FACTORS ASSOCIATED WITH IRON AND FOLIC ACID SUPPLEMENTS UPTAKE AMONG PREGNANT WOMEN IN DAR ES SALAAM, TANZANIA.

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By

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A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree of Masters of Public Health of the

Muhimbili University of Health and Allied Sciences

October, 2024

CERTIFICATION

The undersigned certify that, they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation titled**"Factors associated with iron and folic acid supplements uptake among pregnant women in Dar es salaam, Tanzania",** in partial fulfilment of the requirements for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

……..

Prof. Bruno Sunguya

(Supervisor)

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Date

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Ms Saida Bakari

(Co-Supervisor)

……

Date

DECLARATION AND COPYRIGHT

I, Dr. Careen Elias Koka, hereby declare that this dissertation is my original work and that it has not been presented and will not be presented to any other University or Institution for a similar or any other degree award.

Signature ……. Date ……..

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DEDICATION

I dedicate this work to my parents Mr Elias Koka and Mrs Rehema Elias Koka who have been of great support throughout the study time from the beginning to the end.I pray for God's blessings upon them.

ABSTRACT

Background: Anemia in pregnancy is a public health concern globally particularly in developing countries like Tanzania. Iron and folic acid (IFA) deficiencies during pregnancy have harmful outcomes to both the mother and fetus. Uptake of the IFA supplements in Tanzania has remained low despite various interventions and health promotion messages. Hence need to address the knowledge gap on factors for IFAS uptake by assessing the factors associated with IFAS uptake among pregnant women in Tanzania.

Materials and Methods: A cross-sectional survey was conducted using quantitative approach. Purposive sampling of the hospitals was done. A simple random sampling technique (lottery technique) was used to obtain the study participants. Thetarget population was post-delivery women in postnatal wards of Temeke, Mwananyamala and Amana regional referral hospitals.A total of 428 participants were recruited in the study. Descriptive analyses, bivariate and multivariate analyseswereconductedusing IBM SPSS Statistics 23.

Results: Less than one in three pregnant women (31.8%) attending ANC at referral hospitals of Dar es salaam had an appropriate uptake of IFAS among women attending ANC. IFAS uptake was associated with multiparity (AOR=0.26 95% CI 0.10 – 0.67), increased with the frequency of ANC visits, family support (AOR=0.083 95% CI 0.01 – 0.62), and wealth index (AOR=11.68 95% CI 2.91 – 89.57). IFAS uptake was also 9 times higher among women whose households had food security than those women whose households had food insecurity access (AOR=9.21 95% CI 1.82 – 10.33).

Conclusion and recommendations: IFAS uptake among pregnant women attending regional referral hospitals in Dar es Salaam wasonly 31.8%. Such unprecedented low uptake needs to be addressed to improve the burden of anemia among pregnant women in Tanzania and areas with similar contexts. Targeted interventions are needed among pregnant women with higher parity (multparous women), with fewer ANC attendances, with challenging family support, with household economic hardship (low wealth index), and those from houselholds with food insecurity.

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
DNA	Deoxyribonucleic Acid
FA	Folic Acid
Hgb	Hemoglobin
IFA	Iron and Folic Acid
IFAS	Iron and Folic Acid Supplementation
NTD	Neural Tube Defect
ODK	Open Data Kit
RBC	Red Blood Cell
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization
SP	Sulfadoxine Pyrimethamine
RCH	Reproductive and child health
TDHS	Tanzania Demographic and Health Survey
HIV	Human Immunodeficiency Virus
PCA	PrincipalComponent Analysis
VIP	Ventilated improved pit
DDS	Dietary Diversity Scale
USAID	United States Agency for International Development
FANTA	Food and Nutrition Technical Assistance
TNNS	Tanzania National Nutrition Survey
HFIAS	Household Food Insecurity Access Scale

DEFINITIONS

Anemia: Is defined as hemoglobin (Hb) levels <12.0 g/dL in women and <13.0 g/dL in men (4).

Anemia in pregnancy: Refers to as Hb levels <11.0 g/dL in the first and third trimesters and <10.5 g/dL in the second trimester in pregnant women (4).

Antenatal: Having to do with the time a female is pregnant, before birth occurs (53).

Postnatal: Means after birth (54).

Uptake: Refers to taking in of iron and folic acid tablets (13).

Adherence to IFAS: Taking 65% or more of the supplement, equivalent to taking the supplement at least 4 days a week during the 1-month period preceding the study (4).

Adequate IFAS uptake: Refers to the intake of iron and folic acid tablet for at least 90 days per pregnancy (13).

Prevalence: Refers to the total number of individuals in a population who have a disease or health condition at a specific period, usually expressed as a percentage of the population (55).

Bioavailability: Refers to the fraction of compound that is actively available within the body (11).

CHAPTER ONE:

1.0 INTRODUCTION

1.1 Background

Anemia during pregnancy is diagnosed as hemoglobin concentration less than 11 g/dl. Hemoglobin concentration less than 11g/dl is referred to as mild anemia, between 7–9.9 g/dl moderate anemia and less than 7g/dl is considered as severe anemia. Anemia in pregnancy is usually caused by iron deficiency (4). The RBC protein Hgb, which carries oxygen from the lungs to the tissues, is significantly dependent on iron. Human bodies need folic acid for the synthesis, repair, methylation, and cell division of DNA. Folic acid is also needed by the human body for the development of healthy RBCs and the prevention of anemia, especially during pregnancy and infancy (5).

The prevalence of nutritional anemia is a significant public health issue worldwide, particularly in underdeveloped nations (6). One of the groups most susceptible to iron deficiency anemia is pregnant women (7). Globally, 1.62 billion people suffered from anemia that accounts for 24.8% of the world's population (8,9). It is estimated that 56.4 million pregnant women affected by anemia and Africa account for 17.2 million pregnant women affected by anemia(4). Iron deficiency anemia, accounts for more than half of all occurrences of anemia in pregnancy, it is one of the major contributing factors to the worldwide burden of disease (10).

Pregnancy-related physiological changes, fetal growth, and development raise the need for iron and folic acid. Due to the lower bioavailability of nutrients in pregnant women, the increased demand for essential nutrients cannot be satisfied by diet alone. If nutrition is not supplemented with iron and folic acid tablets throughout pregnancy, there is a considerable risk that iron deficiency and folic acid deficiency may manifest (11). The iron and folic acid supplementation (IFAS) interventionisone of theinterventionsby the WHO for the control of anemia in (4,10,12).

Pregnant women are strongly advised to take daily doses of 30 mg to 60 mg of iron and 0.4 mg of folic acid in order to avoid maternal anemia, puerperal sepsis, low birth weight, neural tube defects, and preterm birth(13,14). The risk of all types of maternal anemia at term is reduced by 70% and the risk of iron deficiency anemia at term is reduced by 57% when daily iron and folic acid supplements (IFAS) are taken throughout pregnancy(4). The risk of infant mortality can be decreased by 34% by using IFAS for 90 days throughout pregnancy(4). Infants' intellectual development may be influenced by maternal folic acid(15).

The WHO defined the iron and folic acid supplementation (IFAS) indicator as "the proportion of women with a birth in the last two years who received or bought for at least six months during their last pregnancy, in amounts that were in accordance with recommended protocols" in order to reach the target of a 50% reduction in anemia in women of reproductive age by 2025 (5). Reduced maternal-child mortality and morbidity, as well as low birth weight, are notable advantages of IFAS(10).Despite the established advantages of IFAS, low supplementation undermines its effectiveness and leads to poor maternal-child outcomes (10).There is a knowledge gap on why IFA supplementation uptake is very low, and therefore factors associated with the uptake. This study aimed to fill this evidence gap.

1.2 Problem statement

Anemia in pregnancy is a burden globally, due to its significant contribution to the high maternal morbidity and mortality rates. It is also a risk factor for poor birth outcomes including low birth weight (11,16). In Tanzania, 57% of pregnant women have anemia, which is a persistently high prevalence (17,18).

Anemia is caused by a number of factors including an insufficient supply of iron and folic acid due to their increased demand in the body during pregnancy which can hardly be met by food sources and thus necessitating supplementation (11). In Tanzania the most common cause of anemia in pregnancy is nutritional deficiencies (16). IFA are the most prevalent micronutrient deficiencies particularly among pregnant women in developing countries (1,4). Anemia during pregnancy significantly affects both the mother's and the fetus's health (19). Impaired cognitive function, cardiovascular illness, delivery complications and even maternal death are typical maternal consequences of anemia in pregnancy (19,20). Premature birth, low birth weight, intrauterine fetal growth restriction, and fetal mortality are among the infant's complications (20). Additionally, maternal anemia has been linked to adverse long-term health effects in children during their growth(18).

The strategies in place to dealing with anemia in pregnancy in Tanzania include IFA supplementation, de-worming, intermittent malaria treatment with sulfadoxine-pyrimethamine (SP) and use of treated mosquito nets. However, despite the placed strategies inconsistent results have been reported on the effectiveness of these interventions (18).

An improvement in the nutritional anemia (iron and folic acid deficiencies) has been very slow. Few studies have been conducted on uptake or use of pre-natal IFA supplementation among pregnant women (12). It is known that supplementation uptake is very low but there is a knowledge gap on the factors associated with the low IFAS uptake even though they are available at health facilities and the facilities are accessible to 98% of the pregnant women. There is an evidence gap on the comprehensive study on the factors which determine the low uptake of IFAS among the already delivered women and therefore this study aimed to fill the

gap by assessing how the individual, family, and health system factors influence low uptake of IFAS for women in three identified hospitals located in Dar es Salaam city in Tanzania.

1.3 Conceptual framework

Factors at different levels, which are individual, family, society/community and health system factors, play an important part in influencing iron and folic acid supplementation uptake among pregnant women (21,22). Individual factors, such as side effects and lack of knowledge about the benefits of IFA, affect compliance (23). Pregnancy order is another individual factor that could affect how much of a supplement a pregnant woman takes in. Women with higher pregnancy are more likely to have less supplementation(24). Family factors including partner involvement, economic status and support of the family has a direct impact on IFAS uptake by the respective pregnant woman (23,25). Community customs, norms and beliefs do play a great role in influencing iron and folic acid supplementation (26). Health systems factors such as nutrition education provision by health care providers, fluctuation of drug availability and distance to health facility also do affect the iron and folic acid supplementation uptake among pregnant women (23,27).The societal factors were not assessed in this study due to lack of validated tools on the topic of study.

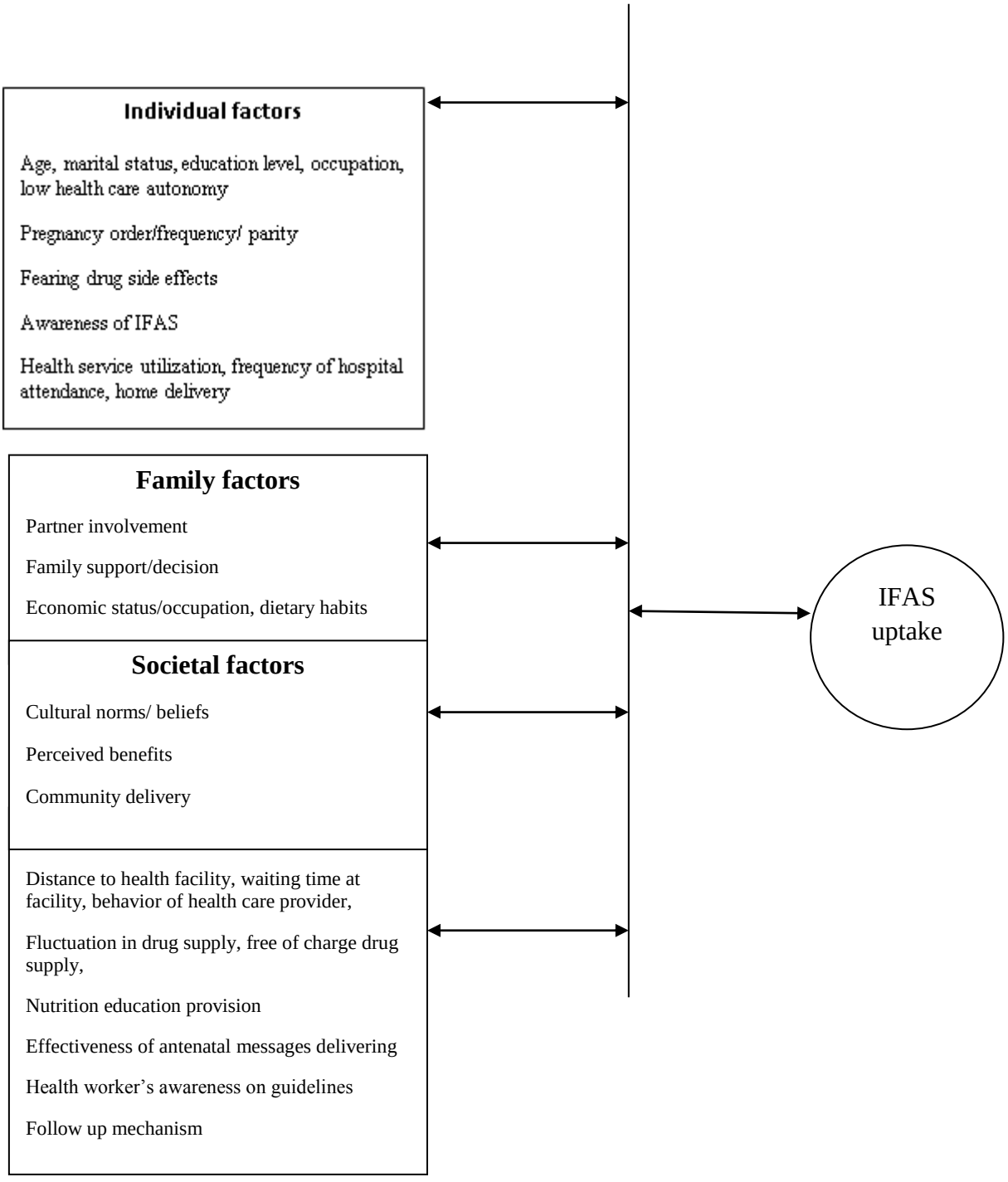


Figure 1: Conceptual framework for factors associated with iron and folic acid supplementation uptake adopted from the social ecological model on IFAS uptake in Tanzania.

1.4 Rationale

The aim of this study was to determine the factors associated with low iron and folic acid supplementation uptake in Dar es Salaam even though supplements are available and accessible. The findings of the study/knowledge acquired will help shed light to health policy makers and planners to come up with effective strategies to increase the IFA supplementation uptake among pregnant women, which will then lead to decreased anemia in pregnancy cases and in the long run reduce maternal, fetus, neonatal and child morbidity and mortality rates. The study assessed how the quality of healthcare services in terms of guidance, counseling, patient care, health facilities, and the patient experience influence IFAS uptake. The current study was a comprehensive one that integratedindividual, family and health system factors to suggest broader interventions for the problem. Moreover, the findings will promote the development of interventions and policies that will enhance the proper IFAS uptake for pregnant women in Tanzania.

1.5 Research Questions

1.5.1 Main Research Question

What are the factors associated with the low iron and folic acid supplementation uptake among pregnant women in Dar es Salaam?

1.5.2 Specific Research Questions

1. What is the IFAS uptake among pregnant women in Amana, Mwananyamala, and Temeke regional referral hospitals?
2. What are the factors influencing IFAS uptake among pregnant women in Amana, Mwananyamala, and Temeke regional referral hospitals?

1.6 Research Objectives

1.6.1 Broad objectives

To determine the factors associated with the low iron and folic acid supplementation uptake among pregnant women in Dar es Salaam.

1.6.2Specific objectives

1. To determine the IFAS uptake among pregnant women in Amana, Mwananyamala, and Temeke regional referral hospitals.
2. To determine the factors influencing IFAS uptake among pregnant women in Amana, Mwananyamala, and Temeke regional referral hospitals.

CHAPTER TWO:

2.0 LITERATURE REVIEW

2.1 Individual factors influencing IFAS uptake among pregnant women.

For women intending to become pregnant, iron and folic acid are two of the micronutrients advised to ensure optimal maternal outcomes (25). For the best outcomes for the mother, current recommendations encourage supplemental intake of iron (60 mg/day) and folic acid (0.4 mg/day) during the gestational period (44). However, if folic acid supplementation is started later than three months into a pregnancy, it is not helpful in avoiding birth abnormalities (28). The World Health Organization (WHO) recommends beginning antenatal care (ANC) in the first trimester and scheduling antenatal appointments at least eight times throughout pregnancy (29). Many women in developing nations do not, however, abide by this recommendation (30). ANC visits are significant for iron and folic acid supplementation uptake to meet the required recommended dosages of the supplements. Pregnant women can access a variety of preventative and health promotion interventions through antenatal care, according to the study (31). Adherence to iron and folic acid supplements during pregnancy is still low despite the interventions (44).

Pregnancy order, which refers to how many pregnancies a woman has had, is a factor that could affect how much of a supplement a pregnant woman takes in. According to several studies, women who experience more pregnancies are likely to have poorer adherence rates than those who experience fewer pregnancies (24). Global perspectives on the association between iron and folic acid supplementation uptake and pregnancy order show both broad trends and regional differences (32). Although women with greater pregnancy orders may have trouble following supplement advice, the precise reasons affecting compliance can vary among nations and contexts. Numerous factors affect the connections between pregnancy order and IFAS uptake in Tanzania (20).

Lack of understanding of the significance of IFAS, as well as myths and cultural prejudices towards supplements, can have an impact on the uptake (31). According to a study conducted in Ghana, characteristics such as having a better level of formal education, health insurance coverage, rising household affluence, living in an urban area, and being a resident of the

Upper East Region were all linked to acceptable or ideal ANC attendance from 2006 through 2017–2018 (33). Moreover, side effects from the drug once taken do influence the iron and folic acid supplementation uptake. Most due to the fear of side effects neglect to take the supplements (23). The other individual factor contributing to low IFAS uptake is forgetfulness to take the drugs (24).

2.2 Family factors influencing IFAS uptake among pregnant women.

Male involvement in maternal health services is recognized as a crucial factor in improving pregnancy outcomes and reducing maternal and neonatal mortality rates (34,35). In Tanzania, where maternal health indicators remain a concern, understanding the role of male involvement in health service utilization among pregnant women is essential (35,36). A study done in Zambia showed women who attended with partners were more likely to attend ANC in the first trimester and were more likely to have more antenatal visits (25).

Male involvement is important in a number of ways, including accompanying pregnant women to antenatal care (ANC) appointments, deciding whether to seek medical attention, providing financial and emotional support, and more (37). However, obstacles like gender norms, a lack of awareness and education among men, and aspects of the health system may make it difficult for men to participate effectively (38). While male involvement may be a supportive factor; it sometimes hinders women from accessing antenatal services. A study done in Zambia revieled the nursing staffs insisted that all women attend ANC with partners and many of them were turned away from several health facilities because they did not go with partners (25). Lack of the father's trust to IFA efficiency could be a factor that influences iron and folic acid supplementation uptake by pregnant women (23).

The pregnant woman's family members do play part in influencing IFAS uptake. Lack of awareness on the importance of IFA supplements to the pregnant woman and her unborn baby by the family members including the in laws is a hinder to the uptake of the supplements. Furthermore the lack of knowledge on how to deal with the drug side effects by the family members contributes to the low uptake of IFAS (23). Generally family support is crucial in IFAS uptake (20).

2.3 Health system factors influencing IFAS uptake among pregnant women.

Health service utilization is greatly affected by the distance to the health facilities (25). Some studies have found that rural women began visits later and attend ANC less frequently than urban women due to long distance to health facilities and fewer clinics at the areas compared to urban (39). Iron and folic acid supplement stock outs could be another health system factor influencing the supplementation uptake by the pregnant women (24).

Counseling and guidance from healthcare professionals influence pregnant women's uptake of IFAS. Counseling leads to knowledge impaction which influences the adherence to supplements (26). Challenges in the quality of care provided by the health care providers do influence attendances to health facilities and thus the IFAS uptake. One of the challenges could be the health care provider’s attitude towards the women (20). A study in New Guinea found that poor relationships with health care providers or negative experiences at the clinic deterred women from attending clinic. This then influences the iron and folic acid uptake (20).

CHAPTER THREE:

3.0 RESEARCH METHODOLOGY

This chapter outlines the studydesign, study population, sample size and selection, variables, data collection techniques, investigation tools and validity and reliability matters, analysis of data, ethical concerns and study limitations and mitigations.

3.1 Study design:

A hospital based cross-sectional quantitative study design was used to determine the factors associated with iron and folic acid supplements uptake among pregnant women in Dar es Salaam, Tanzania.

3.2 Study area:

The study was conducted at referral hospitals found in Dar esSalaam. The hospitals were Temeke hospital, Mwananyamalahospital and Amana hospital located in Temeke district, Ilala district and Kinondoni district respectively. Mwananyamala hospital has a capacity of 317 beds, and it attends about 1,800 patients per day. Mwananyamala hospital serves to about 2.2 million people. Amana referral hospital serves a population of over 1.2 million people and has a bed capacity of 353. The hospital's obstetrics unit performs roughly 50 births per day and sees about 1,000 outpatients per day. Between 1,000 and 1,500 patients a day visit the Temeke referral hospital from different service delivery locations. The emergence of new illnessesand medical technological advancements has made it necessary to enhance the services provided by the Temeke hospital. The hospitals do contain a large number of pregnant women at antenatal clinics and wards(40). The prevalence of anemia among pregnant women visiting referral hospitals is high about 70.9% (16).The hospital's RCH clinics are always open from Monday to Friday so as to see the pregnant women who come for the visits. The pregnant women are sometimes given the IFA tablets during their visits at the RCH clinics or asked to go buy them at the pharmacies. The three hospitals are important centers for IFAS uptake in Dar es Salaam, due to their public nature making them serve a great number of the people living in Dar es Salaam city. These people come from various places of the city. The study

will be done in Dar es Salaam which has a large population of women in Tanzania and diverse people.

3.3 Study population:

Data was collected from post - natal women who were found at the health facilities (Temeke, Mwananyamala, and Amana referral hospitals) at the respective post-natal wards.Both post spontaneous vaginal delivery and post cesarean section women eligible for the study were involved in the study. The three hospitals had approximately about 1765, 1451, and 1311 baby deliveries per month in Amana, Mwananyamala, and Temeke respectively. The study participants were identified, recruited, consented and interviewed at post-natal wards (both post SVD and C/section).

3.4 Sample size and sample selection.

The hospitals were purposively selected. The study participants were randomly selected for the study using a simple random sampling technique.

The sample size of the study was 428 as derived from the formulae below.

$N=Z^2 P (1-P) / E^2$

Where, N= required sample size

Z= standard normal deviate = 1.96 for 95% confidence level

P= prevalence of iron and folic acid adherence (50%) (Prevalence not known in Tanzania)

E= margin of error (0.05)

$N= 1.96^2 * 0.5 (1-0.5) / 0.05^2$

N= 384.16 rounded to 385

Adjusting for non-response rate

Taking the non- response rate (NRR) to be 10%

Sample size = N / (100% + NRR)

Sample size =385 / (100% + 10%)

Sample size =428

For each region, the sample size was calculated in the proportion as follows:

The sample size for Amana referral hospital was 1765/4527*428=167post-delivery women per month

The sample size for Mwananyamala referral hospital was 1451/4527*428=137 post-delivery women per month

The sample size for Temeke referral hospital was 1311/4527*428=124 post-delivery women per month

3.5 Sampling procedures

The sample for the study was selected through simple random sampling technique using a lottery technique whereby participants were assigned numbers each. Numbers were written in small peaces of paper, of the same size, color and shape. The papers were folded and then put in a box and then mixed. A blindfold selection was the made. The process of selecting continued until the required sample size per respective hospital was reached. About 18 – 24 participants were selected in a day.

3.5.1 Inclusion Criteria

The study included all post-natal women aged 15 to 49 years found at the post-natal words at Temeke, Amana, and Mwananyamala regional referral hospitals.

3.5.2 Exclusion Criteria

The study excluded those who were in severe pain or had health emergencies.Those women who did not consent were also not included in the study.

3.6 Study Variables

3.6.1 Dependent variable

This study's variable of interest was the IFAS uptake of 90 pills or more. The uptake was self reported by the stusy participants. AdequateIFAS uptake refers to intake of folic acid and iron tablet for a minimum of ninety days per pregnancy as stated in the WHO guideline. It is a categorical variable categorized as normal uptake (90-180 pills per pregnancy) and low uptake (less than 90 pills per pregnancy (4,13). Adherents are those who take at least four IFA tablets every week for the duration of their pregnancy. Uptake of less than four tablets per week during pregnancy is classified as non-adherent. From the definition and tool was adopted fromLyoba et al. (2020) and Adebo et al. (2017).The categories for the outcome variable were 1= adherent 2= Non-adherent.

3.6.2 Independent Variable

Independent variables included the individual constructs of the individual, family, and health system factors.

Individual factors

The individual factors that were measured included the following. Age asked in years.The marital status that is currently in union or not, was categorized as 1 denotes marriage or cohabitation, 2 separation or divorce, 3 widowed, and 4 never married and neverlived together. This was also a categorical variable adopted fromTDHS-2022. The categories of education level were Pre-primary = 0. Primary was represented by 1, post-primary by 2, 3 = secondary 'o' level, 4 = post-secondary 'o' level, and 5 was the secondary 'a' level. 6 = 'a' level post-secondary education, 7 is for universities and 8 = do not know. This was a categorical variable too and is adopted from TDHS-2022.

Occupation variable was defined astype of employment or what the responded has been doing in the 7 days before the survey. Professional/managerial, sales and services, clerical, skilled and unskilled manual labor, domestic help, agricultural, and other are the types of occupation that are drawn from TDHS-2022.

Health care autonomy, who is the person that usually is responsible in making decisions on medical care for the respondent. The question asked was "Who typically decides regarding your health care?" and the responses were the respondent, spouse/partner, respondent and spouse/partner together, and an additional party or other (TDHS 2022). Gravidity, described as the quantity of pregnancies a woman has had, it was categorized intoprimigravid, secundigravid and multigravida (TDHS2022). Drug side effects, referring to any harm faced after taking the drugs. It was a categorical variable, categorized into 1= yes and 2=no (TDHS2022). HIV status that is the respondent's human immunodeficiency status, where the respondent has the condition or not (TDHS2022) will be categorized into 1= known, 2= unknown. The respondents self-reported if they knew their HIV status or not but also the interviewer checked their antenatal cards to know the true status.

Family factors

The family factors variables and their categories included husband/male partner involvement: Whether during the pregnancythe husband/male partner did any of the following, 1. Stopped the woman from receiving ANC, 2. Encouraged the woman to receive ANC, and 3. Had no interest in the woman receiving ANC. The tool was sourced from the TDHSandcategorized into 1=yes and 2=no. Family support/involvement: Whether during the pregnancy, the family did any of the following, 1. Stopped the woman from receiving ANC; 2. Encouraged the woman to receive ANC; and 3. Had no interest in the woman receiving ANC (TDHS 2022).

Weighted wealth index was used as aproxie for household economic level. It consideredthe ownership of home resources, dwelling features, fuel for cooking and lighting, toilet type, water supply, and feeding habits was used to determine economic status. Principal component analysis was utilized on the dichotomized variables to reduce the variables into the ones that were closely assessing economic level. Further factor analysis helped to give weights to these variables. The item weights, which are factor loadings, were added together to produce the wealth index for every family. Following that, the entire Weighted Wealth Index score was split similarly to three (terciles) representing high, midium, and low economic levels (TDHS 2016, 2022).

Feeding frequency tool was adopted from previous Tanzanian research projects conducted in Tanzania (41). The World Health Organization suggests a feeding schedule of tree meals and at the minimum two snacks in 24 hours for pregnant women (WHO) (42).

Dietary Diversity Scale (DDS) was used to measure dietary diversity like in previous studies conducted in Tanzania. We extracted a roster of twelve foods derived from the DHS of Tanzania (TDHS 2022). In the questionnaire, we asked the respondents about the food items they had in the earlier day and sumedthemto determine the final score for dietary diversification. Dietary diversity below 4 was considered as low (TDHS 2022)

Household food insecurity was assessed using a nine-item Household Food Insecurity Access Score (HFIAS) tool. On this scale, the options are: 0 ="no," 1 = "infrequently," 2 = "spoken" and 3 = "frequently"." 27 is the highest overall summation, and 0 is the lowest. The food insecurity magnitude can be classified into four categories: highly insecure, severely insecure, mildly insecure, and secure. It can also be utilized as a continuous variable. HFIAS has been used in multiple studies in the area and has 30-day recall duration. Household Food Insecurity tool has been used in a number of studies in Tanzania and its user guide by USAID FANTA project(43).

Health system factors

The variables of the health system factors are: Distance to health facility, defined as the distance in kilometers from the addressee's residence to the hospital. The one who replies will state the distance in kilometers from their homes to the respective hospital (TDHS-2022). Charge of ANC services. This refers to whether or not the respondent was charged for the ANC services during the pregnancy period. The responses being, 1= yes and 2=No (TDHS-2022.) Nutrition education provision, that is the nutrition education providedby health care attendants to pregnant mothers, categorized into 1=Provided, 2= Not provided. It is adopted from Gebremichael et al. (2019); (Siekmans et al., 2018), TDHS-2022. Healthcare providers' behavior is another variable. The variable has two responses: 1=favorable behavior, 2= unfavorable behavior. Sourced from Njiru et al. (2022); TDHS-2022. The other variable is

iron's odor and tablets of folic acid. That is whether the respondents like the smell of the tablets or not, and it is categorized into: 1= yes, 2= no, it is adopted from Bahati et al. (2021).

3.7 Data Collection Method

A cross-sectional study design was used for data collection from the eligible for study participants, whereby data was collected at a single point in time. The data was collected using a validated close ended questionnaire that consisted of questions adopted from the TDHS 2022 and TNNS 2018 and from previous studies (criterion validity). There was an English and Swahili version of the questionnaire. The pre-testing of the questionnaire was done to enhance its validity. All participants were asked same questions. The researcher read the questions to the respondents and filled in their answers in the respective questionnaire.

The tool used in this study was avalidated questionnaire, and most of the variables were adapted from the Tanzanian Demographic and Health Survey 2022 and National Nutrition Survey 2018. Others included HFIAS, DDS, and Food Frequency tools. The questionnaire consisted of a total of 80 questions exploring the iron and folic acid uptake, individual, family and health system factors associated with iron and folic acid uptake among pregnant women as per conceptual framework. It was translated to Swahili, a language used for data collection.

3.8 Training

Two research assistants were recruited for the study. They were taught on proper gathering of data by means of the research instruments and then went to the field for data collection with the principal researcher.

3.9 Data Collection procedure

Two research assistants were recruited and trained by the principal investigator. The training was done in a day and was based on the purpose of the study and how to collect data using the questionnaire. Participants were interviewed using a questionnaire. Data was collected by investigator and two research assistants, after obtaining consent from the participants. The questionnaire was translated into Swahili with the help of a language expert, and then translated back to English to ensure validity.

3.10 Data Management in the Field

Researcher and trained research assistants were the ones collecting the data. Filled questionnaire forms from the respondents'were reviewed at the end of every working day for accuracy. Any detected error was discussed and amended, all these helped to increase the quality of the obtained data. Each questionnaire was labeled to make sure there were no duplications.

3.11 Data analysis

The collected data was analyzed to identify the factors associated with low IFAS uptake using appropriate statistical tests. Data cleaning was performed to eliminate missing, invalid, and duplicated data. An IBM SPSS version 23.0 was used for analyzing the collected data. Confidence interval of 95% and a p value of 0.05 were used. Descriptive analysis was performed to summarize the characteristics of the sample, involving creation of frequency distribution tables for demographic characteristics including age, marital status, education level and occupation versus the iron and folic acid uptake.

For objective number one, the outcome variable was uptake of 90 pills or more of IFAS. The IFAS uptake was analysed using summary statistics in descriptive methods. It was presented in frequency and percentage.

For objective number two, the outcome variable was uptake of 90 pills or more of IFAS. The independent variables were individual, family and health system factors respectively. The Pearson Chi – square test was used to evaluate the differences in the groups. Bivariate logistic regression was then performed for each independent variable with the outcome variable. Multivariate analysis was performed for a variable that had a p value of <0.2 in bivariate analysis.

3.12 Ethical Consideration

Ethical approval for the study was obtained from the Research and Publication Committee of the Muhimbili University of health and Allied Science (MUHAS IRB). Permission from the administrations of Temeke, Mwananyamala, and Amana hospitals were sought before data collection. The information obtained from the participants was used for research purposes alone and available to authorized personnel only. The questionnaires will be kept in a place where only authorized personnel will have access to. Identification numbers instead of names were used.

Each participant answered the questionnaires privately and securely ensuring comfort and confidentiality. The questionnaires will be stored securely, accessible only to authorized personnel, using identification numbers instead of names throughout the study. These measures collectively upholded confidentiality, privacy, and data protection for the participants involved in the research. The findings were summarized and only the average findings arereported and the individual respondent's information was concealed. The data file was protected through the password to avoid access to the unauthorized person. Before the data collection, the consent was sought from the respondent and each respondent ticked the consent statement and signed.

The researcher cited all relevant works used in the study and avoided plagiarism. Fabrication (data cooking) was avoided. The research also avoided data falsification. Hence the researcher analyzed and reported the real data collected from the field. The researcher avoided changing data to reflect her own perception.

CHAPTER FOUR:

4.0 RESULTS

4.1 Description of the study sample

A total of 428 participants (post delivery women) were recruited for the study with full informed consent. The age distribution of the study participants is summarized in **Table 1** below. The age range of the sample was 29 years ranging from 16 – 45 years, mean age being 27.68 years, median age 27 years, mode age 23 years with standard deviation (SD) ± 5.702 and variance 32.509.

The other demographic characteristics of the study participants are also described in **Table 1**. Most of the study participants 83.2% were married or living with their partners. Almost all of them (98.6%) had ever attended school, whereby of those who attended school (54.1%) had attained a highest level of education of secondary education. Most of the participants were either housewives (42.5%) or businesswomen (42.5%).

Table 2: Demographic characteristics of study participants (N = 428

Characteristic	Frequency	Percent
Age		
16 – 25	188	43.9
26 – 35	194	45.4
36 – 45	46	10.7
Marital status		
Married / living together	356	83.2
Divorced/ separated/widowed	28	6.5
Never married and never lived together	44	10.3
Attended school		
Yes	422	98.6
No	6	1.4
Highest education level		
Primary level	142	33.6
Secondary level	228	54.1
College or University	52	12.3
Occupation		
Housewife	182	42.5
Famer	6	1.4
Business	182	42.5
Student	12	2.8
Civil servant	46	10.7

4.2 Iron and folic acid uptake

The uptake of iron and folic cid supplements which refers to intake of 90 pills or more is shown in **Table 2**. Of all the study participants only 31.8% had attained the standard iron and folic acid uptake level according to the Tanzanian and WHO guidelines.

Table 3: Iron and folic acid supplements uptake (N = 428)

Characteristic	Frequency	Percent
Days IFAS were taken		
0 – 89	292	68.2
90 and above	136	31.8

4.3 Uptake of IFAS by individual characteristics

The uptake of IFAS was analyzedamong all individual characteristics (**Table 3**). There was a statistically significant differences of IFAS uptake by education level (P value 0.027), parity (P value of 0.046), time of first booking (P value 0.007) and number of ANC visits (P value of <0.001).

Table 4: Uptake of IFAS by individual characteristics (N = 428)

Characteristic	Total n=428	Iron and folic acid uptake n=136 (%)	No IFAS uptake	P-value*
Age				**0.688**
16 – 25	188	56 (29.8)	132 (70.2)	
26 – 35	194	62 (32)	132 (68)	
36 – 45	46	18 (39.1)	28 (60.9)	
Marital status				
Married or living together	356	116 (32.6)	240(67.4)	0.850
Divorced/separated/widowed	28	8 (28.6)	20(71.4)	
Never married and never lived together	44	12 (27.3)	32(72.7)	
Ever attended school				
Yes	422	134(31.8)	288(68.2)	0.963
No	6	2(33.3)	4(66.7)	
Highest education level				
Primary level	142	52 (36.6)	90(63.4)	0.027

Secondary level	228	70 (30.7)	158(69.3)	
University	52	28 (53.8)	24(46.2)	
Occupation				
Housewife	182	46 (25.3)	136(74.7)	0.204
Farmer	6	2 (33.3)	4(66.7)	
Business	182	62 (34.1)	120(65.9)	
Student	12	8 (66.7)	4(33.3)	
Civil servant	46	18 (39.1)	28(60.9)	
Receiving IFAS at clinic				
Yes	398	128 (32.2)	270(67.8)	0.659
No	30	8 (26.7)	22(73.3)	
Source of IFAS				
Clinic	348	106 (30.5)	242(69.5)	0.233
Elsewhere	74	30 (40.5)	44(59.5)	
Parity				
Primeparity	164	38 (23.2)	126(76.8)	0.046
Secondiparity	126	40 (31.7)	86(68.3)	
Multiparity	138	58 (42.0)	80(58.0)	
Time of first booking				
1st trimester	198	106 (53.5)	92(46.5)	0.003
2nd& 3rdtrimester	200	44 (22)	156	
Don't know	30	6 (20)	24(80)	
Number of ANC visits				
1 – 4	168	24 (14.3)	144(85.7)	<0.001
5 and above	212	104(49.1)	108(50.9)	
Don't know	48	8 (16.7)	40(83.3)	
Drug side effects				
Yes	82	22 (26.8)	60(73.2)	0.423
No	342	114 (33.3)	228(66.7)	
Liking smell of drus				
Yes	96	38 (39.6)	58(60.4)	0.205
No	328	98 (29.9)	230(70.1)	
Healthcare autonomy				
Respondent	178	50 (28.1)	128(71.9)	0.406
Husband/partner/someone else	52	14 (26.9)	38(73.1)	
Respondent and husbanb/partner jointly	198	72 (36.4)	126(63.6)	
Awareness of IFAS				
Yes	394	126 (32)	268(68)	0.827

No	34	10 (29.4)	24(70.6)	
Usual place of delivery				
Health facility	422	134 (31.8)	288(68.2)	0.953
Home/elsewhere	6	2 (33.3)	4(66.7)	

4.4 Uptake of IFAS by family characteristics

Table 4 below shows the uptake of iron and folic acid supplements by family characteristics. The characteristics found to have a statistically significant difference in propotions were family support with a P value of 0.031, family economic status affecting uptake (P value 0.018) and wealth index.

Table 5: Uptake of IFAS by family characteristics (N = 428)

Characteristic	Total n=428	Iron and folic acid supplements uptake n=136 (%)	No IFAS uptake	P-value*
Living with partner				
Living with her partner	334	110 (32.9)	224(67.1)	0.473
Staying elsewhere	88	24 (27.3)	64(72.7)	
Partner restriction				
Yes	38	6 (15.8)	32(84.2)	0.123
No	388	128 (33)	260(67)	
Husband support				
Yes	336	114 (33.9)	222(66.1)	0.133
No	90	20 (22.2)	70(77.8)	
Family restriction				
Yes	10	0 (0)	10(100)	0.123
No	418	136 (32.5)	282(67.5)	
Family support				
Yes	380	130 (34.2)	250(65.8)	0.031
No	48	6 (12.5)	42(87.5)	
Partner occupation				
Farmer	20	2 (10)	18(90)	0.288
Business	310	100 (32.3)	210(67.7)	
Civil servant	96	34 (35.4)	62(64.6)	
Wealth index				
High	166	74 (44.6)	92 (55.4)	0.001
Middle	173	55 (31.8)	118(68.2)	
Low	89	7 (7.9)	82 (92.1)	
Family dietary habits				
Usually consume IFAS foods	310	108 (34.8)	202(65.2)	0.119
Don’t consume IFAS foods	118	28 (23.7)	90(76.3)	

*chi-square test

4.5 Uptake of IFAS by health system characteristics

The health system characteristics that were found to be statistically significant were distance to heath facility (P value 0.031), getting money for getting treatment (P value 0.001) and health care worker's attitude affecting attendance (P value 0.030). **Table 5** below illustrates the uptake of IFAS by health system characteristics.

Table 6: Uptake of IFAS by health system factors (N = 428)

Characteristic	Total n=428	Iron and folic acid uptake n=136 (%)	No IFAS uptake	P-value*
Distance to health facility affect getting treatment				
Yes	158	36 (22.7)	122(77.2)	0.031
No	270	100 (37)	170(63)	
Getting money affect getting treatment				
Yes	218	46 (21.1)	172(78.9)	0.001
No	210	90 (42.9)	120(57.1)	
Getting permission affect getting treatment				
Yes	96	24 (25)	72(75)	0.252
No	332	112 (33.7)	220(66.3)	
Not wanting to go alone affect getting treatment				
Yes	102	30 (29.4)	72(70.6)	0.678
No	326	106 (32.5)	220(67.5)	
Waiting time				
Withing 30 minutes	106	36 (34)	70(66)	0.324
31 – 60 minutes	168	46 (27.4)	122(72.6)	
1 – 2 hours	102	30 (29.4)	72(70.6)	
More than 2 hours	52	24 (46.2)	28(53.8)	
Healthcare worker's attitude				
Good	292	106 (36.3)	186(63.7)	0.037
Fair/bad	136	30 (22.1)	106(77.9)	
Healthcare worker's attitude affect attendance				
Yes	88	16 (18.2)	72(81.8)	0.030
No	340	120 (35.3)	220(64.7)	
IFAS drug provision at facility				
Yes	398	128 (32.2)	270(67.8)	0.659
No	30	8 (26.7)	22(73.3)	

Nutrition education provision				
Yes	406	132 (32.5)	274(67.5)	0.320
No	22	4 (18.2)	18(81.8)	
Source of IFAS tablets				
ANC clinic	348	106 (30.5)	242(69.5)	0.233
Elsewhere	74	30 (40.5)	44(59.5)	
Charged for ANC services				
Yes	264	78 (29.5)	186(70.5)	0.374
No	164	58 (35.4)	106(64.6)	

4.6 Uptake of IFAS by food characteristics

Table 6 shows uptake of iron and folic acid supplements by food characteristics. There was statistically significant differences in proportions of IFAS uptake by household food security (P value 0.011) and feeding frequency (P value 0.002).

Table 7: Uptake of IFAS by food characteristics (N = 428)

Characteristic	**Total n=428**	**Iron and folic acid uptake n=136 (%)**	**No IFAS uptake**	**P-value***
Household food security				**0.011**
Food secure	226	95 (42)	131(58)	
Mildly food insecure access	30	11 (36.7)	19(63.3)	
Moderately food insecure access	77	15 (19.5)	62(80.5)	
Severely food insecure access	95	15 (15.8)	80(84.2)	
Dietary diversity score				**0.159**
Below 4 (low)	208	55 (26.4)	153(73.6)	
4 and above (good)	220	81 (36.8)	139(63.2)	
Feeding frequency				**0.002**
Low	143	22 (15.4)	121(84.6)	
Good	285	114 (40)	171(60)	

*chi-square test

4.7 Bivariate and Multivariate ananlysis of factors associated with iron and folic acid uptake

Bivariate analysis was perfomed and the factors found to be associated were number of ANC visits, parity, family support, family's wealth index, getting money affecting getting treatment, household food security and feeding frequency. The results are shown in Table 7.

Multivariate analysis was computed for all factors that had a P value of less than 0.2 in bivariate analysis in order toadjust for confounders. The adjusted odds ratio was computed. The results are shown in Table 7 below.

It was found that the odds of IFAS uptake among primeparous women was 74% lower than multiparous women (AOR=0.26 95% CI 0.10 – 0.67), the IFAS uptake among women who attended 5 or more antenatal visits was 12 times higher than those who attended 1 – 4 ANC visits (AOR=11.7 95% CI 1.62 – 84.34). Furthermore, the IFAS uptake among women with family support was 82% lower than women without family support (AOR=0.083 95% CI 0.01 – 0.62), 12 times higher among women whose families had high wealth index than women whose families had low wealth index (AOR=11.68 95% CI 2.91 – 89.57). The odds of IFAS uptake among women who getting money affected getting treatment was 3 times higher than those whom getting money did not affect getting treatment (AOR=2.67 95% CI 1.20 –5.93) and the IFAS uptake was also nine times higher among women whose households had dood security than those women whose households had severe food insecure access (AOR=9.21 95% CI 1.82 – 10.33).

Table 8: Bivariate and multivariate analysis for factors associated with IFAS uptake

Factor	Bivariate analysis		Multivariate analysis	
	COR (95%CI)	**P value**	**AOR (95%CI)**	**P value**
Age				
16 – 25	0.66 (0.26 – 1.70)	0.390		
26 – 35	0.73 (0.29 – 1.87)	0.513		
36 –45	Reference			
Marital status				
Married/living with partner	1.29 (0.48 – 3.47)	0.615		
Divorced/separated/widowed	1.07 (0.24 – 4.74)	0.932		
Never married and never lived together	Reference			
Ever attended school				
Yes	1.08(0.10 – 12.06)	0.953		
No	Reference			
Highest education level				
Primary	0.29 (0.11 – 0.74)	0.010	0.54 (0.16 – 1.91)	0.341
Secondary	0.38 (0.16 – 0.90)	0.029	0.65 (0.20 – 2.11)	0.474
University	Reference		Reference	
Occupation				
Housewife	0.53 (0.20 – 1.38)	0.191		
Farmer	0.78 (0.06 – 9.89)	0.846		
Business	0.80 (0.31 – 2.06)	0.650		
Student	3.11(0.47 – 20.65)	0.240		
Civil servant	Reference			
Receiving IFAS at clinic				
Yes	0.77 (0.24 – 2.50)	0.660		
No	Reference			
Source of IFAS				
Clinic	1.56 (0.75 – 3.24)	0.236		
Elsewhere	Reference			

Parity				
Primeparity	0.42 (0.21 – 0.84)	0.014	0.26 (0.10 – 0.67)	0.005
Secundiparity	0.64 (0.31 – 1.31)	0.223	0.58 (0.23 – 1.47)	0.246
Multparity	Reference		Reference	
Time of first booking				
1st trimester	3.07(0.82 – 11.57)	0.097	0.82 (0.09 – 7.19s)	0.857
2nd& 3rdtrimester	1.13 (0.29 – 4.26)	0.861	0.54 (0.06 – 4.95)	0.585
Don't know	Reference		Reference	
Number of ANC visits				
1 – 4	0.83 (0.24 – 2.87)	0.772	2.23 (0.29 – 16.86)	0.439
5 and above	4.82 (1.54 – 15.04)	0.007	11.7 (1.62 – 84.34)	0.015
Don't know	Reference		Reference	
Drug side effect				
Yes	1.36 (0.64 – 2.92)	0.424		
No	Reference			
Liking smell of drugs				
Yes	0.65 (0.33 – 1.27)	0.207		
No	Reference			
Healthcare autonomy				
Respondent	0.68 (0.37 – 1.27)	0.227		
Husband/partner/someone else	0.65 (0.25 – 1.68)	0.369		
Respondent and husband/partner together	Reference			
Awareness of IFAS				
Yes	0.89 (0.30 – 2.62)	0.827		
No	Reference			
Usual place of delivery				
Health facility	1.08(0.10 – 12.06)	0.953		
Home/elsewhere	Reference			
Living with partner				

Yes	0.76 (0.37 – 1.60)	0.474		
No	Reference			
Partner restriction				
Yes	2.63 (0.74 – 9.34)	0.136	2.34 (0.36 – 15.09)	0.373
No	Reference		Reference	
Husband support				
Yes	0.56 (0.26 – 1.20)	0.137	2.37 (0.62 – 9.08)	0.208
No	Reference		Reference	
Family restriction				
Yes	7.79 (0.00 -)	0.999		
No	Reference			
Family support				
Yes	0.28 (0.08 – 0.96)	0.042	0.083 (0.01 – 0.62)	0.016
No	Reference		Reference	
Partner occupation				
Farmer	0.20 (0.02 – 1.74)	0.145		
Business	0.86 (0.44 – 1.72)	0.684		
Civil servant	Reference			
Wealth index				
High	16.25 (3.0 – 88.9)	0.001	11.68(2.91 – 89.57)	0.059
Middle	6.96 (1.3 – 36.5)	0.022	6.59 (0.69–62.96)	0.102
Low	Reference		Reference	
Family economic status affecting uptake				
Yes	2.15 (1.14 – 4.08)	0.019	1.24 (0.53 – 2.90)	0.617
No	Reference		Reference	
Family dietary habits				
Usually consume IFAS foods	0.58 (0.29 – 1.15)	0.121	0.69 (0.26 – 1.89)	0.462
Don’t consume IFAS foods	Reference		Reference	
Distance to health facility affecting				

Yes	1.99 (1.06 – 3.75)	0.032	1.92 (0.82 – 4.51)	0.135
No	Reference		Reference	
Getting moneny affecting				
Yes	2.80 (1.54 –5.11)	0.001	2.67 (1.20 – 5.93)	0.016
No	Reference		Reference	
Getting permission affecting				
Yes	1.53 (0.74 – 3.16)	0.254		
No	Reference			
Not wanting to go alone				
Yes	1.16 (0.58 – 2.30)	0.678		
No	Reference			
Waiting time				
Within 30 minutes	0.60 (0.23 – 1.56)	0.296		
31 – 60 minutes	0.44 (0.18 – 1.09)	0.076		
1 – 2 hours	0.49 (0.18 – 1.29)	0.148		
>2 hours	Reference			
Health care workers attitude				
Good	0.50 (0.26 – 0.97)	0.039	0.62 (0.25 – 1.56)	0.313
Fair/bad	Reference		Reference	
HCW attitude affect attendance				
Yes	2.46 (1.07 – 5.62)	0.034	1.62 (0.55 – 4.75)	0.382
No	Reference		Reference	
IFAS drug provision at facility				
Yes	0.47 (0.10 – 2.21)	0.336		
No	Reference			
Nutrition education provision				
Yes	0.46 (0.10 – 2.20)	0.331		
No	Reference			
Source of IFAS tablets				
Clinic	1.56 (0.75 – 3.24)	0.236		

Elsewhere	Reference			
Charged for ANC services				
Yes	1.31 (0.73 – 2.35)	0.375		
No	Reference			
Household food security				
Food secure	6.50 (1.73 – 24.39)	0.006	9.21 (1.82 – 10.33)	0.047
Mild food insecure access	4.50 (0.54 – 37.38)	0.164	8.96 (0.16 – 13.13)	0.234
Moderate food insecure access	1.33 (0.26 – 6.83)	0.730	4.15 (0.47 – 6.24)	0.820
Severe food insecure access	Reference		Reference	
Dietary diversity score				
<4 (low)	1.96 (0.77 – 4.99)	0.161	0.73 (0.21 – 2.51)	0.617
4 and above (good)	Reference		Reference	
Food frequency				
Low	5.47 (1.83 –16.39)	0.002	1.75 (0.31 – 9.82)	0.526
Good	Reference		Reference	

CHAPTER FIVE:

5.0 DISCUSSION

The iron and folic acid uptake in this study was found to be 31.8% which is very low in a context of high burden of anemia among pregnant women despite the already layed out intervention to combat the problem in our country. Efforts are needed to address such low proportion of IFAS uptake for this vulnerable population. These results are not very different in comparison to those of a neighbouring country, Kenya, where uptake was reported to be32.7% (48). Similar results were also recently documented in Mbeya, Tanzania (44). It is however an improved level compared to a study conducted in Moshi, whose data recorded uptake of 2009 to be 16% (49). These results may have been attributed by lack of implementation of the intervention and ignorance of the people both the pregnant women and the people around them.

In this study several factors were associated with such low uptake if IFAS among pregnant women. They included parity, ANC visits, family support, wealth index, food security, among others. Addressing these challenges may see an improvement in uptake of IFAS in Tanzania and areas with similar context. It being more of an implementation problem more efforts to implement the intervention (IFAS) in our country and those of similar settings are required from the individual to government level.

Parity was associated with uptake of IFAS among pregnant women. Compared to women with multiparity, primigravida were 74% less likely to take up IFAS in an adequate amount. More pregnancies might have increased exposure to health education provised to pregnant women in ANC, more understanding of risk of anemia and its complications, and more experiences and tolerance to iron supplements pills. These might have increased the uptake among those with more than one pregnancy. Similar findings were alre reported in Kasulu, Kigoma (52), and other countries including Uganda (53) and other contexts (51).

Number of antenatal visits also influenced uptake of IFAS among pregnant women in this study. The more frequent a pregnant woman attend the clinic, she may get exposed to more

frequent interaction with health care worker, followed up on IFAS uptake, get access to more iron and folic acid tablets, and even receive more health education. In each visit, a woman would be tested for haemoglobin, and this may influence uptake of IFAS. Similar evidence was reported in asystematic review and meta-analysis study done in Sub-Saharan Africa in 2021 (50). Other studies also supported these findings (52,24). Closer disctance to facility, knowledge on the importance of ANC visits, good health care workers attitude could have lead to more numbers of antenatal visits among the pregnant women.

Family support has been named as afactor behind improved health outcomes in pregnant women. Women with family support got moral, financial and social support from their loved ones compared to their counterparts and facilitating them to have more access to IFA tablets and encouragement to have an improved intake of the drugs reaching the uptake level. In this study, it was also associated with IFAS uptake among pregnant women. Similar findings were also noted in Bangladesh it was seen that women who reported a high level of husband's support were more likely to consume IFA (27).

Economic status has effect in most health indicators and among pregnant women as well. In this study, wealth index was also an associated factor to IFAS uptake among pregnant women in the study whereby the wealthier the household is, the more uptake of IFAS it is for pregnant women. Higher SES is associated with education level and access to information and health education. Social economic disadantages however, may have negatively influence uptake of many health intervention, including preventive medications such as IFAS. Access may be a factor behind this. Similar studies also reported findings like these. They include a study by Nisar and others (54), a study by Ogundipe and others (49), and another study in Ethiopia (55).Similar to economic status, household food insecurity was also associated with IFAS uptake among pregnant women. Women whose households had food security were 9 times more likely to take up IFAS compared to those whose families had severe food insecurity. With food insecurity and low economic status, women get ingaged with economc activities and miss the time and moneny for visiting the antenatal cinics, get supplied with IFA tablets, get access to education on the importance of supplementation but also the consequences

arising frm lack of supplimentation and others even completely forget about supplementation at all. Women of this group have minimum or no intake of iron and folic acid supplements.

Strengths

The study sample used wasrepresentative as the facilities used to obtain the study sample (Temeke, Mwananyamala and Amana regional referral hospitails) contained women from differentdemographic characteristics of the study population (Dar es Salaam). This study also included many variables in the study including individual, family and health system ones, differentiating it from many previous studies that mainly based on individual variables alone.

Limitations

The study had some limitations. First was recall bias wereby some of the respondents did not recall some of important information such as the amount of IFAS tablets they had taken, the time of their first antenatal visit and the number of ANC visits they had attended. Second was non-response, some of the study participants did not respond to some of the questions hence missing little information for the study which would have influenced the results obtained. Third is the method of interviewing that was used in the study, it may have influenced the results (e.g. marital status question), women may have responded in a positive manner to the question (reporting to be married) to present themselves in a socially desirable way. Fourthly is the ANC clinics attended by the study participants. Some of the participants attended clinics at different centers apart from those included in the study and this might have influenced the study results in matters such as drug availability, health care workers attitude and distance to the facility. Last but not least is the social desirability bias since the questions were asked by the researchers assisted by a doctor and a nurse. This might have influenced a positive response by the study participants.

CHAPTER SIX:

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The uptake of iron and folic acid supplements among pregnant women is still low, only 31.8% of pregnant women had adequate IFAS uptake in Dar es salaam, Tanzania. The factors associated with IFAS uptake are parity, number of ANC visits, family support, wealth index, getting money for treatment and household food security.

6.2 Recommendations

1. More efforts to address the low IFAS uptake durng ANC visit is of paramount importance. This can be done through tailored interventions targeting women coming from socio-demographic disadvantages such as those with food insecurity, low economic status, and with low social support
2. Tilored interventions and health education be strengthened among pregnant women in their first pregnancies.
3. More efforts be done to maximize frequency of ANC attendance to get the benefits of IFAS knowledge, uptake and follow up
4. Frontline health workers have a responsibility to follow up uptake of IFAS and counsel pregnant women on uptake regardless of their already given or received knowledge
5. Encourage male attendance to ANC to boost up family and social support for IFAS uptake among pregnant women
6. A qualitative study to top up on this quanitative one is needed to help with the findings requiring further explanation/details.
7. Implementation of IFAS intervention should be encouraged.

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APPENDICES

Appendix I: English Consent Form.

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

SCHOOL OF PUBLIC HEALTH AND SOCIAL SCIENCE

Consent to participate in a study titled: ‘‘**FACTORS ASSOCIATED WITH UPTAKE OF IRON AND FOLIC ACID SUPPLEMENTS AMONG PREGNANT WOMEN IN DARES SALAAM, TANZANIA.**’’

Purpose of the Study

The purpose of this study is to determine the reasons as to why iron and folic acid supplementation uptake is very low.

What Participation Involves

If you agree to join the study, data needed for the study will be obtained from you by answering questions in the validated questionnaire.

Confidentiality

The information from the study will be kept confidential and kept in a safe place with access to authorized personnel and will be used for research purposes only. No names will be used instead identification numbers will be used to maintain anonymity of participants.

Duration

Participation in the study will take an average of 30 minutes.

Risks

For this study, we do not expect any risk prior, during and/or after participating in this study

Rights to withdraw

Taking part in this study is completely your choice. You are free to choose either to participate in this study or not. You can decide to stop participating in this study at any time you wish even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

If you agree to take part in this study, there are no direct benefits that you will get from this study but the information obtained from this study will be used to identify areas and opportunities to improve the supplementation of iron and folic acid among pregnant women.

Compensation

There will be no compensation of any kind for participating in this study.

Whom to contact:

In case of any questions about this study, don't hesitate to contact me Dr. Careen Elias Koka, Phone: 0694060218/0754391130 or through email at careenkoka@icloud.com or you can get in touch with the chair of MUHAS IRB, Dr.Nahya (+255-22-2152489)

Consent

I …… have read or have been read to me the contents of this form and understood it, my questions have been adequately answered. I agree to participate in this study

Signature of participant.....

Signature of Investigator.....

Date of signed consent……

Appendix II: Swahili Consent Form.

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

SCHOOL OF PUBLIC HEALTH AND SOCIAL SCIENCES

Fomu ya ridhaa kushiriki kwenye utafiti wenye kichwa kinachosema: ‘‘SABABU ZINAZOHUSISHWA NA UCHUKUAJI WA NYONGEZA ZA CHUMA NA ASIDI YA FOLIC MIONGONI MWA WANAWAKE WAJAWAZITO DAR ES SAALAM, TANZANIA.’’

Umuhimu wa utafiti huu

Lengo kuu ni kubaini sababu zinazo husishwa na uchukuaji wa nyongeza za chuma na asidi ya foliki baina ya wanawake wajawazito.

Jinsi ya kushiriki

Ukikubali kushiriki katika utafiti huu, utajibu maswali yaliyopo kwenye dodoso.

Usiri

Majibu yote yatakayokusanywa kutoka katika eneo la utafiti, yatahifadhiwa sehemu maalum ambapo wahusika tu ndio wataruhusiwa kuzipata taarifa hizo na zitatumika kwaajili ya utafiti tu. Pia majina hayatatumika badalayake tutatumia namba za utambulisho tu.

Muda

Muda wakushiriki katika utafiti ni wastani wa dakika thelathini

Madhara

Hatutegemei madhara yeyote kukutokea ukiwa na ama baada ya kushiriki katika utafiti huu.

Haki ya kushiriki au kusitisha kushiriki

Kushiriki katika utafiti huu ni chaguo lako, na unauhuru wa kukubali au kukataa kushiriki katika utafiti huu. Pia unaweza kusitisha ushiriki wako katika utafiti huu muda wowote utakapo jisikia hatakama umeshakubali kushiriki. Kukataa kushiriki au kusitisha kushiri kikati kautafiti huu hakutakufanya upoteze haki zako za msingi au kupata adhabu yoyote.

Faida

Ukikubali kushiriki katika utafiti huu hakuna faida ya mojakwamoja utakayo pata lakini tunaamini ushirikiano utakaoutoa utasaidia katika utambuzi wa visababishi vinavyo pelekea uchukuaji wa chini wa nyongeza za chuma na asidi ya foliki wa wanawake wajawazito.

Fidia

Hakuna fidia yoyote zinazotolewa wakati wa utafiti huu.

Nani wakuwasilianaye

Kama utakuwa na swali lolote kuhusu utafiti huu unaweza kuwasiliana na mkuu wa utafiti huu

Dr. Careen Elias Koka, Phone: 0694060218/0754391130 au kupitia barua pepe careenkoka@icloud.com, na pia usisite kuwasiliana na mkuu wa bodi ya ukaguzi ya MUHAS Dr. Nahya Massoud (+255-22-2152489).

Idhini

Mimi ……nimesoma au nimesomewa yaliyomo katika fomu hii na kuyaelewa, maswali yangu yamejibiwa vyakutosha. Ninakubali kushiriki katika utafiti huu

Sahihi ya mshiriki……

Sahihi ya mtafiti……

Tarehe……

Appendix III: Questionnaire - English version

Please tickV on the correct answer

Individual factors

1. What is your age in years? ……
2. What is your current marital status?
    1) Married or living together
    2) Divorced/separated
    3) Widowed
    4) Never married and never lived together
3. Have you ever attended school?
    1) Yes
    2) No
4. What is the highest level of school you attended?
    1) Pre-primary
    2) Primary
    3) Post primary training
    4) Secondary‘O’ level
    5) Post secondary‘O’level
    6) Secondary ‘A’ level
    7) Post secondary ‘A’level
    8) University
5. What is your occupation? That is, what kind of work do you mainly do?
    1) House wife
    2) Farmer
    3) Business
    4) Student
    5) Civil servant

6. Do you usually work throughout the year, or do you work seasonally, or only once in a while?
    1) Throughout the year
    2) Seasonally/part of the year
    3) Once in a while
7. Gravidity
    1) Primigravid
    2) Secundigravid
    3) Multigravid
8. How many months pregnant were you when you first booked antenatal care for this pregnancy?
    1) Months ……..
    2) Don’t know
9. How many times did you receive antenatal care during this pregnancy?
    1) Number of times . . . . .
    2) Don't know
10. Did you receive iron and folic acid supplements during ANC visits?
    1) Yes
    2) No
11. Did you take the provided supplements?
    1) Yes
    2) No
12. During this pregnancy, were you given or did you buy any iron tablets or iron syrup?
    1) Yes
    2) No
    3) Don’t know

13. Where did you get the iron tablets or syrup?.....

14. Did you experience any side effects after taking the drugs?

    1) Yes
    2) No

15. If yes did you keep taking the drugs afterwards?

    1) Yes
    2) No

16. Who usually makes decisions about health care for you?

    1) Respondent
    2) Husband/partner
    3) Respondent and husband/partner jointly
    4) Someone else
    5) Other

17. Do you like the smell of the tablets?

    1) Yes
    2) No

18. How do you travel to this healthcare facility from your home?

    Motorized

    1) Car/truck
    2) Public bus
    3) Motorcycle/scooter
    4) Boat with motor

    Not motorized animal-drawn cart

    5) Bicycle
    6) Boat without motor
    7) Walking
    8) Other ……(specify)

19. Are you aware that it is importanttotake IFA supplements?
    1) Yes
    2) No
20. What is your usual place of delivery?
    1) Health facility…….
    2) Home/elsewhere…….
21. Does your economic status influence IFAS intake?
    1) Yes
    2) No
22. Were you tested for HIV as part of your antenatal care while you were pregnant
    1) Yes
    2) No
23. Did you get the results of the test?
    1) Yes
    2) No
24. What was the result of the test?
    1) Positive
    2) Negative
    3) Indeterminate
    4) Declined to answer
    5) Did not receive test result
25. What is the number of times you fed in the previous 24 hours? ……
26. What are the food items you had in the previous 24 hours?

1.	Cereals
2.	Roots and tubers
3.	Vegetables
4.	Fruits

5.	Meat, poultry, offal
6.	Eggs
7.	Fish and seafood
8.	Pulses, legumes, nuts
9	Milk and milk products
10	Oil/fats
11	Sugar/honey
12	Miscellaneous

27. What is the level of your dietary habits of IFAS nutrient intake?
    1) I usually consumed specified IFAS food
    2) I usually don't consume food which are related to IFAS food group

Family Factors

28. Is your husband/partner living with you now or is he staying elsewhere?
    1) Living with her
    2) Staying elsewhere

29. During this pregnancy, did your husband do any of the following?

    Stopped you from receiving ANC? 1. Yes 2. No

    Encouraged you to receive ANC? 1. Yes 2. No

    Had no interest in you receiving ANC? 1. Yes 2. No

30. During this pregnancy, did your family members do any of the following?

    Stopped you from receiving ANC? 1. Yes 2. No

    Encouraged you to receive ANC? 1. Yes 2. No

    Had no interest in you receiving ANC? 1. Yes 2. No

31. Has your (husband/partner) done any work in the last 7 days?
    1) Yes
    2) No
    3) Don't know
32. What is your (husband's/partner's) occupation? That is, what kind of work does he mainly do? …….
33. Does your husband/partner usually work throughout the year, or does he work seasonally, or only once in a while?
    1) Throughout the year
    2) Seasonally/part of the year
    3) Once in a while
34. What is the main source of drinking water for members of your household?

    Piped water
    1) Piped into dwelling
    2) Piped to yard/plot
    3) Piped to neighbor
    4) Public tap/standpipe
    5) Tube well or borehole

    Dug well
    6) Protected well
    7) Unprotected well

    Water from spring
    8) Protected spring
    9) Unprotected spring
    10) Rainwater
    11) Tanker truck
    12) Cart with small tank
    13) Surface water (river/dam/ lake/pond/stream/canal/ irrigation channel)
    14) Bottled water

15) Sachet water
16) Water kiosk / domestic points
17) Other……(specify)

35. What is the main source of water used by your household for other purposes such as cooking and handwashing?

Piped water

1) Piped into dwelling
2) Piped to yard/plot
3) Piped to neighbor
4) Public tap/standpipe
5) Tube well or borehole

Dug well

6) Protected well
7) Unprotected well

Water from spring

8) Protected spring
9) Unprotected spring
10) Rainwater
11) Tanker truck
12) Cart with small tank
13) Surface water (river/dam/ lake/pond/stream/canal/ irrigation channel)
14) Bottled water
15) Sachet water
16) Water kiosk / domestic points
17) Other……(specify)

36. Where is that water source located?

1) In own dwelling
2) In own yard/plot
3) Elsewhere

37. How long does it take to go there, get water, and come back?
    1) Minutes . . . . . .
    2) Don't know
38. In the last month, has there been any time when your household did not have sufficient quantities of drinking water when needed?
    1) Yes
    2) No
    3) Don’t know
39. Do you do anything to the water to make it safer to drink?
    1) Yes
    2) No
    3) Don't know
40. What kind of toilet facility do members of your household usually use?

    Flush or pour flush toilet
    1) Flush to piped sewer system
    2) Flush to septic tank
    3) Flush to pit latrine
    4) Flush to somewhere else
    5) Flush, don't know where

    Pit latrine
    6) Ventilated improved pit latrine
    7) Pit latrine with slab (washable)
    8) Pit latrine with slab (not washable)
    9) Pit latrine without slab/open pit
    10) Composting toilet
    11) Bucket toilet
    12) Hanging toilet/hanging latrine
    13) No facility/bush/field/beach
    14) Other…….(specify)

41. Do you share this toilet facility with other households?
    1) Yes
    2) No
42. Including your own household, how many households use this toilet facility?
    1) No. Of households if less than 10 . . . . . .
    2) 10 or more households . . . . . .
    3) Don't know
43. Where is this toilet facility located?
    1) In own dwelling
    2) In own yard/plot
    3) Elsewhere
44. In your household, what type of cookstove is mainly used for cooking?
    1) Electric stove
    2) Solar cooker
    3) Liquefied petroleum gas (lpg)/ cooking gas stove
    4) Piped natural gas stove
    5) Biogas stove
    6) Liquid fuel stove
    7) Manufactured solid fuel stove
    8) Traditional solid fuel stove
    9) Three stone stove/open fire
    10) No food cooked in household
    11) Other ……
45. What type of fuel or energy source is used in this cookstove?
    1) Alcohol/ethanol
    2) Gasoline
    3) Kerosene/paraffin
    4) Coal/lignite
    5) Charcoal

6) Wood
7) Straw/shrubs/grass
8) Agricultural crop
9) Animal dung/waste
10) Processed biomass (pellets) or woodchips
11) Garbage/plastic
12) Sawdust
13) Other……

46. At night, what does your household mainly use to light the home?

1) Electricity
2) Solar lantern
3) Rechargeable flashlight, torch or lantern
4) Battery powered flashlight, torch or lantern
5) Biogas lamp
6) Gasoline lamp
7) Kerosene or paraffin lamp
8) Charcoal
9) Wood
10) Straw/shrubs/grass
11) Agricultural crop
12) Animal dung/waste
13) Oil lamp
14) Candle
15) No lighting in household
16) Other…….

47. How many rooms in this household are used for sleeping?

1) Rooms …….

48. How many sleeping equipment like carpets, matresses, mats, are used in this household?
    1) Number of equipment . . . . . .
49. Does the economic status of your family influence IFAS intake?
    1) Yes
    2) No
50. What is your family's dietary habits of IFAS nutrient intake?
    1) We usually consumed specified IFAS food …….
    2) We usually don't consume food which isrelated to IFAS food groups…..

Health System Factors

51. Did you pay for antenatal care?
    1) Yes
    2) No
52. How much did you pay for Antenatal care?
    1) TSHS …….
    2) Don't know
53. During your ANC visits were you given nutrition education?
    1) Yes
    2) No
54. Were you given iron and folic acid supplements during your ANC visits?
    1) Yes
    2) No
55. If no what were you told……
56. What was the attitude of the health care worker towards you during ANC visits?
    1) Good
    2) Fair
    3) Bad
    4) Don't know

57. Did the health care worker's attitude affect your attendance rate?
    1) Yes
    2) No
58. Many different factors can prevent women from getting medical advice or treatment for themselves. When you are sick and want to get medical advice or treatment, is each of the following a big problem or not:

The distance to the health facility?	1. Yes	2. No
Getting money needed for advice or treatment?	1. Yes	2. No
Getting permission to go to the doctor?	1. Yes	2. No
Not wanting to go alone?	1. Yes	2. No

59. How far is it to the nearest health facility?.....kilometers
60. What is the waiting time at healthcare centre where you go to take IFAS?.....
61. Have you adhered to uptake IFAS of at least four IFAS tablets per week throughout your gestation period?
    1) Yes
    2) No
62. During the whole pregnancy, for how many days did you take the iron/folic acid tablets or syrup?
    1) Days ……
    2) Don't know

Food frequency Questionnaire

63. In the past four weeks, did you worry that your household would not have enough food?
    0=No
    1=Yes
64. How often did this happen?
    1 = Rarely (once or twice in the past four weeks)
    2 = Sometimes (three to ten times in the past four weeks)
    3 = Often (more than ten times in the past four weeks)

65. In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?

    0=No

    1=Yes

66. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

67. In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?

    0=No

    1=Yes

68. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

69. In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?

    0=No

    1=Yes

70. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

71. In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?

    0=No

    1=Yes

72. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

73. In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?

    0=No

    1=Yes

74. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

75. In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?

    0=No

    1=Yes

76. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

77. In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?

    0=No

    1=Yes

78. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

79. In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?

    0=No

    1=Yes

80. How often did this happen?

    1 = Rarely (once or twice in the past four weeks)

    2 = Sometimes (three to ten times in the past four weeks)

    3 = Often (more than ten times in the past four weeks)

QUESTIONNAIRE

SWAHILI VERSION;
Tafadhali weka alama ya V (vema) kwenye jibu sahihi.

Mambo ya kibinafsi

1. Umri wako wa sasa ni miaka mingapi? ……
2. Hali yako ya ndoa kwasasa?
    1) Nimeolewa / naishi na mwenza
    2) Nimetalikiwa / tumetengana
    3) Mjane
    4) Sijawahi kuolewa wala kuishi na mwenza
3. Umewahi kusoma shule?
    1) Ndio
    2) Hapana
4. Kiwango cha juu zaidi cha elimu yako.
    1) Shule ya awali (Chekechea)
    2) Shule ya msingi
    3) Mafunzo baada ya shule ya msingi
    4) Elimu ya sekondari (Kidato cha nne)
    5) Mafunzo baada ya elimu ya sekondari (Kidato cha nne)
    6) Elimu ya shule ya upili (Kidato cha sita)
    7) Mafunzo baada ya elimu ya shule ya upili (Kidato cha sita)
    8) Chuo kikuu
5. Kazi yako
    1) Mama wa nyumbani
    2) Mkulima
    3) Mfanyabiashara
    4) Mwanafunzi
    5) Mtumishi wa Umma (mwajiriwa)

6. Unafanya kazi mwaka mzima, kwa msimu au mara mojamoja?
    1) Mwaka mzima
    2) Kwa msimu/sehemu ya mwaka
    3) Mara mojamoja
7. Umewahi kupata ujauzito mara ngapi?
    1) Mara moja
    2) Mara mbili
    3) Zaidi ya mara mbili
8. Ulianza kuhudhuria kliniki wakati ujauzito huu ukiwa na miezi mingapi?
    1) Miezi……..
    2) Sijui
9. Umehudhuria kliniki mara ngapi katika ujauzito huu?
    1) Idadi ya mahudhurio ……
    2) Sijui
10. Ulipatiwa dawa zenye virutubisho vya madini chuma na foliki katika mahudhurio yako katika kliniki ya uzazi?
    1) Ndio
    2) Hapana
11. Ulitumia dawa za kuongeza damu zenye virutubisho vya madini chuma na foliki ulizopewa?
    1) Ndio
    2) Hapana
12. Katika ujauzito huu, ulipatiwa ama ulinunua vidonge ama dawa ya maji yenye Madini Chuma?
    1) Ndio
    2) Hapana
    3) Sijui
13. Ulipata wapi vidonge au dawa ya maji ya madini chuma kwaajili ya kuongeza damu?.....

14. Ulipata madhara/changamoto zozote kutokana na kutumia dawa hizo?
    1) Ndio
    2) Hapana
15. Kama ni ndio, uliendelea kuzitumia?
    1) Ndio
    2) Hapana
16. Kwa kawaida, nani hufanya maamuzi kuhusu huduma zako za Afya?
    1) Mimi mwenyewe
    2) Mume/mwenza wangu
    3) Mimi na Mume/mwenza wangu kwa kujadili
    4) Mtu mwingine

17. Unaifurahia/unaipenda harufu ya vidonge vya madini chuma na foliki?
    1) Ndio
    2) Hapana

18. Unatumia usafiri gani kutoka nyumbani kwako Kwenda kwenye kituo cha kutolea huduma?

    Usafiri wenye injini
    1) Gari binafsi
    2) Usafiri wa Umma
    3) Pikipiki/bajaji
    4) Boti

    Usafiri usio na injini
    5) Baiskeli
    6) Mtumbwi
    7) Kutembea kwa miguu
    8) Usafiri mwingine……(taja)

19. Unafahamu umuhimu wa kutumia dawa za kuongeza damu zenye virutubisho vya madini chuma na foliki unapokuwa mjamzito?
    1) Ndio
    2) Hapana
20. Huwa unapendelea zaidi kujifungulia wapi?
    1) Kwenye vituo vya kutolea huduma za afya.
    2) Nyumbani / sehehemu nyingine.
21. Je, kiwango chako cha Uchumi kinaathiri matumizi yako ya dawa za kuongeza damu zenye virutubisho vya madini chuma na foliki?
    1) Ndio
    2) Hapana
22. Ulipimwa UKIMWI kama sehemu ya huduma za kliniki ya ujauzito?
    1) Ndio
    2) Hapana
23. Ulipatiwa majibu ya kipimo hicho cha UKIMWI?
    1) Ndio
    2) Hapana
24. Majibu ya kipimo hicho cha UKIMWI yalionesha nini?
    1) Nina maambukizi
    2) Sina maambukizi
    3) Majibu tata
    4) Siri yangu (sitaki kujibu swali hili)
    5) Sikupata / sikupewa majibu
25. Je, ulijilisha mara ngapi katika saa 24 zilizopita?.....
26. Ni vyakula gani ulivyotumia katika saa 24 zilizopita?

1	Nafaka
2	Mizizinamizizi
3	Mboga
4	Matunda

5	Nyama, kuku, offal
6	Mayai
7	Samaki nadagaa
8	Kunde, karanga
9	Maziwanabidhaa za maziwa
10	Mafuta
11	Sukari/asali
12	Mbalimbali

27. Huwa unatumia chakula chenye virutubisho vya madini chuma na foliki kwa kiasi gani?
    1) Muda wote hutumia vyakula vinavyo pendekezwa kuwa na wingi wa virutubisho vya madini chuma na aside ya foliki
    2) Huwa situmii kabisa vyakula vinavyo pendekezwa kuwa na wingi wavirutubisho vya madin chuma na aside ya foliki

Mambo ya kifamilia

28. Je, wewe na mume/mwenza wako mnaishi pamoja au mnamakazi tofauti kwasasa?
    1) Tunaishi pamoja
    2) Tunaishi tofauti
29. Katika ujauzito huu, mume/mwenza wako amefanya lolote kati ya haya?

    Amekuzuia kuhudhuria Kliniki ya Uzazi

    1. Ndio
    2. Hapana

    Amekusisitiza/kukutia moyo kuhudhuria Kliniki ya Uzazi

    1. Ndio
    2. Hapana

    Hajali kuhusiana na mahudhurio yako ya Kliniki ya Uzazi

    1. Ndio
    2. Hapana

30. Katika ujauzito huu, wanafamilia wako wamefanya lolote kati ya haya?

Kukuzuia kuhudhuria Kliniki ya Uzazi

1. Ndio
2. Hapana

Kukusisitiza/kukutia moyo kuhudhuria Kliniki ya Uzazi

1. Ndio
2. Hapana

Kujali kuhusiana na mahudhurio yako ya Kliniki ya Uzazi

1. Ndio
2. Hapana

31. Je, mume/mwenza wako amefanya kazi yeyote ndani ya siku 7 zilizopita?

1) Ndio
2) Hapana
3) Sijui

32. Mume/mwenza wako anafanya kazi gani? ……

33. Mume/mwenza wako hufanya kazi mwaka mzima, kwamsimu au mara mojamoja?

1) Mwaka mzima
2) Kwa msimu
3) Mara mojamoja

34. Nini chanzo kikuu cha maji ya kunywa kwa wanafamilia yako?

Maji ya bomba

1) Bomba la ndani ya nyumba
2) Bomba la nje ya nyumba
3) Bomba la nyumba ya jilani
4) Bomba la mtaa
5) Bomba la kisima

Kisima cha wazi

6) Kinalindwa vizuri kisichafuliwe
7) Hakina ulinzi

Maji kutoka kwenye chemchem

8) Inalindwa vizuri
9) Haina ulinzi
10) Maji ya mvua
11) Gari la kuuza maji
12) Mikokoteni ya kuuza maji
13) Maji tiririka(mto/bwawa/ziwa/dimbwi/mfereji)
14) Maji ya kopo
15) Maji ya pakiti
16) Maduka ya kuchuja na kuuza maji
17) Mengineyo ……(taja)

35. Nini chanzo kikuu cha maji mnayotumia kwa matumizi ya kupikia na kunawa mikono katika familia yako?

Maji ya bomba

1) Bomba la ndani ya nyumba
2) Bomba la nje ya nyumba
3) Bomba la nyumba ya jirani
4) Bomba la mtaa
5) Bomba la kisima

Kisima cha wazi

6) Kinalindwa vizuri kisichafuliwe
7) Hakina ulinzi

Maji kutoka kwenye chemchem

8) Inalindwa vizuri
9) Haina ulinzi
10) Maji ya mvua
11) Gari la kuuza maji
12) Mikokoteni ya kuuza maji
13) Maji tiririka (mto/bwawa/ziwa/dimbwi/mfereji)

14) Maji ya kopo
15) Maji ya pakiti
16) Maduka ya kuchuja na kuuza maji
17) Mengineyo ……(taja)

36. Chanzo hicho cha maji kinapatikana wapi?
    1) Ndani ya nyumba ninayoishi
    2) Ndani ya kiwanja changu (nje ya nyumba)
    3) Sehemu nyingine
37. Inachukua muda gani Kwenda kuchota maji na kurudi?
    1) Dakika. . . . . .
    2) Sijui
38. Katika mwezi uliopita, kumekuwa na wakati wowote ambapo kaya yako haikuwa na kiasi cha kutosha cha maji ya kunywa inapohitajika?
    1) Ndio
    2) Hapana
    3) Sijui
39. Kuna chochote unachokifanya kwenye maji ili yawe salama kwa kunywa?
    1) Ndio
    2) Hapana
    3) Sijui
40. Wewe na familia yako mnatumia choo cha aina gani?

    Choo cha maji

    1) Kimeunganishwa kwenye mfumo wa maji taka
    2) Kimeunganishwa kwenye shimo la nje
    3) Ni cha shimo la kina cha kumwaga maji
    4) Kimeunganishwa sehemu nyingine
    5) Sijui kimeunganishwa wapi

    Choo cha shimo

    6) Kina madirisha makubwa ya kupitisha hewa

7) Sakafu yake inaweza kudekiwa
8) Sakafu yake haiwezi kudekiwa
9) Hakina uzio (anaye jisaidia anaonekana na wapiti njia)
10) Choo cha mbolea
11) Choo cha ndoo
12) Choo cha kunyongwa
13) Hakuna choo/vichakani/shambani/ufukweni
14) nyingine……(taja)

41. Unachangia choo na wanafamilia wengine?
    1) Ndio
    2) Hapana

42. Ikiwa ni Pamoja na kaya yako mwenyewe, ni kaya ngapi zinazotumia choo hiki?
    1) Idadi ya kaya ikiwa chini ya 10 . . . . . .
    2) kaya 10 au zaidi. . . . . .
    3) Sijui

43. Choo kiko sehemu gani?
    1) Ndani ya nyumba
    2) Nje ya nyumba (katika kiwanja cha nyumba)
    3) Sehemu nyingine

44. Katika kaya yako, ni aina gani ya jiko la kupikia hutumika sana kupikia?
    1) Jiko la umeme
    2) Jiko la jua
    3) Gesi ya petrol iliyoyeyuka (lpg)/ jiko la gesi ya kupikia
    4) Jiko la gesi asilia lenye bomba
    5) Jiko la biogesi
    6) Jiko la mafuta ya kioevu
    7) Jiko la mafuta lililotengenezwa
    8) Jiko la jadi la mafuta ngumu
    9) Jiko la mawe matatu/moto wazi

10) Hakuna chakula kinachopikwa nyumbani
11) Nyingine ……

45. Ni aina gani ya mafuta au chanzo cha nishati kinatumika katika jiko hili?
    1) Pombe / ethanol
    2) Petroli
    3) Mafuta ya taa/parafini
    4) Makaa ya mawe / lignite
    5) Mkaa
    6) Mbao
    7) Majani/vichaka/nyasi
    8) Zao la kilimo
    9) Kinyesi/takataka za wanyama
    10) Nyasi iliyochakatwa (pellets) au mbao
    11) Takataka / plastiki
    12) Machujo ya mbao
    13) Nyingine……

46. Usiku, kaya yako hutumia nini hasa kuwasha nyumba?
    1) Umeme
    2) Taa ya jua
    3) Tochi inayoweza kuchajiwa, tochi au taa
    4) Tochi inayoendeshwa na betri, tochi au taa
    5) Taa ya biogas
    6) Taa ya petroli
    7) Taa ya mafuta ya taa au mafuta ya taa
    8) Mkaa
    9) Mbao
    10) Majani/vichaka/nyasi
    11) Zao la kilimo
    12) Kinyesi/takataka za wanyama

13) Taa ya mafuta
14) Mshumaa
15) Hakuna taakatika kaya
16) Nyingine…….

47. Je, ni vyumba vingapi katika kaya hii vinatumika kulala?
    1) Vyumba …….
48. Je, ni vifaa vingapi vya kulalia kama vile mazulia, magodoro, mikeka, vinatumika katika kaya hii?
    1) Idadi ya vifaa. . . . . .
49. Je, kiwango cha uchumi cha familia yako kinaathiri matumizi yako ya dawa za kuongeza damu zenye virutubisho vya madini chuma na asidi ya foliki?
    1) Ndio
    2) Hapana
50. Je, familia yako inatumia vyakula vyenye virutubisho vya madini chuma na asidi ya foliki kwa kiasi gani?
    1) Muda wote hutumia vyakula vinavyo pendekezwa kuwa na wingi wa virutubisho vya madini chuma na asidi ya foliki
    2) Huwa hatutumii kabisa vyakula vinavyo husiana na makundi ya vyakula vyenye wingi wa virutubisho vya madini chuma na asidi ya foliki

Mambo ya mfumo wa afya

51. Ulilipia huduma za kliniki ya uzazi?
    1) Ndio
    2) Hapana
52. Ulilipia kiasi gani kupata huduma za kliniki ya uzazi?
    1) Tsh. ……..
    2) Sijui

53. Katika mahudhurio yako kwenye kliniki ya uzazi, ulipewa elimu ya lishe?
    1) Ndio
    2) Hapana

54. Ulipatiwa dawa zenye virutubisho vya madini chuma na asidi ya foliki katika mahudhurio yako katika kliniki ya uzazi?
    1) Ndio
    2) Hapana

55. Kama ni hapana, uliambi wa nini

    ……

56. Watumishi wa kliniki ya uzazi walikuwa na mtazamo gani juu yako wakati wa mahudhurio yako?

    1) Mzuri
    2) Wastani
    3) Mbaya
    4) Sijui

57. Mtazamo wa watumishi wa kliniki ya uzazi juu yako uliathiri mahudhurio yako?
    1) Ndio
    2) Hapana

58. Vitu mbalimbali vinaweza kuzuia kina mama kupata ushauri tiba na matibabu. Unapokuwa mgonjwa na kuhitaji ushauri tiba na matibabu, haya yafuatayo huwa tatizo kwako ama hapana.

Umbali kwenda kituo cha kutolea huduma za afya

1. Ndio
2. Hapana

Kupata pesa inayo hitajika kwa ushauri tiba au matibabu

1. Ndio
2. Hapana

Kupata ruhusa Kwenda kumwona Daktari

1. Ndio
2. Hapana

Kutotaka kwenda peke yangu

1. Ndio
2. Hapana

59. Kituo cha kutolea huduma za afya kilicho karibu zaidi kiko umbali gani kutoka makazi yako (kilomita) ……

60. Huwa unasubiri muda gani kupata huduma unapo kwenda kwenye kituo cha kutolea huduma kuchukua dawa za kuongeza damu zenye virutubisho vya madini chuma na asidi ya foliki? …….

61. Umeweza kuzingatia matumizi ya dawa za kuongeza damu zenye virutubisho vya madini chuma na asidi ya foliki walau vidonge vine kwa wiki katika kipindi chote cha ujauzito?
    1) Ndio
    2) Hapana
62. Katika kipindi chote cha ujauzito, umetumia vidonge au dawa ya maji yenye virutubisho vya madini chuma na asidi ya foliki kwa siku ngapi?
    1) Siku ……
    2) Sijui

Dodoso la mzunguko wa chakula

63. Ndani ya wiki nne zilizo pita, umewahi kuwa na hofu ya familia yako kupata chakula cha kutosha kwa matumizi ya nyumbani (kula)?
    0 = Hapana
    1= Ndio
64. Hili limetokea mara ngapi?
    1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)
    2=Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)

3= Mara nyingi (zaidi ya mara kumi ndani ya wiki nne zilizopita)

65. Ndani ya wiki nne zilizopita, kuna yeyote kati yako ama mwanafamilia yeyote aliyeshindwa kula chakula akipendacho kutokana na ukosefu wa fedha?

    0= Hapana

    1= Ndio

66. Hili limetokea mara ngapi?

    1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)

    2= Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)

    3= Mara nyingi (zaidi ya mara kumi ndani ya wiki nne zilizopita)

67. Je, katika wiki nne zilizopita, wewe au mwanafamilia yeyote alilazimika kula vyakula vya aina mbalimbali pungufu kutokana na ukosefu wa rasilimali?

    0= Hapana

    1= Ndio

68. Hili limetokea mara ngapi?

    1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)

    2= Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)

    3= Mara nyingi (zaidi ya mara kumi ndani ya wiki nne zilizopita)

69. Je, katika kipindi cha wiki nne zilizopita, wewe au mwana kaya yeyote alilazimika kula baadhi ya vyakula ambavyo kwa hakika hukutaka kukila kwasababu ya ukosefu wa rasilimali ili kupata aina nyingine ya chakula?

    0=Hapana

    1=Ndiyo

70. Hili limetokea mara ngapi?

    1 = Mara chache (mara moja au mbili katika wiki nne zilizopita)

    2 = Wakati mwingine (mara tatu hadi kumi katika wiki nne zilizopita)

    3 = Mara nyingi (zaidi ya mara kumi katika wiki nne zilizopita)

71. Je, katika wiki nne zilizopita, wewe au mwana kaya yeyote alikula chakula kidogo kuliko vile ulivyohisi kukihitaji kwasababu hakukuwa na chakula cha kutosha?
    0= Hapana
    1= Ndio
72. Hili limetokea mara ngapi?
    1 = Mara chache (mara moja au mbili katika wiki nne zilizopita)
    2 = Wakati mwingine (mara tatu hadi kumi katika wiki nne zilizopita)
    3 = Mara nyingi (zaidi ya mara kumi katika wiki nne zilizopita)
73. Ndani ya wiki nne zilizopita, kuna yeyote kati yako au mwanafamilia alikula milo michache kwa siku kwasababu hakukua na chakula cha kutosha?
    0= Hapana
    1= Ndio
74. Hili limetokea mara ngapi?
    1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)
    2= Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)
    3= Mara nyingi (Zaidi ya mara kumi ndani ya wiki nne zilizopita)
75. Katika wiki nne zilizopita, je, hapakuwa na chakula cha aina yoyote katika kaya yako kwasababu ya ukosefu wa rasilimali za kupata chakula?
    0= Hapana
    1= Ndio
76. Hili limetokea mara ngapi?
    1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)
    2= Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)
    3= Mara nyingi (zaidi ya mara kumi ndani ya wiki nne zilizopita)
77. Ndani ya wiki nne zilizopita, kuna yeyote kati yako au mwanafamilia aliye lazimika kutokula chochote siku nzima na kulala na njaa kutokana na ukosefu wa chakula?
    0= Hapana
    1= Ndio

78. Hili limetokea mara ngapi?

1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)

2= Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)

3= Mara nyingi (Zaidi ya mara kumi ndani ya wiki nne zilizopita)

79. Je, katika wiki nne zilizopita, wewe au mwana kaya yeyote alikaa mchana na usiku bila kula chochote kwasababu hakukuwa na chakula cha kutosha?

0= Hapana

1= Ndio

80. Hili limetokea mara ngapi?

1= Mara chache sana (mara moja au mbili ndani ya wiki nne zilizopita)

2= Mara kadhaa (kati ya mara tatu na mara kumi ndani ya wiki nne zilizopita)

3= Mara nyingi (Zaidi ya mara kumi ndani ya wiki nne zilizopita)