



College of Health Sciences
School of public health

**Dietary practice and its effect on gestational weight gain in Butajira Ethiopia,
2019: a prospective cohort study**

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Acronyms

ANC	Antenatal Care
ARR	Adjusted Relative Risk
BMI	Body Mass Index
BUNMAP	Butajira Nutrition, Mental health and Pregnancy
CSA	Central Statistics Agency
DM	Diabetic Mellitus
EDHS	Ethiopian Demographic and Health Survey
GPAQ	Global Physical Activity Questionnaire
GWG	Gestational Weight Gain
IOM	Institute of Medicine
LBW	Low Birth Weight
MUAC	Mid-Upper Arm Circumference
PHQ-9	Patient Health Questionnaire-9
PCA	Principal Component Analysis
SGA	Small for Gestational Age
TEM	Technical Error of Measurement
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

Abstract

Background: Gestational weight gain is the amount of weight gained between conception and just before the birth of the infant where trimester specific weight gain is the weight gained in between each trimester. Both excess and inadequate weight gain have short and long-term consequences for both the mother and the fetus. Dietary practice is one of the maternal factors that is believed to affect gestational weight gain. Studies in Ethiopia indicate different dietary practice and mother's reason for their action but its further effect on maternal and fetal outcome is not well known.

Objective: To assess the effect of dietary practice during pregnancy on gestational weight gain in Butajira.

Method: A prospective cohort study was conducted on 214 women who are living in Butajira district from Feb – Sep 2019. All pregnant women in their second trimester and with a single tone pregnancy were recruited from the existing cohort (BUNMAP cohort) in the area. Information on socio demographic and dietary practice was collected by face-to-face interview using questionnaire. Dietary intake and physical activity of pregnant women was assessed using multiple pass 24 hr recall method and global physical activity questionnaire respectively. Patient health questionnaire was used to assess depression. Anthropometric measurement of weight was measured by trained data collectors with monthly follow up. Descriptive statistical tests and multinomial logistic regression model was used to see the association between dietary practice and Gestational Weight Gain. P-value less than 0.05 was considered to declare the association.

Result: - 214 participants were involved in the study and 40 % had inadequate weight gain and 51.5 % of women were found to practice decreased amount of food intake during their pregnancy. Women with decreased amount of food intake had 2.16 times more risk to have inadequate weight gain [ARR 2.16: 95% CI: 1.05 – 4.45] compared to those who have no practice in taking decreased amount of food. Risk of inadequate weight gain also increases with high physical activity [ARR 4.7: 95% CI: 1.85 – 11.8] and with inadequate energy intake [ARR 3.8: 95% CI: 1.49 – 9.8].

Conclusion and Recommendation: - This study found that decreased intake is practiced by 51.5 % of women and more prevalently, women in the area have decreased energy intake where also quite high inadequate weight gain was identified. Therefore, interventions focusing on behavior change regarding pregnant women feeding practice and strategies to enhance energy intake of pregnant women aiming in optimum weight gain during pregnancy are needed.

1. Introduction

1.1 Background

Gestational weight gain is defined as the amount of weight gained between conception and just before the birth of the infant. Both excessive and inadequate gestational weight gain has greater consequences on both the mother and the fetus(1). Excessive gestational weight gain is mainly a problem of developed countries whereas inadequate weight gain is a problem of developing countries (2-5).

According to institute of Medicine (IOM) GWG guideline a number of socio demographic, obstetric, anthropometric, physiological and behavioral factors were found to be associated with gestational weight gain (1). Various maternal factors were also believed to be linked with GWG of which dietary practices (restriction of foods) was one of it (1).

Dietary practice of a pregnant women is highly influenced by cultural norms or beliefs or due to spiritual reasons in which it is highly valued in most communities (1, 6). Certain foods were assumed to be inappropriate for consumption during particular phase of life such as during pregnancy and lactation (6-8). There is also a practice of deliberate reduction of amount of intake and restriction of some kind of food that is almost known in all societies(6, 9). Its magnitude is higher in Asian countries which reached up to 80% whereas; in Africa it reached up to 60% in which in Ethiopia it was found to be 49.8%(10-12). These food restrictions are intended to protect both the mother and the fetus from complications (8, 13). The common reasons for altered dietary practices are fear of delivering big baby which may result in difficult labor, miscarriage and discoloration of the fetus (12, 14, 15).

Maternal nutrition highly influences the availability of nutrients for the fetus(16). The energy needed for maternal gestational weight gain, which is the associated with protein and fat accumulation in maternal, fetal and placental tissue determines the energy cost of pregnancy. To meet an optimum or average weight gain of 12 kg as recommended, pregnant women need

additional energy of 85 kcal/day, 285 kcal/day and 475kcal/day during the first, second and third trimester respectively besides their usual intake(17).

In contrary to this fact, due to different reasons limited food intake results in reduced nutrient stream from the mother to fetus, restricting fetal growth(16). Inadequate nutrition of mothers is further strongly related to the under nutrition of their children because such mothers give birth to low-weight babies and their babies will not be compensated during lactation period either (18).Therefore it is identified that preventive interventions should continue to focus on the crucial period of pregnancy and the first 2 years of life, the 1000 days from conception to a child's second birthday in low and middle income countries in which good nutrition and healthy growth have lasting benefits throughout life(19). In Ethiopia community-based health and nutrition services were promising platforms for expanding access to interventions such as social and behavior change communications(20).

1.2 Statement of the problem

Women who have poor nutritional status at conception are at higher risk of disease and death; their health depends greatly on the food intake and they may be unable to cope with their increased nutrient needs during pregnancy (21). In order to optimize birth outcome and to reduce pregnancy complication pregnant women are expected to gain weight based on their pre pregnancy BMI according to institute of medicine (IOM) guideline. Weight gain within a range between 12.5 -18 kg is recommended for women with BMI less than 18.5 and further 11.5-16 kg ,7-11.5 kg and 5 - 9 kg are recommended for women with pre pregnancy BMI of 18.5-24.9,25-29.9 and greater than 30 respectively (1). Women who gained below this recommendation are found to be prone to preterm delivery and gave birth to small for gestational weight. Evidences show that insufficient gestational weight gain was associated with higher odds of preterm birth with odds ratio (OR) of 1.35 in USA/Europe and 1.06 in Asia and small for gestational age with OR of 1.51 in USA/Europe and 1.63 in Asia (22).

Maternal thinness or chronic energy deficiency which was measured by low body mass index (BMI less than 18.5 Mt /ht²) among women aged 15-49 ranged between 10 to 20 % in many countries where the highest is evidenced in India, Bangladesh and Eritrea where it accounted for more than 40% (19). According to EDHS 2016 chronic energy deficiency in Ethiopia is 22 % with a slow progress from the past 16 years (23). These women of the reproductive age are amongst the most vulnerable to malnutrition for social, spiritual and biological reasons. Furthermore pregnant women are subjected for more food taboos in east Africa(24). A large number of women experience micronutrient deficiencies like iron and vitamin A which leads to anemia in almost half of all pregnant women in the world and night blindness in 9.8 million pregnant women(21). The prevalence of Anemia among women of reproductive age in Ethiopia was 24% being higher in rural areas which suggest that it is moderate public health problem in the country in which maternal mortality is 412 per 100,000 live births (23).

Inadequate gestational weight gain was found to be affected by various reasons. Maternal age, educational status, socioeconomic status and frequency of ANC status was some of the socio demographic characteristics which was found to be affecting GWG (1, 4). There are also other

factors that affect GWG such as obstetric, anthropometric or Pre pregnant BMI, physiological and behavioral factors (1). Even though there is limited evidence various social factors such as media, health services, policy, and neighborhood/community factors were also believed to be linked with GWG. A practice of restriction of foods due to cultural norms or beliefs was another social factor which is believed to be associated with GWG(1).

In Ethiopia studies indicate the dietary behavior and woman's reason for their altered dietary practice among different ethnic groups which may directly affects the food intake of pregnant women(25). The most frequently reported restricted foods during pregnancy included restrictions on the consumption of linseed, honey, milk and nuts which typically are good sources of calories, protein and vitamin for fear of giving birth to a big baby, having a baby with discolored skin, abortion and still birth (10). Many vegetables and eating eggs and fruit together or meat with cheese was also considered harmful to mother and baby (10). In southern areas general livestock foods were avoided by over 90% of the women. Furthermore, food items that are white in color like milk, fatty meat, porridge, potato, and banana are not consumed due to a fear that the baby is 'plastered' on the head with white patches (14).

Many studies that are done in different part of the world show the major kinds of food restriction in their specific area and reasons for women's' practice, however little is known regarding its implication on gestational weight gain. A study in Malay though tried to indicate the association between food restriction and gestational weight gain but they were unable to follow the mother's weight gain according to the protocol and again failed to control for other life style factors (such as dietary intake and physical activity) and psychological factors of the mothers. Thus, the main purpose of this study will be showing the implication of dietary practice on gestational weight gain under control of other factors such as diet, physical activity and depression.

1.3 Significance of the study

The findings from this study will provide understanding on the dietary practice during pregnancy in the study area which further show its implication on gestational weight gain. In addition, it will provide information on the magnitude of inadequate gestational weight gain among pregnant women in the area which will be meaningful for further interventions.

The study will also contribute to the health system as a basis for developing culturally appropriate nutritional interventions and programs to promote healthy and balanced diet for women who are pregnant. It will benefit the community by providing information on the common food restrictions in the area and as a base for health professionals to give focused nutritional counseling for pregnant women. This may later have impact on the health and nutritional status of mothers, birth outcomes and long-term quality of life.

2. Literature review

2.1 Gestational weight gain

More than 50 % of pregnant women are not gaining weight appropriately(22). In a meta-analysis of three region it was found that GWG above the guideline was 51%, 51% and 37% in the US, Europe and East Asia respectively (22) . A little higher prevalence was observed in Canada followed by Australia with more than half (59.4% and 54% respectively) of pregnant women gained above the recommended by the guideline (26, 27). Since there is high prevalence of obesity in these areas, women living in developed countries enter pregnancy being overweight or obese. Pre pregnant BMI of the women were decreased from 42% to 10 % as we go from US to east Asia, China (22, 27).

The reverse is true in developing countries where a higher prevalence of inadequate weight gain is observed. Women in Iran, Uganda and Malawi gained 51.3%, 62.5% and 71.8% respectively bellow the recommendation (5, 28, 29). In which only 32% in Iran (Ardal county), and 34.4 % in Uganda gained as the recommendation (5, 28). In Ethiopia also, a considerable amount of women (69.3%) has inadequate weight gain even though the majority (72%) had early pregnancy BMI in the normal range(3).

2.2 Determinants of gestational weight gain

2.2.1 Socio demographic and economic status

Different socio demographic status was found to be associated with gestational weight gain. Age was one of the socio demographic statuses with different finding in the reviewed articles. Some studies found that increase age was associated with low gestational weight gain (30). More specifically pregnant women with age greater than 30 had less gestational weight gain(30). Where as in another study from developed countries showed women aged above 45 were three times higher risk of insufficient weight gain when they are compared to women in between 25-29 (31). Another study found that increasing age was a risk for gaining more than the

recommended(32). In view of the fact that in developed countries overweight or obesity is more prevalent with age and women enter pregnancy with higher BMI (35).

Regarding educational status, high educational status was found to be protective against insufficient weight gain(30, 33). Pregnant women with a higher educational status gained 244gm/month which was more when compared to those with lower educational status (33).

Unlike other socio demographic statuses researches have controversial findings on marital status. A Tanzanian study found that women who are single gained more weight than women living with their partners(33). Whereas another study in Belgium shows single pregnant women are at risk for inappropriate weight gain i.e. both inadequate and excessive weight gain (31). This variation might be due to difference in study setting where possibly in developing countries married women may have more cultural influence.

Socio economic factor was another controversial factor influencing gestational weight gain. Studies showed that women in lower wealth score gained less when compared to women in higher wealth score (33). On the contrary other studies indicate that women with low socio economic status had three times higher risk for excessive weight gain during pregnancy than women with higher income(34). Another third group has found that it has no association with both inadequate and excessive weight gain(32). The differences might be explained with women in developed countries with excessive gestational weight gain may get energy dense food easily.

2.2.2 Obstetric status and ANC visit

There was a consistent finding regarding parity of women (30, 32, 33). Women who had more births previously gained less in the current pregnancy than compared to women who are in their first pregnancy (30, 32, 33, 35). Women with multiple births will be prone to nutrient depletion with close spacing of child birthing.

Frequent ANC visit was associated with adequate weight gain during pregnancy and the vice versa since women often get nutritional advices (3, 36). Additionally Weight gain within the

limits of the Institute of Medicine recommendations was noticed at 44.35% of the women who declared that they received nutritional advice during ANC visit(37).

2.2.3 Anthropometric factor

2.2.3.1 Pre pregnant BMI

Pre pregnancy BMI is known to be one of the modifiable factors which is indicative of further complication in pregnancy outcome as gestational weight gain (38). Pre pregnancy BMI further has a major role on pregnancy outcome (37). There is evidence that shows both pre pregnancy BMI and GWG has positive direct effect on birth weight but the negative effect of pre pregnancy BMI is mediated by gestational weight gain (39). However the effect of gestational weight gain on the increased birth weight was found to be greater than that of pre-pregnancy body mass index (38, 39).

2.2.4 Lifestyle factors

2.2.4.1 Dietary intake

In order to meet the increased demand of pregnancy women are generally recommended to increase their energy intake(17). The gestational weight gain also depends on their diets. In prospective studies concerning weight gain it was found that it has significant correlation with energy, carbohydrate, and monosaccharide and saccharose intake. It was found for every 100 calorie increment in energy resulted in 195 gm weight gain in Germany and again a 6gm per month increase in rate of weight gain in Tanzania(33, 40). A cross sectional study also supports this association of energy intake with GWG (37). A systematic review of 56 studies provides similar evidence that energy intake is associated with gestational weight gain, but the roles of individual macronutrients (protein, carbohydrate and fat) intake are still inconsistent(41). Another recent systematic review of 18 studies indicates that increase in energy intake did not correlate with GWG indicating the dynamic changes that occur in biological and behavioral adaptations to pregnancy are complex and need further evaluation of energy metabolism(42).

Considering dietary pattern of pregnant women there is controversy in which mixed dietary pattern characterized by a high intake of meat, dairy products, fruits, vegetables, potatoes, nuts and seeds and sweets were with higher odds of being inadequate weight gain(43).Whereas another study in south Africa indicate that western and mixed diet patterns were associated with 35 g/week and 24 g/week higher GWG in normal weight and obese women respectively(44).

2.2.4.2 Physical activity

There is observational evidence that physical activity may be a modifiable risk factor for excessive gestational weight gain (1). Currently studies show either no difference in gestational weight gain among women with varying amounts of physical activity or showing decreased gain in women with higher physical activity.

Even though it is controversial some observational studies indicate that physical activity has been associated with a lower risk of excessive gestational weight gain(45, 46). A Meta analysis of 12 RCTs of physical activity found a significant reduction in gestational weight gain in the physical activity intervention group as compared to the control group(47). This is also supported by cross sectional studies which showed that engaging in low physical activity was associated with more weight gain when compare to engagement in high physical activity (48). The association was found in women with activity with at least 21 minutes(49).

In low and middle income countries such as Nigeria, south Africa and Ethiopia the physical activity level was found to be low(50). In contrary in Seri Lanka vigorous activities was associated with decreased weight gain (35). Even though studies have shown association of physical activity with either increased or decreased weight gain, there is no consensus on the duration, intensity and time of physical activity on the course and outcome of pregnancy.

2.2.4.3 Depression

There was inconclusive finding regarding depressive symptoms to be associated with weight gain. Studies suggest that increased level of depressive symptoms may be predictive of higher gestational weight gain (51, 52). It was found that depressive symptoms were associated with

increased gestational weight gain whereas anxiety and stress were not. (51, 53). On the other hand, other studies have disputing evidence that depression may be protective of increased GWG (54). There was different finding from other longitudinal study including 13,314 pregnant women. It showed that women with antenatal depression did not have significantly higher odds of either inadequate or excessive GWG than women without antenatal depression (55). This similar study has found that pre pregnancy obesity is more related with antenatal depression. (55). These differences may arise from socio demographic variation and since the earlier studies did not discretely associate pre pregnancy BMI and depression and dose response relation of pre pregnancy BMI with depression should be considered.

2.2.4.4 Substance use

Cigarette smoking has effect on fetal growth. The smoke crosses the placenta and restricts placental blood flow resulting in reduction of oxygen supply which further result in low birth weight, intrauterine growth restriction and preterm birth (56). Studies regarding cigarette smoking during pregnancy in affecting gestational weight gain are divisive. A prospective study with 6959 mothers show that smoking during pregnancy was associated with increased gestational weight gain (57). whereas another studies show that smoking during pregnancy has a risk of inadequate gestational weight gain when compared to previous history of smoking (58).

Evidences show that alcohol consumption while being pregnant may result in poor nutritional status of the women during pregnancy through interference on absorption of nutrients, impairment of nutrients and energy intake (59). Similar divisive finding is found in alcohol intake during pregnancy. Alcohol intake during pregnancy didn't show any association with anthropometric measurement(60). Again another study finding indicates low and moderate alcohol intake was not associated with low birth weight and preterm delivery but excessive alcohol intake has association with these outcomes(61). Here the dose response relation should be considered too.

2.3 Dietary practice

Dietary practice is highly influenced by proscriptions of certain amount and kind of foods or drinks that are subjected to certain period of a women's life such as menarche, pregnancy and lactation (6, 7, 62) Mostly foods that are staple food in the area and that are inexpensive are restricted(63). Often protein foods, the best liked and most valued items are denied in all or part of pregnancy to women(64).

Magnitude of food restrictions ranged from 68% to 81% in Asian countries (11, 65, 66). Pregnant women in these areas restrict either one or cumulative food items. This high level of prevalence may be due to the reason that there are strong enforcement mechanism through their mothers, mother in laws and other neighbors to adhere to the cultural believes (65).

In Africa the prevalence is about 37 % and 43.8% in Nigeria and Sudan (67, 68). The later prevalence is a little higher since it was not only due to food restriction. The second prevalence was a little higher since there were other reasons for avoiding certain foods besides food restrictions or food taboos such as morning sickness, nausea, vomiting and allergy. Therefore only 35.9% pregnant women refrained from eating some type of food for community reason (68).

The prevalence of food restriction in east Africa also ranged from 27% to 60 %. The lowest being in Ethiopia Hadiya zone followed by Shashemene with 27% and 49.8% respectively (10, 14).The majority (90%) of women in Hadiya zone avoids livestock foods such as meat, milk and cheese (14). The highest prevalence was encountered in Kenya with 60% of the pregnant women practice to the most commonly avoided foods in the area i.e. animal organs, meat and egg (12). The Kenyan study showed a higher prevalence since it is for a cumulative food item restriction unlike that of the Ethiopian studies which indicates for only avoidance of at least a single food item.

2.3.1 Reasons for change in dietary practice

Dietary changes during pregnancy are influenced by different reasons. Pregnant women either increase their amount and variety of intake or they will decrease the amount and variety of intake (62). Evidences show that restricting food items and amount of intake is commonly practiced during pregnancy. Pregnant women are forced to restrict some type of foods during specific trimesters or throughout their pregnancy by people who are close relatives, elderly people or people who are respected among the community with a drive to protect the mother and the unborn baby (63, 69, 70).

Food restriction around Asia (India, Malaysia and China) is alienated into two based on the effect on the mother's body i.e., 'Hot' and 'cold' foods. Fruits, oil seeds, animal proteins and green vegetables were prohibited by pregnant women in Tumkur, Karantaka, India due to the reason for fear of discoloration of the baby. Even frontline health workers of the area (Anganwadi) support these restrictions too. The foods restricted in these areas are non-expensive and common in the area (63). In addition to the foods avoided in these areas, eating less or eating down is being practiced due to fear of delivering a large baby and long lasting, painful labor (9).

Foods such as mutton, rabbit meat, frog, snake, papaya, banana and dark colored foods were restricted among Chinese Pregnant women living in Hong Kong. These women avoids these foods for fear of reason which are almost uniform such as, miscarriage, fetus malformation and a smaller extent fetal ill-health (69). Similarly pregnant women in Malay avoid pineapple in addition to the "Cold" and "Hot" foods for a slightly different reason like to avoid excessive bleeding during labor(66). While in other part of Malaysia which include Temiar women fish that was not caught by the pregnant women's husband, game animals, and packed foods are prohibited (71). Additionally pregnant women avoid plants like coconut and fruits such as banana and jack fruit in both India and Malaysia (11, 71, 72). This similarity may be due to cultural influences.

In western Africa, snail is the commonest type of food prohibited among pregnant women to avoid difficult labor(70, 73). Grass cut meat, garii, nuddels and wheat, egg and beans are forbidden for use of pregnant women in Nigeria(67).Ground nuts, malt sweet potato were prohibited food types in Gahanna additionally in rural parts rats, hot foods and animal lung (73). This was due to socio cultural reasons in which their actions were derived to show respect for ancestors, parents and community elders(73). These cultural reasons were similarly adhered to protect mothers from difficult labor and children from deformity and excessive saliva.

In Gambia main sources of carbohydrate such as cereals, Vitamin A and C sources (legumes and fruits) and animal proteins were restricted by pregnant women. These foods were avoided to guard the mother from difficult labor and the child from skin problems and floppiness (64).

In eastern Africa, Kenya foods that are avoided by pregnant women were primarily organ meat (with exception of liver), meat and eggs. Additionally, oily food, avocados and sugary food are restricted. The reason behind these aversion were to prevent big baby, less blood, lack of strength during birth, miscarriages or stillbirths, and maternal deaths as well as child's colic and poor skin conditions after birth(12). Similarly a qualitative studies in Arsi, and southern Tigray of Ethiopia revealed that yogurt, cheese, sugar cane, and green pepper were the restricted foods among pregnant women in the area especially for fear of weight gain during pregnancy which they think will lead to obstetric complications associated with the delivery of a bigger baby (14, 15, 74). Additionally green leafy vegetables were avoided in Aris (74). Honey, meat, banana, tomato, onion, cactus fruit, chickpea , lentil , roasted crops were prohibited in Alamata, Tigray for fear of abortion or miscarriage(15). Linseed and fatty meat were the other prohibited foods in Ethiopia. While, milk and milk products were avoided for fear of discoloration of the fetus skin. (14, 15, 75).

Foods that are not in liquid form such as different types of bread and cold foods such as cold milk, cold meat and cold water are also avoided and the women's reasons were to avoid difficulty of labor, to prevent disease like Gastritis, Diarrhea, typhoid and skin discoloration of the fetus(75). Further large amount of any type of food is not advisable for pregnant women in

the community (75). In these eastern African countries women are avoiding more protein containing foods in which they believe to result in complicating delivery process.

Research question

Does dietary practice have an effect on gestational weight gain?

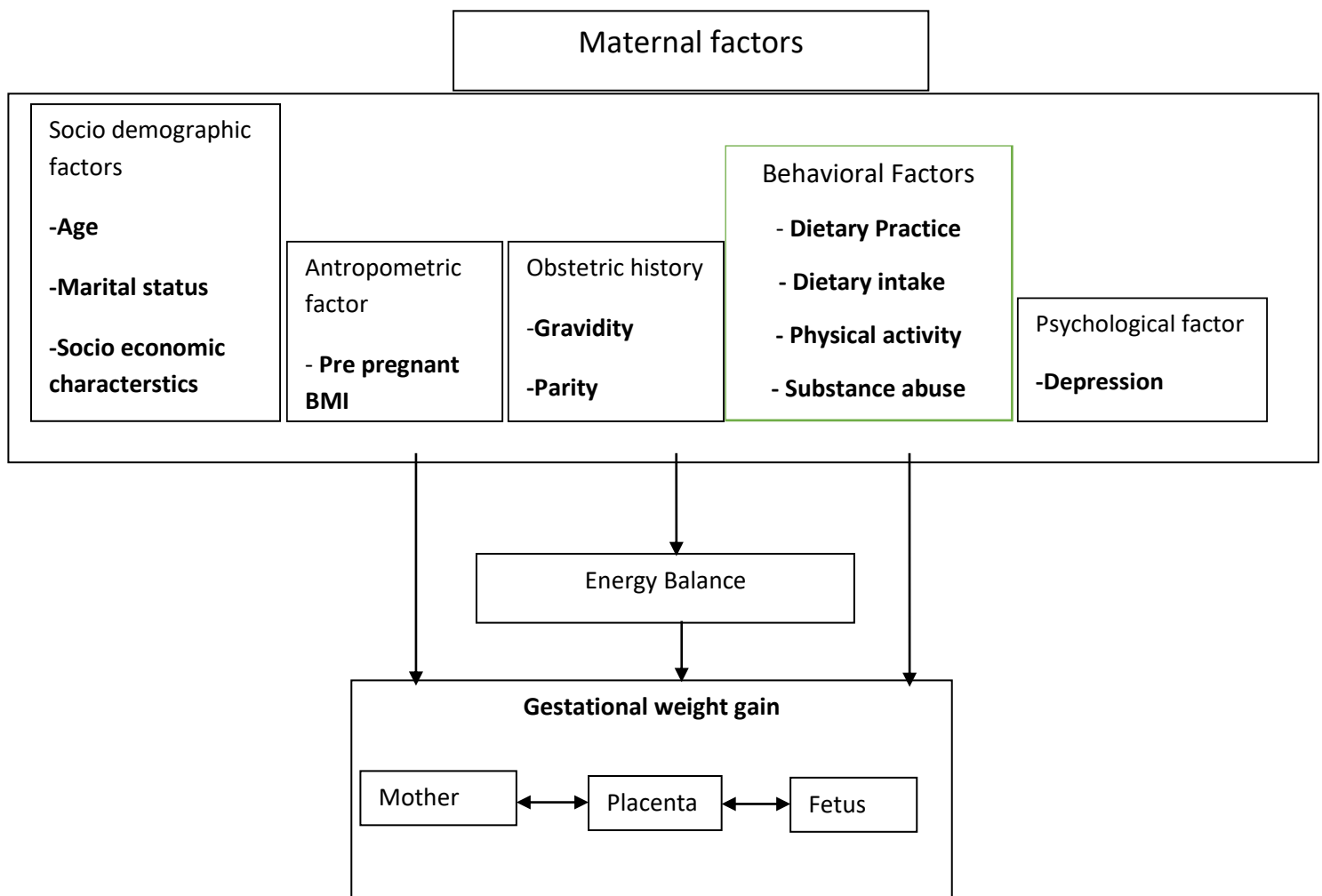


Figure 1: Conceptual framework which is adapted from IOM 2009

3. Objective

3.1 General objective

The general objective of this study is to assess the effect of dietary practice on gestational weight gain among pregnant women in Butajira, Ethiopia, 2019.

3.2 Specific objective

- To assess the effect of dietary practice on trimester specific weight gain among pregnant women in Butajira, Ethiopia, 2019.

4. Method and materials

4.1 Study setting and period

The study was conducted in Butajira, south central Ethiopia Health and Demographic Surveillance site (HDSS) of Addis Ababa University. Butajira is located in the Gurage Zone of the Southern Nations, Nationalities and Peoples' Region(SNNPR), on a latitude and longitude of 8°07'N 38°22'E and an elevation of 2131 meters above sea level. It is surrounded by Meskane woreda. It was part of former Meskan and Mareko woreda. It is located 130 km from Addis Ababa.

The HDSS in Butajira is one of the oldest surveillance sites which was initiated in the mid-1986 and it is found in Meskan and Mareko woredas. It is consisted of 10 kebeles of which 9 are rural and 1 is urban with an estimated total population of 70,000.(76) Gurage is the main ethnic group and Guragigna is the major language but the federal language Amharic, is also widely spoken in the area. The rural population mainly depends on farming and the staple food of the area is Enset (false banana). Teff (a cereal staple), maize, millet, barley and legumes are the main crops found in the area.

This study was conducted from Feb – Sep 2019 in the selected clusters (10 kebeles) of HDSS of Butajira district which is linked to an already established population-based cohort of pregnant women i.e., Butajira Nutrition, Mental health and pregnancy (BUNMAP) project cohort. The BUNMAP cohort is a three-year mother to child pair cohort. It was established in 2016 with a primary aim of evaluating the effect of economic, psychological and quality aspects of food and nutrition on pregnancy outcomes, child growth and development. A total of 1024 pregnant women with their children were followed under this cohort. This study was linked to the existing cohort since the specific objectives of the cohort matches to the current study.

4.2 Study design

The study design was a prospective cohort study in which participants were recruited in three consecutive months.

4.3 Source population

The source populations were all pregnant women in Butajira HDSS.

4.4 Study population

The study populations were all second trimester pregnant women that were engaged from the 10 kebeles of HDSS of Butajira district.

4.5 Inclusion criteria

The study includes all second trimester (3 to 6 month /13-27wk) (77) pregnant women who are enrolled in the existing main cohort whose gestational age was identified using early trimester ultrasonography.

4.6 Exclusion criteria

Pregnant women with multiple gestation pregnancy were excluded.

4.7 Sample size determination

The sample size was calculated using the double proportion formula. The assumptions were 95% confidence interval, 80% power, ratio of unexposed to exposed to be 1:1. By considering dietary practice as the exposure variable where women who practice food restriction was considered as exposed and those who do not practice was considered as non-exposed, Percent outcome in exposed (P_1) and Percent outcome in unexposed (P_2) is taken to be 71.2% and 51.6% respectively which is taken from a study done in Malay (65).

$$n_1 = \frac{\left[Z_{\frac{\alpha}{2}} \sqrt{\left(1 + \frac{1}{r}\right) P(1 - P)} + Z_{\beta} \sqrt{P_1(1 - P_1) + \frac{P_2(1 - P_2)}{r}} \right]^2}{(P_1 - P_2)^2}$$

The sample size became 212 for both groups and with 10% non-response rate it became 233 pregnant women.

4.8 Sampling procedure

The seven out of ten HDSS *kebeles* was included to select the pregnant women in the study. Those three *kebeles* namely *bati*, *hoppie* and *mekakelegna* were excluded from the study due to the ethnic instability in the area during the data collection period. From the Butajira HDSS of ongoing study, first the data of pregnant women was obtained. The obtained data delivered information on the mother's name, age, address (*kebele*, *Gott* or house number) and gestational age which is ultrasonography based. From the obtained data all second trimester pregnant women were recruited and included in the cohort as study participants.

4.9 Study variables

Independent variables and measurement

Socio demographic characteristics

Socio demographic characteristics including age, marital status, religion, educational status and occupation was assessed using questionnaire adapted from EDHS. Socio economic status of a household was assessed using household asset such as housing condition like building materials of the house and ownership of materials such as agricultural land ownership, ownership of cattle, ownership and type of toilet facility and ownership saving account. Overall socio demographic and socio-economic status data were obtained from the BUNMAP cohort.

Pre pregnancy BMI

Pre pregnancy weight and height was obtained from the BUNMAP cohort chart and additionally it was traced and sought from ANC record for women with missing cohort data since women's first measured weight (before or at 12 weeks' gestation) may serves as the proxy for women weight at conception(78, 79). Then body mass index (BMI) was computed using the ratio of weight /height ².

Dietary practice

Dietary practice was assessed by using questionnaire in this study. The question was represented using amount and variety of food intake. Participants were asked if their food intake practice was altered during pregnancy in terms of amount and variety. Amount of food intake has three response category "taking more food" "taking the same amount" and "taking decreased amount". Similarly, variety of food intake has three response categories "taking more variety" "taking less variety" and "taking same variety".

Dietary intake

To assess mean total energy intake and macronutrient intake of the women an interactive, multiple-pass 24 hr. dietary recall questionnaire was used to collect data on dietary intake. The tool is adapted and validated for use in developing countries. (80)

The interactive multiple-pass technique includes, First pass- Quick list of all foods and drinks consumed sequentially from morning of the day before until morning of the data collection day was asked.

Second pass- Detailed descriptions of all the foods and drinks consumed, including cooking method, ingredients added and brand names for purchased foods/drinks were obtained. Additionally, the data collector probed if there is any additional item that were consumed but which were forgotten.

Third pass- In order to accurately estimate the portion size of foods and drinks consumed food weighing scale and pictures of commonly consumed foods with calibrated locally available labeled cup, bowl, spoon, serving spoons was used. Each participant was asked to put the amount of food that is equivalent to the actually eaten if actual food is available in the house.

Fourth pass- At the end the interviewer reviewed the recall to ensure that all the items have been recorded correctly

Physical Activity

Physical activity level was assessed using Global Physical activity questionnaire (GPAQ) which is developed by WHO (81). It is used to assess physical activity over the past 7 days in three different setting (Work/home, traveling to or from places and recreational activities) and expresses in terms of frequency and duration. After cumulative result of the seven-day records physical activity is categorized in to three categories where participants who were engaged in <75 minute/week vigorous activity were classified as “inactive”, participants who were engaged in 75-149 minute/week of vigorous activity were classified as “active” and participants who were engaged in ≥ 150 minute/week of vigorous activity were classified as “very active”.

Depression

Depression was assessed using patient health questionnaire (PHQ-9). The PHQ-9 questionnaire is validated for use in Ethiopia(82). It is a self-report measure of major depressive disorder with nine components to be recalled in the past two weeks. It is categorized as “0” if the response is “not” at all, “1” = if the response is “several times”, “2” if the response is “more than half the day” and “3” if the response is “nearly every day”.

Substance use during pregnancy

Cigarette smoking, chat chewing and alcohol intake of pregnant women was assessed using questionnaire which is adopted from EDHS. Women were asked if they use these substances or not along with the frequency and amount of consumption.

Outcome variables and measurement

Trimester specific weight gain

Gestational weight gain was measured by subtracting the last measured weight from the first measured weight of a specified trimester. Then, trimester specific weight gain for women (either in a second or in a third trimester pregnancy) was calculated and compared to the standard of IOM recommendation for the specific trimesters. To maintain standardization, weight measurement was done using electronic weighing scale to measure the weight of the women. The scale was calibrated before any measurement is done. The scale was placed on a flat surface with appropriate lighting. Women were weighted with light clothing and with their shoes off. Weight was measured to the nearest 0.1 kg.

A total of four weight measurement was done. After recruitment of participants, follow-up weight measurement was started at 13 weeks of gestation for those who are followed for second trimester pregnancy and at 27 weeks of gestation for those who are followed for their third trimester pregnancy. Then monthly follow-up weight measurement was done accordingly for women in both second and third trimesters.

4.10. Data collection tools and procedures

Interviewer administered questionnaire was used to collect data on Socio-demographic and economic characteristics, obstetric history, dietary practice, depression, physical activity and dietary intake by trained data collectors on the first day of data collection.

Three data collectors who were resident of the area were recruited based on their experience in dietary data collection and additionally two supervisors were used. Training was given by the principal investigator. Before starting the interview clear explanation on the purpose, benefit and risk of the study was given and informed consent was obtained from the participants by the data collectors.

4.11. Data quality assurance

Data quality measures were employed throughout the course of the study. The interviewer administered questionnaire was prepared in English and translated to Amharic and again translated back with different people to ensure the consistency of the questions.

Previously trained data collectors were used and additional three days training was given by the principal investigator. The training included explanation of the objective of the study, data collection techniques and procedures based on the questionnaire and practical weight measurement techniques.

During the training, practical weight measurement exercise was done using the anthropometric standardization protocol and technical error of measurement (TEM) was also calculated for each data collectors. During the exercise the intra observer and inter observer TEM for weight measurement was found to be 0.15 kg and 0.23 kg respectively. According to the protocol since both intra and inter observer TEM was in the acceptable range (0.1-0.3 kg for intra and 0.1-4.1 kg for inter observer TEM) the data collectors proceed to take further measurements. Additionally, Measurement scales were handled carefully and calibrated before every data collection.

Two repeated visit of study participants were done where it was impossible to obtain the data in a single visit. Furthermore, close supervision was employed throughout the data collection processes, on following standardization protocol, completeness and consistency of the questionnaires.

4.12. Data Management and Analysis

Epi data Version 3.1 was used to code and enter the collected data whereas Nutri survey 2007 was used to create the nutritional database. Data cleaning and completeness was checked and all further statistical analysis was performed using STATA version 14.0.

Principal Component Analysis (PCA) was done to construct wealth index of participants based on household data such as ownership of assets. The assets include, agricultural land ownership, ownership of cattle, building materials of the house, source of drinking water, type of fuel used for cooking, ownership and type of toilet facility and saving account. After checking for frequency of every asset owned, assets owned between 5% and 95% of households were included in the wealth index construction.

Trimester specific gestational weight gain was the outcome of this study. Descriptive statistics (mean and standard deviation) was calculated for all continuous variables while frequency distribution was used for evaluating the distribution of categorical variables. Bivariate and multivariate multinomial logistic regression was done to assess the effect of reduced intake on gestational weight gain. Variables that have 20 % ($p < 0.2$) significant level on bivariable analyses and those important variables from different literatures were considered for further multivariable multinomial regression. Multinomial regression with relative risk was done and P-value of < 0.05 was considered to denote statistical significance after adjustment for possible confounders like physical activity, sedentary behavior, depression, energy intake and pre pregnancy BMI.

Pre-Pregnancy BMI

Pre pregnancy BMI was calculated using weight/height² ratio by taking early pregnancy weight measurement which was taken <12 wk. of gestation and height of participants. It further was classified using the WHO BMI classification category as “Underweight” if BMI is <18.5, “Normal” if BMI is 18.5-24.9, “Overweight” if BMI is 25-29.9 and “Obese” if BMI is >30. (83)

Dietary practice

Dietary practice i.e., change in amount of food intake was categorized as “taking more food” “taking the same amount” and “taking decreased amount” while change in variety of food intake was categorized as “taking more variety”, “taking less variety” and “taking same variety”.

Dietary intake

Ethiopian food composition table was used to derive macronutrient and energy estimates from the dietary data. A compiled food composition table was entered in to Nutri survey software to create dietary data base and to calculate the amount of intake per individual per day. To check the normality of the data Shapiro-wilk test of normality was done. Since the test showed p-value of < 0.05 for all data i.e., energy, protein, fat and carbohydrate non-normal distribution were confirmed and median intake with 25% & 75% interquartile range was used.

Recommendation of IOM (institute of medicine) for energy intake during the second and third trimester (2275 kcal/day Vs 2356 kcal/day) was used in order to categorize women with adequate and inadequate energy intake (83).

Physical Activity

Global Physical Activity Questionnaire (GPAQ) analysis guide was used to analyze the physical activity level of study participants. The Questionnaire assessed activities of different domains which are time spent at work, travel from place to place and recreational activities which further was categorized as moderate and vigorous activities.

Participant's minutes spend on each domain of physical activity were multiplied by number of days of physical activity to get a weekly physical activity in minutes. Finally, minutes in each domain were added together to get total physical activity level (TPA) per week.

As per the World Health Organization (WHO) physical activity guidelines physical activity level was classified in to three groups i.e., "inactive", "active" and "highly active" with a cut off 150 minutes for moderate-intensity physical activity or 75 minutes for vigorous-intensity physical activity per week or an equivalent combination of moderate and vigorous-intensity physical activity achieving at least 600 Metabolic Equivalents (MET) minutes. Therefore, using vigorous TPA Participants who were engaged in <75minute/week vigorous activity were classified as "inactive", participants who were engaged in 75-149 minute/week of vigorous activity were classified as "active" and participants who were engaged in ≥ 150 minute/week of vigorous activity were classified as "very active". Additionally, Sedentary time spent per day was categorized as < 8 hours and ≥ 8 hours per day based on the mean sedentary time.

Depression

Depression status of the pregnant women was classified using the standard Patient Health Questionnaire-9 (PHQ-9) score instructional manual. The total PHQ was calculated by summing up the individual values under each response categories of the nine depressive symptoms. It was considered "having minimal" or "no depression" if a women's score is 0 to 4, "mild depression" if the score is 5 to 9, "moderate depression" if the score is 10 to 14, "moderately severe depression" if the score is 15 to 19 and "severe depression" if the score is 20 to 27. But due to

small observation, severe depression, moderately severe and moderate depression were merged together and analyzed as moderate depression.

Substance use

Alcohol intake status of pregnant women was categorized as alcohol drinkers and non-alcohol drinkers if women were found to take alcohol during the current pregnancy. Similarly, cigarette smoking status was categorized as smokers and nonsmokers if women were found to smoke during the current pregnancy. Further smoking status of other family members was assessed and categorized as having a family member who smokes cigarette or not.

Regarding chat chewing status, women were classified as chat chewers or non-chat chewers if they were found to chew chat during the current pregnancy. Further women were classified as daily or occasional chat chewers based on their intake of chat on daily bases.

Trimester specific weight gain

Weight gain status is measured using trimester specific measured weight. As recommended by IOM (institute of medicine) GWG guideline women in their second and third trimester should increase with a rate of 0.45 kg per week in order to meet the desired weight gain which is based on the their pre pregnant BMI for better maternal and fetal outcome. It is recommended that the mean range of gestational weight gain per week in both second and third trimester pregnancy is between 0.44-0.58 kg for women with BMI<18.5(Underweight), 0.35-0.5 kg for women with BMI 18.5-24.9(Normal weight), 0.23-0.33 kg for women with BMI 25-29.9 (overweight) and 0.17-0.27 kg for women with BMI ≥ 30 (Obese)(84). Using these references, participants with gestational weight gain below the recommendation is categorized as having inadequate weight gain, those who gained within the recommendation is categorized as having adequate weight gain and those who gained beyond the recommendation is categorized as having excess weight gain for specific trimester.

4.12. Definition of terms

Dietary practice: - an act regarding feeding during pregnancy and expressed either by change in amount and/or variety of food intake.

Trimester specific weight gain: - A weight gain which is specific to the trimester.

Pre-pregnant BMI: - A body mass index which is calculated from early pregnancy (<12wk) weight and height measurement.

Moderate Activity: -An activity that requires a moderate amount of effort and causes a small (noticeable) increase in breathing or heart rate.

Vigorous activity: -An activity that requires a large amount of effort and causes a large or rapid increase in breathing or heart rate.

4.13. Ethical clearance

Ethical clearance was obtained from Addis Ababa University, school of public health research ethics committee. Written Informed consent was also obtained from all pregnant women before the data collection.

A detailed explanation was provided about the purpose of the study, data confidentiality, beneficence of the study and assurance that refusal to participate in the study will not affect any of their services which are provided to pregnant women at the health facilities.

During data collection the interviewer avoided pre judgment and will help the women to calm down by telling the main purpose of the study in order to reduce the emotional harm that might be caused when culture or religion sensitive questions are being raised and weight gain status are told.

4.14 Dissemination plan

The finding of this study will be submitted to school of Public Health College of health science Addis Ababa University. The result will be sent to SNNPR health bureau and Butajira district health bureau including the Butajira HDSS. An attempt will also be made to publish the report on national and international journals.

5 Result

5.1 Demographic and socio-economic characteristics

A total of 233 women were initially recruited for this study, where only 214 women had a complete data. Of the total participants with complete data 89 % were in their second trimester pregnancy while the rest 11% were in their third trimester pregnancy. The final analysis beyond the descriptive analysis was done for those who had complete data.

The mean age of the women was 27.4 years (± 5.1 SD). About 55.4 % of the women had Primary education and 27.5% were illiterates. Majority (88.84 %) were Muslims, 10.3% were Orthodox Christians while the rest 0.86% were Protestants. Gurage and Silte ethnicity accounts for 71.67% and 25.32 % respectively. The majority (80.7%) of the respondents were housewives followed by merchants which accounts for 9%. Regarding residency, 70.39% and 29.61% women were rural & urban dwellers respectively.

Table 1 Socio-demographic and economic characteristics of pregnant women in Butajira, Ethiopia, 2019 (n=233)

Variables	Frequency	Percentage
Women age (in years)		
25-34	145	62.25
15-24	60	25.75
35-45	28	12.02
Education		
Primary (1-8)	129	55.36
Illiterate	64	27.47
Secondary (9-12)	18	7.73
Read and write	18	7.73
College/University	4	1.72
Maternal Religion		
Muslim	207	88.84
Orthodox Christian	24	10.3
Protestant	2	0.86
Maternal Occupation		
Housewife	188	80.69
Merchant	21	9.01

Farmer and housewife	16	6.87
Other	8	3.43

Wealth Status

Poor	48	20.60
Poorest	47	20.17
Rich	47	20.17
Richest	46	19.74
Middle	45	19.31

*Other - Employee/Private, Student, Maid/Servant and Daily Laborer

5.2 Obstetric history

Participants of the study have a mean of 2.5 pregnancies (± 2.2 SD) with a mean of 3 child birth (± 2 SD) in their life time. Out of the total 233 pregnant women 22.32% were primi-gravid (on their first pregnancy), 58.8 % were multi-gravid (on their second, third or fourth pregnancy) and the rest 18.9% were grandmulti-gravid (on their fifth or more pregnancies).

5.3 Substance use during pregnancy

None of the women in this area took local drinks like *Tella* or *Areke* during their pregnancy. However, 6.44% reported to chew chat occasionally. Similarly, no women reported to have history of smoking during their pregnancy but only about 1.29% reported having a family member who smoked cigarette.

5.4 Dietary practice during pregnancy

About 31.33% of the women are aware of food taboo practice in the area. Around 48.1% of the pregnant women reported there is no practice in the area that encourages women to eat more food during pregnancy. Regarding feeding practice, 51.5% of the pregnant women reported that they ate less amount of food during the current pregnancy as compared to their pre-pregnancy period. Similarly, 47.2% ate less variety of food items during their pregnancy than they used to eat before they get pregnant. (Table 2)

Table 2 Dietary practice and traditional practice of participants in Butajira, Ethiopia, 2019 (n=233)

Variables	Frequency	Percentage
Knows traditional practice/food taboo in the area		
Yes	73	31.33
No	107	45.92
Don't Know	53	22.75
Traditional practice encouraging pregnant women eating more food		
Yes	70	30.04
No	112	48.07
Don't Know	51	21.89
Change in amount of food		
Taking more food	12	5.15
Taking less food	120	51.5
Taking same amount	81	34.76
Don't Know	20	8.58
Change in variety of food		
Taking more variety food	15	6.44
Taking less variety food	110	47.21
Taking same variety	92	39.48
Don't Know	16	6.87

5.5 Dietary Intake during Pregnancy

Out of the total 233 women 81.6 % had an inadequate intake of energy while 18.4 % had adequate intake of energy per day as recommended by IOM. Women in the area have a total median energy intake of 1693.26 kcal per day (1318.54, 2173.88). It was also found that the median intake of carbohydrate was 352.87 gm per day (262.11, 455.32), protein was 47.4 gm per day (35.58, 59.66) and total fat was 24.97 gm per day (19.56, 31.11).

Women who ate the same amount of food during their pregnancy had a median energy intake of 1780.9 kcal per day (1481.37, 2197.2), while women who reported to decrease their food intake during pregnancy had a mean energy intake of 1648.53 kcal per day (1259.6, 2139.56). (Figure 2)

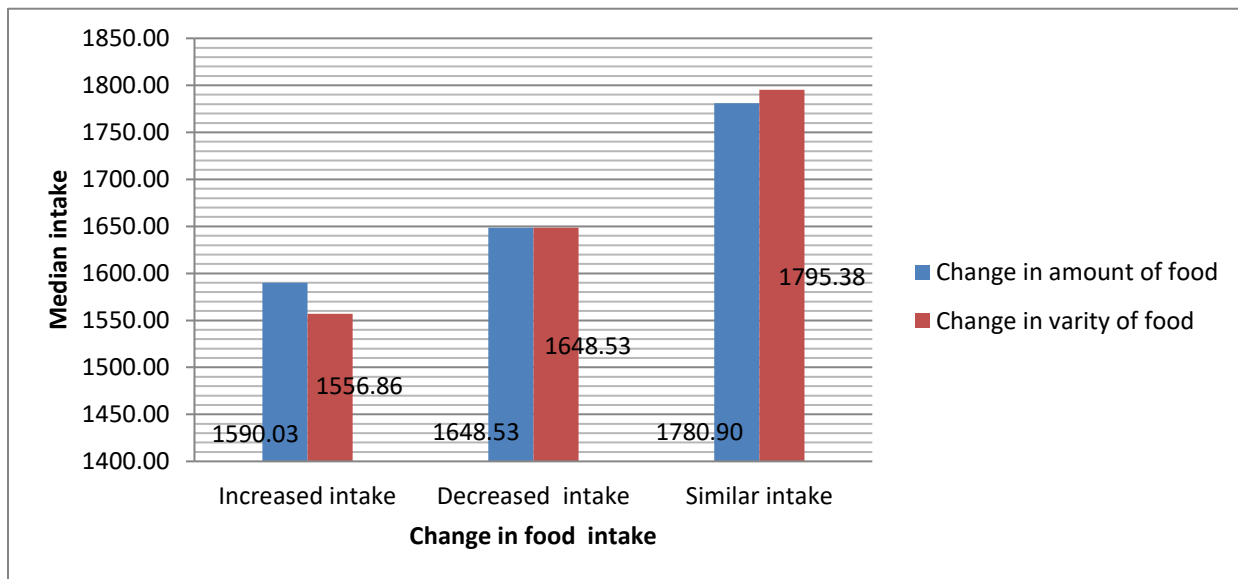


Figure 2 Median energy intake of pregnant women in comparing change in amount of food intake with change in variety of food intake in Butajira, Ethiopia, 2019

Regarding macronutrient intake women who reported decreased intake during pregnancy had median protein intake of 45.51 gm per day (35, 57.42), total fat of 23.93 gm per day (18.94, 30.32) and carbohydrate intake of 343.96 gm per day (248.21, 452.4). Whereas women who reported

similar food intake as pre-pregnancy state had a median protein intake of 47.67 gm per day (40.71,62.83), total fat of 24.75 gm per day (19.92, 31.52), and carbohydrate intake of 384.18 gm per day (292.4, 472.05).

Those women who reported having decreased intake of variety food had median intake of 45.95 gm per day protein (35.23, 56.74), 23.61 gm per day total fat (19.03, 30.31) and 346.24 gm per day carbohydrate (257.07, 463.69). While women reporting to have the same intake of variety food had median intake of 48.65 gm per day protein (40.74, 62.98), of 25.41 gm per day total fat (19.91, 32.06) and 375 gm per day carbohydrate (281.6, 443.66). (Table 3)

Table 3 Median and inter quartile ranges of energy and macronutrients among different groups of participants relative to change in amount of food and variety of food

	Energy (kcal)		Protein (g)		Fat (g)		Carbohydrate (g)	
	Median	(25%,75%)	Median	(25%,75%)	Median	(25%,75%)	Median	(25%,75%)
Total women	1693.26	(1318.54, 2173.88)	47.40	(35.58, 59.66)	24.97	(19.56, 31.11)	352.87	(262.11, 455.32)
Change in amount of food								
Women taking more amount	1590.03	(1086.51, 2486.11)	47.80	(25.76, 68.83)	28.71	(15.16, 34.59)	332.66	(204.15, 533.32)
Women taking less amount	1648.53	(1259.59, 2139.56)	45.51	(34.96, 57.42)	23.93	(18.94, 30.315)	343.96	(248.21, 452.40)
Women taking similar amount	1780.90	(1481.37, 2197.20)	47.67	(40.71, 62.83)	24.75	(19.92, 31.52)	384.18	(292.40, 472.05)
Change in variety of food								
Women taking more variety	1556.86	(927.29, 2236.41)	39.69	(25.37, 58.21)	24.13	(13.3, 34.11)	320.81	(186.88, 450.90)
Women taking less variety	1648.53	(1260.83, 2159.28)	45.95	(35.23, 56.74)	23.61	(19.03, 30.31)	346.24	(257.07, 463.69)
Women taking similar variety	1795.38	(1497.88, 2197.20)	48.65	(40.74, 62.98)	25.41	(19.91, 32.06)	375.00	(281.60, 443.66)

5.6 Physical activity

As indicated in Figure 3, majority (63.52%) of women in this area had excess vigorous physical activity than the recommended. Regarding sedentary time spent per day, the study participants had 5 hr. ($\pm$ SD 1.92) of mean sedentary time per day. About 88.84% participants had less than 8 hours of sedentary time per day while the rest 11.16% had greater than 8 hours of sedentary time per day.

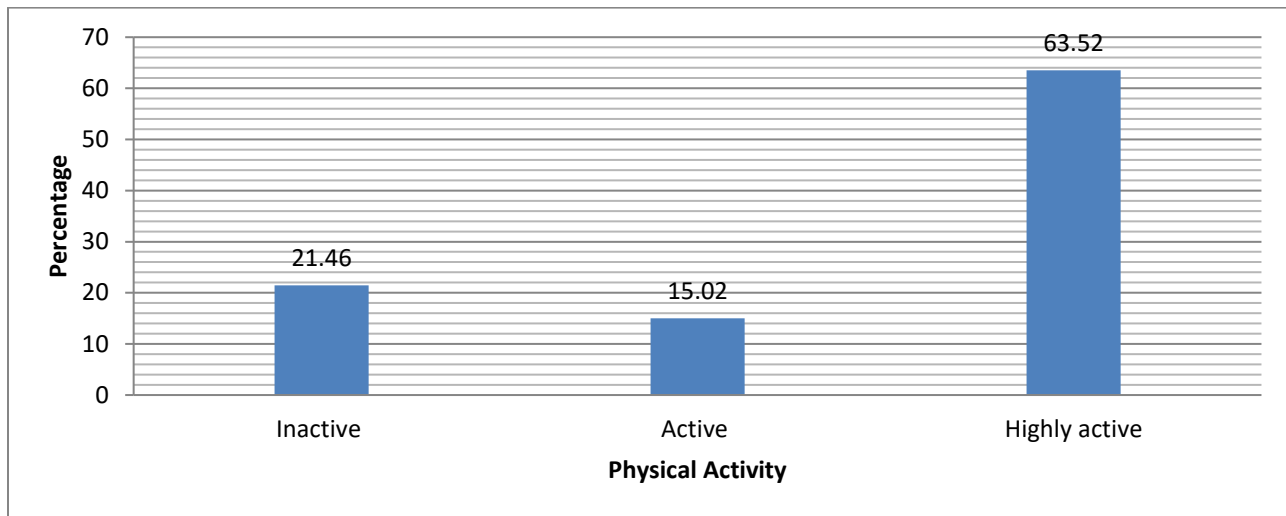


Figure 3 Physical activity of pregnant women in Butajira, Ethiopia, 2019

5.7 Assessment of Depression

As indicated in figure 4, 70.82 % women had no depression.

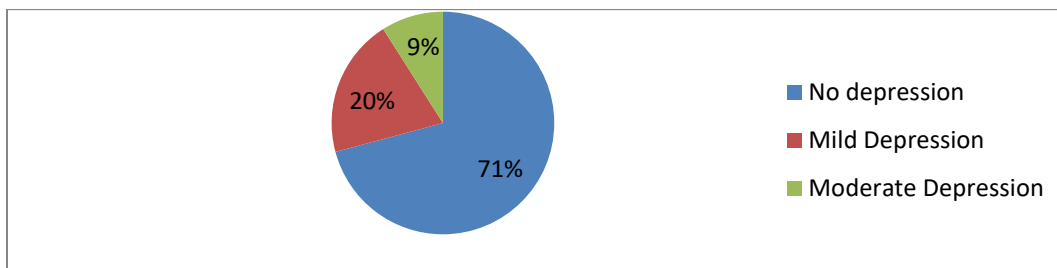


Figure 4: Depression status of participants in Butajira, Ethiopia, 2019

5.8 Pre pregnancy BMI

Women in this area had a mean early pregnancy BMI of 22.43 ($\pm$ SD 2.57). Out of the total 214 women majorities (82.71%) were with normal BMI whereas, only 3.74% were underweight.

5.9 Trimester specific weight gain

Out of the total 214 women with complete data for weight measurement 40.19% had inadequate weight gain. The other 44.39% and 15.43% of women had adequate and excess weight gain respectively. Women aged from 25-34 years had a higher frequency of inadequate weight gain than women aged from 15-24 years (58.1% versus 27.91%). Similarly, multigravid women had a higher frequency (61.63%) of inadequate weight gain than primigravid women (20.93%).

The initial rate of weight gain indicated that about 8.6% of women had decreased weight followed by 12.9% of women who have no change in their weight from their first measurement. The rest 78.5 % had increased weight from the first measurement with a mean of 1.5 kg per month ($\pm$ SD 0.87). The second rate of weight gain showed that about 1.29 % had decreased weight, 11.59 % had no change in weight the rest 87.12 % had increased weight.

Regarding women weight gain status in relation to their pre pregnancy BMI, from the total women who were underweight at conception 62.5% had inadequate weight gain while from the total women who were obese at conception 66.7 % had excess weight gain. (Figure 5)

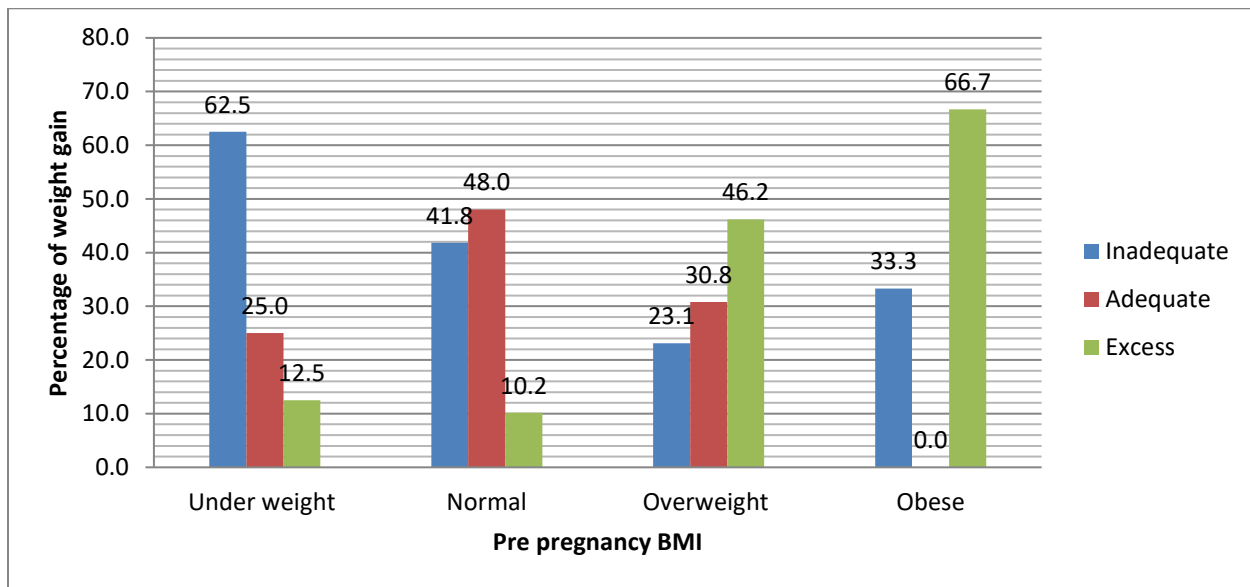


Figure 5 Percentage of inadequate, adequate and excess weight gain based on the pre pregnant BMI of women in Butajira, Ethiopia, 2019.

Regarding physical activity, women that are very active in vigorous activity had higher frequency (69.8%) of inadequate weight gain than both active (17.44%) and inactive (12.8%) women.

Furthermore, from women that reported to have decreased food intake about 65.12% had inadequate weight gain which is higher in frequency than women who have increased food intake and who took a similar amount (1.16% & 26.74%). (Table 4)

Table 4 Frequency and percentage of total weight gain status in relation to participants' age, gravidity, physical activity, and change in amount and variety of food in Butajira, Ethiopia, 2019. (n=214)

Variables	Total Weight gain		
	Inadequate	Adequate	Excess
	N (%)	N (%)	N (%)
Age			
15-24 yrs	24 (27.91)	25 (26.32)	4(12.12)
25-34 yrs	50 (58.14)	59 (62.11)	24(72.73)
>35 yrs	12 (13.95)	11 (11.58)	5(15.15)
Gravidity			
Primi-gravid	18 (20.93)	17 (17.89)	10(30.3)
Multi-gravid	53 (61.63)	57 (60)	16(48.48)
Grand multi-gravid	15 (17.44)	21 (22.11)	7(21.21)
Physical Activity			
Inactive	11 (12.79)	28 (29.47)	7(21.21)
Active	15 (17.44)	16 (16.84)	3(9.09)
Highly active	60 (69.77)	51 (53.68)	23(69.7)
Change in amount of food			
Taking more food	1 (1.16)	3 (3.16)	5(15.15)
Taking less food	56 (65.12)	43 (45.26)	13(39.39)
Taking same amount	23 (26.74)	36 (37.89)	14(42.42)
Change in variety of food			
Taking more variety food	2 (2.33)	5 (5.26)	5(15.15)
Taking less variety food	49 (56.98)	41 (43.16)	12(36.36)
Taking same variety	30 (34.88)	39 (41.05)	15(45.45)

5.10. Multinomial regression analysis

Multinomial logistic regression model with relative risk was used and significance level of 5% ($p < 0.05$) values was considered. In this study, the second category of the dependent variable, “Adequate weight gain” was taken as the reference category, while for the independent variables “taking more and same amount of food” category of the food intake change variables, “Inactive” category of the Physical activity variable, “ <8 hrs” category of the sedentary behavior variables, “No depression” category of depression variable, “Adequate intake” category of the energy intake category and “Normal weight” category of early pregnancy BMI was taken as the reference category and the results were interpreted accordingly.

After controlling the effect of covariates i.e., physical activity, sedentary behavior, depression, energy intake and early pregnancy BMI, the regression analysis showed a statistically significant association between change in amount of food intake and trimester specific weight gain. High vigorous activity was also found to have significant relation with gestational weight gain. Similarly decreased energy intake was associated with inadequate weight gain.

The multinomial regression analysis below in table 5 depicted the result when change in food intake is regressed on weight gain and others covariates. Food intake change, Physical activity, sedentary status, depression and energy intake were the factors that showed initial association during bivariate analysis where early pregnancy BMI was found to be associated with weight gain in different literatures.

Specifically, women who had decreased amount of intake are more likely to have inadequate weight gain relative to adequate weight gain than those who ate increased and same amount with a relative risk of 2.16 [ARR 2.16; CI: 1.05-4.45]. Similarly, those women with high activity had 4.7 times more risk for inadequate weight gain relative to adequate weight gain when compared to those who are inactive [ARR 4.7; CI: 1.85-11.8].

Women who had decreased energy intake than the recommended had a 2.76 greater risk of inadequate weight gain relative to adequate weight gain than those with adequate intake [ARR 2.76; CI: 1.06-7.19].

Table 5 Multinomial regression analysis result of food intake practice, Physical activity, sedentary status, depression and energy intake with inadequate weight gain during pregnancy, in Butajira, Ethiopia 2019. (Base outcome – Adequate weight gain)

Variable	Total weight gain						CRR (95%CI)	ARR (95%CI)	
	Inadequate		Adequate ^{RC}		Excess				
	N	%	N	%	N	%			
Food intake change									
Taking less food	56	50	43	38.39	13	11.61	2.1(1.1-4.03)	2.16(1.05-4.45) *	
Taking more and taking same amount ^{RC}	24	29.27	39	47.56	19	23.17	1	1	
Physical activity									
Inactive ^{RC}	11	23.91	28	60.87	7	15.22	1	1	
Active	15	44.12	16	47.06	3	8.82	2.39(0.88-6.43)	3.4(1.08-10.7) *	
Highly Active	60	44.78	51	38.06	23	17.16	2.99(1.36-6.6)	4.7(1.85-11.8) **	
Sedentary									
<8hrs ^{RC}	80	42.33	82	43.39	27	14.29	1	1	
>=8hrs	6	24	13	52	6	24	0.47(0.17-1.3)	0.6(0.2-1.9)	
Depression									
No ^{RC}	57	38.26	69	46.36	23	15.44	1	1	
Mild	22	50	15	34.09	7	15.91	1.77(0.84-3.74)	1.23(0.5-2.89)	
Moderate	7	33.33	11	52.38	3	14.29	0.77(0.28-2.12)	0.6(0.19-1.9)	
Energy intake									
Inadequate	78	43.82	71	39.89	29	16.39	3.3(1.4-7.8)	3.8(1.49-9.8) *	
Adequate ^{RC}	8	22.22	24	66.67	4	11.11	1	1	
Early Pregnancy BMI									
Under Weight	5	62.5	2	25	1	12.5	2.87(0.54-15.24)	2.6(0.4-17.9)	
Normal Weight ^{RC}	74	41.81	85	48.02	18	10.17	1	1	
Overweight & Obese	7	24.14	8	27.59	14	48.28	1.00(0.35-2.9)	0.7(0.2-2.2)	

*p-value < 0.05, **p-value < 0.01, CI: Confidence interval, CRR: Crude risk ratio & ARR: Adjusted risk ratio

6. Discussion

This study was conducted with the main aim of examining effect of dietary practice on gestational weight gain. This study revealed a considerable number of women have changed their dietary practice in terms of decreased food intake and with inadequate weight gain. It was also found that woman who decreased dietary intake was with higher risk to have inadequate weight gain.

This study found that about 51.5% pregnant women in the area practiced decreased amount of food intake. Those women who have decreased their amount of intake are more likely to have inadequate weight gain relative to adequate weight gain than those who have same and increased amount of intake with a relative risk of 2.16. Additionally, 34.8% reported to take similar amount of food as they used to take before they get pregnant. Similarly, those women with inadequate energy intake had 3.8 higher risk of inadequate weight gain than those with adequate intake. In addition, it was found that physically active women had higher risk of gaining inadequate weight gain when compared to those inactive women.

Taking decreased and taking similar amount during pregnancy as non-pregnant state was found to be 51.5% and 34.8% in our study respectively. The magnitude of decreased intake was lower than the study done in Bangladesh and India (75% and 54.4%) (85, 86) This difference might be caused since both studies considered additional causes beyond cultural reasons like illnesses and aversion (strong dislike) that occurred during their pregnancy. But the finding is supported with the studies done in Arsi zone and Abala district of Afar region which indicates intentional restriction of amount of food and variety of food due to fear of large baby which may lead to possible obstructed labor and with misperceptions towards gestational weight gain (73, 74). Similarly the study was also supported by a review from nine countries including Burkina Faso, Senegal, Nepal, Laos, India, Japan, Pakistan, and Indonesia where women were reported to have a deliberate decrease of food intake among pregnant women for fear of having big baby and enduring difficult labor (87). Our finding of taking same amount is lower than the study done in Shashemene where about 66.8% did not change the amount of intake from pre pregnant state. The difference may be explained with the cumulative assessment of dietary practice of women with decreased and taking similar amount

together. But regarding food restriction our result has comparable finding with the study done in shashemene and China (10, 68).

In this study around 40.19% pregnant women had inadequate weight gain. This finding is lower than the study done in Harari region where 69.3% were found to have inadequate gestational weight gain. This may be explained with the difference of measuring gestational weight gain since the later study measured total gestational weight gain from first till the last measured weight before delivery while our study measured trimester specific weight. Secondly, the difference may arise since significant proportion of women were underweight at conception in the study of Harari region where in contrary majority of our subjects were with normal weight at conception. Similarly the finding in this study is lower than the findings of inadequate weight gain of Uganda and Nigeria(88, 89). This discrepancy may arise from variation in population characteristics and gestational weight for the entire pregnancy were compared in both studies where in our study only trimester specific weight was compared. The other explanation might be due to methodological difference where the study in Nigeria categorizes subjects based on BMI category of IOM 1990 which considered BMI <19.8 as underweight, 19.8-26 as normal weight, 26.1-29 as overweight and BMI>29 as obese whereas, the current study used the WHO classification. This might cause pre pregnant BMI misclassification of subjects as underweight, normal, overweight and obese women. Again, there was high loss to follow up in the Nigerian study which may overestimate the finding.

The current study has also lower magnitude of inadequate weight gain than the study in Malay where the magnitude of gestational weight gain was 64.4%. This difference may be explained by methodological difference first, where the current study is a follow up study where the actual weight of subjects was measured and followed prospectively which may help to detect the actual weight difference between the last and first measured weights in the specific trimesters. Whereas the later study calculated rate of gestational weight gain by dividing the difference of two measured weight by the gestational age of subjects which only indicate the rate at which the subjects are gaining till the measurement day. Secondly, the discrepancy may be explained with the difference of sample size in the two studies (63). However our result of inadequate weight gain has comparable finding with the study done in Cameroon (90).

In contrary a systematic review and Meta analysis across USA, Europe and Asia showed very low inadequate weight gain than the current study. This difference is observed since pregnant women in developed countries enter pregnancy being overweight or obese which may lead to excess weight gain since early pregnancy BMI is highly correlated with gestational weight gain(91).

Regarding the association between food restriction and gestational weight gain, the current study showed significant association between reduction of amount of food and gestational weight gain. Whereas there was not significant association between food variety restriction and gestational weight gain. This finding of absence of association was consistent with the study finding of Hadiya zone, Ethiopia (14). In contrary the study done in Malay showed positive association between food avoidance and gestational weight gain (63). This difference in association might be explained first due to cultural difference where in the current study area reducing amount of food is especially practiced than restricting in taking variety of food. Secondly in the Malay study pre pregnant weight was based on participant's recall which may lead to recall bias. Though there is a limited literature that showed the association between amount of food reduction and gestation weight gain the finding of this study on the positive association of food restriction and gestational weight gain is consistent with the study done in an experimental study done in Nigeria where significant difference in gestational weight gain was observed between experimental group with nutrition counseling of appropriate kind and amount of food and control group with restricted food intake (92).

A deliberate aversion of food intake has influence on food choice of the women which may lead to practice of food restriction which further have impact on gestational weight gain and having inadequate weight gain during pregnancy may have adverse consequences for both the mother and the fetus. The current study also found that women with decreased energy intake were with higher risk of inadequate weight gain. It was also found that women reporting to reduce amount of food has 132.4 kcal lower median energy intake per day than women that reported to take similar amount during their pregnancy. While in contrary no difference of energy intake was observed between women who have food restriction and who do not in a study done in China (93). This may be explained by the presence of varied food categories and cuisine in China which may provide adequate alternatives to meet a balanced diet whereas the absence of varied type of food in

developing countries may affect the energy intake if some types of food items are avoided or reduced. This finding was consistent with the Tanzania and Germany studies. The Tanzanian study showed 6 gm/month increase in weight for every 100 kcal daily increase in total energy intake while 195 gm increase in weight for every increase in 100 Cal of energy was seen in the study done in Germany (94, 95).

Our other finding showed that women who were active had 3.4 times more risk and who were highly active had 4.7 times more risk for inadequate weight gain relative to adequate weight gain when compared to those who are inactive [ARR 3.4; CI: 1.08-10.7 & 4.7; CI: 1.85-11.8]. Another study done in the area showed that women in the area had higher physical activity and were prone to low birth weight (96). This result is supported with a review which indicated optimal level of physical activity have positive impact on optimal weight gain and preventive of excessive gestational weight gain where also high level exercise have negative impact resulting in SGA by interfering with oxygen and nutrient delivery to the placenta(97). Similarly a meta-analysis done of intervention trials showed less gestational weight gain in the intervention groups comparing to the control groups (47). Conversely it has different finding with the study done in Hispanic population which showed no association of physical activity with gestational weight gain (98). This variation might be due to difference in the intensity and duration of physical activity of women to impact gestational weight gain(97, 98).

Our result regarding pre-pregnancy BMI did not show any association with inadequate gestational weight gain. This finding differed from studies done in Malawi, Brazil and Canada. ((27,29,39)) This discrepancy might be resulted since majority of the current study participants had normal weight at conception and small proportion of women were underweight, overweight and obese making it difficult to show the association during the analysis. Though the current result did not show an association, a substantial number of women who were underweight before pregnancy were found to have inadequate gestational weight gain though they are expected to gain more as per the recommendation. Similarly, many women in the current study who were overweight and obese before pregnancy were found to have excess gestational weight gain. The reason behind this is wide-ranging of the women in the area (83%) failed to meet the energy intake recommendation

which is the major factor and that is highly correlated with weight gain. As to the energy source is similarly may affect the amount of weight gained by the pregnant women (83).

This study tried to address critical area which needs great attention especially in developing countries. The use of prospective study design is one of our strong sides since it helped to detect cause-effect relationship between dietary practice and gestational weight gain. The control of possible confounders like physical activity, depression and substance use was the other strength of the study. This helped to see more appropriate estimate of the true association. Additionally, recruitment of women based on early ultrasound detected gestational age to participate in study and the use of standardization protocol on each weight measurement helped in precise and accurate measurements and comparison of gestational weight gain with the standard institute of medicine recommended weight gain.

The findings of this study have to be seen in light of some limitations. First, weight before pregnancy was sought from ANC records for some subjects. These could cause pre pregnancy BMI misclassification of these subjects since weight measurement was done with different practitioners who was not trained and with the use of non-calibrated instrument. Secondly, the use of single day 24 hr. recall in order to control energy intake as a confounder was another limitation. This might have influenced the result in over/under estimation of energy intake since within person and person to person variation could not be identified. Finally genetic factor and other pre-existing medical conditions were not addressed in this study as it may confound the result related to gestational weight gain.

7. Conclusion and recommendation

7. 1. Conclusion

In conclusion this study found that dietary practice specifically decreased intake is practiced by a significant number of women and more prevalently, women in the area have decreased energy intake where also quite high inadequate weight gain was also identified. Women having decreased

intake, inadequate energy intake and, having vigorous physical activity are at higher risk of inadequate weight gain.

7.2 Recommendation

For health care professionals

In ANC services, Health professionals should strengthen gestational weight gain monitoring in all pregnant women and it should be subsequent for those with inadequate weight gain since it is critical in order to have good outcome of both the mother and the fetus. Practice of deliberate reduction of food intake and the physical activity level of the women should be considered in the nutrition advices provided aiming in behavioral change among pregnant women in the area.

For programmers

Heath promotion programmers working on maternal and child health shall plan intervention programs considering possible implication of deliberate reduction of food intake with the ultimate goal of preventing inadequate gestational weight gain in the area.

For researchers

Further longitudinal study including the whole pregnancy period is needed to verify cause and effect relationship of changed dietary practice and weight gain during pregnancy, and further determination of macro and micronutrient level of pregnant women in the area is required since good outcome of the fetus and women is determined via both macro and micro nutrient intake.

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Annex

Annex 1 English format of Information sheet for participants

My name is _____. I am here to have an interview with you on behalf of Bezawit worku, a year II Master of public health nutrition student at Addis Ababa University. She is currently working on dietary changes that are commonly practiced among pregnant women in this area. The main aim of this study is to assess the effect of dietary practice on their weight gain. This knowledge will help the community and the pregnant women in which it will be a base for interventions such as culture sensitive nutrition counseling in the area. We would appreciate your participation in this survey very much. If you agree to participate, I will ask you questions about basic information about you, your family and your pregnancy, your dietary history during your pregnancy and your dietary practices during your current pregnancy. After you finish your interview, you will be weighted and this weight measurement will be repeated monthly for three months. For the interview part, there is no right or wrong answer to each question. Whatever information you provide will be kept strictly confidential by using codes and will not be shown to other individuals. Your contact information like phone Number will be taken as a follow up for your consequent visits. Your Participation is voluntary, and you can choose not to participate now or at any time during our interview. However, we hope that you will actively participate in this study since the insights and data we get from you are very important. The interview will take only about 20-30 minutes of your time. You will not have any direct incentives by participating and your participation or non-participation in the study will not influence the type of care to be rendered.

Do you have any questions? If you have, you can contact the Principal Investigator Bezawit worku by (0910 51 17 67). At this time, do you want to ask me anything about the survey? (If yes answer her questions politely)

Annex 2 English format of Informed consent

May I begin the interview now? (Circle) 1 = Yes 2 = No (Thank her for her time and end the interview).

Signature of participant: _____ Date: _____

Name & Signature of interviewer: _____ Date: _____

Name & Signature of Supervisor: _____ Date: _____

Annex 3 English Questionnaire

Date of interview	____/____/____
Household ID	_____
Name of the Kebele	_____
Name of the Gott	_____
Phone number	_____
Place of ANC Visit (Name of the facility)	_____
Name of Data collector	_____
Interviewers' ID	_____
Supervisors' ID	_____
Weight of the women in her first ANC visit (Only before 12 wks.) NB: please review the chart of the women for weight in the first visit	. kg
Outcome of this interview	1. Complete 2. Incomplete 3. Refused

Part 1: Socio demographic and economic characteristics

I would like to ask you a few questions about you and your partner

Number	Question	Responses	Variable name
101.	In what month and year where you born?	Month..... Don't know month 9999 Year..... Don't know year..... 99	WMONTH WYEAR
102.	How old are you now? COMPARE AND CORRECT AND /OR IF INCONSISTENT	____years	WAGE
103.	What is the highest level of school you attended?	Primary (1-8)..... 1 Secondary (9-12)..... 2 College/university 3 Read and write 4 Illiterate 5	HEDUTION

104.	What is your religion?	Orthodox Christian 1 Islam 2 Protestant 3 Catholic Widowed 4 Other (specify) 99 	WRELIGION
105.	To which ethnic group do you belong?	Oromo 1 Amhara 2 Gurage 3 Tigray..... 4 Afra 5 Silete 6 Other (specify) 99____ 	WETHNIC
106.	What is your occupation?	Farmer and housewife..... 1 Housewife 2 employee/private 3 Student 4 Merchant 5 Local drink seller 6 Commercial sex worker 7 Maid servant 8 Daily laborer 9	WOCCUPATI

		Unemployed 10 Farmer and merchant 11 Other (specify) 99 	
107.	What is your marital status?	Currently married 1 Separated 2 Divorced..... 3 Widowed..... 4 Never married..... 99	WMARITAL If 2,3,4,99 Go to 211
108.	How old is your partner?	_____ years	PAAGE
109.	What is your partner/husband educational status? (Highest level of school attended)	Primary (1-8)..... 1 Secondary (9-12)..... 2 College/university 3 Read and write 4 Illiterate 5	PAEDCUATI

110.	What is your partner/husband occupation?	Farmer 1 employee/private 2 Student 3 Merchant 4 Daily laborer 5 Unemployed 6 Other (specify) 99____ _____	PAOCCUPAT
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I am going to ask you questions about your household and related conditions.

Number	Question	Responses	Variable name
111.	Main construction material used for the floor: CIRCLE ALL THAT APPLY	<u>Natural floor</u> Earth /sand11 dung12 <u>Rudimentary floor</u> Wood planks21 Bamboo.....22 <u>Finished floor</u> Polished wood or parquet31 Ceramic tiles32 Cement33	HFLOOR

		Carpet34 Other (specify).....99 	
112.	Main construction material used for the roof: CIRCLE ALL THAT APPLY	<u>Natural roofing</u> Thatch/leaf/mud11 <u>Rudimentary roofing</u> Plastic21 Bamboo.....22 Wood planks23 <u>Finished roofing</u> Corrugated iron/metal.....31 Wood32 Cement/concrete33 Other (specify).....99 	HROOF
113.	Main construction material used for exterior walls: CIRCLE ALL THAT APPLY	<u>Natural walls</u> No walls11 Cane/Trunks/Bamboo/Reed12 Dirt13 <u>Rudimentary walls</u> Wood with Mud21 Stone with mud22	

		Card board23 <u>Finished walls</u> Stone with lime/cement31 Bricks32 Wood planks/shingles33 Other (specify).....99	
114.	What kind of toilet facility does your household have? [INTERVIEWER: LIMIT TO ONE RESPONSE; IF TWO TYPES ARE MENTIONED, RECORD THE TYPE CLOSEST TO THE TOP OF THE LIST]	<u>Flush toilet</u> Flush to septic tank11 Flush to Pit latrine12 Flush to somewhere else13 <u>Pit latrine</u> Traditional pit toilet21 Pit latrine with slab22 Pit latrine without slab23 Ventilated improved pit latrine24 Composting toilet25 No facility/bush/field31 Other (specify)99	HTOILET

115.	What is the main source of drinking water for members of your household? [INTERVIEWER: BE SURE OF THE SOURCE OF “PIPED WATER”. IF THE ANSWER IS “PIPED WATER” CHECK THE SOURCE AND CIRCLE THE APPROPRIATE CODE]	<u>Piped water/supply water</u> Piped inside dwelling11 Piped to yard/plot.....12 Public tap13 <u>Water from spring</u> Protected well/spring21 Unprotected well/spring22 <u>Water from Dug well</u> Protected well31 Unprotected well.....32 <u>Surface water</u> Pond/lake/River/stream/spring/Dam..51 <u>Rain water</u>.....61 <u>Tanker truck</u>.....71 <u>Vendor</u>81 <u>Bottled water</u>.....91 No fixed facility96 Other (specify)99 _____	HWATER

116.	Tell me, please, if your home has: [INTERVIEWER: CIRCLE ALL THAT APPLY]	Electricity1 Watch/clock2 Radio.....3 Television4 Mobile Telephone.....5 House Phone6 Refrigerator Chair8 A bed with cotton/Sponge/Spring mattress9 Electric Mitad10 Kerosene Lamp/pressure11 Solar12 Flash light that works with battery13	HELECTRIC HWATCH HRADIO HTELEVISION HMOBILE HPHONE HFRIGE HCHAIR HBED HMITAD HLAMP
117.	What type of fuel does your household mainly use for cooking? [INTERVIEWER: ALLOW MULTIPLE ANSWERS]	Electricity1 LPG/natural gas2 Biogas3 Kerosene4 wood5 Charcoal.....6 Straw/shrubs/grass7 Animal Dung8	HFUELELECT HFUELGAS HFUEL BIO HFUELKERO HFUELWOO HFUELCHAR HFUELGRAS HFUELDUN

		Agricultural crop.....9 Other (specify).....10 _____	HFUELCROP HFUELOTHE
118.	Do you have a separate room which is used as a kitchen?	No1 Yes2	HKITHCEN
119.	Does any member of the house hold own the following? [INTERVIEWER: CIRCLE ALL THAT APPLY]	Bicycle.....1 Motorcycle/scooter/Bajaj.....2 Animal drawn cart3 Car/Truck.....4	HBICYCLE HMOTOR HCART HCAR
120.	How many (LOCAL UNITS) of agricultural land do members of this household own? LOCAL UNITS _____ (SPECIFY)	Local units _ _ Don't have00	HLANDSIZE
121.	How many of the following animals do you keep? (INTERVIEWER: IF HOUSEHOLD DOES NOT OWN A PARTICULAR ITEM, RECORD "00" AGAINST THAT ITEM.)	a) Milk cows, oxen or bulls..... _ _ b) Chickens _ _ c) Goats..... _ _ d) Sheep _ _ e) Horses, donkey, or mule _ _ f) Beehives _ _	HCOWS HCHICEKEN HGOATS HSHEEP HHORISE HBEEHIVES

122.	Does any member of the hold have a bank or microfinance saving account	No0 Yes1	HSAVING
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Part 2: Substance use during pregnancy

201.	Do you drink <i>tella</i> or <i>Areke</i> (local drinks) or <i>Beer</i> in this pregnancy? (please specify the type of drink here ([____]))	Yes1 No.....0 → Go to 205 Don't Remember.....99 → Go to 205	
202.	Do you drink [mention drink] every day during this pregnancy?	Yes.....1 No.....0 Don't Remember.....99	
203.	If yes, how many [units/bottle] per day?	[____] units/bottle per day	
204.	If yes, how many [units/ bottle] per week/month?	[____] units/bottle per week [____] units/bottle per Month Don't Know.....99	
205.	Do you chew khat during this pregnancy?	Yes1 No.....0 → Go to 209 Don't Remember.....99 → Go to 209	
206.	Do you chew khat every day during this pregnancy?	Yes1 No.....0 Don't Remember.....99	
207.	If yes, how much [local unit] per day?	[____] [local unit] per day	
208.	If no, how much [local unit] per Week?	[____] [local unit] per week	
209.	Have ever smoked cigarettes?	Yes.....1 No.....0 → Go to 212	

		Don't Remember..... 99 →Go to 212	
210.	Do you currently smoke cigarettes?	Yes.1 No 0 Don't Remember..... 99	
211.	In the last 24 hours, how many cigarettes did you smoke?	[][] CIGARETTES	
212.	Is there any family member who smoke cigarettes?	Yes1 No 0 Don't know.....99	

Part 3: Obstetric history

I am going to ask you about your previous pregnancies and health. Please respond to the following questions about you yourself. (Skip if it is first pregnancy)

	Question	Responses	Skip
301.	Now I would like to ask about all the pregnancies you have had during your life. During your life how many times have you been pregnant? (Including those that did not end with a live births), record "00" if none	[] times If "00" go to 305	
302.	Now I would like to ask about all the births you have had during your life. During your life how many times have you given live birth? <i>[I mean, to a child who ever breathed or cried or showed other signs of life – even if he or she lived only a few minutes or hours], record "00" if none)</i>	[] times Don't Know.....99	
303.	Have you ever had abortion/pregnancy terminated before 28 weeks of gestation?	Yes1 No 2 →Go to 305 Don't Know.....99 →Go to 305	
304.	During your life how many times have you had abortion/pregnancy terminated before 28 weeks of gestation?	[] times Don't Know.....99	
305.	For how many weeks have you been pregnant? (Prompt with date of last menstrual period)	_____ weeks	
306.	Did you see anyone for antenatal care during this pregnancy?	Yes 1 No 0 →Go to part 4	
307	How many times did you receive antenatal care during this pregnancy?	Number of times []	

Part 4: Dietary practice during Pregnancy

	Question	Pregnant?	Variable name
401.	In your area, are there traditional practices that prohibit pregnant or breastfeeding women from taking some foods or types of foods?	1=yes 0=no →Q409 98 = don't know →Q409	FDTABOBF FDTABOLAC

402.	In your area, are there traditional practices that encourage pregnant women to eat <u>more</u> of certain foods?	1=yes 0=no→Q413 98 = Don't know →Q413	FDTABMORE
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	Question	Response	Variable name
403.	How has the <u>amount</u> of your food you eat changed after you became pregnant?	1. I eat more food than normal 2. I eat less food than normal 3. The amount of food I eat has not changed 4. Don't know	FTAMTCHANG
404.	How has the <u>variety</u> of foods in your diet changed after becoming pregnant?	1. I eat more types of food than normal 2. I eat less types of food than normal	FTVARCHG
		3. I eat the same foods as normal 4. Don't Know	

Part 5: Dietary History

24-hour dietary recall quick food list record form

1. Quick food list form

I would like to ask you about the types of foods that you ate over the past 24 hours, from sunrise yesterday to sunrise today.

Occasions	Place of intake	Type and list of food
Morning before breakfast		
Breakfast		
After breakfast		
Lunch		
After lunch		
Snack		
After snack		
Dinner		
After snack		
Dinner		
Over night		
Out of home		
While the mother preparing food /working other activities		

2. Description of food and ingredients

Food or drink	Description and cooking method	Amount prepared (using equipment)	Amount eaten (using equipment)	Weighted equivalent (In gram)
	Ingredient and cooking method List of ingredients and their amount			
	Ingredient and cooking method List of ingredients and their amount			
	Ingredient and cooking method List of ingredients and their amount			
	Ingredient and cooking method List of ingredients and their amount			
	Ingredient and cooking method List of ingredients and their amount			
	Ingredient and cooking method List of ingredients and their amount			
	Ingredient and cooking method List of ingredients and their amount			
Probe for alcohol: 1. Yes 2. No		Probe for sickness: 1. Yes 2. No If yes, did sickness affect appetite? 1. Yes 2. No If yes, how? 1. Increase 2. Decrease		
Was food intake unusual? 1. Yes 2. No If yes, how was it unusual?		Probe for tablets: 1. Yes 2. No If yes 1. Iron 2. Vitamins 3. Other supplements 4. Anti-malaria		
Was it a feast day? 1. Yes 2. No Was it a market day? 1. Yes 2. No Was it a fasting day? 1. Yes 2. No				

Part 6: MODIFIED GLOBAL PHYSICAL ACTIVITY QUESTIONNAIRE

READ: I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.

Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, Terracing, fishing, seeking employment. [Insert other examples if needed]. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

NB: (interviewer: Please ask the questions carefully and fill up the boxes appropriately)

Code	Questions	Response	Skip
P1	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work] for at least 10 minutes continuously?	Yes1 No.....2	If no go to P2
P1A	Please note the number of days a week and time spent each day on the following activities listed below which are considered to be vigorous. Consider only those activities that are carried out by you in a typical week		
P1A	Activities (vigorous - intensity PA)	Number of days a week	Time spent in a day
P1A1	Carrying, loading or stacking wood		hrs. : mins
P1A2	Drawing water from the well, river and bringing water from another house		hrs. : mins
P1A3	Manual grinding		hrs. : mins
P1A4	Pounding grains		hrs. : mins
P1A5	Chopping wood-splitting logs		hrs. : mins
P1A6	Manual crushing		hrs. : mins
P1A7	Ploughing or digging		hrs. : mins

P1A8	Weeding		hrs. : mins
P1A9	Mowing		hrs. : mins
P1A10	Threshing		hrs. : mins
P1A11	Terracing		hrs. : mins
P1A12	Any other..... (Please specify)		hrs. : mins
Code	Questions	Response	
P2	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously?	Yes.....1 No2	If No go to P3
P2A	Please note the number of days a week and time spent each day on the following activities listed below which are considered to be moderate. Write aside only those activities that is carried out by you in a typical week		
P2A	Activity (moderate intensity P A)	Number of days a week	Time spent in a day
P2A1	Washing clothes		hrs. : mins
P2A2	Washing dishes		hrs. : mins
P2A3	Sweeping floor (inside or outside house)		hr. : mins
P2A4	Mopping floor (bend on knees and using hand)		hrs. : mins
P2A5	Drawing and bringing water from outside tap		hrs. : mins
P2A6	Animal care: feeding animals, washing animals, cleaning animal house, etc.)		hrs. : mins
P2A7	Walking to bring grass, leaves, etc. for feeding animals		hrs. : mins
P2A8	Milking cow		hrs. : mins
P2A9	Gardening: watering plants, pruning, sowing seeds, cleaning, etc.		hrs. : mins

P2A10	Patient and elderly care		hrs. : mins
P2A11	Tailoring		hrs. : mins
P2A12	Child care-standing, dressing, bathing, grooming, feeding and occasional lifting of the child		hrs. : mins
P2A13	Cooking or food preparation, baking injera, bread		hrs. : mins
P2A14	Shopping and carrying packages		hrs. : mins
P2A15	Any other..... (Please specify)		hrs. : mins

Travel to and from places

The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you the usual ways you travel to and from places.

Code	Questions	Response	
P3	Do you walk for at least 10 minutes continuously to get to and from places?	Yes.....1 No2	If no, go to P 4
P3A	Activity	Number of days a week	Time spent in a day
P3A1	To work		Hrs. : mins
P3A2	To market		hrs. : mins
P3A3	To shops		hrs. : mins
P3A4	To bring children from school		hrs. : mins
P3A5	To see friends, relatives or others		hrs. : mins
P3A6	To church or mosque		hrs. : mins
P3A7	Another..... (Please specify)		hrs. : mins

Recreational activity

READ: The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure)

P4	Do you do any vigorous-intensity sports, fitness or recreational (leisure)	Yes1 No2	If no, go to P7
----	--	-------------------------	-----------------

	activities that cause large increases in breathing or heart rate like [running] for at least 10 minutes continuously?		
P5	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?	Number of days	
P6	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours: hrs. Minutes: mins	
P7	Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that causes a small increase in breathing or heart rate such as brisk walking, swimming for at least 10 minutes continuously?	Yes.....1 No.....2	If No go to P10
P8	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities	Number of days	
P9	How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	Hours: hrs. minutes: mins	
Sedentary behavior			
READ: The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent [sitting at a desk, sitting with friends, travelling in car, bus, train, reading, playing cards or watching television], but do not include time spent sleeping.			
P10	How much time do you usually spend sitting or reclining on a typical day?	Hours: hrs. minutes: mins	

Part 7: Assessment of Depression

1. Over the past two weeks how often have you been bothered by any of the following problems (use ✓ to indicate your answer)				
	Not at all	Several days	More than half the days	Nearly every day
1 Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling staying asleep or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself or that you are a failure or having let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading a newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3
Add columns				
Total				

2.If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	Not difficult at all _____
	Somewhat difficult _____
	Very difficult _____
	Extremely difficult _____

Part 8: Anthropometric measurement

No	Measurements		Reading	Code
801	Height in centimeters			
802	Weight measurement in kilogram	1 st		
		2 nd		
		3 rd		

Annex 4 Amharic format of Information sheet for participants

የመጠየቂያ መረጃ ቅፅ

ስሜ _____ ይባላል። የመጣሁት በአዲስ አበባ ዩኒቨርሲቲ የሁለተኛ አመት የስነ ምግብ ህብረተሰብ ጤና ሳይንስ ተማሪ የሆነችውን ቤዛዊት ወርቁን ወክሎ ቃለ መጠይቅ ለማድረግ ነው። የሁለተኛ ዲግሪ የመመረቂያ ፅሁፉን የምትሰራው በዚህ አካባቢ በተለምዶ ነፍሰጡር ሴቶች እንዳይመጡ የሚመከሩት የምግብ አይነቶች ላይ ነው። የዚህ ጥናት ዋነኛ አላማ በነዚህ ምግቦች መከልከል ምክንያት የሚመጣውን በእርግዝና ወቅት ያለ የኪሎ ለውጥ ማየት ነው። : በዚህም ውጤት ላይ በመመስረት በዚህ አካባቢ ለሚሰሩ የጤና አገልግሎቶችን የጤና ምክሮች ለመወሰን ይረዳል። በዚህ ጥናት ውስጥ ቢሳተፉ በጣም ደስ ይልኛል። ፈቃደኛ ሆነው ለመሳተፍ ከወሰኑ ስለ እረስዎ፣ ቤተሰብዎ እና ስላለፉትም ሆነ ስለ አሁኑ እረግዝናዎ አመጋገብ ሁኔታ ጥያቄዎችን እጠይቃለሁ። ቃለመጠይቁንም ካጠናቀቅን በኋላ ከብደትዎን እንለካለን። ይህም በየወሩ የሚደጋገም ሲሆን ለሶስት ወራትም ይቆያል። በመጠየቁ ወቅት ትክክል ወይም ስህተት መልስ የለም። ሁሉም የሚሰጡት መረጃ ፍፁም ሚስጥራዊነቱ የተጠበቀ ነው። ለሁለተኛ ቀጠሮአችን ይረዳን ዘንድ የስልክ ቁጥሮችን እንወስዳለን። ተሳትፎዎም በርስዎ ፈቃደኝነት ላይ የተመሰረተ ነው። አሁንም ሆነ በማንኛውም ሰአት መጠይቁን የማቆም መብትዎ የተጠበቀ ነው። ይህ ቃለ መጠይቅ ከ 20-30 ደቂቃ ሊፈጅ ይችላል። በጥናቱ በመሳተፍዎ የሚያገኙት ምንም አይነት ቀጥተኛ ጥቅም ባይኖርም ባለመሳተፍዎ ግን የሚደርስብዎት ጫናም ሆነ የአገልግሎት መጋደል የለም።

ጥያቄ አለዎት? ስለ ጥናቱ ጥያቄ ወይም ተጨማሪ መረጃ ከፈለጉ በዚህ አደራሻ መጠየቅ ይችላሉ።

ስም፣ቤዛዊት ወርቁ

ስልክ ቁጥር፣0910 51 17 67

በአሁኑ ሰአት ስለ ጥናቱ ጥያቄ አለዎት (መልሱ አዎ ከሆነ ጥያቄዉን በትህትና ይመልሱ።)

Annex 5 Amharic format of Informed consent

የስምምነት መጠየቂያ/ማረጋገጫ ቅፅ

ከላይ በተሰጡት መረጃ መሰረት መጠይቁን አሁን መጀመር እችላለሁ

1 አዎ (ቃለመጠይቁ ይቀጥል)

2 አይደለም (አመስግነህ/ሽ ወደ ሚቀጥለው ተሳታፊ አለፍ)

የተሳታፊው ፊርማ _____ ፊርማ _____

ቃለመጠይቅ አድራጊው ስም _____ ፊርማ _____

የተቆጣጣሪው ስም _____ ፊርማ _____

Annex 6 Amharic questionnaire

ቃለመጠይቅ የተካሄደበት ቀን ____/____/____	
የቤት ቁጥር _____	
ቀበሌ _____	
ጎጥ _____	
ስልክ ቁጥር _____	
ክትትል የሚደረግበት ተቋም ስም _____	
የካርድ ቁጥር _____	
የጠያቂው ስም _____	
የጠያቂው ኮድ _____	
የተቆጣጣሪው ኮድ _____	
የተሳታፊዎ የመጀመሪያ ኪሎ ልኬት (ከ 12 ሳምንት በፊት የተለካ ብቻ) ☐ ☐ ☐ . ☐ ኪ.ግ	
እባክዎ የተሳታፊዎን የክትትል ካርድ በማየት ይመሉ	
የመጠይቁ ውጤት	1. የተሟላ 2. ያልተሟላ 3. ያልተሰማመ

ክፍል1: አጠቃላይ የቤት እና የኑሮ ደረጃ መለኪያ

ስለ እርሶ እና ስለ ባለቤቶች የተወሰነ ጥያቄ ልጣይቆት አወዳለሁ

ቁጥር	ጥያቄ	መልስ	የመለያስም
123.	በምን ወር እና አመት ምህረት ነበር የተወለዱት?	ወር..... ወሩን አላውቀውም..... 9999 አመት ምህረት..... ዓ.ምቱን አላውቀውም..... 99	WMONTH WYEAR
124.	አድሜዎት ስንት ነው? በማነፃፀር የማይጣጣም ከሆነ/ስህተት ካለው ይታረም	_____ አመት	WAGE
125.	የተማሩት ከፍተኛ የትምህርት ደረጃ የትኛው ነው?	የመጀመሪያደረጃ(1-8) 1 ሁለተኛደረጃ(9-12)..... 2 ኮሌጅ/ዩኒቨርሲቲ..... 3 ማንበብ እና መጻፍ 4 ያልተማረ..... 5	HEDUTION
126.	ሐይማኖትዎ ምንድን ነው?	ኦርቶዶክስ..... 1 ሙስሊም..... 2 ፕሮቴስታንት 3 ካቶሊክ 4 ሌላ (የገለጽ) 99	WRELIGION
127.	የየትኛው ብሄረሰብ አባል ኖት?	ኦሮሞ 1 አማራ..... 2	WETHNIC

		ጉራጌ..... 3 ትግራይ..... 4 አፋር 5 ስልጤ..... 6 ሌላ (የገለጽ) 99	
128.	የስራዎ አይነት	አርሶአደር እና የቤትአመቤት..... 1 የቤት አመቤት..... 2 የግል 3 ተማሪ 4 ካጋዴ 5 የመጠጥ ሻጭ..... 6 ሴተኛ አዳሪ 7 የቤት ሰራተኛ 8 የቀን ሰራተኛ 9 ስራ ፈላጊ..... 10 ግብርና እና ካጋዴ 11 ሌላ (ይገለጽ) 99	WOCCUPATI
129.	የጋብቻ ሁኔታ?	በአሁኑሰአትበትዳርላይያሉ..... 1 የተለያዩ..... 2 የተፋቱ..... 3 ባለቤታቸውየሞተባቸው 4	WMARITAL →ጥ211 →ጥ211 →ጥ211 →ጥ211

		በጭራሽአግብተው የማያውቁ/ያላገቡ 99	
130.	የባለቤቱ እድሜ ስንት ነው?	_____ አመት	PAAGE
131.	የባለቤትዎ ከፍተኛ የትምህርት ደረጃ የትኛው ነው?	የመጀመሪያደረጃ(1-8) 1 ሁለተኛደረጃ(9-12) 2 ኮሌጅ/ዩኒቨርሲቲ 3 ማንበብ አናመጻፍ 4 ያልተማረ 5	PAEDCUATI
132.	የባለቤትዎ ስራ አይነት ምንድን ነው?	አርሶአደር 1 የግል 2 ተማሪ 3 ነጋዴ 4 የቀንሰራተኛ 5 ስራፈላጊ 6 ሌላ (ይገለጽ) 99 _____	PAOCCUPAT

አሁን በመቀጠል ደግሞ ስለቤትሽ ሁኔታ እና ስለተያያዥ ነገር እጠይቅሻለሁ

ቁጥር	ጥያቄ	መልስ	የመለያስም
133.	ለቤቱ የወለል ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው? የተሰራበትን ሁሉ ያክብቡ	<u>ባህላዊ ወለል</u> አፈር11 የከብት ውዳቂ12 <u>ያላለቀ ወለል</u> የእንጨት ድርድር.....21 ቀርከሀ/አገዳ/ጨፈቃ.....22 <u>ዘመናዊ ወለል</u> ዘመናዊ ጣውላ31 ሴራሚክ32 ሲሚንት33 ምንጣፍ.....34 <u>ሌላ (ይገለጽ)99</u>	HFLOOR
134.	ለቤቱ የጣሪያ ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው? የተሰራበትን ሁሉ ያክብቡ	<u>ባህላዊ ጣሪያ</u> ጣሪያ የለውም11 የሳርክዳን/ቅጠል/12 <u>ያላለቀ ጣሪያ</u> ፕላስቲክ.....21 ቀርከሀ/አገዳ/ጨፈቃ.....22 የእንጨት ድርድር.....23 <u>ዘመናዊ ጣሪያ</u>	HROOF

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135.	ለቤቱ የግርግዳ ስራ በዋነኛነት የተጠቀሙት የግንባታ እቃ ምንድን ነው የተሰራበትን ሁሉ ያከብቡ	<u>ባህላዊ ግርግዳ</u> ግርግዳ የሌለው11 አገዳ/ቀርከሀ/ጨፈቃ.....12 ቆሻሻ.....13 <u>ያላለቀ ግርግዳ</u> እንጨት እና ጭቃ21 ድንጋይ እና ጭቃ22 ካርቶን23 <u>ዘመናዊ ግርግዳ</u> ድንጋይ እና ሲሚንቶ31 ጡብ32 የእንጨት ጣውላ ድርድር33 ሌላ (ይገለጽ)99	
136.	ቤትዎ ምን አይነት መጽዳጃ ቤት አለው ከአንድ በላይ መልስ ከተሰጠ በዋናነት የሚጠቀሙትን ይመዝግቡ	<u>ውሀ ያለው ሽንት ቤት</u> ወደ ሴፕቲክታንክ የሚያመራ.....11 ወደ ጉርጓድ መጽዳጃ ቤት የሚያመራ.....12 ወደ ሆነበታ ጋር የሚገናኝ13	HTOILET

		<u>የጉርጓድ መጻዳጃ ቤት</u> ባህላዊ የጉርጓድ መጻዳጃ ቤት21 ባህላዊ የጉርጓድ ሽንት ቤት በሲሚንቶ የተሰራ.....22 ባህላዊ የጉርጓድ ሽንት ቤት በሲሚንቶ ያልተሰራ23 የተሻሻለ የጉርጓድ መጻዳጃ ቤት24 ኮምፖስት መጻዳጃ ቤት25 መጻዳጃቤት/የለም/በቁጥቋጥ /በሜዳ31 ሌላ (ይገለጽ)99	
137.	ለቤተሰቡ የመጠጥ አገልግሎት የሚውል ውሀ ዋና ምንጩ ምንድን ነው (ለጥያቄ፡ ምንጩ የቧንቧ ውሀ ስለመሆኑ ያረጋግጡ መልሱ የቧንቧ ውሀ ከሆነ አረጋግጦ ውትከከለኛውን ድያክብሩ)	<u>የቧንቧ ውሀ</u> በመኖሪያ ግቢ ውስጥ ያለ11 ከመኖሪያ ግቢ ውጪ12 የቦኖ ውሀ13 <u>የምንጭ ውሀ</u> የተከለለ/የተጠበቀ የምንጭ ውሀ21 ያልተከለለ/ያልተጠበቀ የምንጭ ውሀ22 <u>የጉርጓድ ውሀ</u> የተከለለ/የተጠበቀ ጉርጓድ31 ያልተከለለ/ያልተጠበቀ ጉርጓድ32 <u>የምድር ውሀ</u> ኩሬ/ሀይቅ/ወንዝ/ትንሽ ወንዝ/ምንጭ/ግድብ51 <u>የዝናብ ውሀ</u>61 <u>የታንክ ውሀ</u>71 <u>የግዢ ውሀ</u>81 <u>የታሽገ ውሀ</u>91 ቋሚ የሆነ ምንጭ የለም96 ሌላ (ይገለጽ)99	HWATER

138.	ከሚከተሉት ውስጥ በቤት ውስጥ ያለውን ሊነግሩኝ ይችላሉ በቤት ውስጥ ያለውን ሁሉ ያክብቡ	ኤሌክትሪክ 1 ሰአት 2 ሬድዮ 3 ቴሌቪዥን 4 ተንቀሳቃሽ ስልክ 5 የቤት ስልክ 6 ፍሪጅ 7 ወንበር 8 አልጋ የጥጥ/የስፖንጅ/የስፕሪንግ ፍራሽ/ 9 የኤሌትሪክ ምጣድ 10 በጋዝ የሚሰራ ፋኖስ 11 ሶላር 12 በባትሪ የሚሰራ መብራት 13	HELECTRIC HWATCH HRADIO HTELEVISION HMOBILE HPHONE HFRIGE HCHAIR HBED HMITAD HLAMP
139.	ምግብ ለማብሰል በዋናነት ቤተሰቡ የሚጠቀመው የሀይል ምንጭ ምንድን ነው [ከአንድ በላይ መልስ ይቻላል]	ኤሌክትሪክ 1 የተፈጥሮ ጋዝ 2 ባዮ ጋዝ 3 ነጭ ጋዝ 4 እንጨት 5 ከሰል 6 ሳር/ቁጥቋጥ/ቅጠላ ቅጠል 7 የእንስሳ ፍግ 8 የእርሻ ምርት 9	HFUELECT HFUEL GAS HFUELBIO HFUELKERO HFUELWOO HFUELCHAR HFUELGRAS HFUELDUN HFUELCROP

		ሌላ(ይገለጽ)10 _____	HFUELOTHE
140.	ለማብሰያነት የምትጠቀሙበት የተለየ የማገዶ ቤት አላችሁ	የለም1 አዎ2	HKITHCEN
141.	ከሚከተሉት ውስጥ የትኞቹ የቤተሰቡ አባል አለው [ከአንድ በላይ መልስ ይቻላል]	ብስክሌት1 ሞተርሳይክል/ትንሽዶቅዶቄ/ባጃጅ2 በእንስሳየሚጎተትጋሪ3 መኪና/የጭነትመኪና4	HBICYCLE HMOTOR HCART HCAR
142.	የቤተሰቡ አባል ምን ያህል የእርሻ መሬት አለው በአካባቢው መለኪያ----- (ይገለጽ)	የአካባቢው መለኪያ __ __ የእርሻመሬት የለኝም00	HLANDSIZE
143.	ከተዘረዘሩት የእንስሳ መሀል የቤተሰቡ አባል ምን ያህል አለው (የቤተሰቡ አባል እንስሳ የሌለው ከሆነ በሳጥ ንውስጥ 00 ይጻፉ)	a) የወተት ላም፣ በሬ፣ ኮርማ __ __ b) ዶሮ __ __ c) ፍየል __ __ d) በግ __ __ e) ፈረስ፣ አህያ፣ በቅሎ __ __ f) የንብ ቀፎ __ __	HCOWS HCHICEKEN HGOATS HSHEEP HHORISE HBEEHIVES
144.	ከቤተሰቡ አባል መሀል በባንክ ውስጥ /በአነስተኛ ቁጠባ/ የቁጠባ ሂሳብ ያለው አለ	የለም0 አለ1	HSAVING

ክፍል 2: የአልኮል እና የጭንቅጭት ፍጆታ

201.	በዚህ እርግዝና ወቅት አረቄ (ጠላ፣ጠጅ) ወይም ቢራ ይጠጣሉ? (አባክዎን የመጠጡን አይነት እዚህ ይግለጹ ([_____]))	አዎ 1 አይ 0 → ጥ205 አላስታውስም 99 → ጥ205	
202.	በዚህ እርግዝና ወቅት በየቀኑ [የመጠጥ አይነት] ትጠጫለሽ?	አዎ 1 አይ 0 አላስታውስም 99	
203.	አዎ ከሆነ, በቀን ምን ያህል [መለኪያ/ጠርመራ] ትጠጫለሽ	[_____] መለኪያ/ጠርመራ/በቀን	
204.	አዎ ከሆነ, በሳምንት / በወር/ምን ያህል [መለኪያ/ጠርመራ] ትጠጫለሽ	[_____] መለኪያ/ጠርመራ/በሳምንት [_____] መለኪያ/ጠርመራ/በወር አላውቅም 99	
205.	በዚህ እርግዝና ወቅት ጫት ይቅማሉ?	አዎ 1 አይ 0 → ጥ209 አላስታውስም 99 → ጥ209	
206.	በዚህ እርግዝና ወቅት በየቀኑ ይቅማሉ?	አዎ 1 አይ 0 አላስታውስም 99	
207.	አዎ ከሆነ, በቀን ምን ያህል [ጥቅል] ይቅማሉ?	[_____] ጥቅል በቀን	
208.	አዎ ከሆነ, በሳምንት / በወር/ምን ያህል [ጥቅል] ይቅማሉ?	[_____] ጥቅል በሳምንት [_____] ጥቅል በወር አላውቅም 99	
209.	ሲጋራ አጭሰው ያውቃሉ?	አዎ 1 አይ 0 → ጥ 212 አላስታውስም 99 → ጥ 212	

210.	በዚህ እርግዝና ወቅት ሲጋራ ያጨሳሉ?	አዎ 1 አይ 0 → ጥ212 አላስታውስም 99 → ጥ212	
211.	ባለፈው 24 ሰዓት ውስጥ ምን ያህል ሲጋራ አጭሰው ነበር?	[.....] በቁጥር አላውቅም 99	
212.	ከቤተሰብ አባላት ሲጋራ የሚያጨስ ሰው አለ?	አዎ 1 አይ 0 አላውቅም 99	

ክፍል 3: የወሊድሁኔታ

	ጥያቄ	መልስ	
301.	አሁን በህይወት ዘመንዎ ስለነበሩት እርግዝናዎች እጠይቅዎታለሁ፡፡ ምን ያህል ጊዜ እርጉዝ ሆነው ያውቃሉ? (በህይወት ያልተወለዱትን ልጆች ጨምሮ)፣ ከሌለ “00” የመዝግቡ	[] ጊዜ 00 ከሆነ ወደ ጥያቄ 303	
302.	አሁን በህይወት ዘመንዎ ስለነበሩት ወሊዶች እጠይቅዎታለሁ፡፡ ምን ያህል ጊዜ በህይወት ያለ ልጅ ወልደዋል? <i>[ይህ ማለት እስከ ጉዳዩን በረው፣ ያለቀሰ ወይም ሌላ በወህይወት የመኖር ምልክት ያሳየ፣ ለትንሽ ደቂቃ ወይም ለትንሽ ሰዓት ምሳሌ ሆኖ በህይወት የቆየው]፣ ከሌለ “00” የመዝግቡ</i>	[] ጊዜ	
303.	ውርጃ አጋጥሞዎት ያውቃል? (የእርግዝና መቀረጥከ 28 ሳምንት በፊት)?	አዎ 1 0 ወደ ጥያቄ 305	
304.	ካለ ስንት ጊዜ ውርጃ አጋጥሞዎት ያውቃል? (የእርግዝና መቀረጥከ 28 ሳምንት በፊት)?	[] ጊዜ	
305.	እርጉዝ ከሆነ ምን ያህል ጊዜ ሆነሽ? (የመጨረሻ ጊዜ የወር አበባ መቼ እንዳየች ይጠይቁ)	_____ ሳምንት	
306.	በዚህ የእርግዝና ወቅት ከማንኛውም ባለሙያ የቅድመ ወሊድ (ለእርጉዞች የሚደረግ) ምርመራ አግኝተው ነበር?	አዎ 1 አላገኘሁም 0	
307.	በዚህ እርግዝና ወቅት ለምን ያህል ጊዜ ለእርጉዞች የሚደረግ ምርመራን አግኝተዋል?	[] ጊዜ አላውቅም 99	

ክፍል 4: በእርግዝና ወቅት ያለ የአመጋገብ ለውጥ

	ጥያቄ	መልስ	የመለያስም
401.	በዚህ አካባቢ እርጉዝ እናቶችን ወይም የሚያጠቡ እናቶችን አንዳንድ ምግቦችን ወይም የምግብ አይነቶችን እንዳይወስዱ የሚከለክል ባህላዊ ልምድ አለ ?	1=አለ 0=የለም→ጥ409 98 = አላውቅም→ጥ409	FDTABOBF FDTABOLAC

402.	በአካባቢዎ ውስጥ ነፍሰ ጡር ሴቶች ተጨማሪ ምግቦችን እንዲመገቡ የሚያበረታቱ ባህላዊ ልምዶች አሉ?	1=አሉ 0=የሉም→ጥ413 98 = አላውቅም→ጥ413	FDTABMORE
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	ጥያቄ	መልስ	የመለያስም
403	ከፀነሱ በኋላ የሚመገቡት የምግብ መጠን እንዴት ተለውጧል?	1. ከተለመደው በላይ ብዙ ምግብ እበላለሁ 2. ከተለመደው ያነሰ ምግብ እበላለሁ 3. የምበላው ምግብ መጠን አልተቀየረም 4. አላውቀውም	FTAMTCHANG
404	ከፀነሱ በኋላ የሚመገቡት የምግብ አይነቶች እንዴት ተለውጧል ?	1. ከተለመደው በላይ ብዙ የምግብ አይነት እበላለሁ 2. ከተለመደው ያነሰ የምግብ አይነት እበላለሁ 3. የምበላው የምግብ አይነት አልተቀየረም 4. አላውቀውም	FTVARCHG

5. የአመጋገብ ሁኔታ

5.1 የ24 ሰዓት የምግብ ትዕዛዝ ፎርም

ከዚህ በመቀጠል በትናንትናዉ እለት ቀንም ሆነ ማታ የተመገቡትን /የጠጣጡትን

ምግቦችን/መጠጦች በዝርዝር አጠይቆታለዉ፡፡

1.የምግቦቹዝርዝር ፎርም

ምግቡ የተበላበት ጊዜ	ምግቡ የተበላበት ቦታ	የምግቦቹ ዝርዝር ና አይነት
ጠዋት ከቁርስ በፊት		
ቁርስ		
ከቁርስ በኋላ		
ምሳ		
ከምሳ በኋላ		
መክሰስ		
ከመክሰስ በኋላ		
እራት		
ሌሊት		
ከቤት ውጪ		

5.2 የምግቦችና ወህድቶች ገለፃ ፎርም

አሁን ደግሞ ከላይ የተዘረዘሩትን ምግቦች የአበሳሰል ዘዴያቸው፣ ወህድቶችና የወህድቶችን መጠን፣ አይነትምን ያህል አንደበሉ /አንደጠጡ በዝርዝር ይነግሩኛል ፡

የ ምግብ/መጠጡ ዝርዝርና አይነቱ	የምግብ/መጠጡ ገለፃና የአበሳሰል ዘዴ (ይህን መረጃ ለ መሰብሰብ ወህ ድቶች ፣ የ ወህዶቹን አይነትና መጠን እና የአበሳሰል ዘዴውን በጥልቀት ይጠይቁ)	የተዘጋጀው ምግብ መጠን (በመለኪያ)	የተበላው መጠን (በመለኪያ)	የተነሳው ምግብ መጠን (በግራም)
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
	ወህድቶችና የአበሳሰል ዘዴ፡ የወህዶቹ ዝርዝርና መጠናቸው			
1. ስለ አልኮል ይጠይቁ አልኮል ወስደዉ ነበር ? 1.አዎ 2. አይ	4. ታመዉ ነበር 1. አዎ 2. አይ ህመሙ የ አመጋገብዎን ሁኔታ ቀይሮ ነበር? 1. አዎ 2. አይ አዎ ከሆነ እንዴት ነዉ የቀየረዉ? 1. ጨመረ 2. ቀነሰ			
2. የምግብ አመጋገብ ያልተለመደ ነበር? 1.አዎ 2.አይ አዎ ከሆነ ለምን ያልተለመደ ሆነ? የበዓል ቀን ነበር 1. አዎ 2. አይ የገበያ ቀን ነበር 1. አዎ 2. አይ የፆም ቀን ነበር 1. አዎ 2. አይ የእረፍት(ቅዳሜ/አሁድ) ቀን ነበር 1.አዎ 2.አይ	5. ተጨማሪ እንክብሎች ወስደዉ ነበር? 1. አዎ 2. አይ አዎ ከሆነ ምን አይነት እንክብል እንደመሰዱ ያረጋግጡ? 1.አይረን1 3.የ ወባ መዲኒት..... 2. ቫይታምን.....2 4. ሌላካለ(ግለፅ)_____			
3. መጠይቁ በድጋሜ የተካሄደ ነበር? 1.አዎ 2.አይ በድጋሚ የተካሄደ ከሆነ የተካሄደበት ቀን ቅደም ተከተል 0 1 2				

ክፍል 6:የአካላዊእንቅስቃሴመጠይቅ

ይነበብ: በመቀጠል ባለፈው አንድ ሳምንት ውስጥ ስላደረጉአቸው የተለያዩ አካላዊ እንቅስቃሴዎች እጠይቆታለሁ።እባክዎን ራስዎን አካላዊ እንቅስቃሴ የሚያደርግ ሰው አድርገው ባይቆጥሩም ሁሉንም ተግባራት በመመልከት ጥያቄዎቹን ይመልሱ።እነዚህም በቤት ውስጥ በመስሪያ ቤት ወይም ከቦታ ወደ ቦታ ለመሄድ የሚያደርጉአቸውን መደበኛ እንቅስቃሴዎች እና በዕረፍት ጊዜዎ ውስጥ ለመዝናኛ ወይም ለስፖርት የሚሰሯቸውን እንቅስቃሴዎች ያጠቃልላሉ።

ጥያቄዎቹን በሚመልሱበት ወቅት ጠንካራ የአካላዊ እንቅስቃሴዎች ማለት ከባድጥረት የሚጠይቁትን ፋሽዎና የልብ ምትዎ ላይ ከፍተኛ ጭማሪ የሚያመጡ ማለትም ቶሎ ቶሎ መተንፈስ ወይም ፈጣን የልብ ምት ሊያስከትሉ የሚችሉ እንቅስቃሴዎች ናቸው። መካከለኛ የአካላዊ እንቅስቃሴዎች ደግሞ መካከለኛ ጥረት የሚጠይቁ ትንፋሽና የልብ ምት ላይ መጠነኛ ጭማሪ ሊያመጡ የሚችሉ አካላዊ እንቅስቃሴዎች ናቸው።

መለያ	ጥያቄዎች	መልስ	አለፍ
P1	መደበኛ አካላዊ እንቅስቃሴዎ ወይም የቤት ስራዎ ከፍተኛ የትንፋሽ ወይም የልብ ምት መጨመር የሚያመጡ ጠንካራ አካላዊ ተግባራትን ያካተተ ነበር? ለምሳሌ፡ከባድ እቃ ማንሳት፣መቆፈር ወይም የግንባታ ስራ	አዎን.....1 የለም.....2	
P1A	ከዚህ በታች የተዘረዘሩት ተግባራት ጠንካራ አካላዊ እንቅስቃሴዎች የሚያስከትሉ እንደሆኑ ይታመናል።እርስዎ እነዚህን እንቅስቃሴዎች በሳምንት ውስጥ ለምን ያህል ጊዜ ያከናውናሉ?		
የተግባራትዝርዝር		በሳምንት ውስጥ የሰሩበት የቀናት ብዛት	የወሰደው ጊዜ
P1A1	እንጨት፣ኩብት መልቀም፣ሸክም መሸከም?	____ ቀናት	ሰአት __ __ ደቂቃ፡ __ __
P1A2	ከጉድጓድ ወይም ከወንዝ ውሃ መቅዳት ከአንድ ቤት ወደ ሌላ ቤት ማመላለስ	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A3	ጥራጥሬ መፍጨት(ብቅል፣አሻሮ መፍጨት፣አተር፣ባቄላ መከካት)	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A4	እህል መውቃት (በመደብደብ)	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A5	እንጨት መፍለጥ፣መስከጣጠቅ	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A6	እህል መውቀጥ	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A7	ማረስ ወይም መቆፈር፣መጎልጎል፣መንቀል	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A8	ማረም	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A9	እህል ማጨድ	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A10	እህል መውቃት	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A11	እርከን መስራት	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P1A12	ሌላ ካለ ይጥቀሱ_____	____ ቀናት	ሰአት ፡ __ __ ደቂቃ፡ __ __
P2	በቤት ወይም ከቤት ውጪ የሚያደርጉት መደበኛ እንቅስቃሴ ወይም የቤት ውስጥ ስራዎች መጠነኛ የትንፋሽና የልብ ምት መጨመር የሚያስከትሉ መካከለኛ አካላዊ ተግባራትን	አዎን.....1 የለም2	

	ይጨምራል? ለምሳሌ ቢያንስ በተከታታይ ለ 10 ደቂቃ ፈጠን ያለ እርምጃ ወይም ቀለል ያሉ እቃዎችን መሸከም		
P2A	ከዚህ ቦታች የተዘረዘሩት ተግባራት መጠነኛ የትንፋሽና የልብ ምት መጨመር የሚያስከትሉ መካከለኛ አካላዊ ተግባራት ናቸው፡፡እርስዎ እነዚህን ተግባራት በሳምንት ስንት ጊዜ ያከናውናሉ ?		
የተግባራትዝርዝር		በሳምንት ውስጥ የሰሩበት የቀናት ብዛት	የወሰደው ጊዜ
P2A1	ልብስ ማጠብ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A2	እቃ ማጠብ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A3	ቤት እና ግቢ መጥረግ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A4	ቤት መወልወል (ቆመው፣አጎንብሰው ወይም ተንበርክከው)	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A5	ከቤት ውጪ ከሚገኝ ቧንቧ ውሃ መቆዳት እና ወደ ቤት ማስገባት	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A6	እንስሳት መንከባከብ (እንስሳቱን ማጠብ፣መመገብ፣በረት ወይም ጋጣ ማፅዳት	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A7	ለእንስሳት መኖ የሚሆን ቅጠል፣ሳር መሰብሰብ ወይም ማዘጋጀት	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A8	ላም ማለብ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A9	አትክልት መንከባከብ (ውሃ ማጠጣት፣ በክርክም፣ ዘር መዝራት፣ማፅዳት)	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A10	የታመመ ወይም አዛውንት ሰው መንከባከብ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A11	ልብስ መስፋት (ጥልፍ፣እጅ ስራ መስራት)	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A12	ልጆች መንከባከብ ልብስ ማልበስ፣ማጠብ፣መመገብ፣አልፎ አልፎ ማቀፍ ወይም መሸከም	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A13	ምግብ ማብሰል (ወጥ መስራት፣ቆጮ፣እንጀራ፣ዳቦ መጋገር)	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A14	ሱቅ፣ሱፐር ማርኬት ወይም ገበያ ውስጥ ተዘዋውሮ መገባደጥ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P2A15	ሌላ ካለ ይዘርዝሩ_____	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
ቀጥሎ ያሉት ጥያቄዎች ከላይ የጠቀሷቸውን በቤት ወይም በህዝብ የስፖርት ስፍራዎች ያደረጉትን መደበኛ እንቅስቃሴዎች አያካትቱም፡፡ አሁን ደግሞ በተለምዶ ከቦታ ቦታ የሚጓዙባቸውን መንገዶች እጠይቃለሁ፡፡ለምሳሌ ከቤት ወደ ገበያ ቦታ፣ወፍጮ ቤት፣ውሃ ለመቆዳት፣ወደአ ምልኮ ቦታ እና ከነዚህቦታዎች ወደ ቤት ለመመለስ የሚያደርጉትን ጉዞ የተመለከቱ ናቸው፡፡			
መለያ	ጥያቄ	መልስ	አለፍ
P3	ከቦታ ቦታ ለመጓጓዝ በእግር ጉዞ ያደርጋሉን?	አዎን1 አላደርግም2	P4
P3A	የሚሄዱባቸው ቦታዎች ዝርዝር	በሳምንት ውስጥ የሚጓዙበት የቀናት ብዛት	የወሰደው ጊዜ
P3A1	ወደ ስራ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __
P3A2	ወደ ገበያ	____ ቀናት	ሰአት : __ __ ደቂቃ: __ __

P3A3	ወደ ሱቅ	____ ቀናት	ሰአት : __ __ ደቂቃ : __ __	
P3A4	ልጆች ከትምህርት ቤት ለማምጣት	____ ቀናት	ሰአት : __ __ ደቂቃ : __ __	
P3A5	ዘመድ፣ጓደኛ ለመጠየቅ	____ ቀናት	ሰአት : __ __ ደቂቃ : __ __	
P3A6	ወደ ቤተክርስቲያን፣መስኪድ	____ ቀናት	ሰአት : __ __ ደቂቃ : __ __	
P3A7	ሌላ ካለ ይዘርዝሩ.....	____ ቀናት	ሰአት : __ __ ደቂቃ : __ __	
ቀጥሎ ያሉት ጥያቄዎች ከላይ የጠቀሷቸውን በቤት/ በስራ ቦታ ወይም በህዝብ የስፖርት ስፍራዎች ያደረጉትን መደበኛ እንቅስቃሴዎች እና የመጓጓዣ ሁኔታ አያካትትም፡፡አሁን የምንጠይቁት የመዝናኛ ተግባራትን ለምሳሌ በትርፍ ጊዜዎ በመስሪያ ቤት የእረፍት ሰአት ወይም በቤት ውስጥ ስለሚያደርጓቸው የመዝናኛ እንቅስቃሴዎች ነው፡፡				
መለያ	ጥያቄ	መልስ	እለፍ	
P4	እንደ መዝናኛ/ የትርፍ ጊዜ እንቅስቃሴዎች ከፍተኛ የትንፋሽ ወይም የልብ ምት መጨመር የሚያመጡ ጠንካራ አካላዊ ተግባራትን ቢያንስ ለተከታታይ 10 ደቂቃ ያደርጋሉ? ለምሳሌ፡ዳንስ (ጭፈራ)፣ሶምሶማ ሩጫ	አዎን1 አላደርግም2	→P7	
P5	በሳምንቱ ለምን ያህል ቀናት ጠንካራ አካላዊ እንቅስቃሴዎችን ወይም የመዝናኛ/ የትርፍ ጊዜ እንቅስቃሴዎችን አድርገዋል?	____ ቀናት		
P6	ከነዚህ ቀናት በአንዱ ጠንካራ አካላዊ እንቅስቃሴዎችን ወይም የመዝናኛ/ የትርፍ ጊዜ እንቅስቃሴዎችን ለምን ያህል ሰአት አድርገዋል?	__ __ ደቂቃ : ____ ____ ሰአት		
P7	እንደ መዝናኛ እንቅስቃሴዎች አካል መጠነኛ የትንፋሽ ወይም የልብ ምት መጨመር የሚያመጡ መካከለኛ አካላዊ ተግባራትን ቢያንስ ለተከታታይ 10 ደቂቃ አድርገዋል? ለምሳሌ፡ዋና	አዎን1 አላደርግም.....2	→P10	
P8	በሳምንቱ ለምን ያህል ቀናት መካከለኛ አካላዊ ተግባራትን ወይም የመዝናኛ/የትርፍ ጊዜ እንቅስቃሴዎችን አድርገዋል?	____ ቀናት		
P9	ከነዚህ ቀናት በአንዱ መካከለኛ አካላዊ ተግባራትን ወይም የመዝናኛ/ የትርፍ ጊዜ እንቅስቃሴዎችን ለምን ያህል ሰአት አድርገዋል?	____ ____ ደቂቃ : ____ ____ ሰአት		
የሚቀጥለው ጥያቄ በቤት፣በመስሪያ ቤት ወይም በትርፍ ጊዜዎ በመቀመጥ ወይም ጋደም ብለው ያሳለፉትን ጊዜ ይመለከታል፡፡ (ቤት ውስጥ፣በመኪና ውስጥ፣ከቤተሰብዎ፣ከዘመድዎ፣ከጓደኞችዎ ጋር ቴሌቪዥንን ለመመልከት ተቀምጠው ወይም ጋደም ብለው ያሳለፉትን ጊዜ ይጨምራል፡፡ነገር ግን በእንቅልፍ ያሳለፉትን ጊዜ አያካትትም፡፡				
P10	ከሳምንቱ አንዱን ቀን በጠቅላላው ምን ያህል ጊዜ ተቀምጠው ወይም ጋደም ብለው አሳልፈዋል?	____ ____ ደቂቃ : ____ ____ ሰአት		
P11	በአንድ ቀን በአማካይ ለስንት ሰዓት ይተኛሉ ?	____ ____ ደቂቃ : ____ ____ ሰአት		

ክፍል 7:- የመደበት ስሜት (የድብዳቤ) መለኪያ መጠይቅ

ተ.ቁ	በባለፉት ሁለት ሳምንት ጊዜ ውስጥ የሚከተሉት ችግሮች በየስንት ጊዜ ኢጋጥመውህ/ሽ ያውቃል?	ኢጋጥሞኝ አያቅም (0)	ብዙ ጊዜ ያጋጥመኛል (1)	ከግማሽ ቀን በላይ (2)	በየቀኑ (3)
701	ነገሮችን ለማድረግ ምንም/ጥቂት ፍላጎት ያለማሳየት				
702.	ደስታ ማጣት መደበኛ እና ተስፋ ማጣት				
703.	እንቅልፍ ማጣት ወይም ለረዥም ሰዓት መተኛት				
704.	የድካም ስሜት ወይም አነስተኛ አቅም መኖር				
705.	የምግብ ፍላጎት መቀነስ ወይም በብዛት መመገብ/መብላት				
706	ስለራስህ/ሽ የሚሰማህ/ሽ መጥፎ ስሜት ወይም የውድቀት ስሜት ራስን ወይም ቤተሰብን ለውድቀት የመደረግ ስሜት				
707	ነገሮችን በተመስጦ ያለማድረግ ስሜት ለምሳሌ በንባብ ወቅት/ቴሌቪዥን በምትመለከትበት/ች ወቅት				
708	ንግግር ወይም እንቅስቃሴ በሚያደርጉበት ወቅት ከወትሮው በተለየ የሰዎችን ትኩረት ለማግኘት በቀስታ ማድረግ፣ ድምጽን ከፍ አድርጎ መናገር ወይም እርፍት ማጣት እና መንቀሻቀሻ				
709	በህይወት መኖሪያ ትርጉም የለውም ብሎ የማሰብ ወይም ራስን የመጉዳት ስሜት				

ቃለ መጠየቅ በሚሞሉበት ጊዜ በዚህ መጠየቅ ውስጥ ያጋጠምዎት ችግር ምን ያህል በስራዎት ላይ፣ በቤት ውስጥ በሚከናወኑት ተግባራት ላይ እና ከሰዎች ጋር ባሉዎት መግባባት ምን ያህል አስቸጋሪ አድርጎብዎታል?	ምንም አስቸጋሪ አለደረገብኝም _____ በጥቂቱ/በትንሹ አስቸጋሪ አድርጎብኛል _____ በጣም አስቸጋሪ አድርጎብኛል _____ እጅግ በጣም አስቸጋሪ አድርጎብኛል _____
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ክፍል 8: -የአንትሮፖሜትሪክ ልኬት

ቁጥር	ልኬት	የተነበበው	መለያ ቁጥር
701	ቁመት በ ሳንቲ ሜትር		
702	ክብደት በ ኪሎ ግራም	የመጀመሪያ	
		ሁለተኛ	
		ሶስተኛ	

Annex 7 Technical Error of Measurement for Weight measurement (TEM)

Data Collectors	Subjects								Intra observer (each observer) TEM	Intra observers (3 observers) TEM	Inter observers TEM				
	1	2	3	4	5	6	7	8							
Tigist									0.173	0.146	0.227				
Measurement 1	50	50	58.5	57.4	61	55	61.3	48							
Measurement 2	49.7	50	59	57.5	60.8	55	61.6	48							
Zehara									0.11			0.146	0.227		
Measurement 1	49.8	50.2	59	57	60.5	54.9	61.5	48.1							
Measurement 2	49.6	50	59	57	60.6	54.8	61.2	48.1							
Hareg									0.15					0.146	0.227
Measurement 1	49	49	58.4	57	61	55	61.7	48							
Measurement 2	49.5	49	58.5	57.3	61	55	61.7	48							

*The intra observer TEM is between 0.1-0.3 Kg and the inter observer TEM is between 0.1-4.1 kg.