

St. Paul's Hospital Millennium Medical College Department of Public Health



MAGNITUDE OF UNDERWEIGHT AND ASSOCIATED FACTORS OF WOMEN AGE 15-49 YEARS WITH OBSTETRIC FISTULA IN HAMLIN FISTULA HOSPITAL ADDIS ABABA, ETHIOPIA

A THESIS TO BE SUBMITTED TO DEPARTMENT OF PUBLIC HEALTH FOR PARTIAL FULFILMENT OF DEGREE OF MASTER IN PUBLIC HEALTH NUTRITION

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June / 2021

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Declaration

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ACKNOWLEDGEMENT

First and foremost, praises and thanks to the God, the Almighty, for his showers of blessings throughout my research work to complete the research successfully.

I am thankful to the St. Paul Millennium Medical College, School of Public Health Sciences, for giving me the chance to learn. My heartfelt gratitude goes to my advisors Mr. Tesfalem Teshome (Msc, AHN) and Mrs. Fatimetu Mohammed (Msc, RH) and all instructors for their unreserved guidance and constructive suggestions and assisting me in all aspects of learning through the course of research proposal preparation.

I thank the management, medical director, Matron and all Hamlin Fistula Hospital staff for their support to do this work. I would like to say thanks to my friends and research colleagues.

I am extremely grateful to express my appreciation to special friend Barbara E. Kwast FRCOG (PhD, MPH, MTD) who put her finger print to the fulfillment of this study. I would also like to thank her for her friendship, empathy, and great sense of humor.

I am very much thankful to my husband, my and my husband's family for their love, understanding, prayers and continuing support to complete this research work.

Finally, my thanks go to all the people who have supported me to complete the research work directly or indirectly.

Table of Contents

ACKNOWLEDGEMENT.....	iii
Abbreviations	vi
List of Tables and Figures.....	viii
ABSTRACT.....	ix
1. Introduction.....	1
<i>1.1 Background</i>	<i>1</i>
<i>1.2 The statement of the problem</i>	<i>3</i>
<i>1.3. Significance of the study</i>	<i>5</i>
2. Literature Review	6
Conceptual Framework	13
3. Objectives.....	14
<i>3.1. General Objectives</i>	<i>14</i>
<i>3.2. Specific Objectives.....</i>	<i>14</i>
4. Methods	15
<i>4.1 Study design and settings</i>	<i>15</i>
<i>4.2 Population</i>	<i>15</i>
<i>5.3 Sample size determination</i>	<i>16</i>
<i>4.5. Study Variables</i>	<i>17</i>
<i>4.6. Operational definition</i>	<i>18</i>
4.7 Data collection tools and procedures.....	19
4.8. Data Analysis	22
4.9 Data Quality Management.....	23

4.10 Ethical Considerations.....	24
4.11 Dissemination of the findings	25
5. Result	26
6. Discussion	35
Strength and limitation.....	39
7. Conclusion	40
8. Recommendation	41
References.....	42
Annex.....	46
<i>Information sheet and Informed consent</i>	46
<i>Questionnaire (Amharic and English version)</i>	48

Abbreviations

AAFH:	Addis Ababa Fistula Hospital
AOR:	Adjusted Odds Ratio
BMI:	Body mass index
CEM:	Chronic Energy malnutrition
CI:	Confidence Interval
Cm:	Centimeter
COR:	Crude Odd Ratio
DDS:	Dietary diversity score
DHS:	Demographic and Health survey
EDHS:	Ethiopia Demographic and Health survey
FANTA:	Food and Nutrition Technical Assistance
FAO:	Food and Agriculture Organization
FFQ:	Food frequency questionnaire
HFE:	Hamlin Fistula Ethiopia
HHDD:	Household dietary Diversity score
HFIAS:	Household food insecurity Access scale
HH:	House Hold
Ht:	Height
IDDS:	Individual dietary diversity score
Kg:	Kilogram
KSSE:	Kilifi Stigma scale of Epilepsy
MUAC:	Mid-upper arm circumference
OBF:	Obstetric fistula

OPD:	Out-Patient department
OR:	Odds Ratio
QOL:	Quality of life
SD:	Standard Deviation
SNNP:	Southern Nation and National Population
UNICEF:	The United Nations Children's Fund
USAID:	United States Agency for International Development
WHO:	World Health Organization
WRA:	Women of Reproductive Age
Wt:	Weight

List of Tables and Figures

List of Tables

Table 1: Socio-demographic characteristics of women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Table 2: Health care and health related characteristics of women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia 2021 (n=143).

Table 3: Respondent's by food group, women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n= 143).

Table 4: Bivariate binary logistic regression result showing factors associated with underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Table 5: Multivariate binary logistic regression result showing factors associated with underweight among women with obstetric fistula in Hamlin fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

List of Figures

Figure 1: A modified conceptual framework adapted from UNICEF.

Figure 2. Percentage of psychosocial status of women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Figure 3: Percentage of household food security of women with obstetric fistula in Hamlin Fistula Hospital Addis Ababa, Ethiopia, 2021(n=143).

Figure 4: Magnitude of underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

ABSTRACT

Background: Poor nutritional status of women within the reproductive age group has been a serious problem in Ethiopia. Various factors are linked with underweight among women with obstetric fistula. However, studies on the magnitude of underweight and the associated factors among women with obstetric fistula aren't adequately studied in Ethiopia.

Objective: To assess the magnitude of underweight and its associated factors among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia.

Methods: A hospital-based cross-sectional study was conducted among 143 women with obstetric fistula ages 15-49 years. A single population proportion formula was used to determine the sample size. A convenience sampling technique at OPD level was used for data collection. Data was collected through anthropometric measurements, chart review, and face to face interviews using a structured questionnaire from January 20/2021 to February 20/2021. Data on the socio-demographic and other relevant issues including Household-Food-Insecurity and Dietary was collected. A 15-item Kilifi stigma scale and the Oslo-3 social support instruments were used to assess the psycho-social factors. The collected data was analyzed using SPSS version 26 software. Descriptive Statistics like means $\pm$ SD, frequency, percentages, and binary logistic regression like bivariate and multivariate logistic regression analysis were applied for analysis. A two-sided *p* value of less than 0.05 was used to declare a statistically significant association between the independent variables and underweight among women.

Results: The magnitude of underweight among obstetric fistula women in Hamlin Fistula Hospital, Addis Ababa Ethiopia was 48 (33.6%). Women had poor social support and perceived stigma 81.1% and 65.7%, respectively. Women who live in rural areas (74.8%) ,who were from food insecure households (58.7%), and who had low dietary diversity score (16.1%) were nearly five (AOR=4.72,95% CI (1.44, 15.54)), four (AOR = 3.53, 95% CI (1.50,8.32) and four (AOR=3.61, 95%CI (1.31,9.95)) times more likely to be undernourished as compared to their counterparts, respectively.

Conclusion and recommendations: Underweight among women with obstetric fistula in Hamlin Fistula Hospital Addis Ababa Ethiopia was found to be more than three-folds compared to the global prevalence rate (9.7%) for underweight women. Hence, stakeholders should give special emphasis to those residing in rural areas and efforts to strengthening nutritional activities that contribute to reduction of food insecurity and to improve dietary intake could also be important.

Key Words: Obstetric fistula, underweight, stigma, household food insecurity, dietary diversity, Addis Ababa, Ethiopia.

1. Introduction

1.1 Background

Currently, 815 million people that means 11% of the worldwide population are affected by all forms of malnutrition (1). Globally, 9.7% of women are underweight (2). From those in low-and middle-income countries the prevalence of underweight varies from 20-25 % (1). The poor nutritional status of women has been a significant problem in Ethiopia (3). According to the 2016 EDHS report, 22% of reproductive age group women in Ethiopia were underweight, one out of each four women of reproductive age (WRA) groups are thin (22.4 %), adolescent girls age 15-19 (29%) are presumed to be thin (BMI below 18.5) and rural areas have a higher percentage of thin women (25%) than urban areas (15%) (2,4). Low body mass index ($<18.5\text{kg/m}^2$) and /or short stature (height < 145 cm) are common in women living in southern and southeastern Asia, followed by Sub-Saharan Africa, with critical rates ($>4\%$) in Eritrea. Malnourished women with a body mass index (BMI) below 18.5 showed a progressive increase in mortality rates also as an increased risk of illness (1). Malnutrition among women is probably going to have a serious impact on their own and their children's health for example: maternal and perinatal morbidity and mortality, stillbirth, miscarriage low birth weight, underweight, thinness, infections, and birth trauma like obstetric fistula (OBF) (5).

Obstetric fistula is a childbirth injury during which a hole-or fistula-between the vagina and the bladder and/or rectum occurring during unassisted, prolonged, obstructed labor, without timely medical intervention-such as an emergency cesarean delivery. The sustained pressure of the baby's head on the mother's pelvic bone damages soft tissues and deprives blood flow to the tissue, resulting in necrosis. Eventually, the dead tissue comes away, leaving a fistula, which causes an unbroken leaking of urine and/or feces through the vagina (6). Very young mothers who haven't attained their adult stature having their first birth, women whose growth has been stunted due to poor nutrition or childhood illness, women in the country those that use traditional care and home delivery are particularly in danger (7,8). About two million women in developing countries suffering from OBF, 50,000 to 100,000 new cases are estimated to occur annually. It's most prevalent in sub-Saharan Africa and Asia. In Ethiopia, the prevalence of obstetric fistula is 18.8%, an estimated 9,000 women develop OBF every year and 1,200 of them are treated by Hamlin Fistula Ethiopia (HFE) (9,10). However, OBF is a preventable and in most cases treatable childbirth injury and in 2014, the Federal Ministry of health with other key partners United States Agency for International Development (USAID) renewed its focus on OBF and taking the bold step of developing a plan of action to eliminate fistula by the year 2020 (6,11).

Information on the nutrition status of obstetric fistula women and risk factors that affect the nutritional status of women with obstetric fistula is quite lacking. Available data mainly refer to particular groups like pregnant and lactating women. Therefore, this study findings provide information on the nutritional status and the associated factors that influence the nutritional status of women with obstetric fistula in the Addis Ababa Fistula Hospital (AAFH) and will be used for the improvement of future planning for intervention.

1.2 The statement of the problem

In low-and middle-income countries, many WRA particularly adolescents and young women are nutritionally vulnerable and don't consume enough healthy and nutrient-rich foods to satisfy their daily needs. Under-nutrition is a significant issue in Ethiopia and is understood to be related to maternal and perinatal morbidity and mortality (12). In Sub-Saharan Africa, a serious reason for the widespread malnutrition and therefore the associated consequences in resource-poor settings are due to diets that are often monotonous, largely dominated by starchy staples, mainly of cereal or root staple foods, plant-based with little or no intake of animal source proteins vegetables and fruits (13,14). In countries like Ethiopia poor protein and carbohydrate intake are the main causes of under-nutrition (9). Maternal under-nutrition has been strongly linked to functional consequences (12) and OBF constitutes a severe threat to the health of adolescent women especially.

Obstetric fistula leaves women incontinent, ashamed, and often isolated from their communities. They are the foremost vulnerable and marginalized groups of society and OBF has a profound effect on women's quality of life as they suffer from physical, psychological, and social problem (6,15,16). Several factors contribute to women's nutritional status among which age, marital status, educational status, place of residence, and income are the main ones (12,17). Additionally, inadequate dietary intake, household food insecurity, social factors, and diseases are among factors that determine the nutritional status of WRA (17). This shows that a combination of factors at the individual, household, and community level also contribute to women's health status (18).

Besides, the majority of women with OBF are predisposed to being malnourished. This is often happening due to the fact most of them experience physical, social, and psychological problems (9). A qualitative study that was carried out in Bahirdar, one of the outreach centers of HFE discussed the results of OBF. Women experienced: a) physical problems like uncontrollable leakage of urine and feces through the vagina; genital sores; burning and itching of the genital area; offensive odor; wetting and soaking of their dresses, bed sheet, inability to move their body parts and exhaustion. b) social problems like ostracization by relatives, neighbors and other community members, divorce, lack of affection and support from husbands, school dropout because of discrimination by classmates, husbands seeking second wives, faced social disintegration and isolation, as they weren't allowed to participate in social events, mourning ceremonies, weddings, "EKUBS" (tradition social group which mainly focused on money contribution and saving and eventually refunding it by lottery method) and "MAHIBERS" (traditional social association formed for religious purpose and to assist other and poor). c) psychological problems like most of them perceived themselves as inferior to other healthy women, feelings of hopelessness, fear, sadness; some had even attempted suicide, others said "better to die", unable to participate in socio-cultural events (9,19)

Obstetric fistula is an-under-valued and under-studied problem in low-resource countries. It occurs more often in rural areas and may be hidden from view and the majority of women take quite a long time before seeking medical intervention for their condition. Also most women with obstetric fistula often experience shame and isolation from their communities and have no transportation money to go to health institutions because they have no income due to their situations (11,20). The cumulative factors prevent these women from getting a balanced diet and finally suffering from under-nutrition. Also, malnutrition and underfeeding are risk factors for postoperative complications (21). These conditions have an impact on surgery outcomes like breaking down of surgery site, predispose the women for repeated surgery and again the condition aggravates further psychological problems (15).

Therefore, studying the magnitude of malnutrition and identifying factors that are associated with under-nutrition among OBF women is necessary to control it and helps to achieve appropriate healing and functional recovery through providing appropriate nutritional support in addition to good technical surgical skills (15).

1.3. Significance of the study

The significance of this paper was to get a valuable extent, determinants of under nutrition, and relationships between the determinants and nutritional outcomes in obstetric fistula women in Hamlin Fistula hospital. This study finds out the association and risk factors of women with obstetric fistula in Hamlin fistula Hospital. Moreover, health education will be conducted and will develop awareness in women with obstetric fistula regarding malnutrition and its risk factor. The results of the study are going to be useful to the hospital managers, health professionals, and nutritionists to plan for nutrition interventions targeting the foremost vulnerable group of women. It serves as an input to the ministry of health and its stakeholders to gauge an existing nutrition program and make the acceptable decision for remedial actions to promote dietary diversification and modification. Also, help policymakers to decide on which factors to intervene. Additionally, serve as an input for other researchers interested to try to do their study in a similar area.

2. Literature Review

Under nutrition is one of the world's most devastating problems which is linked with Poverty (3,22). Poverty amplifies the danger of and risks from malnutrition and also malnutrition can perpetuate a cycle of poverty and ill-health, as a result, it increases health care costs, reduces productivity, and slows economic growth (22). "The developmental, economic, social, and medical impacts of the worldwide burden of malnutrition are serious and lasting for people, their families, communities, and countries" (3).

2.1 Underweight

Nutritional status is a sign of the general well-being of a population and Women's nutritional status is a crucial component of Ethiopia's efforts to end all forms of malnutrition (11,23). Nutritional status assessment is a measurement of the extent to which an individual's physiologic need for nutrients is being met. It is the interpretation of information obtained from anthropometric, biochemical/biophysical, clinical, and dietary studies to determine whether an individual or group of people are well-nourished or malnourished (23).

Malnutrition in all its forms includes over-nutrition and under-nutrition (3,5). Over-nutrition refers to excessive intake of energy and /or macronutrients resulting in overweight, obesity, and diet-related non-communicable diseases. Under-nutrition is often divided into Chronic energy malnutrition (Underweight) and micronutrient deficiencies (5,24). "CEM occurs when the level of energy intake is insufficient to meet the person's energy requirement assessed by using a body mass Index (BMI). BMI is a simple index of weight-for-height (wt/ht^2) that is used to classify adults' nutrition levels" (24).

A study conducted in Afar Assayita district reported that the prevalence of underweight ($\text{BMI} < 18.5$) was 41.1% among non-pregnant women, with a percentage of mild, moderate, and severe underweight being 34.5%, 3.9%, and 2.7%, respectively. The mean weight, height, and BMI were 42.49 kg, 1.51 M, and 18.53 kg/m^2 , respectively (25). Another analysis on factors associated with CEM among reproductive-age women in Ethiopia shows that 22.6% were underweight (24).

2.2 Factors associated with underweight

In 2018, a review of factors like nutrition, household economic status, educational status, place of residence, age and marital status are found significantly affect the nutritional status of women in Ethiopia (12).

2.2.1 Age of women

Women's age and parity are important factors that affect maternal depletion, especially in high fertility countries. DHS surveys conducted in Burkina Faso, Ghana, Malawi, Namibia, Niger, Senegal, and Zambia showed a greater proportion of mothers age 15-19 and 40-49 that exhibit chronic energy deficiencies. An area study in Ethiopia has also shown that ladies within the youngest age bracket (15-19) and ladies within the oldest age bracket (45-49) are affected mostly by under-nutrition (15). Early marriage is one of the socio-cultural factors related to under-nutrition and among the determinant factors of obstetric fistula (10,26). "The 2012 USAID report on delaying the age at marriage and reducing malnutrition of adolescent girls in India showed that early marriage was related to early pregnancy and high fertility; the close spacing of births, unwanted pregnancies, and pregnancy termination which cumulatively deteriorates nutritional status of adolescent girls" (26). A study conducted in Somalia found that, majority of women (85.7% developed obstetric fistula at the age of 15 and 24 years (14). In Ethiopia, AAFH statistics show that-quite 95% of girls with Vesico vaginal fistulas developed after obstructed labor-the mean age of marriage was 14.7 and therefore the mean age at causative delivery was 17.8 years (27). In the 2016 EDHS report, the national median age of girls initially married is 17.1 years (4). This is often almost according to the study conducted in the Gambella region which is 17.4 (26). During this study pregnant women who were married before the age of eighteen, 66 (46.8%) which is almost fourfold were undernourished whereas, from those that married at their eighteen or more age, only 26 (14.4%) were undernourished (27). A similar study shows in West Arsi, Ethiopia, pregnant women who married before the age of fifteen were sixteen times more likely undernourished compared to pregnant women who married between the ages of eighteen and nineteen years (26). Additionally, in a study conducted from Afar, Assayita district the result has shown that 30–39 year-old women had fewer odds of underweight compared to 15–19 year-old women (COR = 0.51, 95% CI: 0.27, 0.96) (28). Another study conducted in the Afar region by Jemal in 2016 shows that rural women age 15-19 and 40-49 were more than 1.5 times more likely to be suffering from chronic energy deficiency than women age 20-29 (28).

A study from India identified that the age of the ladies may be a prominent risk factor of under-nutrition among women within the reproductive age bracket. Women within the age bracket 15-49 and 20-34 are 3.1 and 1.7 times respectively more likely to suffer from under-nutrition compared to women within the age bracket 35-49. In rural India, women within the age bracket 15-49 and 20-34 are 2 times more likely to be undernourished

and in urban India, under-nutrition is 5.5 times and a couple of .3 times quite more than the 35-49 age bracket respectively (29). Another study conducted in Nepal shows that ladies aged 15 to 24 years were about 3 times more likely to be malnourished than women of 35 to 49 years age (AOR = 2.7, 95 % CI = 2.5,3.0) (30).

2.2.2 Marital status of women

“Marital status of the women is related to household headship and another social-economic status of the ladies that affect their nutritional status. Nutritional and social securities could be endangered by a negative change in marital status” (12). Different studies in Ethiopia showed that women’s malnutrition is significantly related to the marital status that indicates as compared to married women malnutrition is higher in unmarried rural and divorced/separated urban women (12,25). In 2016, a study in the Afar region also found that never-married women were 1.6 times more likely to be suffering from CED than married women. Among non-pregnant women result shows that women who haven't been married had quite 3 times the odds of underweight compared with married women (COR = 3.61, 95% CI: 1.68, 7.75) (25).

2.2.3. Education status of women

The education sector provides opportunities for improving nutrition through all three of the pathways: the extent of underlying drivers, the nutrition sensitivity of drivers, and therefore the use of underlying determinant interventions as platforms for direct nutrition interventions. It is a crucial way of empowering women and of adjusting norms about nutrition. Women’s empowerment is significant to ending malnutrition which education may be a crucial driver of empowerment. It emphasizing the high value of girls' education for the nutrition status of their children (31). Women who even received a minimal education have generally more awareness than people who had no education on the way to utilize available resources for the development of their nutritional status and that of their families. Education may enable the women to make independent decisions, to be accepted by other household members, and to possess greater access to household resources that are important to enhance their nutritional status (15), as a result, it's very effective in raising overall economic productivity, lowering infant and maternal mortality, improving nutrition, and promoting health (12).

A study conducted in Somalia found that 71.4% of women with OBF had no formal education, while only 28.6% had formal education. Among those that had a formal education, just one woman had education beyond the secondary level (18). A comparative study on maternal malnutrition in ten Sub-Saharan African countries and a study within the Southern Nation and National Population (SNNP) of Ethiopia showed that the upper the level of education the lower the share of undernourished women. Similarly, studies in the Philippines, have shown a

decreased incidence of malnutrition among young children with an increase in the level of mothers' education (15). Another study conducted in Hossana shows that women who attend higher institutions had 2.1 higher odds of attaining adequate dietary diversity as compared to those who can't read and write (AOR=2.1; CI: 4.8, 15.2). Also, women who got health education about nutrition concerning eating additional meals, iron source, and diversified foods during pregnancy (AOR=2.3; 95% CI: 1.2, 4.4) were 2.3 times more likely to have adequate dietary diversity as compared to those who didn't get the information (22). Extra study in India, in both rural and urban areas the findings revealed that women with primary, secondary, and higher education are less likely to be affected by under-nutrition than their no education counterparts (32). Surprisingly, one study conducted in Nepal shows that albeit women having formal education were 1.4 times more likely to be malnourished than the women having informal education (OR = 0.7, 95 % CI = 0.6, 0.8). This is because the majority of them (48.5%) were unemployed and lack of nutrition education provided. Women who didn't get nutrition education from any organization were 1.1 times more likely to be malnourished than those women who got (OR = 1.1, 95 % CI = 1.0, 1.2) (25).

2.2.4 Place of residence

Rural women are more likely to be undernourished than urban women and under-nutrition is assumed to be suffering from health, poor dietary diversity, and food security status of the individual (28). An analysis of the 2016 EDHS data on factors associated with CEM among reproductive-age women in Ethiopia shows that 77% of women were living in rural resident and women who lived in a rural area had higher odds of underweight compared to those who lived in the urban setting (AOR = 1.59; 95%CI: 1.19–2.12) (28). A study which is conducted in Somali showed that 57.1% of women with obstetric fistula were from rural areas before the event of obstetric fistula and 42.9% were living in urban areas (19). According to a comparative study on maternal nutritional status, 16 out of the 18 DHS conducted in African countries and a study in the SNNPR of Ethiopia showed that rural women are more likely to suffer from chronic energy deficiency (CED) than women living in urban areas (12). In 2017 a study done in northwest Ethiopia shows that residential areas significantly associated with maternal under-nutrition the odds of under-nutrition among rural resident mothers were 1.5 times higher than the odds of urban mothers (AOR 1.5, 95% CI 1.1–2.12) (26).

2.2.5 Household economic status

The economic status of a household is an indicator of access to adequate food supplies and a serious determinant of child and maternal nutritional status. A study of most of the Demographic Health Surveys (DHS) conducted in developing countries showed that women from low economic status households were affected consistently by malnutrition (12). Employment of women benefit household nutrition in general and thus the women's nutritional status especially. A study conducted in Nepal shows that unemployed women had nearly twice more chances of being malnourished than women doing manual work (AOR = 1.9, 95 % CI = 1.5, 2.2) (25). The similar result's observed from a study reported from Hosanna, women whose family monthly income earned greater than 2000 Ethiopia birr 1.9 times (AOR=1.9; 95% CI: 1.06, 7.1) more likely to possess adequate dietary diversity as compared to those 500 Ethiopia birr (22). Another studies in Gonder and Addis Ababa Kolfe keraniyo sub city women with household income 1000-2000 and more than 5,000 ETB had dietary diversity practice almost 2 and 2.3 times than those household having household income less than 1000 and 2000 per month respectively. A study in Bahirdar also revealed that pregnant women earn more than 2000 ETB monthly were 3.1 times more likely to have good dietary practice than those earning less than 1000 ETB (14).

2.2.6 Time interval before treatment

A study in Bahirdar Hamlin fistula revealed that women had lived with obstetric fistula for a mean of 12.6 years before seeking medical treatment (9). Another study conducted in Somali found that the typical years of women living with obstetric fistula were between 1 and 29 years although the majority 52.4% were living with obstetric fistula for less than 4 years. One woman has been living with obstetric fistula for up to 29 years (19).

2.2.7 Psychosocial factors

Poor social support are negatively associated with physical, social and environmental domain of Quality of life QOL. Women with physical challenges might need assistance from husband, family members, relatives and community members but studies showed women with fistula divorced because of their fistula and lacks support. A study conducted in Ethiopia regarding psycho-social factors revealed that 52.6% respondents had poor social support; 30.4% had moderate social support:83% were stigmatized and 84% had experience of discrimination (16).

2.2.8 Household Food Insecurity

Food insecurity is a state or a condition during which individuals experience limited or uncertain physical and economic access to safe, sufficient, and nutritious food to satisfy their dietary needs or food preferences for a productive, healthy, and active life. On the opposite hand, Food security is achieved when all people, in the least times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for a lively and healthy life. Different literature has shown that the extent of food insecurity remains very high which needs special attention and it's is found to be a significant modifiable determinant of maternal nutritional status that resulted in under-nutrition at different levels (25,26). A study in Colombia showed that food insecurity was an enormous determinant of maternal underweight. Another study in Guatemala showed that the nutritional status of WRA, explained by short stature (height < 145 cm), was related to greater food insecurity; however, there was no significant difference within the BMI of women from households classified as moderately or severely food-insecure. In low-income households of Los Angeles, as an example, the food insecurity level was 24.4%. For instance, Similarly, a study result in Jordan showed food-insecure women with hunger were at higher risk of malnutrition (26). The study conducted in Vietnam also showed that Food insecurity (HFIAS) scores were 6.7 (5.7 SD) out of 27 classifying 51% as having severe, 15% as moderate, and 19% as mild food insecurity (25).

Levels of food insecurity in developing countries are still substantially above developed countries. In Kenya, a recent study showed that of all households involved, 70.1% were severely food-insecure, 21.9% were moderately food-insecure, and 3.7% were mildly food-insecure, whereas food-secure accounted for fewer than 4.3% (24).

A study from Afar regional state in Assayet District found that severely food insecure women were quite 6 times likely to be underweight as compared with food-secure women (AOR =6.99, 95% CI: 2.66 to 18.38). Prevalence of HFIAS was 70.4 with a mean of seven .0 ($3.6 \pm \text{SD}$); 26.1%, 30.20%, and 14.1% were mild, moderate, and severe food insecurity, respectively (25). Another study executed in Farta district, Ethiopia, about 70.7% of total study participants were categorized as food-insecure. Similarly, a study conducted in Addis Ababa city showed that 58.16% of the entire households were below the food-insecurity cutoff point. Another longitudinal study reported in Ethiopia on adolescent food-security levels, there have been different food-insecurity magnitudes identified during the study period. Overall, 20.5% of adolescents were food-insecure within the first-round survey, while the proportion of adolescents with food insecurity increased to 48.4% 1 year later. During the 1-year follow-up period, quite half (54.8%) of the youth encountered transient food insecurity (24).

2.2.9 Women's Nutrition

Some evidence in developing countries indicated that for social and biological reasons, WRA are amongst the foremost susceptible to malnutrition (4,12). Under-nutrition among women is caused by eating insufficient or having an unbalanced diet that lacks adequate nutrients (4).

Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods and is additionally a proxy for nutrient adequacy of the diet of people (31). Dietary diversity score (DDS) emerged as a measure of nutritional adequacy and it refers to the number of food groups consumed in a given time, commonly a diet of at least 4 DDS was valid as nutritionally adequate(4). DDS is differentiated as household dietary diversity score (HDDS) and individual dietary diversity score (IDDS) (32). IDDS is a proxy measure of the nutritional quality of individual's diet, aim to reflect micronutrient adequacy of a diet (31,32). The dietary diversity questionnaire represents a rapid, user-friendly, and simply administered low-cost assessment tool (31).

A study conducted in West Gojam shows that a large proportion of women (98.3%) rely on the monotonous food group, only 10.2% women found within the high dietary diversity score (DDS >6) means eating more than 6 food groups from 10 (14). Another study conducted in Hossana found that nearly half of the respondents (48.2%) were within the medium (5–7 food groups), 9.2% in low (<5 food groups) and 42.6% had high dietary diversity (> 8 food groups) (33). The finding is related to another study in South Africa showed that 8.1% low, 44.2% medium, and 47.7% of the women stated high-level dietary diversity. But inconsistency in the studies conducted in Gonder 21.1% low, 62.7% medium, and 16.2% high, and Malaysia 2.5% low, 9.1% medium, and 88.4% of the participants had high dietary diversity (33).

Also, under-nutrition is a major risk factor for adverse birth outcomes (24). About two million women in developing countries suffering from obstetric fistula, 50,000 to 100,000 new cases are estimated to occur annually. It's most prevalent in sub - Saharan Africa and Asia. In Ethiopia, an estimated 9,000 women develop obstetric fistula annually and 1200 of them are treated by HFE. OBF constitutes a severe threat to the health of adolescent women especially. It has many consequences: about 93% of girls with obstetric fistulas had a stillbirth and 97% develop psychological state problems like depression. Among people that experienced depression, 54% reported suicidal ideation. Further, 68% had no living children, nearly 54% were divorced, 13% weren't allowed to eat with family members and 41% didn't belong to any community association (9).

Conceptual Framework

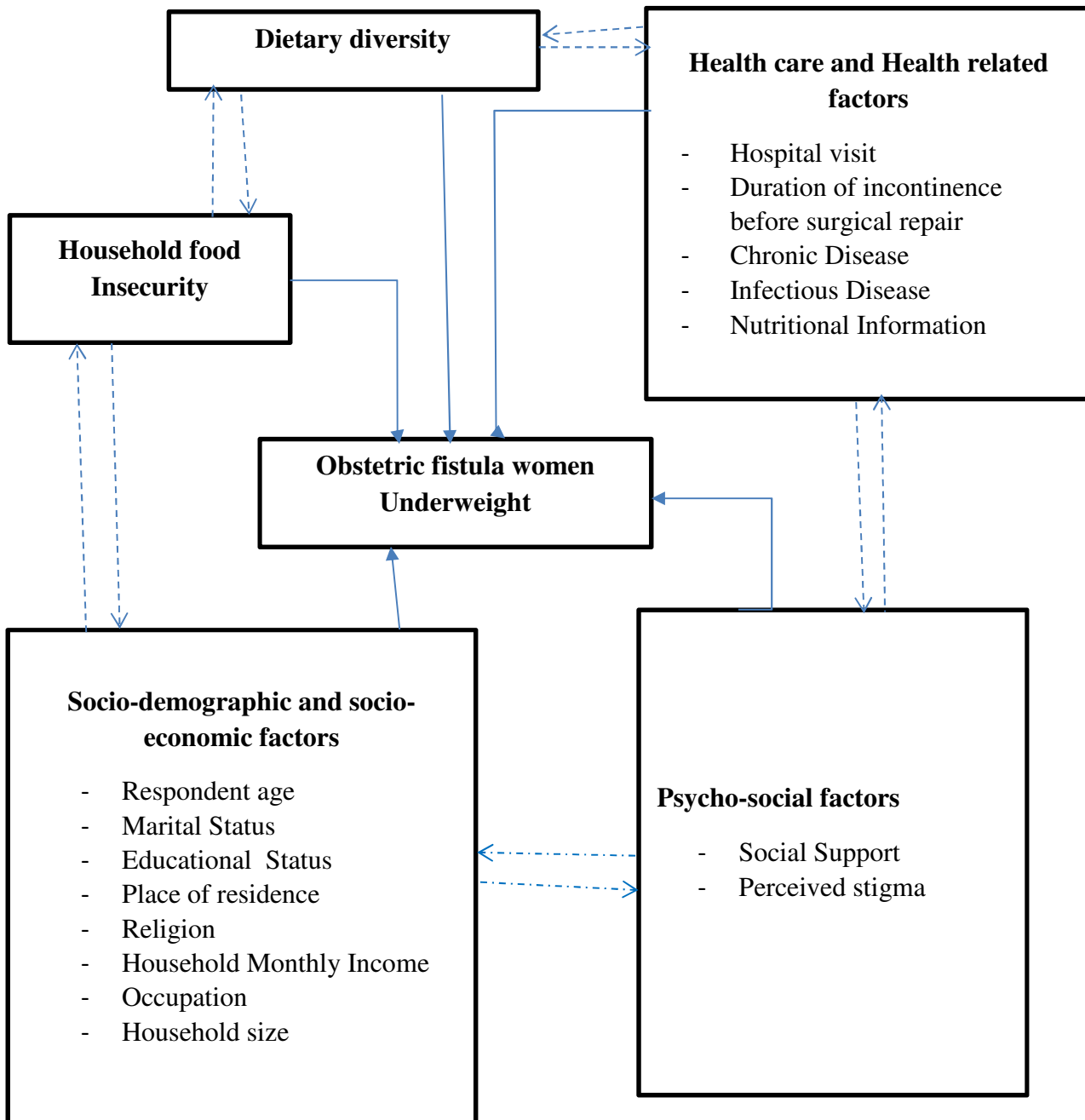


Figure 1: A modified conceptual framework adapted from UNICEF (34).

3. Objectives

3.1. General Objectives

To assess the magnitude of underweight and associated factors of women aged 15-49 years with obstetric fistula in Hamlin Fistula Addis Ababa, Ethiopia from January 20/2021 G.C to February 21/2021 G.C.

3.2. Specific Objectives

- a) To assess the magnitude of underweight of women age15-49 years with obstetric fistula.
- b) To identify risk factors associated with underweight of women with obstetric fistula aged 15-49.

4. Methods

4.1 Study design and settings

A hospital-based cross-sectional study was conducted from January 20/2021 G.C to February 21/2021 G.C to determine the prevalence of underweight and the associated factors among women with obstetric fistula in the reproductive age group (15-49 years). The study was conducted at Hamlin Fistula hospital, Addis Ababa, Ethiopia. HFE is a registered charitable organization in Ethiopia dedicated to the treatment and prevention of childbirth injuries called obstetric fistulas. Dr. Catherine and Reg Hamlin founded this organization in 1974 after being confronted with the tragic situation of Ethiopian women affected by obstetric fistulas. HFE oversees AAFH- the world's first fistula hospital, five regional hospitals providing health care to rural women, Hamlin College of Midwives, and Desta Mender-a rehabilitation training center for long-term care of patients. HFE is a world-class center of excellence for treating obstetric fistulas and training doctors to specialize in this surgery. Rehabilitation services like physiotherapy, counseling, and skills training are available to assist patients to regain their self-esteem, find meaningful employment, and reintegrate into village life. HFE is dedicated to the eradication of obstetric fistulas through its preventive strategy of providing trained midwives in the rural regions of the country. HFE relies on the generosity of donors to continue its work in treating and preventing obstetric fistulas, ensuring Ethiopian women have holistic and compassionate healthcare free of charge. AAFH has been providing outpatient and inpatient with 120 beds. A total of 60,000 women have been treated since 1959 G.C starting from the arrival of Dr. Hamlin to Ethiopia from Australia.

4.2 Population

4.2.1. Source population

The source population included all women with obstetric fistula who came to Addis Ababa Fistula Hospital

4.2.2. Study Population

The study population included all women with obstetric fistula fulfil the eligibility criteria who came to Addis Ababa Fistula Hospital during the study period.

Inclusion Criteria

All women with obstetric fistula in the reproductive age group (15-49 years) who attended the Hamlin Fistula Hospital during data collection time were included in the study.

Exclusion Criteria

Pregnant women, lactating women, severely ill patients were excluded from the study.

5.3 Sample size determination

The required sample size of the study participants was determined by the single population proportion formula.

$$n = Z_{\alpha/2}^2 (p \cdot q) / d^2$$

Where, n = sample size

p = prevalence rate = (50 %)

z = standard normal variable that at the confidential level of 95 %

d = margin of error which is 5%

q = 1-p

N = total population

$$n = (1.96)^2 (0.5 \times 0.5) / (0.05)^2 = 384.16 \sim 384 \quad n = 384$$

Since the population is less than 10,000, so the sample area is adjusted using the following correction formula

$$N_f = \frac{n_i}{1 + n_i/N} = \frac{384}{1 + 384/200} = 130$$

Where n_i = initial sample size

N_f = new sample size

N = Total population = 200

NF = 130

The 10% of the sample size was added by considering for non-response rate $10/100 \times 130 = 13$. Therefore the sample size was approximately 143.

4.4. Sampling technique/procedure

In this study, a convenience sampling technique at the OPD level was used to select the study subjects.

4.5. Study Variables

Dependent Variables

Underweight and it is dichotomized with 1 being underweight and 0 was Normal.

Independent Variables

- **Socio-demographic and socio-economic factors**
 - Respondent age,
 - Marital status,
 - Educational level,
 - Place of residence,
 - Religion,
 - Household monthly income,
 - Occupation,
 - Household size
- **Health Care and health related factors**
 - Hospital visit,
 - Duration of incontinence before surgical repair,
 - Chronic disease
 - Infectious illness,
 - Nutritional information
- **Psycho-social factors**
 - Social support,
 - Perceived stigma
- **Household Food Insecurity**
- **Dietary Diversity**

4.6. Operational definition

Underweight status: Based on the WHO classification body mass index for adults as follows: Underweight is defined as $BMI < 18.5 \text{ kg/m}^2$ and when $BMI \geq 18.5 \text{ kg/m}^2$ are not underweight (2).

Dietary Diversity Score: DDS determined by counting the number of the 9 food groups consumed by individuals over a reference period of 7 days, A diet of at least 4 DDS was valid as nutritionally adequate (32).

Food secure households was defined as households experienced fewer than the first 2 food insecurity indicators. Whereas, a household which experienced from 2 to 10, 11–17, and > 17 food insecurity indicators considered as **mildly, moderately, and severely** food insecure households, respectively. The mild, moderate and severe Food insecurity were merged and considered as Food Insecure Household (35).

Household Monthly income status was classified as: Poor household: households with monthly income less than 2,000 ETB; **Medium household:** households with monthly income from 2,000-5,000 ETB; **Rich household:** households with monthly income more than 5,000 ETB. The medium and rich household were merged and considered as rich household (14)

Social support: was measured using the Oslo-3 items social support scale and scores ranging between 3 and 14: 3–8 = poor social support; 9–11 = intermediate social support; and 12–14 = strong social support. The intermediate and strong social support were merged and considered as strong social support (16).

Perceived Stigma Score: Based on 15-item Kilifi Stigma Scale: a total score was calculated by addition of all item scores. The score above the value on 66th percentile of the data indicate the presence of perceived/felt stigma (36).

4.7 Data collection tools and procedures

Data was collected through anthropometric measurements, chart review, and face to face interviews with two experienced enumerators who had a BSC Degree in clinical nursing. One supervisor was responsible for checking whether the questionnaires were correctly completed or not.

4.7.1 Anthropometric Measurements

Anthropometry is a widely accepted technique used for the measurement of physical dimensions such as height or weight, as well as the fat mass composition of the human body to provide information about the nutrition status of an individual (12,17). Body mass index is the best measurement indicator of nutritional status for non-pregnant women in reproductive age group WRA (17).

Weight and height measurements were taken from all study subjects. Bodyweight Kilogram (kg) was measured using an electronic scale to the nearest 0.1 kg. Height in centimeter (cm) was measured in standing position using a wall stadiometer to the nearest 0.5 cm. Subjects were instructed to take off their shoes before while performing these measurements. Malnutrition in women was assessed using BMI, which was calculated as body weight in Kilograms divided by the square of her height in meters ($BMI = \text{Kg}/\text{m}^2$). A BMI below $18.5 \text{ kg}/\text{m}^2$ indicates underweight while BMI above 18.5 was taken not underweight (37).

The data collection was done during the Covid 19 Pandemic and all precautionary measures were taken. Data was collected in an open area with good ventilation. Both study participants and data collectors wore face masks throughout the data collection, optimal social distance of 2 meters was observed and hand sanitizer was used before and after measuring height and weight of the study participants.

4.7.2 Interview using a questionnaire

The data was collected by face-to-face interviews using a structured questionnaire which was initially prepared in English and then translated into Amharic. If language is other than Amharic, data was collected using a translator. A questionnaire with five different sections was prepared. The primary section addressed socio-demographic and socio-economic characteristics of participants, the second section focused on health care and health related information, the third section assessed psycho-social factors, the fourth section measured the Household food insecurity a month before the interview conducted while the fifth section was concerned to assess women dietary diversity using Food Frequency Questionnaire (FFQ).

4.7.3. Psycho-social factors

For the third section, the Kilifi Stigma Scale for Perceived stigma and Oslo-3 items social support scale were used for measurement of Psycho-social factors.

The perceived stigma was measured by using the Kilifi Stigma Scale of Epilepsy (KSSE) which was validated in Ethiopia at Amanuel Hospital Epilepsy department. It is a simple three-point Likert scoring system scored as “not at all” (score of 1), “sometimes” (score of 2), and “always” (score of 3). It has fifteen items and a total score was calculated by addition of all item scores. The score above the value on 66th percentile of the data indicate the presence of perceived/felt stigma (36).

Social support was measured using the Oslo-3 items social support scale and scores ranging between 3 and 14: 3–8 = poor social support; 9–11 = intermediate social support; and 12–14 = strong social support. The intermediate and strong social support were merged and considered as strong social support (16).

4.7.4. Household Food Insecurity

For the fourth section, the Household food insecurity Access Scale "score "(HFIAS) was used for measurement of Food access. The indicator guide was derived from FANTA III (Food and Nutrition Technical Assistance) for the HFIAS score (38). Commonly used tools to measure food security at the household level in developing country settings include the HFIAS. Responses to the questions in the scale was used to create a continuous numeric food insecurity “score,” which then compared with established cut-points to categorize the level of food insecurity experienced by the household. The HFIAS, a 9-item questionnaire, queries respondents about three domains of food insecurity, including anxiety/uncertainty about the household food supply, insufficient quality of food (including variety and food preferences), and insufficient food intake and its physical consequences. The participant responses indicate a frequency of occurrence of never, rarely (1 to 2 times), sometimes (3 to 10 times), and often (>10 times) for each of the questions, over the previous 30 days. Then HFIAS scores were calculated. HFIAS scores range from 0 to 27 with a higher score indicating greater food insecurity. Finally, Households was categorized into 4 levels of food insecurity according to recommendations by the US Agency for International Development's Food and Nutrition Technical Assistance III Project (38). Food secure households experienced fewer than the first 2 food insecurity indicators. Whereas, a household which experienced from 2 to 10, 11–17, and > 17 food insecurity indicators were considered as mildly, moderately, and severely food insecure households, respectively. The mild, moderate and severe Food insecurity were merged and considered as Food Insecure Household (35).

4.7.8. Dietary Diversity

For the fifth section, dietary intake information was collected using the FAO Guideline for measuring household and individual dietary diversity (31) of nutritional intake to assess women's dietary diversity. A FFQ which was taken from a previously validated questionnaire (39). For the food frequency questions, the respondents were asked about the frequency of consumption of each food in the prior one week. Food items of the FFQs were grouped into nine food groups. 1. Cereals, 2. Legumes, and nuts, 3. Roots and tubers, 4. Fruits, 5. Vegetables 6. Meat and fish, 7. Egg (Hens), 8. Milk and milk products 9. Fast foods, beverages, and sweets. Assigned food groups were derived from FAO dietary guidelines (31). The consumers of a food item were defined as the intake of a food item at least once a week. The number of food groups the women ate within a week was counted to analyze dietary diversity score (DDS). DDS was constructed as the sum of numbers of food groups consumed over the past week. A diet of at least 4 DDS was valid as nutritionally adequate and taken as high DDS whereas a score below 4 DDS considered as Low DDS (32,33,35).

4.8. Data Analysis

Data was checked, cleaned, and entered into SPSS version 26 software for further analysis. BMI was calculated based on weight and height taken. For examining prevalence and factors associated with underweight both descriptive and analytical analyses were computed. Descriptive analysis like means $\pm$ SD, percentages and frequency distribution were used to summarize variables. Psychosocial factors were assessed using the Oslo-3 items social support scale and the Kilifi Stigma Scale of Epilepsy to measure social support status and perceive stigma respectively. The food security status of the household was assessed using the household food insecurity access scale. Dietary Diversity score used as a measure of nutritional adequacy. Bivariable and multivariable binary logistic regression analysis used to identify the factors associated with underweight among women with obstetric fistula. All independent variables that were associated ($P < 0.25$) with the outcome variables in bivariable analysis were included in the final multivariate binary logistic analysis. Both crude and adjusted odds ratios together with their corresponding 95% confidence intervals was computed to see the strength of association between the outcome and independent variables. A value of $P < 0.05$ was considered to declare the result as statistically significant. Hosmer-Lemeshow Goodness-of-fit-test was done to check model fitness. Texts, tables and figures were used to present the finding of the study.

4.9 Data Quality Management

The final version of the questionnaire was translated into Amharic language and again translated back to English to check the consistency. The data collectors had two days of intensive training on the instruments, method of data collection, how to take anthropometric measurements, ethical issues, and the purpose of the study. Data collectors' accuracy of anthropometric measurements was standardized with their trainer during training. During data collection, data collectors took two separate height and weight measurements for an individual and the average value was reported. The functionality of digital weight scales was checked using known weight every morning before data collection begins and before every weight measurement. Data collectors ensured the scale reading exactly at zero. Investigator checked the collected data for completeness and consistency throughout the data collection period. The instrument designed based on the literature review was approved for validity and reliability. Data collection was supervised and checked before electronic data entry by the principal investigator. Before analysis, data was checked for normality and homogeneity, then analyzed & interpreted. Finally, a quality scientific report was developed and will be disseminated.

4.10 Ethical Considerations

A letter of Ethical Clearance was obtained from the IRB of St. Paul's Millennium Medical College. Verbal consent was obtained from each study participant after thoroughly explaining the objectives and benefits of the study. In this study, the consent was prepared in English and translated into Amharic. The information sheet was read loudly by the data collector before the interview. Privacy and confidentiality were assured at all levels. To ensure confidentiality, any personal identifying information on participants was not collected. All individuals had the right to refuse participation and data collectors were instructed not to attempt to force anyone to participate.

4.11 Dissemination of the findings

The study results will be shared for Addis Ababa Hamlin Fistula Hospital, Hamlin Fistula Ethiopia, Hamlin Fistula Midwifery College, and concerned governmental bodies like the Addis Ababa Health Bureau. The findings will be given to non-governmental organizations that are working on malnutrition and related projects in Ethiopia. Also, the finding will be shared through different websites like Catherine Hamlin Fistula Foundation (hamlin.org.au), Fistula Foundation (fistulafoundation.org), UNFPA (www.unfpa.org), International day to end obstetric fistula /United Nations (www.un.org) and Obstetric Fistula Care Plus (fistula.care.org). Finally, it will be presented in relevant scientific conferences and published in peer reviewed journals.

5. Result

5.1. Background characteristics of participants

A total of 143 women with obstetric fistula participated in this study with a response rate of 100%. Table 1. Shows the socio-demographic characteristics. Nearly half of the participants 67 (46.9%) and 71 (49.7%) were within 25-34 year age group and married, respectively. Regarding the educational level large majority of women 96 (67.1 %) had no formal education and 107 (74.8 %) were from rural areas. Forty (28.0%), thirty-nine (27.3%) and sixty-four (44.8 %), of them were orthodox, protestant and Muslim respectively. The majority 111 (77.6 %), were within poor household classification and 86 (60.1 %) were farmer. Nearly half of the participants 68 (47.6 %) live alone within 1-3 household size category.

Table 1: Socio-demographic characteristics of women who attend in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Variable	Category	Frequency (n)	Percentage (%)
Respondent's age	15-24	45	31.5
	25-34	67	46.9
	>=35	31	21.7
Current marital status	Single	15	10.5
	Married	71	49.7
	Other*	57	39.9
Educational level	No formal education	96	67.1
	Primary education	34	23.8
	Secondary and higher	13	9.1
Place of residence	Urban	36	25.2
	Rural	107	74.8
Religion	Orthodox	40	28.0
	Protestant	39	27.3
	Muslim	64	44.8
Household monthly income	<2000	111	77.6
	>=2000	32	22.4
Occupation	Farmer	86	60.1
	Private business	28	18.2
	Student	11	7.7
	Jobless	2	1.4
	Employee	18	12.6
Household size	1-3	68	47.6
	4-6	53	37.1
	>=7	22	15.4

Notice: Other* (Divorced, Widowed)

5.2. Health care and health related characteristics

More than half 80 (55.9%) patients were new for the hospital visit. Of 143 women, substantial number of women 90 (62.9%) stayed incontinent for more than 6 months before fistula repair. Almost all respondents had no chronic and infectious diseases 139 (97.2%) and 141(98.6%) respectively. Regarding nutritional counseling, very large majority 105 (73.4%) of women had no access to get nutritional information (Table 2).

Table 2: Health Care and health related characteristics of women with obstetric fistula who attend in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Variable	Category	Frequency (n)	Percentage (%)
Hospital visit	New	80	55.9
	Repeated	63	44.1
Duration of Incontinence before Surgery	< 6 months	53	37.1
	≥ 6 months	90	62.9
Chronic Disease	Yes	4	2.8
	No	139	97.2
Infectious Disease	Yes	2	1.4
	No	141	98.6
Nutritional Information	Yes	38	26.6
	No	105	73.4

5.3. Psycho-social-related results

Nine-tenths 116 (81.1%) of the participants had poor social support (Fig. 2). The social support status was assessed using the Oslo-3 items social support scale scores ranging between 3 and 14. The score ranging from 3-8 was taken as poor social support while the intermediate (9-11) and strong (12-14) scores were merged and taken as strong social support.

The perceive stigma was assessed using the Kilifi Stigma Scale of Epilepsy. The lowest score of the data was 32 and the highest score was 45. The lower, median, and upper quartile values were 32, 42, and 45 respectively. The 66th percentile of the data was 42, so that scores above 42 were considered to show women with obstetric fistula who felt stigmatized. Accordingly, out of the 143 study subjects recruited in the study, 65.7% fulfilled the criteria for perceived stigma as measured by the KSSE (Fig.2).

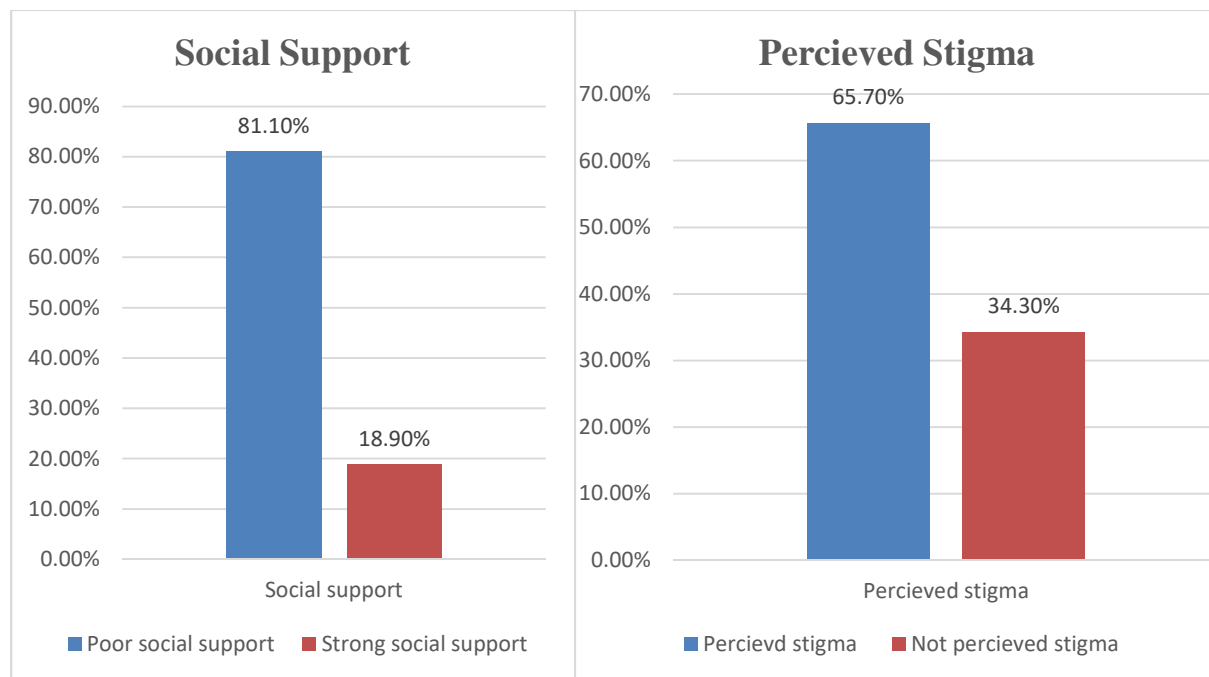


Figure 2. Percentage of psychosocial status of women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

5.4 Household Food Insecurity Status-related result

The food security status of the household was assessed using 27 questions, which were adapted from the household food insecurity access scale. Nearly half of 143 women (42.7%) from food secure households experienced fewer than the first 2 food insecurity indicators. Whereas, a household which experienced from 2-10 (31.5%), 11-17 (16.8%), and >17 (9.1%) food insecurity indicators were considered as mildly, moderately, and severely food insecure households, respectively. The mild, moderate and severe food insecurity were merged and considered as food insecure household. Eighty four women (58.7 %) were from food insecure households.

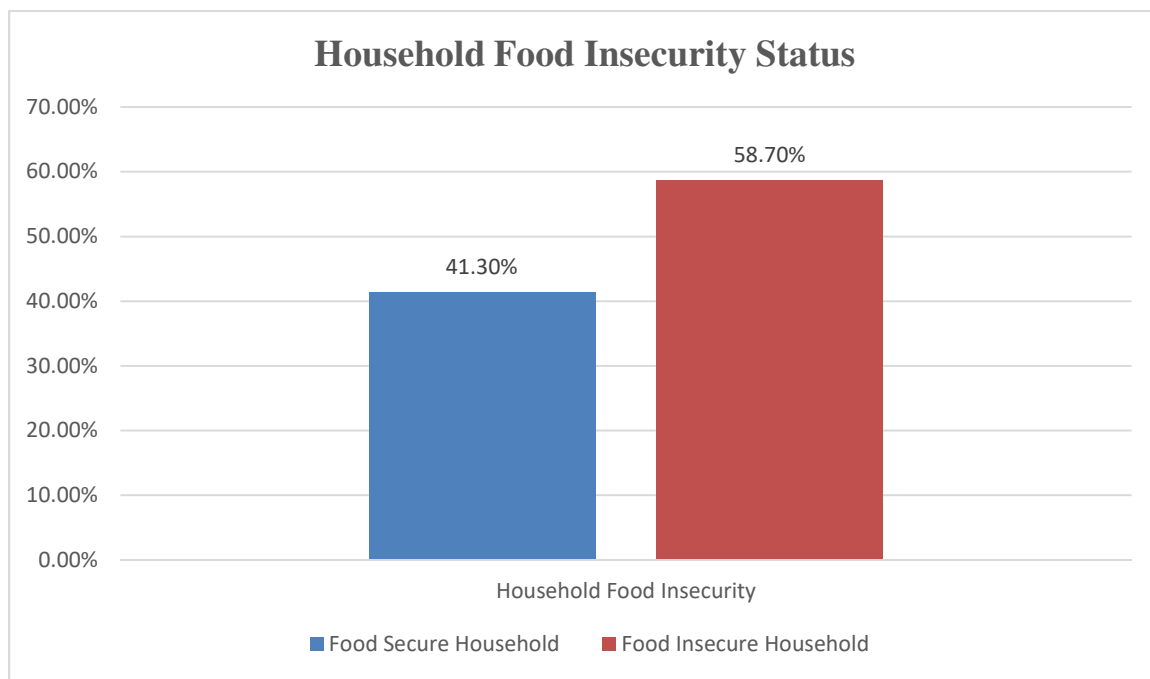


Figure 3: Percentage of household food security of women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

5.5 Dietary Diversity-related results

The study found the mean DDS was 6.41 (± 1.84 SD). Out of nine food groups, 120 (83.9%) of the respondents had high dietary diversity (≥ 4 food groups) (Table 3). The assigned food groups were derived from FAO dietary guidelines. The DDS was constructed as the sum of numbers of food groups consumed over the past week. A diet of at least 4 DDS was taken as high DDS whereas a score below four was considered as Low DDS. From the nine food groups cereal were commonly used, which accounts for 130 (90.9%) women (Table3).

Table 3: Respondents by food group, women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Food Group	N=143	Percentage
Cereal	130	90.9
Legumes and Nuts	123	86.0
Roots and Tubers	117	81.8
Fruits	109	76.2
Vegetables	127	88.8
Meat and Fish	61	42.7
Egg	61	42.7
Milk product	62	43.4
Fast food, beverages and sweet	127	88.8
DDS<4 food group	23	16.1
DDS$\geq$4 food group	120	83.9
Mean and SD	Mean 6.41$\pm$1.84SD	

5.6. Nutritional status (BMI) of women with obstetric fistula

The mean ($\pm$ SD) height (m), weight (kg) and BMI of respondents was 1.52 ($\pm$ 0.07), 47.47 ($\pm$ 7.23) and 20.51 ($\pm$ 2.98) respectively.

An analysis revealed that 48 women with obstetric fistula in reproductive age group (15-49) years were underweight (P=33.6%; 95% CI: 26%-42%).The underweight status in obstetric fistula women was assessed using the BMI. The magnitude of underweight (BMI<18.5) was 33.6% while 66.4 % of the study participants had a BMI $\geq$ 18.5 kg/m² (n=143) (Fig. 4).

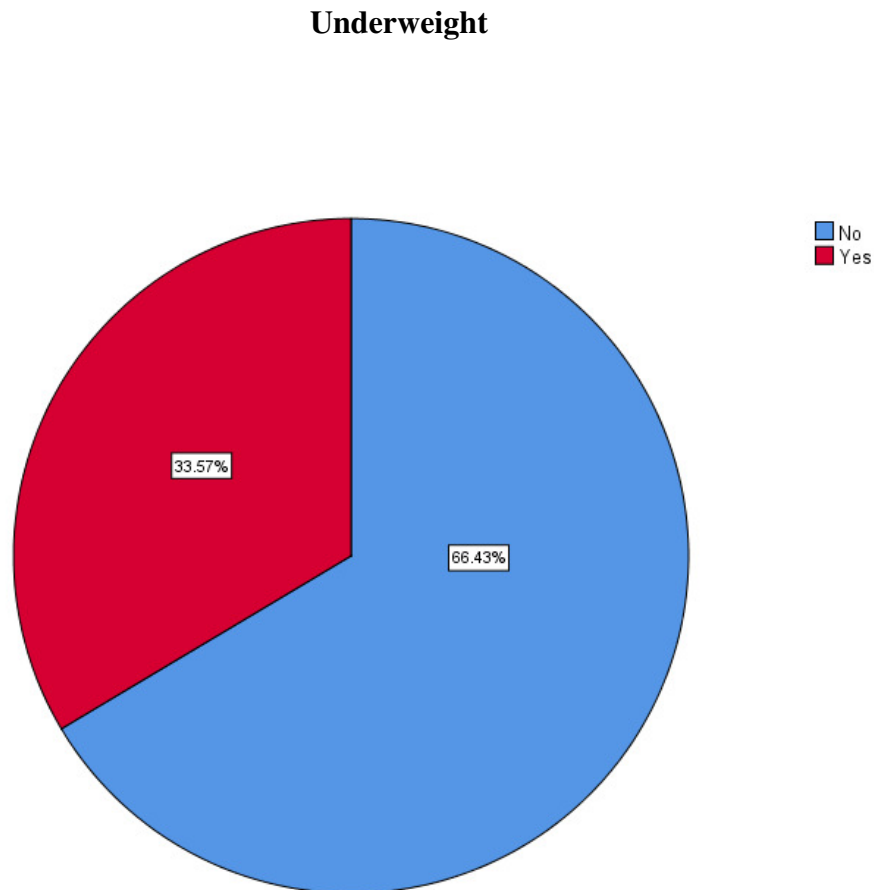


Figure 4: The magnitude of underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

5.7. Factors associated with Underweight among Women with obstetric fistula

In this study, bivariate logistic regression analysis was performed, and variables that have a *p* value of less than 0.25 were fitted into the multivariate logistic regression analysis model. In the bivariate logistic regression analysis, of the 17 independent variables, 4 were significant at a 25% level of significance (but only 3 were significant at 5 % level of significance).

Table 4: Bivariate binary logistic regression result of factors associated with underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Respondent's Characteristics	Underweight		COR (95% CI)	P value
	Yes, n (%)	No, n (%)		
Age of Respondent				
15-24	19 (39.6)	26 (27.4)	0.78 (0.31,1.95)	0.596
25-34	14 (29.2)	53 (55.8)	0.28 (0.11,0.71)*	0.007
>=35	15 (31.3)	16 (16.8)	1	
Marital Status				
Single	4 (8.3)	11 (11.6)	0.62 (0.18, 2.21)	0.464
Married	23 (47.9)	48 (50.5)	0.82 (0.40,1.71)	0.599
Divorced+Widowed	21 (43.8)	36 (37.9)	1	
Educational status				
No formal education	31 (64.6)	65 (68.4)	0.84 (0.40,1.75)	0.65
Primary and secondary Education	17 (35.4%)	30 (31.6%)	1	
Residence				
Urban	7 (14.6)	32 (33.7)	1	
Rural	41 (85.4)	63 (66.3)	5.59 (1.84,16.93)*	0.002
Relegion				
Orthodox	11 (22.9)	29 (30.5)	1	
Protestant	12 (25.0)	27 (28.4)	1.17 (0.44,3.10)	0.749
Muslim	25 (52.1)	39 (41.1)	1.69 (0.72,3.98)	0.230
Household monthly income				
<2000	40 (83.3)	71 (74.7)	1.69 (0.70,4.11)	0.247
>=2000	8 (16.7)	24 (25.3)	1	
Occupation				
Farmer	32 (66.7)	54 (56.8)	1.45 (0.60, 3.53)	0.415
Privet Buisness	7 (14.9)	19 (20.0)	0.90 (0.28,2.88)	0.860
Other	9 (18.8)	22 (23.2)	1	
Household size				
1-3	23 (47.9)	45 (47.4)	1	
4-6	17 (35.4)	36 (37.9)	0.92 (0.43,1.99)	0.839

>=7	8 (6.71)	14 (14.7)	1.12 (0.41,3.05)	0.828
Hospital visit				
New visit	28 (58.3)	52 (54.7)	1.16 (0.57,2.34)	0.683
Repeated Visit	20 (41.7)	43 (45.3)	1	
Duration of incontenece before surgical repaire				
< 6 month	17 (35.4)	36 (37.9)	1	
>=6 month	31(64.6)	59 (62.1)	1.11(0.54,2.29)	0.772
Chronic disease				
Yes	3 (6.3)	1 (1.1)	0.16 (0.02,1.58)	0.116
No	45 (93.8)	94 (98.9)	1	
Infectious disease				
Yes	1 (2.1)	1 (1.1)	0.50 (0.03,8.17)	0.627
No	47 (97.9)	94 (98.9)	1	
Nutritional information				
Yes	12 (25.0)	26 (27.4)	1	
No	36 (75.0)	69 (72.6)	0.89 (0.40,1.96)	0.762
Social support				
Poor Social Support	42 (87.5)	74 (77.9)	1.99 (0.74,5.31)	0.171
Strong Social Support	6 (12.5)	21 (22.1)	1	
Percieved stigma				
Not Percieved Stigma	20 (41.7)	29 (30.5)	1	
Percieved Stigma	28 (58.3)	66 (69.5)	0.62 (0.30,1.27)	0.187
Household food insecurity				
Food Secure Household	12 (25.0)	47 (49.5)	1	
Food Insecure Household	36 (75.0)	48 (50.5)	2.94 (1.36,6.33)*	0.006
Dietary diversity score				
Low DDS	14 (29.2)	9 (9.5)	3.94 (1.56,9.94)*	0.004
High DDS	34 (70.8)	86 (90.5)	1	

Notice:*significant at p-value < 0.05, COR Crude odds ratio, AOR Adjusted odds ratio, 1=reference, CI confidence interval, other (student, jobless, employee)

In the multivariate logistic regression analysis, place of residence, household food insecurity and dietary diversity have a statistically significant association with underweight women.

Women who lived in a rural area were 4.72 times more likely to be underweight than in the urban setting (AOR=4.72, 95% CI (1.44, 15.54)). Household food Insecurity was another important variable that was significantly associated with underweight. The risk of being underweight are 3.53 times greater for women from food insecure households than food secure households (AOR = 3.53, 95% CI (1.50, 8.32)). Similarly, the odds of underweight for women with low DDS are 61% higher than the odds of underweight for women with high DDS (AOR=3.61, 95%CI (1.31, 9.95)) (Table 5).

Table 5: Multivariable binary logistic regression result showing factors associated with underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143).

Respondent's Characteristics	Underweight		COR (95 % CI)	AOR(95 % CI)
	Yes, n (%)	No, n (%)		
Age of Respondent				
15-24	18 (37.5)	25 (26.3)	0.77 (0.31,1.91)	1.14 (0.41, 3.14)
25-34	14 (29.2)	53(55.8)	0.28 (0.11,0.69)	0.36 (0.13,0.99)
>=35	16 (33.3)	17(17.4)	1	1
Residence				
Urban	7 (14.6)	32(33.7)	1	1
Rural	41 (85.4)	63(66.3)	5.59 (1.84,16.93)	4.72 (1.44, 15.54)*
Household food insecurity				
Food Secure Household	12 (25.0)	47(49.5)	1	1
Food Insecure Household	36 (75.0)	48(50.5)	2.94 (1.36,6.33)	3.53 (1.50, 8.32)*
Dietary diversity score				
Low DDS	14 (29.2)	9(9.5)	3.94 (1.56,9.94)	3.61 (1.31, 9.95)*
High DDS	34 (70.8)	86(90.5)	1	1

Notice:*significant at p-value < 0.05, COR Crude odds ratio, AOR Adjusted odds ratio, 1=reference, CI confidence interval.

6. Discussion

According to this study, the magnitude of underweight (BMI < 18.5) among women with obstetric fistula in Hamlin Fistula Hospital Addis Ababa, Ethiopia was 33.6% and the mean BMI was 20.5 ($\pm$ 2.98 SD).

This result is similar with women in Nepal with the mean BMI 21.5 ($\pm$ 3.5SD) which is within normal range of BMI (40). The magnitude of underweight of this study was in line with an analysis revealed among non-pregnant and non-postpartum reproductive-age group women in the Tigray Region Ethiopia in which the magnitude of underweight was also high (34.3%) (28).

This study finding is more than threefold of the global prevalence rate (9.7%) of women underweight and is also considerably higher than the WHO's prevalence reference rate of 20-29% for underweight (2). This study also found higher magnitude of underweight as compared to the study conducted in a community based cross-sectional study which was conducted in Gambela, with under nutrition prevalence rate of 28.6% among pregnant women (27). Another institution-based study conducted among lactating women in Arba Minch, the prevalence of under nutrition was found 26.1% (1). A multinational study revealed that 22.6% and 23.5% of reproductive-age women were underweight in Ethiopia and India respectively (24). An analysis of the 2016 EDHS on factors associated with CEM revealed that the magnitude of underweight was lowest in Addis Ababa City administration (13.5%) (24). This may be due to the fact that the women in this study came mostly from rural areas and also from outside Addis Ababa. The finding was also much higher than a community-based cross-sectional study among mothers in Northwest Ethiopia where 12.6% of mothers had a Body Mass Index (BMI) <18.5 kg/m² (26). Another study in Tanzania mainland of determinants of under nutrition among WRA shows that the overall prevalence was 11% (17).

But this study finding was smaller than a study conducted among WRA in the Kunama population, Tigray which revealed the prevalence of under nutrition /chronic energy deficiency was 47.9% (3). Another community-based cross-sectional study conducted in Assayite reported that the prevalence of under nutrition among women in reproductive age group was 41.1% which is higher than this study finding (25). Also a study which was conducted in Afar region found that the underweight prevalence was 39.6% (28). The reason for the low level of underweight in Afar and Tigray region as compared to other studies could be the difference in the level of food security; Afar and Tigray are among the most food-insecure regions in Ethiopia (24).

The possible explanation about the discrepancy might be the study population and the sample size. This study is an institution/hospital based cross-sectional study. Most studies found in the literature which were used for purpose of comparison were done in large community-based studies, multinational, national and global analysis with large sample size. In addition, there was a dearth of literature about under nutrition or prevalence of

underweight specifically related to women with obstetric fistula. Therefore, the investigator tried to use literature which was related to different aspects of reproductive age group of women.

In this study, place of residence, household food insecurity and dietary diversity were significantly associated with the odds of underweight among obstetric fistula women.

World literature states that under-nutrition is prevalent in rural poor communities (2,19,24,40). Findings in this study agree that with this statement where 85.4% (Table 4) of women who were undernourished came from rural areas. This study finding is consistent with other study reports in low-and middle-income countries (12,19). A comparative study on maternal nutritional status, 16 out of the 18 DHS conducted in African countries and studies reported by local studies in Ethiopia showed that rural women are more likely to suffer from chronic energy deficiency than women living in urban areas (12). This might be due to different food security, low social status, poverty and lack of education on how to utilize available resources among rural dwellers as compared to the urban population (2,28).

In this study the odds of being underweight among respondents those who live in rural areas was more than four-fold higher (AOR=4.72,95% CI (1.44, 15.54)) than those who live in urban areas. This result is higher than both analysis of 2016 EDHS data on prevalence of underweight and factors associated with CEM among reproductive-age women in Ethiopia which is 2.25-fold higher (AOR = 2.25, 95% CI (1.57, 3.23)) and nearly 2 fold (AOR = 1.59; 95%CI: 1.19–2.12) respectively (2,24). This result is much higher than a study conducted in Tanzania in which only 13% of women were underweight as compared to this study (17). Another study in Northwest Ethiopia shows that residential areas significantly associated with maternal under-nutrition. The odds of under-nutrition among rural resident mothers were 1.5 times higher than the odds of urban mothers (AOR 1.5, 95% CI 1.1–2.12) (26). The reason for this variety might be the difference in the study setting, education, and marital status of the study participants. Educated and married women are less likely to be undernourished than their counterparts (24).

Household food insecurity was another significant factor associated with underweight status. This study finding revealed that 41.5% of the households were food secured and 58.7% of the households faced food insecurity. The mean and SD of HFIAS was 6.27 (± 7.07 SD). This result is very similar with a study in Addis Ababa (58.16%) of the entire households were the food insecure. Similarly, it was also in line with the study conducted in Vietnam which showed that HFIAS were 6.7 (5.7 SD) (25).

But the finding was higher than reports from Tigray (42.7%) and Amhara (43.8%) (25). In low-income households of Los Angeles the food insecurity level was 24.4%. (26). A study conducted in Arba Minch in the

southern part of Ethiopia reported that the majority of the respondents were food secured and only 2.5% of the respondents were severely food insecure (1) .

This study finding is smaller compared with studies from Afar regional state in Assayet District the prevalence of HFIAS was 70.4 (25). Another study executed in Farta district, Ethiopia, about 70.7% of total study participants were categorized as food-insecure. In Kenya, a recent study showed that of all households involved, 70.1% were severely food-insecure (24). The possible explanation might be differences in the socio-economic status, study time and area and sample size of the studies.

Besides, another significantly associated factor in this study was dietary diversity. In the present study, a mean DDS of 6.41 ± 1.84 SD was reported in table 5, which is similar to a study conducted in Pakistan, South Africa and Kenya reported mean DDS of 6.17 ± 0.99 , 6.70 ± 2.22 SD and 6.84 ± 1.46 SD respectively (14).

According to this study finding 90.9% of women frequently took a cereal-based monotonous diet. This finding correlates with the study done in West Gojam, Ethiopia (35). Similarly, another study conducted in Nepal showed that 85.7% took cereals (40). This could be explained by the fact that cereals are easily available, accessible and community use of types of food groups. In addition, a large proportion of women rely on the monotonous food group, largely dominated by starchy staples, mainly of cereal or root staple foods, plant-based with little or no intake of animal source proteins vegetables and fruits (13,14,35)

Nearly eighty four percent (83.9%) of women with Obstetric fistula had high dietary diversity score and 16.1% had low dietary diversity .This study in line with the studies conducted in Gonder in which pregnant women had 16.2% high dietary diversity (33). But the finding is lower as compared to a study conducted in west Gojam (89.8%) (35) and in Malaysia where 88.4% of the participants had high dietary diversity (33).

This finding is higher than a study conducted among lactating women in Southern Ethiopia shows that the mean $\pm$ SD of lactating mothers dietary diversity score was 5.0 ± 1.89 and majority of them (67.1%) had mean DDS of ≥ 5 (1). A study conducted among women attending ANC in Kolfe Keraniyo sub city health center Addis Ababa, Ethiopia reported that 60.9% of pregnant women had good dietary diversity practice and 39.1% pregnant women did not receive a minimum dietary diversity (14). Another study conducted in Hossana found that out of 10 food groups 57.4 % had adequate dietary diversity score that was $\geq$ eight food groups and 57.4% consumed inadequate dietary diversity that is < 8 food group (33). In South Africa, 8.1% low, 44.2% medium, and 47.7% of the women stated high-level dietary diversity (33).

This result was also greater than a study in Gojam, North west, Ethiopia where 47% of women received ≥ 4 food groups from 10. (14). Another study done in west Gojam reported that only 33.0% of participants consumed a diversified meal, in which from 9 food groups the highest tertile was considered as a high DDS (35).

Similarly, another study conducted in West Gojam shows that only 10.2% women found within the high dietary diversity score (DDS >6) eating more than 6 food groups out of 10 (14).

The difference in this study might be due to the study population and even if most of them uses FFQ, different data classification methods were applied in the classification of the food groups. In this study the food group was classified out of nine food groups. Women who had 4 or more food group within one week were considered as High dietary diversity and if the women had less than 4 food group they were considered as having Low Dietary diversity score. Again, as there was no adequate study in literature specifically among women with obstetric fistula about dietary intake, the investigator tried to use literature that referred different to different study populations of women in reproductive age group who were either pregnant or lactating.

Strength and limitation

Strength

- High response rate
- Quality of the data is assured as the investigator uses a standardized protocol
- Validated tools in the data collection process.
- Direct observations and interviews of obstetric fistula patients in OPD rather than only retrospective record review.

Limitation:

- The study cannot show cause and effect relationship between outcome and explanatory variables due to cross-sectional nature of the data.
- Due to the nature of convenient sampling technique, this study might not hold in a general population. The findings are true for the sample of the study, further studies should investigate whether the results can extrapolate to a population.
- There was a possibility of recall bias.
- There was insufficient data to assess the prevalence of under nutrition among obstetric fistula women.

7. Conclusion

It is concluded from the study that one third of the women with obstetric fistula in Hamlin fistula hospital suffered from underweight. Residing in rural areas, having food insecure household and low dietary diversity score were important factors to determine the nutritional status of women with obstetric fistula. These factors are associated with underweight and it was statistically significant. This is worrying because underweight may increase women's vulnerability to different types of problems.

8. Recommendation

Based on the finding of this study, the following recommendations were made:

Hamlin fistula Hospital:

- Hamlin Fistula Hospital should have to work with different stockholders like: government and non-government organizations should give due consideration to health education and strengthening nutritional activities that contribute to reduction of food insecurity and to improve dietary intake, giving special emphasis to those residing in rural areas.
- There is a need to create awareness on prevention and control methods of underweight among women with obstetric fistula in Hamlin fistula hospital. Context-based awareness creation programs need to be designed.
- Nutritionists should be assigned at Hamlin Fistula Hospital.
- Counseling services for all women with obstetric fistula who attend Hamlin Fistula Hospital might help to improve their nutritional status.
- Incorporating nutrition education into the education curriculum is recommended.
- There is a need to refresh the knowledge of health professionals at Hamlin fistula hospital on diet.

Researchers:

- Further research that uses advanced design is needed to identify more variables that determine the underweight of women with obstetric fistula.

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Annex

Information sheet and Informed consent

English version information sheet

Good morning/good afternoon. My name is _____. I am a student of St. Paul's millennium medical college school of public health partial fulfillment of a master's degree in public health. I would like to ask you a few questions about your household food security situation, dietary intake, and related factors affecting your nutritional status. This will help us to identify some of the barriers to good nutritional status outcomes based on your answer to our questions.

I will also take some measurements including weight and height from you. If you are interested I can tell your weight and height measurements. You have the full right to refuse, withdraw, or completely reject part or all of your participation in the study. But we encourage your full participation as the answers you give on this form and your participation in taking your measurements are very important to this study.

Confidentiality and informed consent

I would like to assure you that all of your responses to our questions will be kept confidential throughout the study process. Any of the information you provide will be used only by the research team and will, by no means, be revealed to a third party. I will ask you questions and take measurements in a place where other people or conditions couldn't interfere. I would like to assure you that your participation in this research will not affect any of your interests and other benefits that you get from any organization. I would be thankful if you spend some time with us answering questions related to the issues described above and cooperating in taking some measurements from you. The questions and measurements will take 30-40 minutes. May I get your permission to continue my interview?

Yes 1_ if yes, continue

No 2_ Stop

Respondent Signature_____ Date_____

Interviewer Name_____ Signature_____ Date_____

የአማርኛ ይሁንታ ወይም ፍቃድ መጠየቂያና የመረጃ ቅጽ

እንደምን አደራቸው/እንደምን ዋሉ? ስሜ _____ ይባላል። እዚህ የመጣው ከጳውሎስ ሚሊኒየም ሜዲካል ኮሌጅ የጤና ሳይንስ ኮሌጅ የሕ/ሰብ ጤና አጠባበቅ ት/ቤት የማስተርስ (ሁለተኛ ዲግሪ) መመረቂያ ፅሁፍዋን በሕ/ሰብ ጤና አጠባበቅ ለመስራት የምታጠናን ተመራማሪ በማገዝ ነው። የስነ ልቦናና የማህበራዊ ጉዳይዎች፣ የቤተሰብ የምግብ ዋስትና **ሁኔታ** እንዲሁም የአመጋገብ ሁኔታ በፊስቱላ ተጎጂዎች ህይወት ላይ ያለውን ተጽዕኖ ለማየት ጥቂት ጥያቄዎችን ልንጠይቀዎት እንወዳለን። ጥያቄዎቹን በመመለስም በሴቶች አመጋገብ ላይ ያሉ ችግሮችን ለይቶ ለማወቅና ወደፊትም ምን መደረግ እንዳለበት መፍትሔ ለማፈለግ ይረዳናል።

ከጥያቄዎቹ በተጨማሪ ክብደትዎንና ቁመትዎን እንለካለን። ፍላጎትዎ ከሆነም ውጤቱን እንነግረዎታለን ። በቃለ መጠይቁ በከፊል አለመሳተፍ፤ ማቋረጥ እንዲሁም ሙሉ ለሙሉ ያለመሳተፍ ሙሉ መብት አለዎት። ነገር ግን የእርሶዎ ተሳትፎ ለጥናታዊ ፅሁፉ ትልቅ ጠቀሜታ ስለሚኖረው በመጠይቁ ሙሉ ተሳትፎ እንዲኖረዎት እናበረታታለን።

በቃለ መጠይቁ ጊዜ ለሚሰጡን ምላሽ ሚስጥራዊነቱ የተጠበቀ እንደሚሆን ከወዲሁ ቃል ልንገባለዎት እንወዳለን። የሚሰጡንን ማንኛውም አይነት መረጃ ጥናቱን በሚሰሩ ሰዎች ለጥናታዊ ፅሁፉ ከመጠቀም ውጭ በምንም መልኩ ለሶስተኛ ወገን አሳልፈን አንሰጥም። ጥያቄዎቹን ለመመለስ እንዲሁም የእርሶን ቁመትና ክብደት ለመለካት ማንም በሌለበት ለእርሶዎ አመቺ በሆነ ቦታ እናከናውናለን። ሌላው ልናረጋግጥልዎት የሚገባ ነገር ቢኖር በዚህ ጥናታዊ ፅሁፍ በመሳተፍ ማንኛውም አይነት የግልም ሆነ ከድርጅት የሚያገኙት ጥቅም እንደማይጎዳ ለመግለፅ እንወዳለን።

በመጨረሻም ጥያቄዎችን ለመመለስ እንዲሁም ቁመትዎንና ክብደትዎን ለመለካት የተወሰነ ጊዜ ሰጥተው አብረውን እንዲቆዩ ከፍ ያለ ምስጋና እናቀርባለን። ጥያቄዎችን ለመመለስ እንዲሁም ቁመትዎንና ክብደትዎን ለመለካት ከሰላሳ እስከ አርባ ደቂቃ ሊፈጅ ይችላል።

ከዚህ በላይ ስለጥናቱ የተፃፈውን መግለጫ በሚገባኝ ቋንቋ ተነበልኝ ተረድቻለሁ በመሆኑም በዚህ ጥናት ለመሳተፍ ፍቃደኛ ነኝ 1_ ይቀጥሉ ፍቃደኛ አይደለሁም 2_ ያቁሙት

የመረጃ ሰብሳቢ ስም _____ ፊርማ _____

Questionnaire (Amharic and English version)

English Version Questionnaires

Participant Code -----	Signature _____		
Date of Interview	____/____/____		
Time interview started	____:____		
Time interview ended	____:____		
Result code	001. Completed 002. Discontinued interview 003. Refused. Reason for refusal_____.		
Anthropometric Measurements	Weight= _____Kg	Height= _____cm	BMI =_____Kg/m ²

Section 1. Socio-demographic and Socio-economic factors				
Ser. No	Questions/Variables	Response options	Code	Skip
101	Current Age(Year)	15-24	1	
		25-34	2	
		>=35	3	
102	Marital Status	Single	1	
		Married	2	
		Divorced	3	
		Widowed	4	
103	Educational Status	No Formal Education	1	
		Primary Education	2	
		Secondary and Higher	3	
104	Place of Residence	Urban	0	
		Rural	1	
105	Religion	Orthodox	1	
		Catholic	2	
		Protestant	3	
		Muslim	4	
		Other Specify_____	5	
106	Household monthly income (birr)	<2000	1	
		2000-5000	2	
		>5000	3	
107	Occupation	Farmer	1	
		Privet Business	2	
		Student	3	
		Jobless	4	
		Employee	5	
108	Household size	1-3	1	
		4-6	2	
		≥7	3	

Section 2. Health care and Health related factors

Ser. No	Questions/variables	Response option	Code	Skip
201	Hospital Visit	New visit	0	
		Repeated visit	1	
202	Duration of incontinence before surgical repair	< 6 month	0	
		>=6 month	1	
203	Do you have any chronic disease?	No	0	If no, Skip to Q. No 205
		Yes	1	
204	If yes, types of chronic disease	Hypertension	1	
		Diabetes Mellitus	2	
		Cancer	3	
		HIV	4	
		Other, please specify__	5	
205	Do you have any infectious disease in the previous two weeks	No	0	If no, Skip to Q. No 207
		Yes	1	
206	If yes, type of infectious disease.	Acute Febrile Illness	1	
		Urinary tract infection	2	
		Intestinal infection	3	
		Malaria	4	
		Other, please specify__	5	
207	Do you get any nutritional information?	No	0	If no, Skip to Q. No 301
		Yes	1	
208	Source of Nutritional information?	From health professionals	1	
		From social media	2	
		Others, please specify__	3	

Section 3: Psycho-Social factors			
A. Social Support			
Ser. No	Questions/Variables	Response Option	Coding
301	How many people are you close to that you can count on them if you have great personal problems?	None	1
		1-2	2
		3-4	3
		5 and above	4
302	How much interest and concern do people show in what you do?	Very little	1
		Little	2
		Uncertain	3
		Some	4
		A lot	5
303	How easy is it to get practical help from neighbors if you should need it?	Very difficult	1
		Difficult	2
		Possible	3
		Easy	4
		Very easy	5

B. Perceived stigma

Ser.No	Item	Not at all	Sometimes	Always
304	Do you feel different from other people?			
305	Do you feel lonely?			
306	Do you feel embarrassed?			
307	Do you feel disappointed in yourself?			
308	Do you feel you cannot have a rewarding life?			
309	Do you feel you cannot contribute anything in society?			
310	Do you feel you cannot join others in public places?			
311	Do you feel other people are uncomfortable with you?			
312	Do you feel other people don't want to go to occasions with you?			
313	Do you feel other people treat you like an inferior person?			

314	Do you feel other people would prefer to avoid you?			
315	Do you feel other people avoid exchanging greetings with you?			
316	Do you feel you are mistreated by other people?			
317	Do you feel other people discriminate against you?			
318	Do you feel other people treat you like an outcast?			

Section 4. Occurrence of Frequency of Household Food Insecurity Derived from version 3 of HFIAS measurement Guide

Ser. No	Question	Response option	Code	Skip
401	In the past four weeks, did you worry that your household would not have enough food?	No	1	Skip to Q No 402
		Yes	2	
401.a	How often did this happen?	Rarely (once or twice in the last 4 weeks)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
402	In the past four weeks, were you or any HH member not able to eat the kinds of foods you preferred because of a lack of resources?	No	1	Skip to Q No 403
		Yes	2	
402.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
403	In the past four weeks, did you or any HH member have to eat a limited variety of foods due to a lack of resources?	No	1	Skip to Q No 404
		Yes	2	
403.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
404	In the past four weeks, did you or any HH member have to eat some foods that you did not want to eat because of a lack of resources to obtain other types of food?	No	1	Skip to Q No 405
		Yes	2	
404.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
405	In the past four weeks, did you or any HH member have to eat a smaller meal than you felt you needed because there was not enough food?	No	1	Skip to Q No 406
		Yes	2	

405.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
406	In the past four weeks, did you or any other HH member have to eat fewer meals in a day because there was not enough food?	No	1	Skip to Q No 407
		Yes	2	
406.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
407	In the past four weeks, was there ever no food to eat of any kind in your HH because of a lack of resources to get food?	No	1	Skip to Q No 408
		Yes	2	
407.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
408	In the past four weeks, did you or any HH member go to sleep at night hungry because there was not enough food?	No	1	Skip to Q No 409
		Yes	2	
4.8.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	
409	In the past four weeks, did you or any HH member go a whole day and night without eating anything because there was not enough food?	No	1	
		Yes	2	
409.a	How often did this happen?	Rarely (once or twice)	1	
		Sometimes (3-10 times)	2	
		Often (more than ten times)	3	

Section 5. Dietary assessment for Women with obstetric fistula using Food Frequency Questioner

Please, tell me in your average total use during the past one week of each specific food and drink

Question Number	Food Groups	Locally Available Foods	Yes=1 No=0
1	Cereals	Teff nech injera, Teff key injera, injera firfir, Sende nech dabo, Ambasha, ye Aja kinche, pasta, maccoroni, rice, ye Aja Atmit, chechebsa, nech ye gebs genfo, kinche, shimbira Kolo	
2	Legumes and Nuts	Shiro wet, miten shiro wet, misir kik wet, Difin misir wet, ater kik wet, Yeocholoni kibe, bakela ashuk	
3	Roots and Tubers	Dinich wet, Sequar dinich kikil, bula genfo, bula atmit, keysir, carrot alcha, dinich kikel	
4	Fruits	Banana, Orange, Avocado, Lemon, Papaya, Mango, Zeyetune	
5	Vegetables	Tikil Gomen, Habesh Gomen, Kosta, selata, Timatim kurt, Timatim selse, Fosoliya, Duba wet, kariya seneg,	
6	Meat and Fish	Key sega wet, Ye bere sega tibs, Ye beg sega tibs, Ye feyel tibs, kitfo, Asa tibs	
7	Egg	Yetekekele inkulal, yetetebese inkulal	
8	Milk Product	Yefela yelam wetet, Ayeb, Ergo	
9	Fast Food, Beverages and sweet	Burger, Pizza, Dinich Tibs, Mirinda, Coca-Cola, Tea, Coffee, Macchiato, Beer, Birth, Tella, Sugar, Honey, Marmalade	

የአማርኛ ቃለ-መጠይቅ

የቅዱስ ጳውሎስ ሆስፒታል ሚሊኒየም ህክምና ኮሌጅ በአዲስ አበባ ሐምሌን ፊስቱላ ሆስፒታል የሚገኙ የፊስቱላ ተጓጂ እናቶችን የቤተሰብ የምግብ ዋስትናና የአመጋገብ ሁኔታ ለማጥናት የተዘጋጀ መጠይቅ

መመሪያ:- ይህ መጠይቅ የተዘጋጀው በቃለ ምልልስ መልክ እዚህ ጥናት ላይ ከሚሳተፉ የፊስቱላ ተጓጂ ሴቶች ላይ መረጃ ለመሰብሰብ ሲሆን መጠይቁ ከታች እንደሚከተለው አምስት ዋና ዋና ክፍሎች አሉት። የመጀመሪያው ክፍል የተሳታፊዎችን ግላዊ መረጃ ሲዳሰስ፣ የሁለተኛው ክፍል የጤና ክብካቤ አገልግሎት እና አጠቃላይ የጤና ሁኔታ የሚመለከቱ ጥያቄዎችን ሲይዝ፣ ሶስተኛው ክፍል የስነ-ልቦናና ማህበራዊ ድጋፍን የዳስሳል፣ የአራተኛው ክፍል የቤተሰብ የምግብ ዋስትና ሁኔታን መረጃ ሲይዝ አምስተኛው እና የመጨረሻው ክፍል 70 የተመረጡ የምግብ አይነት ዝርዝሮችን የያዘና የተሳታፊዎችን የዘወትር ምግብ አወሳሰድ ሁኔታን የሚጠይቅ ይሆናል።

ክፍል 1 ግላዊ መረጃ በመጠቀል ስለስራዎ እና ስለቤተሰብዎ ሁኔታ ጥቂት ጥያቄዎችን እጠይቅዎታለሁ

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	ኮድ	እለፍ
101	የአሁን እድሜዎት ስንት ነው ?	15-24	1	
		25-34	2	
		>=35	3	
102	በአሁን ጊዜ ያለዎት የጋብቻ ሁኔታ?	ያላገባ	1	
		ያገባች	2	
		የፈታች	3	
		የሞተባት	4	
103	የትምህርት ደረጃዎ?	ያልተማረች	1	
		አንደኛ ደረጃ	2	
		ሁለተኛ ደረጃ እና ከዚያ በላይ	3	
104	የመኖሪያ ቦታ?	ከተማ	0	
		ገጠር	1	
105	የሚከተሉት ኃይማኖት ምንድን ነው?	ኦርቶዶክስ	1	
		ካቶሊክ	2	
		ኘሮቴስታንት	3	
		ሙስሊም	4	
		ሌላ ጥቀስ	5	
106	የቤተሰብዎ የወረ ገቢ በብር?	<2000	1	
		2000-3500	2	
		3500-5000	3	
		> 5000	4	

107	ስራዎች ምንድን ነው ?	ግብርና	1	
		የግል ስራ	2	
		ተቀጣሪ	3	
		ተማሪ	4	
		ስራአጥ	5	
108	የቤተሰብዎ ብዛት	1-3	1	
		4-6	2	
		≥7	3	

ማስታወሻ :- ይህ መጠይቅ የተሳታፊዎች ፍቃደኝነት ከታወቀ በኋላ መሞላት ያለበት በጠያቂው ብቻ ነው።

የተሳታፊ መለያ ቁጥር ፡ -----	ፊርማ-----		
መጠይቁ የተደረገበት ቀን	-----/-----/-----		
መጠይቁ የተጀመረበት ሰዓት	-----:-----		
መጠይቁ ያለቀበት ሰዓት	-----:-----		
የውጤት መለያ	001 ሙሉ በሙሉ ተሞልቷል 002 መጠይቁ ተቋርጧል 003 ለመሳተፍ ፍቃደኛ አልሆኑም ፍቃደኛ ያልሆኑበት ምክንያት		
አንትሮፖሜትሪክ መለኪያ	ክብደት፡ -----ኪግ	ቁመት፡-----ሴ.ሜ	ቢኤምአይ ፡---ኪ/ሜ ²

ክፍል 2 የጤና ክብካቤ አገልግሎት እና አጠቃላይ የጤና ሁኔታ የሚመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	ኮድ	
201	እዚህ ሆስፒታል የመጡበት ምክንያት ምንድነው?	ለመጀመሪያ ጊዜ ህክምና	0	
		ለክትትል	1	
202	ሳይታከሙ ምን ያህል ጊዜ ቆዩ?	< 6 ወር	0	
		>=6 ወር	1	
203	በህክምና የተረጋገጠ ለረጅም ጊዜ የሚቆይ የህመም አይነቶች አለብዎት?	አዎ	0	
		የለብኝም	1	መልሱ የለብኝም ከሆነ ፣ ወደ ጥያቄ 205 ይለፉ
204	መልሱ አዎ ከሆነ፣ ምን አይነት ህመም አለብዎት?	ደም ግፊት		
		የስኩዋር በሽታ		
		ካንሰር		
		ኤች አይ ቪ		
		ሌላ		
205	በዚህ ሁለት ሳምንት ታመው ያውቃሉ?	አዎ	0	
		አልታመምኩም	1	መልሱ አልታመምኩም ከሆነ ፣ ወደ ጥያቄ 207 ይለፉ
206	መልሱ አዎ ከሆነ፣ ምን አይነት ህመም አለብዎት?	የትኩሳት ህመም	1	
		የሽንት ኢንፌክሽን	2	
		የአንጀት ኢንፌክሽን	3	
		ወባ	4	
		ሌላ	5	

207	ስለ አመጋገብ ሁኔታ ምክር (መረጃ) አግኝተው ያውቃሉ?	አዎ	0	መልሱ አላገነሱም ከሆነ ፣ ወደ ጥያቄ 301 ይለፉ
		አላገነሱም	1	
208	ስለ አመጋገብ ሁኔታ ምክር (መረጃ) ከየት አግኝተው ያውቃሉ?	ከጤና ባለሙያ	1	
		ከማህበራዊ ሚዲያ	2	
		ሌላ	3	

ክፍል 3፡ የስነ ልቦናና የማህበራዊ ጉዳዮች ዳሰሳ			
ሀ. ማህበራዊ ድጋፍ			
ተራ ቁ.	ጥያቄዎች	አማራጭ መልሶች	ከድ
301	በህይወትዎ በጣም ከባድ የሆነ ችግር ቢያጋጥምዎት ለችግሩ ይደርሱልኛል ብለው የሚያስቡት በዙሪያዎ ስንት የቅርብ ሰዎች አሉት?	ምንም	1
		1--2	2
		3--5	3
		ከ 5 በላይ	4
302	ማድረግ በሚፈልጓቸው ማንኛውም ነገሮች ላይ ሰዎች ምን ያህል ድጋፍና ፍላጎት ያሳይዋታል ?	በጣም ትንሽ ሰዎች	1
		ትንሽ ሰዎች	2
		አላውቅም	3
		ጥቂት ሰዎች	4
303	እርዳታ በሚያስፈልግዎት ጊዜ ከጎረቤትዎ በተግባር የታገዘ እርዳታ ማግኘት ምን ያህል ቀላል ነው?	በጣም አስቸጋሪ ነው	1
		አስቸጋሪ ነው	2
		ማግኘት እችላለሁ	3
		ቀላል ነው	4
		በጣም ቀላል ነው	5

ለ ራስን የማገለል ጥያቄዎች				
ተራ. ቁ	ጥያቄዎች	አይሰማኝም	አንዳንድ ጊዜ	ሁልጊዜ
304	ከሌላው ሰው የተለየሁ ነኝ ብለው ያስባሉ?			
305	ብቸኝነት ይስማዎታል?			
306	ሀፍረት ይስማዎታል?			
307	በራስዎ ደስተኛ አይደሉም?			
308	ህይወቴ ዋጋ የለውም /ዋጋ ቢስ/ ነው የሚል ስሜት ይስማዎታል?			
309	በማህበረሰብዎ ውስጥ ምንም አይነት ነገር ማበርከት እንደማይችሉ ያስባሉ?			
310	ህዝብ በተሰበሰበች አካባቢ መገኘት እንደማይችሉ ያስባሉ?			
311	ሰዎች ከእርስዎ ጋር ሲሆኑ ጥሩ ስሜት ላይሰማቸው ይችላሉ ብለው ያስባሉ?			
312	ሰዎች ከእርስዎ ጋር የለያዩ በአላት ወደሚያከብሩባቸው ቦታዎች አብረዎት ለመሄድ ፍላጎት እንደሌላቸው /ፍቃደኛ እንዳልሆኑ/ ይስማዎታል?			
313	ሰዎች እርስዎን የበታች አድርገው የሚመለከቶት ይመስለዎታል?			
314	ሰዎች አብረዎት መሆን እንደማይፈልጉ ይስማዎታል?			
315	ሰዎች ከእርስዎ ጋር ሰላምታ መለዋወጥ የማይፈልጉ ይመስለዎታል?			
316	ሰዎች ከሌላው ሰው በተለየ ሁኔታ በደል እያደረሰብዎት እንደሆነ ይስማዎታል?			
317	ሰዎች የሚያገሎት /አድሎ የሚያደረጉብዎት/ ይመስልዎታል?			

318	በማበሰብረሰቡ ውስጥ የተጠላሁ ነኝ ብለው ያስባሉ?			
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ክፍል 4፡ የቤተሰብ የምግብ ዋስትና ሁኔታ ለመዳሰስ የተዘጋጀ መጠይቅ			
ተ.ቁ			
401	ባለፈው አንድ ወር ውስጥ በቤትዎ ውስጥ የምግብ እጥረት እዳያጋጥሞት ተጨንቀው ያውቃሉ?	0-አላውቅም (የለም ካሉ ጥያቄ 201a ይዘለሉት) 1-አዎ	[]
401a	መልስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
402	ባለፈው አንድ ወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት የሚፈልጉትን ምግብ ሳይመገቡ ቀርተዋል?	0-የለም የለም ካሉ ትያቄ 202 a ይዘለሉት 1-አዎ	[]
402a	መልስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
403	ባለፈው አንድ ወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ አቅርቦት ምክኒያት የሚመገቧቸው ምግብ አይነቶች ቀንሰዋል?	0-አላውቅም (የለም ካሉ ጥያቄ 203 a ይዘለሉት) 1-አዎ	[]
403a	መልስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
404	ባለፈው አንድ ወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ አቅርቦት ምክኒያት የማይፈልጉትን የምግብ አይነት ተመግበዋል?	0-አላውቅም (የለም ካሉ ጥያቄ 204 a ይዘለሉት) 1-አዎ	[]
404a	መልስዎ አዎ ከሆነ ይህ ለምን ያህል ጊዜ ተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቴ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
405	ባለፈው አንድ በወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት የሚመገቡትን የምግብ መጠን ቀንሰዋል?	0-አላውቅም (የለም ካሉ ጥያቄ 205 a ይዘለሉት) 1-አዎ	[]

405a	መልሶአዎከሆነይህለምንህልጊዜተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቱ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
406	ባለፈው አንድ ወር ውስጥ በምግብ እጥረት ምክኒያት እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት በቀን ምግብ የሚበሉባቸው ጊዜያቶች ቀንሰዋል?	0-አላውቅም (የለም ካሉ ጥያቄ 206 a ይዝለሉት) 1-አዎ	[]
406a	መልሶአዎከሆነይህለምንህልጊዜተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቱ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
407	ባለፈው አንድ ወር ውስጥ በምግብ እጥረት ምክኒያት ማንኛውም የሚበላ ምግብ ከቤት ጠፍቶ ያውቃል?	0-አላውቅም (የለም ካሉ ጥያቄ 207 a ይዝለሉት) 1-አዎ	[]
407a	መልሶአዎከሆነይህለምንህልጊዜተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቱ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
408	ባለፈው አንድ ወር ውስጥ እርሶ ወይም ሌላ የቤተሰብ አባል በምግብ እጥረት ምክኒያት እየተራቡምግብሳይበሉተኝተውያውቃሉ?	0-አላውቅም (የለም ካሉ ጥያቄ 208 a ይዝለሉት) 1-አዎ	[]
408a	መልሶአዎከሆነይህለምንህልጊዜተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቱ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
409	ባለፈው አንድ ወር ውስጥ ማንኛውም የቤተሰብ አባልበምግብእጥረትምክኒያትእየተራቡቀንና ለሊት ሙሉ ምግብሳይበሉቀርተውያውቃሉ?	0-አላውቅም (የለም ካሉ ጥያቄ 209a ይዝለሉት) 1-አዎ	[]

409 a	መልሶአዎከሆነይህለምንህልጊዜተከስቷል?	1- አልፎ አልፎ (አንዴ ወይ ሁለቱ) 2- የተወሰነ ጊዜ (3-10) 3- ብዙ ጊዜ (ከ10 ጊዜ በላይ)	[]
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ክፍል 5: የምግብ ዓይነት ዝርዝር እና የዘወትር የአመጋገብ ሁኔታን የሚያሳይ መጠይቅ

መመሪያ :- እባክዎ ትንሽ ጊዜ ይውሰዱና ባሳለፍነው አንድ ሳምንት ጊዜ ውስጥ አዘውትረው የተመገቡዎቸውን ምግቦች ያስታውሱ። የተለያዩ የምግብ ዓይነቶችን ስጦራልዎት የተመገቡዎቸውን ምግቦች ብቻ መመገብን ይነግሩኛል።

ጥያቄ ተ.ቁ	የምግብ ዓይነት ዝርዝር	በአገር ውስጥ የሚገኙ ምግቦች	ተመግቤአለሁ፡ 1 አልተመገብኩም፡ 0
1	የእህል ዘር	ነጭ የጤፍ እንጀራ፡ቀይ የጤፍ እንጀራ፡እንጀራ ፍርፍር፡ነጭ የስንዴ ዳቦ፡አንባሻ፡የአጃ ቂንጮ፡ፓስታ፡ማካሮኒ፡ሩዝ፡የአጃ አጥሚት፡ጨጨብሳ፡ነጭ የገብስ ገንፎ፡ጫኮ፡ሽምብራ ቆሎ	
2	ጥራጥሬ	ሽሮ ወጥ፡ምጥን ሽሮ ወጥ፡ምስር ክክ ወጥ፡ድፍን ምስር ወጥ፡አተር ክክ ወጥ፡የለውዝ ቅቤ፡ባቄላ አሹቅ	
3	ሥራስር	ድንች ወጥ፡ስኩዋር ድንች ቅቅል፡ቡላ ገንፎ፡ቡላ አጥሚት፡ቀይ ስር፡ካሮት አልጫ፡ድንች ቅቅል	
4	ፍራፍሬ	ሙዝ፡ብርትኪን፡አሸካዶ፡ሎሚ፡ፓፓያ፡ማንጎ፡ዘይቱን፡	
5	አትክልት	ጥቅል ጎመን፡ሀበሻ ጎመን፡ቆስጣ፡ሰላጣ፡ቲማቲም ቁርጥ፡ቲማቲም ስልስ፡ፎሶሊያ፡ዱባ ወጥ፡ቃሪያ ስንግ	
6	ሥጋ እና አሳ	ስጋ ወጥ፡የበሬ ስጋ ጥብስ፡የበግ ስጋ ጥብስ፡የፍየል ጥብስ፡ክትፎ፡አሳ ጥብስ	
7	እንቁላል (የዶሮ)	እንቁላል ጥብስ፡የተቀቀለ እንቁላል፡	
8	ወተትና የወተት ውጤቶች (የላም)	የፈላ ወተት፡አይብ፡እርጎ	
9	ፈጣን ምግቦች መጠጦችና ጣፋጮች	በርገር፡ፒዛ፡ድንችጥብስ(ችብስ)፡ሚሪንዳ፡ኮካኮላ፡ስፕራ ይት፡ሻይ፡ቡና፡ማክያቶ፡ቢራ፡ብርዝ፡ጣላ፡ስኳር፡ማር፡ማርማላት	

አመሰግናለሁ