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Magnitude of underweight and associated factors among women aged 15-49 years with obstetric fistula in Hamlin fistula hospital, Addis Ababa, Ethiopia, 2021: A cross-sectional hospital-based study.

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Abstract

Background: The poor nutritional status of women has been a significant problem in Ethiopia. A reason for the widespread malnutrition and the associated consequences in resource-poor settings are due to diets that are often monotonous

Objectives: This study aimed to assess the prevalence of underweight and its associated factors among women with obstetric fistula at Addis Ababa Hamlin Fistula Hospital, Ethiopia.

Methods: This study gathered data through a cross-sectional survey involving 143 women aged 15-49 who attended the outpatient department of Addis Ababa Fistula Hospital between January 20 and February 20, 2021. The sample size was determined using a single population proportion formula, and systematic random sampling was applied. Face-to-face interviews, structured questionnaires, chart reviews, and anthropometric measurements were conducted. The data was analyzed using SPSS version 26. Descriptive statistics, binary, and multiple logistic regressions were done. A significance level of $p<0.05$ was utilized.

Results: The findings revealed that 33.6% (95% CI: 26%-42%) of women with obstetric fistula were underweight. Rural residence was associated with a 5.14-fold higher likelihood of being underweight compared to urban areas (AOR=5.14, 95% CI: 1.33, 19.84). Additionally, women from food-insecure households had a 4.06 times higher risk of being underweight compared to those from food-secure households (AOR=4.06, 95% CI: 1.61, 10.25). Furthermore, women with low dietary diversity scores were 4.07 times more likely to be underweight compared to those with high dietary diversity scores (AOR=4.07, 95% CI: 1.29, 12.91).

Conclusion: The study highlights the high prevalence of underweight among women with obstetric fistula, even greater than global prevalence rate of 9.7%, and emphasizes the importance of implementing comprehensive interventions to improve nutrition and well-being in this population.

Keywords: Dietary diversity, Ethiopia, Household food insecurity, Obstetric fistula, Underweight

Background

Globally, 9.7% of women are underweight, (1) The prevalence of underweight among women in low- and middle-income countries (LMIC) varies from 20=-25%. (2) In LMIC, many women in reproductive age group (WRA), particularly adolescents and young women, are nutritionally vulnerable and do not consume enough healthy and nutrient rich foods to satisfy their daily needs. (3) In sub-Sahara 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. (4,5) According to the 2016 Ethiopian Demographic Health Survey (EDHS), 22% of WRA in Ethiopia were underweight. One out of four (22.4%) WRA are thin and rural areas have a higher percentage of thin women (25%) than urban areas (15%). (1, 6)

The poor nutritional status of women has been a significant problem in Ethiopia, (7) Maternal under nutrition has been strongly linked to functional consequences and has 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). (3,8)

Obstetric fistula is a preventable childbirth injury, affects significant number of women in Ethiopia with a prevalence of 18.8%. (4,9,10) OBF 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 problems. (4, 9,11–13)

Obstetric fistula is often hidden and under-studied, particularly in rural areas where women face challenges in seeking medical intervention due to their poor circumstances. (14, 15) This complex situation prevents these women from getting a balanced diet and they finally suffer from under-nutrition. Also, malnutrition and underfeeding are risk factors for postoperative complications. (16) They may have an impact on surgery outcomes like breaking down of the surgery site, predisposing the women to repeated surgery and thus aggravating existing psychological problems. (11) Factors such as age, marital status, educational status, place of residence, and income contribute to women's nutritional status. (3,17) 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).

The study findings will inform targeted nutrition interventions for vulnerable women, benefiting hospital managers, health professionals, and nutritionists. It will also guide the Ministry of Health and stakeholders in evaluating and improving nutrition programs. Policymakers will utilize the findings to determine intervention priorities, while other researchers can base it for future studies in the same field. (11)

Methods and materials

This study was conducted in the Addis Ababa Hamlin Fistula Hospital (AAHFH), Ethiopia from January 20/2021 G.C to February 21/2021 G.C. AAHFH is a registered charitable organization in Ethiopia dedicated to the treatment and prevention of childbirth injuries called obstetric fistulas and ensuring Ethiopian women have holistic and compassionate healthcare free of charge . Dr. Catherine and Reg Hamlin founded this organization in 1974 after being confronted with the tragic situation of Ethiopian women affected by OBF. The AAHFH has been providing outpatient and inpatient care 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.

A hospital-based cross-sectional study design was used to assess the magnitude and factors associated with under nutrition in women with OBF in the reproductive age group (RAG). The source population was all eligible women with OBF in the RAG (15-49 years). The study population was all eligible women with OBF in the RAG (15-49 years) who attended the outpatient department of AAHFH during data collection time. Pregnant women, lactating women and severely ill patients were excluded from the study. The sample size was calculated using the formula for estimation of a single population proportion with the assumptions of 95% Confidence Level (CL), marginal error (d) of 0.05, a proportion of 50% . The total population during this period was 200 which is less than ten thousand.

Thus, by adding a non-response rate of 10% and using the correction formula; the final sample size was 143. Study participants were selected by using systematic random sampling techniques in the outpatient department.

Data collection tools

Data was collected by two experienced enumerators with BSC degrees in clinical nursing. They conducted face-to-face interviews using a structured questionnaire translated into Amharic. The questionnaire was back-translated to ensure consistency. Translators were used for non-Amharic speakers. Chart reviews and anthropometric measurements were also carried out.

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. Pre-test of questioners was done in one of the Hamlin Centers before the actual data collection work, which was not included in the study to see for consistency. The scales indicators were checked against zero reading after weighing every woman. The principal investigator supervised data collection for completeness and consistency. Epi-info software flagged errors during data processing. Enumerators were closely supervised to ensure data validity and reliability. The data collection was done during the COVID 19 Pandemic and all precautionary measures were taken.

Study variables and operational definitions

Dependent Variable

Anthropometric measurements

Body mass index (BMI) is the best measurement indicator of nutritional status for non-pregnant 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. 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. Data collectors' accuracy of anthropometric measurements was standardized with their trainer during training. Subjects were instructed to take off their shoes before 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= Kg/m2). A BMI below 18.5kg/m2 indicates underweight (19).

Independent variables

Psycho-social factors

The perceived stigma was measured by using the Kilifi Stigma Scale of Epilepsy (KSSE), which was validated in Ethiopia in the 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.(20).

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 (12).

House hold food insecurity

The Household food insecurity Access Scale "score "(HFIAS) was used for measurement of Food access. The indicator guide was derived from Food and Nutrition Technical Assistance (FANTA III) for the HFIAS score (21). 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), 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 were categorized into 4 levels of food insecurity according to recommendations by the US Agency for International Development's FANTA III Project (21). 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 Households (22).

Dietary diversity

Dietary intake information was collected using the Food and Agriculture Organization (FAO) Guideline for measuring household and individual dietary diversity of nutritional intake to assess women's dietary diversity. (21) A Food Frequency Questionnaire (FFQ) which was taken from a previously validated questionnaire. (23) 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. (23)

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. 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 (21,24,25).

Data processing and analysis

Data was entered, checked, cleaned, and analyzed using Epi- info 1.4.3 and SPSS version 26 statistical software respectively. Descriptive statistics like mean, standard deviation (±SD), percentages and frequency distribution were computed for all variable according to the type. Multivariable analysis was performed following bivariate analysis to adjust for the effect of confounders using variables that have a $p < 0.25$. Both crude and adjusted odds ratio together with their corresponding 95% confidence interval was computed to see the strength of association between the outcome and independent variables. A value of $p < 0.05$ declared the result as statistically significant. Cronbach's alpha was used to calculate the internal reliability coefficient for a multiple regression analysis. The coefficient assessed the consistency of the measurements. The 'VIF' command was employed to check for multicollinearity, and no significant results were found

Results

Socio-demographic characteristics of participants

A total of 143 women with OBF participated in this study with a response rate of 100%. Sixty seven (46.9%) women were within the 25–34-year age group and 71 (49.7%) were married. The majority of women 96 (67.1 %) had no formal education and 107 (74.8 %) were from rural areas. Nearly forty-five (44.8%) of them were Muslim. The majority, 111 (77.6 %), household monthly income were < 2000 ETB and 86 (60.1 %) of the study subjects were farmer. Sixty-eight (47.6 %) participants live alone and within the 1-3 household size categories (Table 1).

Table 1: Socio-demographic characteristics of women with Obstetric fistula at 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)

Reasons for PAFP acceptance and hesitancy

Eighty patients (55.9%) were new for the hospital visit. Of 143 women,

a substantial number (62.9%) stayed incontinent for more than 6 months before fistula repair. Only 4 (2.8%) and 2 (1.4%) respondents had chronic and infectious diseases respectively. Regarding nutritional counseling, the majority, 105 women (73.4%), had no access to get proper nutritional counseling (Table 2).

Table 2: Health Care and health related characteristics of women with obstetric fistula at 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 Counseling	Yes	38	26.6
	No	105	73.4

Psychosocial characteristics

Using KSSE the perceived stigma was measured. The lowest and highest score of the data was 32 and 45 respectively. 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 OBF who felt stigmatized. Accordingly, out of the 143 study subjects recruited in the study, 65.7% fulfilled the criteria for perceived stigma. Nine-tenths 116 (81.1%) of the participants had poor social support.

Household Food Insecurity status

Nearly half of 143 women (42.7%) were from food secure households whereas, 84 (58.7 %) were from food insecure households. The latter were from mildly (31.5%), moderately (16.8%) and severely (9.1%) food insecure households.

Dietary Diversity Score

The study found the mean DDS was 6.41 (± 1.84SD). Out of nine food groups, 23 (16.1%) of the respondents had low dietary diversity (< 4 food groups). Cereals were commonly used, which accounted for 130 (90.9%) (Table3).

Table 3: Respondents dietary diversity, 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≥4 food group	**120**	**83.9**
Mean and SD	**Mean 6.41±1.84SD**	

Nutritional Status of Women with Obstetric fistula

Using the BMI with the cutoff point of less than 18.5 kg/m2 the magnitude of underweight among the study participants was found to be (33.6%) (P=33.6%; 95% CI: 26%-42%) with the mean and + SD 20.51 (± 2.98). Women who lived in a rural area were 5.14 times more likely to be underweight than in the urban setting [AOR=5.14, 95% CI: (1.33, 19.84)]. The risk of being underweight is 4.06 times greater for women from food insecure households than food secure households [AOR = 4.06, 95% CI: (1.61,10.25)]. Moreover, the DDS of the women were statistically associated with underweight. Women having low DDS were 4.07 times more likely to be underweight compared to women who had high DDS [AOR=4.07, 95%CI: (1.29, 12.91)] (Table 4)

Factors associated with underweight among women with obstetric fistula

The multivariable logistic regression analysis conducted using significant variables in the bivariate analysis, identified that the most important covariates were place of residence, household food insecurity and dietary diversity.

Women who lived in a rural area were 5.14 times more likely to be underweight than in the urban setting [AOR=5.14, 95% CI: (1.33, 19.84)]. The risk of being underweight is 4.06 times greater for women from food insecure households than food secure households [AOR = 4.06, 95% CI: (1.61,10.25)]. Moreover, the DDS of the women were statistically associated with underweight. Women having low DDS were 4.07 times more likely to be underweight compared to women who had high DDS [AOR=4.07, 95%CI: (1.29, 12.91)] (Annex 1-Table 4)

Discussion

The present study assessed the magnitude of underweight and the associated factors among women with OBF in Addis Ababa Fistula Hospital, Ethiopia. The study showed that 48 (33.6%) women are underweight based on the cutoff point of BMI <18.5. Our finding is in line with studies in Nepal and Tigray Region in Ethiopia. (26,27) The result is more than threefold compared to the global prevalence rate (9.7%) of underweight women and is also considerably higher than the WHO's prevalence reference rate of 20-29% for underweight. (1) Our BMI results are also higher than studies conducted in different Regions in Ethiopia, India and Tanzania. (1,17,26–28) But this study finding was smaller than a study conducted in Kunama (Tigray) and Assayita (Afar) in Ethiopia. (7,27,28) The discrepancy might be due to differences in the study population, residence and the sample size. This study is an institutional based cross-sectional study. Most studies found in the literature which were used for purpose of comparison were done in large community-based studies and multinational, national and global analysis with large sample sizes.

Living in rural areas is associated with 5.14 times higher odds of being underweight compared to urban areas. This finding is consistent with studies conducted in Northwest Ethiopia, Tanzania, and an analysis of 2016 EDHS data. (1, 17, 28) It is also supported by other studies in low- and middle-income countries, African countries, and local studies in Ethiopia. (3,4,12,23,26,27) The higher odds of being underweight among rural dwellers compared to urban populations may be attributed to factors such as lower social status, higher poverty rates, limited access to food, and inadequate education on resource utilization. These factors are commonly associated with rural areas and can contribute to increased vulnerability to underweight status. (2, 27)

The risk of being underweight is 4.06 times greater for women from food insecure households than food secure households. This result is very similar with a study in Vietnam and Addis Ababa. (28) But the finding was higher than in low- income households of Los Angeles and different Ethiopia regions (Tigray, Amhara and Arba Minch). (2,28,29) and smaller as compared with studies from Kenya, Afar regional state in Assayita and Farta district, Ethiopia. (27,28) The possible explanation might be differences in the socio-economic status, study time, area and sample size of the studies.

There was a significant association between underweight and dietary diversity. The risk of underweight was more among women who have low DDS than who have high DDS. A similar finding was reported from a study conducted in Pakistan, South Africa, Kenya and Gonder. (5,25) But the finding is lower as compared to a study conducted in west Gojam and Malaysia. (22,26) and higher than study conducted in South Africa and different parts of Ethiopia (Addis Ababa, Hossana, West Gojam, North West Gojam and Southern Ethiopia). (2,5,23,26) Differences in the study population and the classification methods used for food groups in the analysis may contribute to the variations observed.

Limitations of the study

The limitation of the present study includes the fact that there was a dearth of literature about the magnitude of underweight and dietary intake specifically related to women with OBF. Therefore, the investigator tried to use literature which was related to different aspects of reproductive age group of women. Due to Covid 19 pandemic the research study has faced challenges related to data collection, including limitation to sample size. Furthermore, the study cannot show a cause-and-effect relationship between outcome and explanatory variables due to the cross-sectional nature of the data.

Conclusion

Underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa Ethiopia was found to be high as compared to the global prevalence rate 9.7%. To reduce underweight among women with obstetric fistula and improve their overall health and well-being, it is recommended to implement health education programs to enhance nutrition knowledge, strengthen nutritional support specifically tailored to this population, address food insecurity through collaborative efforts with stakeholders, focus on developing targeted interventions for rural areas, and foster multi-stakeholder collaboration for integrated efforts. These recommendations aim to address the underlying factors contributing to underweight and promote better nutritional outcomes for women with obstetric fistula.

Abbreviations

AOR:	Adjusted Odds Ratio
BMI:	Body mass index
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
FFQ:	Food frequency questionnaire
HFIAS:	Household food insecurity Access scale
Ht:	Height
Kg:	Kilogram
KSSE:	Kilifi Stigma scale of Epilepsy
OBF:	Obstetric fistula
OR:	Odds Ratio
SD:	Standard Deviation
RAG	Reproductive age group
UNICEF:	The United Nations Children's Fund
WHO:	World Health Organization
WRA:	Women of Reproductive Age

Declarations

Consent for publication

Participants consented for unanimous sharing of compiled data as approved by the IRB of the college at SPHMMC.

Ethical declaration

Ethical approval was obtained from the IRB of St. Paul's Millennium Medical College and Addis Ababa Hamlin Fistula Hospital research ethical committee. The nature of the study, the research objectives, and the confidentiality of data was fully explained to the participants. Verbal informed consent was obtained from every study participant. Privacy and confidentiality were assured at all levels.

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Authors contributions

TD conceptualized the research problem, designed the study, conducted fieldwork, collected and data analyzed, and drafted the manuscript. TT and MF was involved in conceptualization, preparing the research proposal, and revising the final manuscript. All authors of the manuscript have read and agreed to its content.

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Competing interest

All authors read and approved the final manuscript. The authors declare that they have no competing interests.

Availability of data and materials

The datasets used in the current study or data collection tool are available from the corresponding author with a reasonable request.

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Annex 1

Table 4: Bivariate and Multivariable Logistic Regression Analysis for factors associated with underweight among women with obstetric fistula in Hamlin Fistula Hospital, Addis Ababa, Ethiopia, 2021 (n=143)

Variables		Underweight		COR (95%CI)	*Adjusted OR [95%CI]*
		Yes, n (%)	No, n (%)		
Age of Respondent	15-24	19 (39.6)	26 (27.4)	0.78 (0.31,1.95)	1.14(0.35,3.64)
	25-34	14 (29.2)	53 (55.8)	**0.28 (0.11,0.71)***	0.39(0.12,1.22)
	>=35	15 (31.3)	16 (16.8)	1	1
Marrital Status	Single	4 (8.3)	11 (11.6)	0.62 (0.18, 2.21)	0.83(0.17,4.23)
	Married	23 (47.9)	48 (50.5)	0.82 (0.40,1.71)	1.32(0.49,3.53)
	Divorced+Widowed	21 (43.8)	36 (37.9)	1	1
Educational Status	No formal education	31 (64.6)	65 (68.4)	0.84 (0.40,1.75)	0.51(0.19,1.34)
	Primary and secondary Education	17 (35.4%)	30 (31.6%)	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)	**5.14(1.33,19.84)***
Relegion	Orthodox	11 (22.9)	29 (30.5)	1	1
	Protestant	12 (25.0)	27 (28.4)	1.17 (0.44,3.10)	0.67(0.18,2.49)
	Muslim	25 (52.1)	39 (41.1)	1.69 (0.72,3.98)	1.29(0.43,3.83)
Household monthly income	<2000	40 (83.3)	71 (74.7)	1.69 (0.70,4.11)	1.32(0.43,4.04)
	>=2000	8 (16.7)	24 (25.3)	1	1
Occupation	Farmer	32 (66.7)	54 (56.8)	1.45 (0.60, 3.53)	1.35(0.40,4.62)
	Privet Buisness	7 (14.9)	19 (20.0)	0.90 (0.28,2.88)	1.71(0.36,8.17)
	Other	9 (18.8)	22 (23.2)	1	1
Houshold size	1-3	23 (47.9)	45 (47.4)	1	1
	4-6	17 (35.4)	36 (37.9)	0.92 (0.43,1.99)	1.18(0.39,3.01)
	>=7	8 (6.71)	14 (14.7)	1.12 (0.41,3.05)	1.16(0.29,3.99)
Hospital visit	New Visit	28 (58.3)	52 (54.7)	1.16 (0.57,2.34)	2.39(0.81,7.16)
	Repeated visit	20 (41.7)	43 (45.3)	1	1
Duration of incontenence before surgical repair	<6 month	17 (35.4)	36 (37.9)	1	1
	>=6 month	31(64.6)	59 (62.1)	1.11(0.54,2.29)	1.19(0.47,3.06)
Chronic disease	Yes	3 (6.3)	1 (1.1)	0.16 (0.02,1.58)	0.38(0.03,4.96)
	No	45 (93.8)	94 (98.9)	1	1
Infectious disease	Yes	1 (2.1)	1 (1.1)	0.50 (0.03,8.17)	0.27(0.01,8.26)
	No	47 (97.9)	94 (98.9)	1	1
Nutritional information	Yes	12 (25.0)	26 (27.4)	1	1
	No	36 (75.0)	69 (72.6)	0.89 (0.40,1.96)	0.99(0.33,3.05)
Social Support	Poor social support	42 (87.5)	74 (77.9)	1.99 (0.74,5.31)	1.91(0.57,6.50)
	Strong social support	6 (12.5)	21 (22.1)	1	1
Percieved Stigma	Not Percieved Stigma	20 (41.7)	29 (30.5)	1	1
	Percieved Stigma	28 (58.3)	66 (69.5)	0.62 (0.30.1.27)	0.37(0.14,1.02)
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)	**4.06(1.61,10.25)***
Dietary Diversity Score	Low DDS	14 (29.2)	9 (9.5)	3.94 (1.56,9.94)	**4.07(1.29,12.91)***
	High DDS	34 (70.8)	86 (90.5)	1	1