associated diseases	Yes	42	14.7
	No	244	85.3

Number of antenatal visits on current pregnancy	One			20	7
	Two			55	19.2
	Three			127	44.4
	Four and above			84	29.4
Nutritional information	Yes	162(56.6%)	Where?	Health provider	91(56.2%)
	No	124(43.4%)		Family	23(14.2%)
				Media	43(26.5%)
				Friends	5(3.1%)

5.3. Knowledge of mothers on maternal nutrition during pregnancy

The findings showed that 96(33.6%), 212(74.1%), 212(74.1%), 258(90.2%) and 215(75.2%) of the respondents had a nearly correct answer to what is good nutrition, pregnant mothers' diet differ than others, component of balanced diet, danger of malnutrition for pregnant mother, and the fetus respectively. Regarding sources of various nutrients only 167(58.4%), 185(64.7%), 79(27.6%) know the sources of protein, vitamin, and calcium respectively. Only 93(32.5%), 197(68.9%), 9(3.1%), 133(46.5%) know the importance of protein, milk and milk products, folic acids and iron respectively. And only 86(30.1%) know the example of iron rich foods. And most of them, 232(81.1%) know the two types of vitamin supplemented during pregnancy.

Table 3: Nutrition knowledge of pregnant mothers attending ANC follow up at SPHMMC, 2018 (N= 286)

Variables	**Knowledgeable, (Number, %)**	**Not knowledgeable (Numbers, %)**
Good nutrition	96(33.6%)	190(66.4%)
Pregnant diet differ than other diet	212(74.1%)	76(25.9%)
Component of balanced diet	212(74.1%)	74(25.9%)
Sources of protein(animal& plants)	167(58.4%)	119(41.6%)
Importance of protein	93(32.5%)	193(67.5%)
Source of vitamins	185(64.7%)	101(35.3%)
Source of calcium	79(27.6%)	207(72.4%)

Importance of milk &its products	197(68.9%)	89(31.1%)
Micronutrient supplements for pregnant women	232(81.1%)	54(18.9%)
Health benefit for taking folic acid supplements	9(3.1%)	277(96.9%)
Source of iron	86(30.1%)	200(69.9%)
Importance of iron to pregnant	133(46.5%)	153(53.5%)
Danger of malnutrition for pregnant	258(90.2%)	28(9.8%)
Danger of malnutrition for baby	215(75.2%)	71(24.8%)

Therefore, based on operational definition and criteria for knowledgeable and non-knowledgeable, overall 100 (35%) were knowledgeable and 186 (65%) were non-knowledgeable.

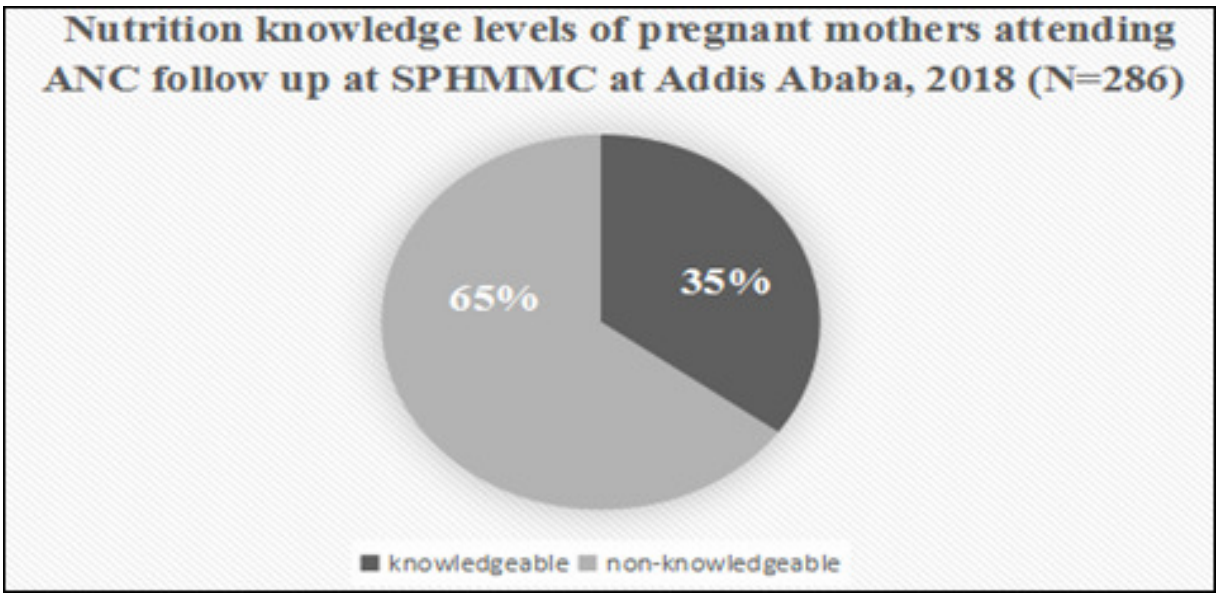

Figure 2: Nutrition knowledge levels of pregnant mothers attending ANC follow up at SPHMMC at Addis Ababa, 2018 (N=286)

5.4. Attitudes of mothers on maternal nutrition during pregnancy

In regards the attitude, 120 (42%) of women believed that it is good to eat more food during pregnancy. Most of respondents, 212(74.1%), 152(53.1%), 174(60.8%) had positive attitude of eating more carbohydrate during pregnancy, eating more proteins or beans and prepare food with iron during pregnancy than non-pregnancy state is good respectively.

Most of the respondents, 272(95.1%), 262(91.6%) had a positive attitude toward eating milk and milk products and vegetables respectively.

Most respondents 228(79.7%), 228(79.7%) had positive attitude toward eating more milk and its products and liked the taste of milk and products. Most of respondent 239(83.6%) liked the taste of meat and other iron-rich food item or meals. Almost half of respondent 147(51.4%) had negative attitude on preparing food with iodized salt.

Table 4: Nutrition Attitudes of pregnant mothers attending ANC follow up at SPHMMC in Addis Ababa, 2018 (N= 286)

Variables	Favorable	Unfavorable	I am not sure

Eating more food during pregnancy	120(42%)	163(57%)	3(1%)
Eating more carbohydrate than non-pregnancy	212(74.1%)	36(12.6%)	38(13.3%)
Eating more proteins or beans during pregnancy	152(53.1%)	75(26.2%)	59(20.6%)
To have more milk & its products during pregnancy	228(79.7%)	37(12.9%)	21(7.3%)
To prepare meals with iron-rich foods such as beef, chicken or liver	174(60.8%)	78(27.3%)	34(11.9%)
To have vegetables containing meals	189(66.1%)	92(32.2%)	5(1.7%)
Taste of meat and other iron-rich food item or meals	239(83.6%)	47(16.4%)	-----
Taste of milk and milk products	228(79.7%)	54(18.9%)	4(1.4%)
Preparing meals with iodized salt	127(44.4%)	147(51.4%)	12(4.2%)

Therefore, based on the computed median and operational definition; 162(56.7%) of respondents had favorable attitude and 124(43.3%) had unfavorable attitude towards nutrition during pregnancy.

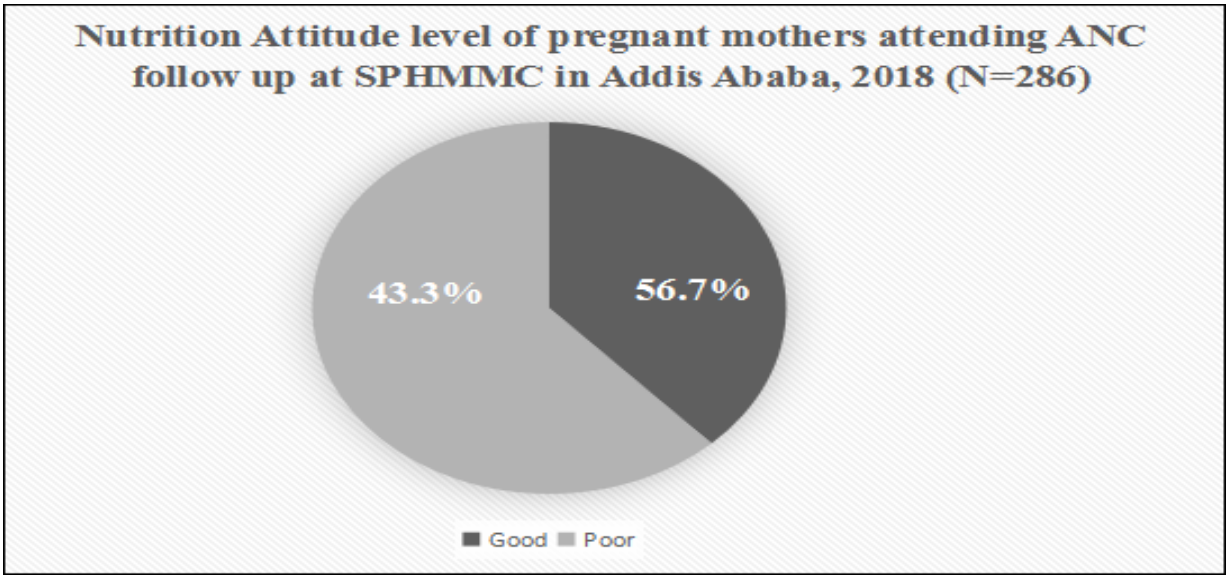

Figure 3: Nutrition Attitude level of pregnant mothers attending ANC follow up at SPHMMC in Addis Ababa, 2018 (N=286)

5.5. Practices of mothers on maternal nutrition during pregnancy

Concerning the practice, 147(51.4%) of women followed specific dietary regimen, 186(65%) of women used iodized salt to prepare their daily main meals. 124(67.1%) of respondent had the habit of eating fresh citrus fruits/juice. 155(54.2%), 164(57.3%) of respondent had the habit of taking carbohydrate and protein respectively.

As regards fresh vegetable, only 97(33.9%) of respondents practiced daily servings. But 155(55.2%), 160(55.9%), 122(42.7%), 131(45.8%), 198(69.2%) and 190(66.4%) of women had poor practices of daily servings of fresh fruits, vegetables, protein, carbohydrate, milk and milk products respectively. Regarding the diet frequency of meal per day, 87(30.4%), 162(56.6%) of respondents had diet frequency of twice and thrice daily. The rest 37(12.9%) respondents had meal four time a day and above. Only 68(23.8%) of respondents had the habits of taking snacks. Concerning micronutrient supply, 159(55.6%) of women had iron tablets and took them correctly. But only 8(2.8%) of women had folic acid supplies, 6(2.1%) before pregnancy and 2(0.7%) within three months after conception.

Table 5: Nutrition Practices of pregnant mothers attending ANC follow up at SPHMMC, 2018 (N= 286)

Variables	**Good (number, %)**	**Poor (number, %)**	**I do not know**

Following specific dietary regimen	147(51.4)	68(23.8)	71(24.8)
Using salt to cook the main meal	205(71.7)	81(28.3)	-------
Habit of eating fresh citrus fruits/juice	124(43.4)	158(55.2)	4(1.4)
Iron supplementation	159(55.6)	127(44.4)	-------
Folic Acid supplementation	8(2.8)	278(97.2)	-------
Frequency of meal per day	199(69.5)	87(23.8)	-------
Habit of taking snacks between meal	68(23.8)	207(72.4)	-------
Habit of eating more carbohydrates between meals	155(54.2)	131(45.8)	-------
Eating protein daily	164(57.3)	122(42.7)	-------
Habit of eating fresh vegetables	97(33.9)	160(55.9)	29(10.1)
Drinking milk	88(30.8)	198(69.2)	-------
Eating milk products	96(33.6)	190(66.4)	-------
Eating meat	138(48.3)	148(51.7)	-------

Therefore, based on operational definition and criteria for good practices and poor practices, overall 109(38%) had good practices and 177(62%) had poor practices

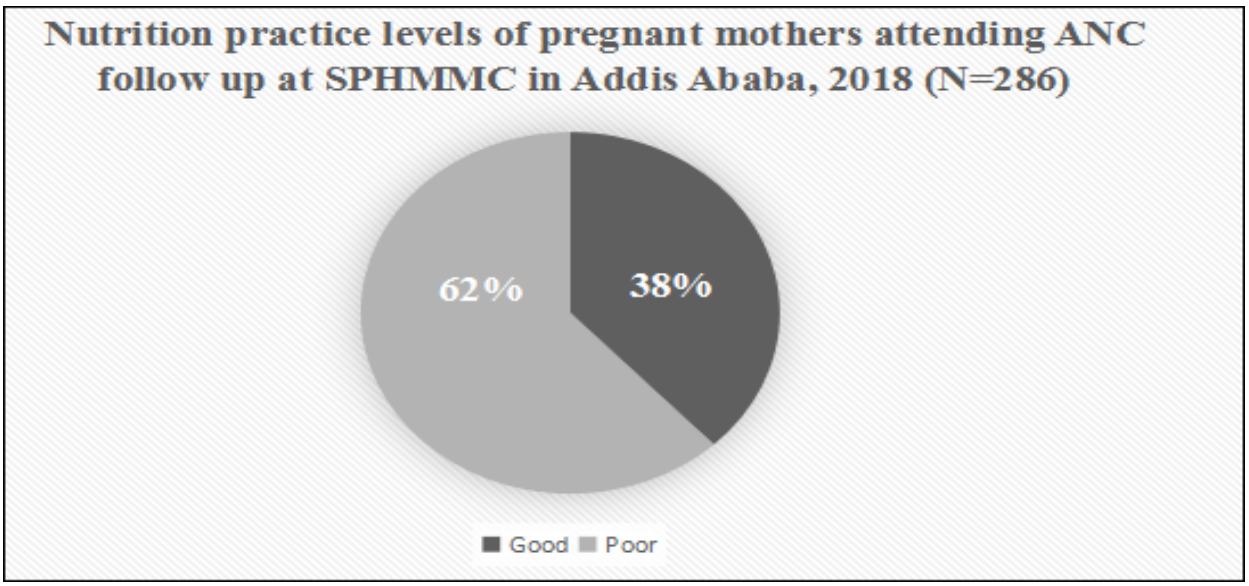

Figure 4: Nutrition practice levels of pregnant mothers attending ANC follow up at SPHMMC in Addis Ababa, 2018 (N=286)

Chapter Six

6. Discussion

This study revealed that 35% (100) had good knowledge about nutrition during pregnancy which is partially agreed with a research done with the same title from public hospitals in Addis Ababa, which revealed that 27% had good knowledge about nutrition during pregnancy[27], and this finding did not agreed with finding on research done in Guto Gida Woreda, East Wollega Zone, Ethiopia on knowledge of Pregnant Mothers on Maternal Nutrition and Associated Factors which

showed 64.4% of women had nutrition knowledge during pregnancy, the reason may explained by education of mothers, income or even by education of their husband and economic status[1].

It also agree partially with finding with research done in Kanpur on assessment of knowledge, and attitude of antenatal women about maternal nutrition attending a tertiary care center which also revealed only 22 % of the women had good knowledge about nutrition during pregnancy[21], but not agreed with the finding with research done in Etoug Ebe Baptist Hospital in Yaounde revealed ninety two percent of mothers had knowledge on good maternal nutrition before pregnancy which also could be explained by higher educational status of that study, income, information source, husband educational level[17] and also the finding for this research is not in agreement with research done on awareness and knowledge about the maternal nutrition and complications encountered by the antenatal mothers in the rural population which revealed that around 98% of women were very clear that nutrition is necessary in pregnancy the reason may be due to educational status, income, educational level of husband [2].

Most of the respondents 211(73.8%) had three and more antenatal visits on current pregnancy which is relatively consistent with cross sectional study done on assessment of awareness and knowledge about the maternal nutrition and complications encountered by the antenatal mothers in the rural population About 77% of mothers had an idea that minimum of 6-10 visit should be there in their antenatal period [2] Higher number of ANC clinic visits positively associated with maternal health knowledge [22].

More than half of respondents 91(56.2%) who had nutritional information, their source of information was health providers (see Table 2), whereas on cross sectional study done on assessment of awareness and knowledge about the maternal nutrition and complications encountered by the antenatal mothers in the rural population Major source of knowledge about the nutrition was obtained from the family members (81%) [2]

And on cross sectional study done on assessment of knowledge, and attitude of antenatal women about maternal nutrition attending a tertiary care center, source of information for pregnant women were immediate family members (41%) [21]

As far as attitude concerning 162(56.7%) had favorable attitude to maternal nutrition during pregnancy which agreed partially with study done on assessment of awareness and knowledge about the maternal nutrition and complications encountered by the antenatal mothers in the rural population revealed that 53% had good attitude [2] and also agreed with another study done on awareness of Antenatal Nutritional Education among pregnant women in jodhpur revealed 55% were partially aware and 18% were fully aware [4] and also agreed with research done with same topic in public hospitals in Addis Ababa revealed that 48.4% had favorable attitude [27].

Concerning practice only 109(38%) had good practice which partially agreed with research done in Gondar Town North West, Ethiopia on dietary practice and associated factors among pregnant showed that good dietary practice was found to be 40.1% during pregnancy [9] and also partially agreed with the research done in public hospital in Addis Ababa which showed that 34.5% had good practices during pregnancy [27].

Most of respondents 278(97.2) had poor practices with regarding folic acid supplementation in their diet may be women's knowledge of dietary sources of folic acid 8(100%) as majority of women who take Folic acid in their diet have education; college and above which is consistency with cross sectional study done on limited knowledge about folic acid and iodine nutrition in pregnant women reflected in supplementation practices of pregnant women residing in the Illawarra region of New South Wales [18].

Chapter Seven

7. Strength and Limitation of research

Strength

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

Limitation

- ✓ Since the research was institution based it cannot be good representative of the whole community.
- ✓ Due to social desirability bias respondents might respond what they didn't believe and experience.

Chapter Eight

8. Conclusion

Based on the major finding on maternal nutrition knowledge, attitude and practice, the conclusion can be: approximately only one third of mother had good knowledge and almost three fourth (74.1%) know that pregnant diet could differ from non-pregnant diet and also three-fourth (74.1%) know the component of balanced diet and good diet, and more than three-fourth (81.1%) know the micronutrient supplement during pregnancy. And 90.2% and 75.2% have knowledge malnutrition could danger their life and life of baby respectively.

Attitude is very important for practicing, almost half had good attitude and less than half had good practice.

Chapter Nine

9. Recommendation

- ✓ It is recommended providing adequate health education about proper and balanced maternal nutrition at pre-conception care for future mothers and during early pregnancy.
- ✓ Supply in the antenatal units with enough vitamins and minerals necessary for pregnant women and supplying them with adequate audiovisual materials that help nurses in health teaching as we see in this study majority had good attitude toward minerals and vitamin but yet their practice was very low
- ✓ Make community at large to aware pregnant women about importance of nutrition during pregnancy through various mean like media, newspaper and other mean possible, thus this may directly improve practice of nutrition during pregnancy.

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ANNEXES

Annex I: Consent form

Consent form for respondent

Name of researcher…….....Sign……Date…….

I am final year student at St. Paul's Hospital Millennium Medical College and I am conducting a research with the title; assessment of knowledge, attitude and practice regarding maternal nutrition among pregnant women attending antenatal care in Saint Paul's hospital, Addis Ababa. As part of my research processes I have prepared a set of questions to be answered by voluntary mothers, which are meant only to achieve the study objective. I am requesting you to respond honestly for interview questions. By this I declare that the identity of any participant will be through randomly set code name and will not be disclosed under any circumstance. The

questionnaires take only 20-30 minutes to answer. Your participation is voluntary and you are kindly requested to answer every question. So I need your genuine cooperation.

Would you be willing to participate?

1. If yes, please proceed to the next page
2. If no pass to the next participant

And thanks.

If you need any clarification, do not hesitate to ask the investigator assigned for you or try to contact the main concerning personnel via this adress:

Dr. Gatluak Jock Chol

Telephone: +251917481639

Email: gatluaklangw303@gmail.com

Annex II: English version questionnaires

1. Socio-Demographic Characteristics

S.No	**Questions**	**Response**
101	Age(in years)	_____Yrs.
102	Marital status	1. Single 2. Married 3. Divorced 4. widowed 5. Separated
103	Religion	1. Orthodox 2. Muslim 3. Catholic 4.Protestant 5.Others(specify)_____

104	Ethnicity	1. Amhara 2. Oromo 3. Tigrie 4. Guragie 5. others specify_____
105	Family size	1.One 2. Two 3. three 4. four 5. Five and above
106	Educational level	1. No formal learning 2. Primary school 3. Secondary school 4. College education 5. Other specify_____
107	Your husband educational level	1. No formal learning 2. Primary school 3. Secondary school 4. College education 5. Other specify_____
108	Occupation	1. Housewife 2. Private business 3. Employee 4. Other specify
109	Your husband occupation	1. Housewife

		2. Private business 3. Employee 4. Other specify
110	Monthly income	_____Birr

2. Obstetrics and medical Characteristics

201	Obstetrical score.	1. Gravida_____ 2. Para_____
202	Previous delivery	1. Normal 2. Abnormal
203	Associated diseases:	1. Hypertension 2. Diabetes 3. Renal disease 4. Other specify___ 5. No
204	How many antenatal visits do you have on the current pregnancy?	1. One 2. Two 3. Three 4. Four

		5. Other specify
205	Have you gotten pregnancy related nutritional information?	1. Yes 2. No If Yes, from where? 1. Health provider 2. Family 3. Media 4. Friends 5. Others specify_____

3. Knowledge Questions (More than one answer is allowed)

301	What does good nutrition mean to you?	1. It is getting the right types and amounts of foods and drinks to supply nutrition and energy for promoting the health of yourself and your baby and to achieve a healthy weight gain and to meet your increased nutrient needs. 2. Does not know
302	How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her and her baby to help him grow?	1. Eat more frequently (eat more times each day) 2. Eat more protein-rich foods 3. Eat more iron-rich foods 4. Other 5. Doesn't know
303	Do you know the component of importance nutritions during pregnancy? (More than one is allowed)	1. Carbohydrate 2. Fat 3. Protein 4. Folic acid 5. Iodine

		6. Iron 7. Calcium 8. Vitamin D 9. Vitamin B12 10. Multi vitamin supplements 11. Don't know
304	Do you know the sources of protein (animal& plants)?	1. Plant sources (Legumes: beans, chickpeas, lentils, peas, peanuts, soybeans and Grains like barley, rice, wheat) 2. Animal sources: meat eggs. 3. Doesn't know
305	What is the importance of protein for both mother &baby?	1. It provides the amino acids needed for adequate bone and muscle development, for development of new cells in the placenta and maternal tissues and encourages healthy blood production. 2. Doesn't know
306	What are the sources of vitamins?	1. Meat 2. Fish 3. Seafood 4. Eggs 5. Milk and milk products 6. Fruits 7. Vegetables

		8. Grains 9. Others specify:_____ 10. Doesn't know
307	What are the Sources of calcium?	1. Milk 2. Cheese 3. Yogurt 4. Spinach 5. Others specify:_____ 6. Doesn't know
308	What is the importance of milk & its products?	1. Dairy products are excellent sources of calcium, protein, vitamin D, and phosphorus. These nutrients are important for baby's developing bones, teeth, muscles, heart, and nerves, and for blood clotting. 2. Doesn't know
309	Most women would benefit from two types of supplements, or tablets, during pregnancy. Which are they?	1. Iron supplements 2. Folic acid supplements 3. Others specify 4. Doesn't know
310	What is the health benefit for taking folic acid supplements/tablets?	1. for normal development of the nervous system of the unborn baby (brain, spine and skull)

		2. To prevent birth defects/abnormalities the nervous system of the unborn baby (brain, spine and skull) 3. Others specify _____ 4. Doesn't know
311	Do you know the examples of foods rich in iron?	1. Organ meat (Liver, Kidney, Heart) 2. Flesh meat: (Beef, Lamp, Goat, and Chicken) 3. Fish and seafood 4. Teff 5. Egg 6. Don't know
312	What is the importance of Iron?	1. To prevent physiologic anemia 2. Don't know
313	What are the dangers of malnutrition for pregnant women?	1. Anemia 2. High maternal mortality on the mother 3. Low productivity 4. Obstructed labor 5. Decreased immune function, 6. Others specify_____

		7. Doesn't know
314	What are the dangers of malnutrition for the fetus?	1. Increased fetal and neonatal death 2. Intrauterine growth retardation 3. Low birth weight, preterm delivery 4. Decreased immune function, 5. Birth defects 6. Others Specify_____ 7. Doesn't know

4. Attitude questions

	Questions	**Perceived benefits:**
401	How good do you think it is to eat more food during pregnancy?	1. Not good 2. I am not sure 3.Good
402	How good do you think it is to eat more carbohydrate than non-pregnancy?	1. Not good 2. You're not sure 3. Good
403	How good do you think it is to eat more proteins or beans during pregnancy?	1. Not good 2.I am not sure 3. Good
404	How good do you think it is to have more milk & its products during pregnancy?	1. Not good

		2. I am not sure 3. Good
405	How good do you think it is to prepare meals with iron-rich foods such as beef, chicken or liver?	1. Not good 2. I am not sure 3. Good
406	How good do you think it is to have vegetables containing meals?	1. Not good 2. I am not sure 3. Good
407	How much do you like the taste of meat and other iron-rich food item or meals	1. Dislike 2. I am not sure 3. Like
408	How much do you like the taste of milk and milk products?	1. Dislike 2. I am not sure 3. Like
409	How good do you think it is to prepare meals with iodized salt?	1. Not good 2. I am not sure 3. Good

5. Practice Questions

501	Do you follow specific dietary regimen during pregnancy?	1. Yes 2. No 3. Don't know	
502	Did you use salt to cook the main meal eaten by members of your family last night?	1. Yes 2. No 3. Don't know	If Yes: What kind of salt did you use? 1. Iodized 2. Not iodized

503	Do you eat fresh fruits, such as: Orange, Lemon, mango, or drink juice made from them?	1. Yes 2. No 3. Don't know/no answer	If Yes: how many times? 1. Once a day 2. Twice a week 3. Three times 4. Other specify_____ 5. Don't know
504	If yes for question No.503, When do you usually eat fresh citrus fruits?	1. 2 hours Before a meal 2. During the meal or just after a meal 3. 2 hours After a meal 4. Other (specify) ____ 5. Don't know	
505	Do you have iron supplement?	1. Yes, I have 2. No, I have not 3. Don't know	If yes, do you take it daily? 1. Yes 2. No 3. Don't know
506	Do you have folic acid supplement?	1. Yes, I have 2. No, I have not 3. Don't know	If yes, when did you start taking this supplement? 1. Before pregnancy 2. Within the first trimester 3. Later 4. Don't know
507	How many times do you	1. Once	

	have meal daily?	2. Twice 3. Three times 4. Four and above	
508	Do you have the habits of eating snacks between meals?	1. Yes, I have 2. No, I have not 3. Don't know	
510	Do you the habits of eating more carbohydrates between meals?	1. Yes, I have 2. No, I have not 3. Don't know	
511	Do you eat protein (plant source) daily?	1. Yes 2. No 3. Don't know	If yes, how many times? 1. Once a day 2. Twice a week 3. 3 times a week 4. Other specify _____ 5. Don't know
512	Do you eat fresh vegetables?	1. Yes 2. No 3. Don't know	If yes, how many times? 1. Once a day 2. Twice a week 3. 3 times a week 4. Other specify ____ 5. Don't know
513	Do you drink milk?	1. Yes, I have 2. No, I have not 3. Don't know	If yes, how many times? 1. Once a day 2. Twice a week

			3. 3 times a week 4. Other specify ____ 5. Don't know.
514	Do you eat milk products?	1. Yes 2. No 3. Don't know	If yes, how many times? 1. Once a day 2. Twice a week 3. 3 times a week 4. Other specify_____ 5. Don't know
515	Do you eat meat?	1. Yes 2. No 3. Don't know	If yes, how many times? 1. Once a day 2. Twice a week 3. 3 times a week 4. Other specify_____ 5. Don't know

Annex III: Amharic version questionnaires

የመጠይቁ መለያ ቁጥር_____

የፈቃደኝነት መጠየቂያ ቅጽ

እኔ በ ቅ/ጳ/ሆ/ሚ/ሜ/ ኮ የ መጨረሻ ዓመት ተማረ ሰሆን የ መመረረቂያ ጥናት ፅዐፈን በ ነፍሰ-ጡር እናቶች በ እርግዝና ወቅት አመጋገብ ያላቸው እውቀት፣አመለካከት ና ተግባር በ ቅ/ጳ/ሆ ቅዱመ-ወሊድ እርግዝና ክትትል ክፍል በሚመጡ እናቶች ላይ በመስራት ላይ እገኛሉ። ለዝህም እንድረዳኝ ፈቃደኛ በሆኑ እናቶች ብቻ የሚመለስ መጠይቅ አዘጋጀቻለሁ በዝህም ጥናት የማንም እናት ማንነት ለልሎች እንድታወቅ አይደረግም። መጠይቁ ከ 20-30 ድቂቃ ይወስዳል; ሁሉንም ጥያቄዎች በትህትና እንድትመደ እጠይቃለሁ ማብራረያ ከ ፈለጉም ገልጻ ሰለምደረግልዎ ይጠይቁ።

መስተፍ ፈቃደኛ ነዎት?

1. አዎ ቃሉ፣ይቀጥሉ

2. አይደለሁም ቃሉ፣ለቀጣይ

አመሰግናለሁ!!!

ማንኛውም ገለጻ የሚያስፈልጋቸው ነገሮች ካለ መረጃ ሰበሰሳቢውንም ሆነ ዋና ተመራማሪውን በአካልም ሆነ በአድራሻው ይጠይቁ።

የዋና ተመራማሪው አድራሻ

ዶ/ር ጋትሉዋክ ጀክ

ስልክ ቁጥር : +251917481639

ኢሜል: gatluaklangw303@gmail.com

1. ማህበራዊና ነባራዊ ሁኔታ

ተ.ቁ	ጥያቄ	መልስ
101	ዕዴሜ (በዓመት)	_____
102	የጋብቻ ሁኔታ	1. ያላገባ 2. ባለትዳር 3. የፈታች

		4. ባል የሞተባት 5. የተላያየች
103	ሃይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ካቶሊክ 4. ፕሮቴስታንት 5. ልሎች (ይጠቀስ)_____
104	ብሔር	1. አማራ 2. ኦሮሞ 3. ትግሬ 4. ጉራጌ 5. ልሎች (ይጠቀስ)_____
105	የቤተሰብ ብዛት	1. አንድ 2. ሁልት 3. ሦስት 4. አራት 5. አምስት ና ከዛበላይ
106	የትምህርት ደረጃ	1. ያለተማረች 2. 1-8ኛ ክፍ ል 3. 9-12ኛ ክፍል 4. የኮልጅ ት/ት እና ከዛ በላይ
107	የባለቤትሽ የትምህርት ደረጃ	1. ያለተማረ

		2. 1-8ኛ ክፍል 3. 9-12ኛ ክፍል 4. የኮልጅ ት/ት እና ከዚያ በላይ
108	የስራ ሁኔታ	1. የቤት እመቤት 2. የግል ስራ 3. የመንግስት ሰራተኛ 4. ልሎች (ይጠቀስ)_____
109	የባለቤትሽ የስራ ሁኔታ	1. የግል ስራ 2. የመንግስት ሰራተኛ 3. ልሎች (ይጠቀስ)_____
110	የወር ገቢ	_____

2. የወሊድ እና ጤና ሁኔታ

201	የወሊድ ሁኔታ	1. ከአሁኑ ፅንስ ጋር ምን ያክል ጊዜ ፀንሰዋል? _____ 2. ፅንስ ከ 28 ሳምንታት በላይ ለምን ያክል ጊዜ ፀንሰው ወልደው ያቃሉ?_____
202	መጨረሻ ጊዜ ሲወልዱ	1. ችግር አለጋጠመኝም 2. ችግር ገጥሞኝ ነበር , ምን ነበር ? (ይጠቀስ)_____ 3. አለወለደኩም
203	ከእርግዝናሽ ጋር የተያያዘ የበሺታ ሁኔታ	1. የ ደም ግፊት 2. የስኪር በሺታ 3. የኩላሊት በሺታ 4. ልሎች (ይጠቀስ)_____ 5. የለብኝም
204	ለዚህ ፅንስ ምንያክለ የቅዲመ- ወሊድ ክትትል	1. አንድ

	አዲርገዋል?	2. ሁልት 3. ሦስት 4. አራትና ከዚያ በላይ
205	ከእርግዝና ጋር በተያያዘ ስለ ስርዓት ምግብ መረጃ አግኝተሻል?	1. አዎ 2. አላገኘሁም አዎ ከሆነ መልስዎ፡ መረጃውን ከየት አገኙ? 1. ከጤና ባለሙያ 2. ከቤተሰብ 3. ከመገናኛ ብዙሃን 4. ከጓደኛ 5. ልሎች ምንጮች_____

3. ግንዛቤን የተመለከተ መጠይቅ (ከ አንድ በላይ ይችላል)

301	የተመጣጠነ ምግብ ምን ማለት ነው?	_____
302	ነፍሰ- ጡር ሴትን ነፍሰ-ጡር ካልሆነች ሴት ጋር ስናወዳድር የአመጋገብ ሁኔታዋ ምን ምን መምሰል አለበት?	_____
303	የተመጣጠነ ምግብ ምን ምን ይይዛል?	_____
304	ፕሮቲን ከምን ከ ምን እናገኛለን?	1.ከእንስሳት፡_____ 2.ከእፅዋት፡_____
305	ፕሮቲን ለ እናትና ለ ፅንሱ የሚሰጠው ጥቅም ምንድን ነው?	_____
306	ቫይታሚን ከምን ከምን ምግቦች እናገኛለን?	_____

307	ካልሽየም የተባለውን ንጥረ-ምግብ የያዙ የምግብ አይነቶችን ግለጭልኝ?	_____
308	ከወተትና የወተት ተዋፅኦ ምግቦች ለ እናትና ለ ፅነሱ ምን ጥቅም አለቸው?	_____
309	ለ ነፍሰ-ጡር እናቶች የሚሰጡ እና በእንክብል መልክ የሚዘጋጁ ንጥረ-ምግቦችን ቢያንስ ሁልቱን ይነግሩኛል?	_____
310	ቫይታሚን ቢ9 (ፎሊክ አሲድ) ለ ፅንሱ የሚሰጠው ጥቅም ምንድን ነው?	_____
311	ደም ማነስን የሚከለ ንጥረ- ምግቦችን የያዙ የምግብ አይነቶችን ሊዘረዝሩልኝ ይችላል?	_____
312	አይረን የተባለው ንጥረ- ምግብ ጥቅሙ ምንድን ነው?	_____
313	ያልተመጣጠነ ምግብ መመገብ እናት ላይ ሊያደርስ የሚእለውን የጤና ችግር ቢገልጹልኝ?	_____
314	ያልተመጣጠነ ምግብ መመገብ በፅንሱ ላይ ሊያስከትል የሚችለውን የጤና ችግር?	_____

4. የምግብ አመለካከትን የሚለካ መጠይቅ

401	በእርግዝና ወቅት አብዝቶ ስለ መመገብ ያለዎት ዕይታ ምን ይመስላል?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም 3. ጥሩ ነው
402	ከበፊቱ ይልቅ በእረግዝና ወቅት ሃይሌ ሰጭ ምግቦችን በዛ አዲርጎ ሰለመመገብ ያለዎት አመለካከት ምንዲን ንው?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም

		3. ጥሩ ነው
403	ከበፊቱ ይሌቅ በእረግዝና ወቅት የሰውነት ገንቢ ምግቦችን እንደ በቄሊና መሳሰለ ምግቦችን በዛ አዴርጎ ሰለመመገብ ያለዎት አመለካከት ምንዲን ንው?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም 3. ጥሩ ነው
404	በእረግዝና ወቅት ወተትና የወተት ተዋፅኦችን በብዛት መመገብ ላይ ያለዎት አስተያየትስ ምን ይመስላል?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም 3. ጥሩ ነው
405	የደም ማነስን መከላከል የሚያስችለ ንትረ- ምግቦችን ለምሳል፡ የበሬ ስጋ፤ጉበት፤ዶሮ ወጥ፤እና ጤፍ የመሳሰለትን የያዙ የምግብ አይነቶችን ለ ማዘጋጀት ያለዎት ዝንባላ ምን ይመስላል?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም 3. ጥሩ ነው
406	የ ፍራፍሬ ማነስን መከላከል የሚያስችለ ንትረ- ምግቦችን የያዙ የምግብ አይነቶችን ለ ማዘጋጀት ያለዎት ዝንባላ ምን ይመስላል?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም 3. ጥሩ ነው
407	የደም ማነስን የሚከላከላውን ንጥረ- ምግብ የያዘ እንደ ስጋና የመሳሰለትን ምግቦች ጣዕም እነዳት ያዩታል?	1. እጠላለሁ 2. እርግጠኛ አይደለሁም 3. እወዳለሁ
408	ለ ወተትና የወተት ተዋፅኦዎች ጣዕም ያለዎት አመለካከት?	1. እጠላለሁ 2. እርግጠኛ አይደለሁም 3. እወዳለሁ
409	ምግብን በአዮዱን በበለፀገ ጨው ስለ ማዘጋጀት ምን ያሰባለ?	1. ጥሩ አይደለም 2. እርግጠኛ አይደለሁም 3. ጥሩ ነው

5. የአመጋገብ ተግባርን የተመለከተ መጠይቅ

501	በእርግዝና ወቅት የሚመገቧቸውን የምግብ አይነቶች ዝርዝር አውጥተው ይጠቀማለ?	1. አዎ 2. አልተቀምም 3. አላውቅም	
502	ላንችና ለቤተሰቦችሽ ትናንት ባዘጋጀሽው ምግብ ላይ ጨው ጨምረው ነበር?	1. አዎ 2. አልጨመርኩም 3. አላውቅም	መልሰዎ አዎ ከሆነ ምን አይነት ጨው የተጠቀሙ? 1. በአዮዱን የበለፀገ 2. በአዮዱን ያለበለፀገ
503	ተቆረጠው ያልቆዩ እንደ ብርቱካን፤ሎሚ፤ማንጎና የመሳሰለ ፍራፍሬዎችን ወይም ከነርሱ የተዘጋጁ ጭማቂዎችን የመመገብ ልምድ አለዎት?	1. አዎ 2. የለኝም 3. አላውቅም	መልሰዎ አዎ ከሆነ ምን ያክል ጊዜ? 1. በቀን አንድ 2. በሳምንት ሁልት ጊዜ 3. በሳምንት ሦስት ጊዜ 4. ልሎች ይጥቀሱ)_____ 5. አላስታውስም
504	ለ 503 ኛው ጥያቄ መሌሰዎ አዎ ከሆነ ፍራፍሬዎችን (ጭማቂውን) መቸ ነው የሚመገቡት?	1. ከምግብ 2 ሰዓት በፊት 2. ከምግብ በኋሊ ወዲውኑ 3. ከምግብ አንድ ወይም ሁልት ሰዓት በኋላ 4.ልሎች(ይጥቀሱ)_____ 5. አላሰታውስም	
505	የ ደም ማነስን የሚከላከል እንክብል አለዎት ?	1. አዎ 2. የለኝም 3. አላስታውስም	መልሰዎ አዎ ከሆነ በየቀኑ ይወስዳሉ? 1. አዎ 2. አልወስድም

			3. አላስታውስም
506	ቫይታሚን ቢ9 (ፎሊክ አሲዴ) እንክብል አለዎት?	1. አዎ 2. የለኝም 3. አላስታውስም	መሌሰዎ አዎ ከሆነ መቸ ነው የጀመሩት? 1. ከመፀነሴ በፊት 2. ከፀነስኩኝ በኋላ በመጀመሪያዎቹ ሦስት ወራት ውስጥ 3. ከፀነስኩኝ ከ 3 ወር በኋሊ 4. አላስታውስም
507	በቀን ምን ያክሌ ጊዜ ይመገባለ?	1. አንዴ ጊዜ 2. ሁልት ጊዜ 3. ሦስት ጊዜ 4. አራት ጊዜ 5. ልሎች (ይጠቀስ)_____ 6. አላስታውስም	
508	በዋና ዋና የመመገቢያ ሰዓታት መካከል መክሰስ(ማቆያ) የመመገብ ልምድ አለዎት?	1. አዎ 2. የለኝም 3. አላስታውስም	
509	በዋና የምግብ ሰዓታት መካከል ሃይሌ ሰጭ ምግቦችን የመመገብ ልምድ አለዎት?	1. አዎ 2. የለኝም 3. አላስታውስም	
510	ከእፅቃት ወይም ከእንስሳት የሚገኙ ገንቢ ምግቦችን የመመገብ ልምድ አለዎት ?	1. አዎ 2. የለኝም 3. አላስታውስም	
511	ተቆርጠው ያልቆዩ አትክልቶችን የመመገብ	1. አዎ	መልሰዎ አዎ ከሆነ ምን ያክል ጊዜ?

	ልምድ አለዎት ?	2. የለኝም 3. አላስታውስም	1. በቀን አንዴ 2. በሳምንት ሁልት ጊዜ 3. በሳምንት ሦስት ጊዜ 4. ልሎች ች ይጥቀሱ _____ 5. አልስታውስም
512	ንሱህ አትክልቶችን የመመገብ ልምድ አለዎት ?	1. አዎ 2. የለኝም 3. አላስታውስም	መልሰዎ አዎ ከሆነ ምን ያክል ጊዜ? 1. በቀን አንዴ 2. በሳምንት ሁልት ጊዜ 3. በሳምንት ሦስት ጊዜ 4. ልሎች ች ይጥቀሱ _____ 5. አልስታውስም
513	ወተት ይወስዳለ/ይጠጣለ?	1. አዎ 2. የለኝም 3. አላስታውስም	መልሰዎ አዎ ከሆነ ያክል ጊዜ? 1. በቀን አንዴ 2. በሳምንት ሁልት ጊዜ 3. በሳምንት ሦስት ጊዜ 4. ልሎች ች ይጥቀሱ _____ 5. አልስታውስም
514	የወተት ተዋፅኦችን ይመገባለ?	1. አዎ 2. የለኝም 3. አላስታውስም	መልሰዎ አዎ ከሆነ ምን ያክል ጊዜ? 1. በቀን አንዴ 2. በሳምንት ሁልት ጊዜ 3. በሳምንት ሦስት ጊዜ 4. ልሎች ች ይጥቀሱ _____ 5. አልስታውስም

515	ስታ ይመገባለ?	1. አዎ 2. የለኝም 3. አላስታውስም	1. በቀን አንዴ 2. በሳምንት ሁልት ጊዜ 3. በሳምንት ሦስት ጊዜ 4. ልሎች ች ይጥቀሱ _____ 5. አልስታውስም

Annex IV: Dummy tables

Knowledge	14 questions	Each one had two points for correct and one point or no answer for the incorrect
Attitude	9 questions	the answers had two points for the answer of yes I like, one point for I am not sure and zero for I Dislike
Practices	15 questions	The answers had scores of one points for good practice and zero for bad practice.