

## Knowledge of Expectant Mothers on the Need for Folic Acid and Iron (IFA) Supplements Use among Expectant Mothers in Pumwani Maternity Hospital, Kenya

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### Abstract

**Background:** Out of three expectant mothers, one has anaemia and lack folic acid, signifying that iron and folic acid (IFA) deficiencies make up the major micronutrient deficiencies among women in the world. Iron insufficiency is a serious health problem due to its increased prevalence and potential negative outcome. Iron insufficiency may lead to many adverse consequences like preterm births, stillbirth, underweight births, and maternal and neonatal deaths. The main aim of the research was to establish the assess the knowledge of expectant mothers on the need for Folic acid and iron (IFA) supplements use among expectant mothers in Pumwani Maternity Hospital, Kenya.

**Methods:** A cross-sectional design was used. The primary data was collected from the expectant mothers visiting PMH for ANC services by administering questionnaires and key informant interviews. The researcher used both probability and non-probability sampling methods. The researcher used random sampling approach to determine equal chance among the pregnant women in PMH. All expectant mothers that consented to the research were interviewed with the aid of a written questionnaire targeting a sample size of 341 participants. The data was collected, edited, coded and put into Epi-Data after which it was exported to SPSS. Descriptive analysis was utilized to establish the use of IFAS amongst expectant mothers. Distribution of the variables was analyzed via the use of frequency tables. Bivariate analysis was completed to establish the factors related with IFAS used amongst expectant mothers by using P-value and Pearson's Chi-Square. Binary Logistic regression was used to establish predictors of use of iron and folate supplements. Ethical clearance to conduct this study was obtained.

**Result:** Findings from the study show that 70% of respondents used IFAS during pregnancy. Close to 52 % respondents had good knowledge on the use of iron and folate supplementation. Bivariate analysis illustrates that level of education  $\chi^2$  ( $df=3$ ) (15.15, N=341),  $p=0.02$  and level of knowledge  $\chi^2$  ( $df=1$ ) (22.6, N=341)  $p=0.001$  were significantly associated with uptake of iron and folate supplementation. Regression analysis shows that the level of education A.O.R=3.331 (CI 2.0119-5.496)  $p=0.0001$ , level of knowledge A.O.R=1.886 (CI 1.317-2.701)  $p=0.001$  and the number of pregnancies A.O.R=0.154, (CI 0.010-1.413) were strong predictors of iron and folate supplementation. Social demographic factors that significantly influenced use of IFAS were household income and number of children. Formal education and mothers' knowledge on use of IFAS significantly increased the odds three folds using IFAS. Use of IFAS reduced the chances to experience of anaemia in life or during pregnancy. Majority mothers were able to access health facilities and IFAS whenever needed. IFAS was affordable. The health facilities were operational and met health care needs. Health care workers hospitability and provision of satisfying prescription of IFAS increased use of IFAS by 9.5 and 2.8 times respectively.

**Conclusion:** To achieve desirable coverage level on the use of iron-folate supplementation, policy makers should develop novel strategies to educate expectant women. All stakeholders should take a further step on promoting IFAS use to ensure 100% compliance.

**Keywords:** Anaemia, Folic Acid and Iron, Expectant mothers

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### 1. Introduction

World Health Organization (WHO), (2015) describes anaemia in female who are at the age of bearing children being the state in which hemoglobin convergence is below 12.0 g/dL. It is characterized as less than 11.0 g/dL amongst expectant mothers. Hemoglobin focus cut-off level that characterizes anaemia shifts in age, physiological status, smoking status, and the height in that evaluated populace resides. Frailty amid pregnancy can prompt unfavorable maternal and prenatal results. The WHO prescribes that every single pregnant woman, gets supplements containing iron and folic acid are highly recommended in areas where anemia is common.

Iron deficiency is a condition that occurs when there is not enough iron in the body to maintain the typical physiological states of tissues. Anemia is caused by a lack of iron in the body. Although there are a number of factors that might lead to anemia, it is

generally accepted that a significant fraction of instances are brought on by a deficiency in physical activity (Ganz and Nemeth, 2016). Anemia is caused by a lack of iron in the diet in at least one out of every two pregnant women who develop the condition (Percy and Fraser, 2017). The government guideline for the Philippines' effort to prevent micronutrient deficiencies emphasizes the necessity of daily IFAS throughout pregnancy (WHO, 2012). Factors such as population size and maternal health care access in a country like the Philippines shape the IFAS policy for pregnant mothers there and elsewhere. Factors including travel, the price of tablets, and the quality of prenatal counseling on IFAS all play a role (Nisar et al., 2014). However, both globally and locally, supplementation is the most often used method of treating iron insufficiency. In accordance with programs offered by the Philippine government many Filipinos rely on the services provided by barrio health stations which are staffed and located in

rural areas (Kavle & Landry, 2018). The midwife at each BHS knew the names of all of the women who got IFAS. Pregnant women receive IFAS at no cost. Pregnant women consumed 82.4% of the recommended pills, according to the 2008 Philippines National Survey that assessed the uptake of IFAS (Fiedler & D'Agostino, 2015). According to estimates, forty percent of Eswatini's female population is anemic, which may be caused by a lack of iron in the diet (Birhanu et al., 2018). As part of their prenatal care (also known as antenatal care or ANC), all pregnant women ought to be given an oral supplement of IFA (Barua et al., 2014). USAID (2014) indicated that, in Nairobi, the prevalence of folic acid and iron corrosive use amongst expectant moms was at 28.0%. This demonstrates a gap between the administration's focus of reaching 80% and the genuine take-up in the populace. The report also demonstrates 44.6 % and 58% detailed had gotten data on compress and folic corrosive independently. Out of the women who got supplementation, 67.7% established being begun on press supplementation after 4 months of incubation while 80.7% proclaimed having begun on folic corrosive supplementation following twelve weeks. Investigation indicates poor learning or absence of data on press and folic corrosive supplementation. The Ministry of Health, Kenya (MoHK), in 2012, as a joint effort with different partners, designed a five-year programme (2012-2017) for reducing maternal Anemia via Folic Acid and Iron supplements of expectant mothers. The intent of this programme was to expand Iron and Folic Acid supplements coverage to 80% and build Iron and Folic Acid use beginning 2.5% to 30% for no less than 90 long stretches of pregnancy by end of 2017. Use of IFAS has been connected to the guideline and the data of expectant mothers: it can be distinctly or unfavorably, chooses the women's choice on searching for and becoming a predictable to the game plan.

The preparation past the optional school is distinctly linked to the usage of Folic and Iron destructive supplementation (Lacerte, et al., 2011). Of course, in similar report, data related to Anemia in pregnancy and its balancing activity procedures have been reviewed as a basic determinant that can influence use of Folic and Iron destructive supplementation. This exhibits poor data related to Anemia amongst expectant mothers can be an imperative pointer for poor usage of IFAS.

In a study conducted in, Mecha district (2013), Ethiopia showed women aged 35-49 years old, Literate women, report history of Anaemia during pregnancy, had higher knowledge of Anaemia, had higher knowledge of iron foliate tablets were 3.41, 4.49, 5.83, 3.64, 5.25 counts more likely to adhere in comparison to women aged 15-24 years old, were unable to read and write, did not report history of Anaemia, had low knowledge of Anaemia, and had low knowledge of IFA tablets respectively. 28.45% of study participants had fear that continuous consumption of IFAS leads to overweight babies.

Kouadio et al. (2013), assessed to determine the knowledge of expectant mothers on the need of IFAS, indicted that there is a significant effect between knowledge and uptake of IFAS. Researchers also did not find any evidence of treatment resistance. Women in Bangladesh who participated in another study by Alam et al., 2015 about women's understanding of iron supplements

reported that they were aware that taking iron and folic acid pills reduced their risk of developing anemia.

Fewer expectant mothers expressed anxiety regarding the link between folic acid use and large newborns, according to the same study. Some research has shown that pregnant women in poorer nations don't get enough of certain vitamins and minerals because of their poor dietary habits, therefore getting enough of all of them is essential for a healthy pregnancy and baby (Zeng et al., 2014). Research by Messina et al. (2013) and others has shown that having access to a refrigerator and residing in an urban setting can reduce the risk of developing anemia. Increased education of iron-rich diets is credited with this development.

This examination agrees with some different investigations completed freely from various zones of the world. As per an examination done in Malaysia by Thirukkanesh et al., (2010), the principle purposes behind non-use with press and folic corrosive among the pregnant moms were absent-mindedness, encounters about reactions including sickness and heaving, stress in regards to enormous size of the infants and poor learning about the program medical advantages.

In 2014, study completed in Ethiopia by Taye et al., demonstrated that out of 628 talked with ladies who conceived an offspring a year prior to the overview, just 20.4% were consistent with the Folic and Iron corrosive supplementation, one of the related indicators with utilize was training status of moms, their insight on Anemia in pregnancy and Folic corrosive drug, encounter in Anemia amid past pregnancy. Then again, the examination uncovered that conviction that an excessive number of tablets would hurt the infant and dread of the repulsive impact of the Folic Acid and Iron drugs were amongst the real explanations behind none utilize.

Siekman et al. (2018) investigated and evaluated the facilitators and barriers to iron and folic acid (IFA) supplements use. IFA supplementation projects were analyzed based on preliminary data gathered in 2012 and 2013. Content analysis was applied to qualitative data gathered through focus groups to uncover overarching themes involving facilitators. Throughout the world, women are aware of the risks associated with anemia during pregnancy, yet many of them do not feel at risk for it personally. Facility-based prenatal care (ANC) is an effective method of delivering IFA because to widespread knowledge and expanded coverage; nevertheless, access to IFA is restricted due to attitudes about when to visit ANC for the first time. Inconsistent availability and poor quality of ANC services, such as a shortage of IFA supplies and minimal counseling to boost consumption, impede both coverage and adherence. IFA delivery in the community and ANC referrals provide for earlier and more regular access as well as more opportunity for follow-up. To enable IFA supplementation throughout pregnancy, ANC access and quality must be improved. Problems with timely and ongoing access to supplements can be addressed by community-based distribution and counseling.

Kurzawa et al. (2021) used a quasi-experimental method to examine the program's efficacy and cost-effectiveness in boosting pregnant women's consumption and adherence of IFA supplements. The program boosted IFA consumption by 45.05 supplements. Pregnant mothers and front-line healthcare workers

have both enhanced their familiarity of IFA supplement prescription and advantages. When measured against a number of cost-effectiveness standards, the program's cost avoided in 2018 was \$ 47.11 USD, which is seen as being extremely cost-effective. The goal of Wana (2020) was to determine the extent and the variables influencing the use of prenatal iron supplementation. In January 2016, a cross-sectional quantitative study with a focus on the community and a qualitative component was done. 411 pregnant women who delivered their babies six months prior to the data collection were chosen. Four focus group discussions (FGDs) with local expectant women and interviews with the district's MCH focal, three MCH center directors, and four health extension workers were used to evaluate the elements that contribute to the proper use of supplements. With 95% confidence intervals. 11.5% (95% CI = 9.9-13.1%) of the study's participants took the supplement for three months or more. The odds of pregnant women utilizing iron supplements were 77% lower for those who couldn't read and write than for those who could (AOR = 0.23 (95% CI: 0.07-0.75)). Those who had two or three antenatal care had 78% less chance of utilizing the supplementation, compared to four or more ANC visits. The equivalents had 90% lower likelihood of utilizing the supplement compared to women who were aware of its advantages for maternity and child health. Women who were unaware of anemia had 85% lower likelihood of using the supplement than those who were aware (AOR = 0.15(0.04-0.62)). According to the qualitative study, there were no issues with the iron supplement's supply or logistical system, and the most common excuses for not taking the supplement were a delayed start to prenatal care and ignorance

Maternal iron-folic acid (IFA) supplements adherence was studied by Wiradnyani et al. (2016), who also looked into whether this was connected to women's awareness of potential risks during pregnancy and the amount of emotional and practical help they received from their loved ones. Data were utilized for this secondary analysis. Increased loyalty to IFA supplementation was related with knowledge of pregnancy-related hazards and full family support (especially from the husband; adjusted OR=1.9; 95% CI 1.6, 2.3). Increased adherence was linked to receiving adequate prenatal care (ANC). Unfortunately, even among women who had adequate ANC visits, 15% said they had never been given or purchased IFA tablets, and 30% said they had no idea of the risks connected with pregnancy. In predicting adherence, a substantial interaction between family support and the women's educational attainment was found. Among women with less than nine years of education, family support dramatically boosted adherence.

An in-hospital cross-sectional survey was conducted by Bahati et al. (2021) among 241 postnatal women who had sought MCH services at Kakamega level 5 hospital. 241 eligible postnatal women provided the quantitative data. Respondents cited a variety of factors as contributing to their lack of adherence, including undesirable effects from using IFA (41.3%), forgetfulness (37.3%), and the odor of the IFA supplements (10.3%). In comparison to multigravida participants, primigravida participants demonstrated higher IFA adherence (OR=2.704; 95% CI: 1.262, 5.793; p=0.010), as well as those with higher anaemia knowledge than those with lesser anaemia understanding. Other

characteristics that showed a connection with IFA adherence were preconception counseling, IFA education, and the total number of prenatal care visits achieved.

Research on supplements and related factors was undertaken by Kamau et al. (2019) in a rural Kenyan county. 364 pregnant women between the ages of 15 and 49 took part in this cross-sectional study. Two-stage sampling was used to select five public health facilities and one sub-County. Sixty-seven percent of the 364 people polled were familiar with IFAS, while only 40.9% (149) were very well-versed in the subject. The highest levels of knowledge were held by women who learned about the topic via brochures (91%), and community health workers (CHWs) (87%). Women over the age of 30 who were married and had multiple children had a significantly higher chance of being successful (p 0.05). There was a considerable gap in the quality of IFAS counseling provided by various health care practitioners, and there was a correlation between the level of IFAS comprehension possessed by the client and the extent to which therapy was administered.

Senoga (2015) examined the knowledge, attitudes, and behaviors of antenatal care (ANC) patients who went to KCCA health clinics in Kampala in regards to iron-folic acid (IFA) supplementation. A cross-sectional assessment of health care facilities was conducted in the six KCCA clinics. Respondents were pregnant women in need of ANC services. Information on demographics, education, employment, and IFAS-related knowledge, belief, and behavior was gathered by interviews using a standardized questionnaire. Health professionals were interviewed as key informants to get qualitative data. STATA 12 was used to examine quantitative data that was submitted into EpiDATA. Manual content analysis using condensed and abstracted key themes was used to assess qualitative data. Only 19.4% of the 423 participants recognized that folic acid supplementation should start before conception, and only 16.5% of them had ever used folic acid during preconception. Eighty-one percent of the 423 people surveyed were already using IFA supplements, and 343 of those people (81%) had heard of IFAS. In total, 68.9% of those polled had adequate knowledge, 68.3% had a constructive outlook, and 79.2% were engaging in beneficial habits. The adjusted odds ratios for positive attitudes and good practices toward IFAS among women with sufficient information were 4.18; 95% CI 4.18(2.566.83) and 3.86; 2.37-6.30, respectively. Graduates had a 5.6-times higher likelihood of being knowledgeable than people without a degree (AOR 5.6; 95%CI 1.4 - 22.3). Three ANC visits increased respondents' likelihood of being knowledgeable by 2.41 times compared to one visit. Married women had an adjusted odds ratio (AOR) of 1.8 (95% CI: 1.1- 3.0) for having sufficient awareness of IFAS, compared with solitary women. Women in their pregnancies who went to an ANC at a KCCA health center were well-informed, enthusiastic, and prepared. Because so few women were aware of the significance of preconceptionally use of FA and because so few actually used FA before becoming pregnant, health professionals should concentrate on educating all women of reproductive age about the value of FA (prevention of NTDs) and advocating for its preconception use. The primary reason that mothers stopped taking IFAS was stock-out, which suggests that additional efforts are required to guarantee access to IFAS for

pregnant women. A significant predictor of both IFAS knowledge and practice was having completed at least the secondary level of schooling. Being married and going to more than two ANC visits were significant predictors of having sufficient knowledge, a favorable attitude, and excellent behaviors with regard to IFAS. The fact that more IFAS is used when mothers are encouraged to get prenatal care and more people know about it is strongly supported by the positive effects that pregnant women's knowledge of IFAS has on how they feel about it and how they use it in general.

In Kisumu and Migori, Kenya, Kimiywe et al. (2017) evaluated the obstacles to maternal supplementation in randomly chosen health facilities, each representing three sub-counties in the counties of Migori and Kisumu. To code, analyze, and identify key themes, qualitative data was imported into NVIVO II software (QSR International Pty Ltd.). The qualitative interview guide's primary themes served as the foundation for the codes. The data were put into groups based on themes that kept coming up in the FGD transcripts and issues that people kept bringing up. Due to its suitability for identifying the most frequently occurring repeating themes and concerns, thematic analysis was employed. Even though a significant number of pregnant women go to at least four prenatal sessions, the majority of them do not go as regularly or as early as is recommended. This could have a negative impact on the health of both mothers and infants, in addition to the number of people who receive IFA supplements through ANC. More than fifty percent of women do not receive enough BCC messaging exposure. Although the MOH's IFA media campaign and the "Malezi Bora" biennial outreaches may have contributed to some women's knowledge, more should be done to inform them of the health advantages of taking IFA supplements. Though they may not completely grasp it, most women recognize the value of arriving at ANC early. Some women receive information from healthcare professionals, such as CHWs and facility-based clinicians, about when to take IFA supplements and the advantages of IFA supplementation, but it is insufficient (what, why, and how it prevents health consequences can be reinforced). Side effects are significant obstacles to adherence that need to be removed. The vast majority of women understand the importance of getting to ANC on time, even if they may not have a thorough comprehension of its meaning. It is true that some women obtain information about when to take IFA supplements and the benefits of IFA supplementation from healthcare professionals such as CHWs and facility-based clinicians; nevertheless, the information that they receive is often insufficient (what, why, and how it prevents health consequences can be reinforced). The elimination of side effects is necessary since they present considerable adherence barriers.

## 2. Materials and methods

In order to achieve the goal of the study, a descriptive cross-sectional study design was used. Both approaches were taken in order to complete the study. Quantitative and qualitative approaches were utilized in the data analysis portion of the study, which focused on pregnant patients at Pumwani Maternity Hospital.

The study was conducted at a prenatal clinic in Nairobi, Kenya. This study site is the largest maternity hospital in Kenya and Sub-Saharan Africa ([savethecradle.org/Pumwani-maternity-hospital/](http://savethecradle.org/Pumwani-maternity-hospital/)). Pumwani Maternity Hospital is a referral hospital for other Nairobi hospitals. 350 maternity beds and 150 neonatal beds are available.

The study population was drawn from pregnant women who were attending the free maternity services at Pumwani Maternity Hospital, Nairobi, willing and consenting to participate in the study. The study was conducted over a two weeks period in the month of October 2018.

To establish the needed sample size, Kish-Leslie Formula (Kish 1965) was utilized. The sample size was obtained was 310. However, the sample size was enhanced by 10 percent to 341 to cater for any attrition during the study.

The study included all expectant mothers seeking antenatal care at Pumwani Maternity Hospital. Those women that were not pregnant and those who were not willing to take part in the research were excluded in the study.

This study adopted probability and non-probability sampling methods. Data was gathered via a pre-designed questionnaire and an interview guide for key informants. Research participants were asked for their permission by enumerators who described the study's purpose. The questionnaire was administered by the researcher. Key Informants including health workers, multi-gravida and prima-gravidas were assessed, by use of Key Informant Interview guide, to seek further data on the likely factors that inform the use of IFAS among expectant mothers. The data was collected, edited, coded and put into Epi-Data after which it was exported to SPSS. Descriptive analysis was utilized to establish the use of IFAS amongst expectant mothers. Distribution of the variables was analyzed via the use of frequency tables. Bivariate analysis was completed to establish the factors related with IFAS used amongst expectant mothers by using P-value and Pearson's Chi-Square. Binary Logistic regression was used to establish predictors of use of iron and folate supplements. Ethical clearance to conduct this study was obtained.

## 3. Results

### Social Demographic Characteristics of respondents

This study used a sample of 341 mothers. This implied that the response rate was 100%. The response rate was 100%. Table 1 illustrates that of the 341 respondents, a large proportion of respondents aged between 22-27 years old (32%) and 18-22 years old (29%) respectively. Three quarters of respondents were married and that slightly more than half (54%) had secondary school level of education. Less than one quarter (24%) were employed and that household income was less than 10,000 Kenyan shillings among 77.4% of respondents.

### Maternal Characteristics of respondents

The majority of respondents, which represents 32% of the total, had two children, as shown in figure 1. While 26.7% of respondents had either one or three children, 11% had four children, and less than 3% of the total respondents had at least five

children, the number of respondents with at least five children was less than 3%.

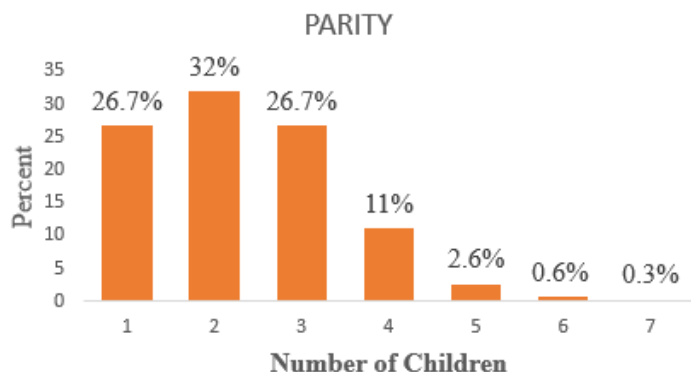


Figure 1: Parity

Figure 2 illustrates the trimester in which the mothers were in at the time of data collection. From figure 4.2, the majority of the mothers were in third (46%) and second (40%) trimester and only 14% were in their first trimester.

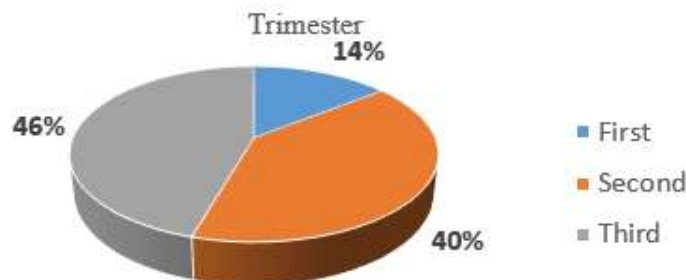


Figure 2: Trimesters period of respondents

Figure 3 illustrates that at the time of data collection, 34.3% of respondents had made four or more antenatal care visits, 29.9% were on their third visit, 26.1% on the second visit and only 10% were on the first antenatal visit.

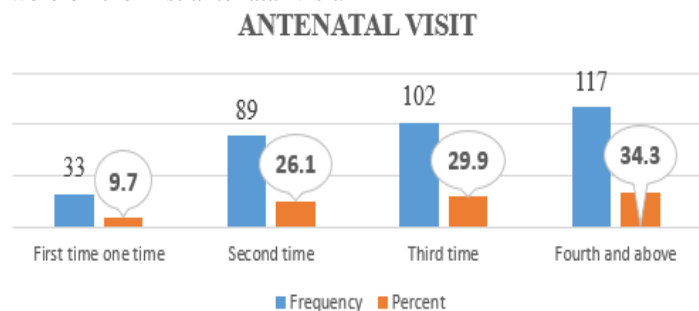


Figure 3: Antenatal visit

### Level of Knowledge on use of IFAS Supplements

Table 2 illustrates that 65% of respondents were not aware that IFAS supplements prevents anaemia though 90% were knowledgeable that the use of IFAS enhances maternal health. Slightly more than half were not aware that IFAS usage has some side effect while only percent thought that IFAS supplementation was not beneficial during pregnancy.

Multiple response analysis indicates that of the all the respondent in the survey who answered yes in the individual knowledge questions, (N=885) a paltry 13.4 % were aware that the use of iron and folate supplement prevents anaemia. Close to a third of respondents in the survey 34.8% attested that IFAS usage enhances maternal health. Only 17.3% claimed to have experienced side effects after use of IFAS.

Overall, as displayed on table, knowledge composite score illustrates more than half 52% had good knowledge on the use of IFAS supplementation. The rest, 42.5% were categorized as having poor knowledge on the use of IFAS supplementation.

### Test of Hypothesis

This study sought to test the following hypothesis

1. H<sub>01</sub>: There exist no statistically significant association among sociodemographic features and the use of IFA supplements among expectant mothers in Pumwani Maternity Hospital, Kenya.
2. H<sub>02</sub>: There is no statistically significant relationship between knowledge of expectant mothers on the need of IFA supplements and the use IFA amongst expectant mothers in Pumwani Maternity Hospital, Kenya.

### Social demographic characteristics and uptake of IFAS

Table below shows bivariate analysis between socio-demographic characteristics and uptake of iron and folate supplements. It is evident that the level of education  $\chi^2$  ( $df=3$ ) (15.15, N=341),  $p=0.02$  and use of iron folate supplements is statistically significant. Age  $\chi^2$  ( $df=5$ ) (2.183, N=341), marital status  $\chi^2$  ( $df=2$ ) (0.401, N=341),  $p=0.1818$  employment status  $\chi^2$  ( $df=1$ ) (2.16, N=341)  $p=0.15$  household income  $\chi^2$  ( $df=$ ) (3.639, N=341),  $p=0.457$  and religion  $\chi^2$  ( $df=2$ ) (0.268, N=249),  $p=0.875$  were not statistically significant at bivariate level.

Table 6 illustrate that at bivariate level, the level of knowledge on iron and folate supplements is directly associated with its uptake  $\chi^2$  ( $df=1$ ) (22.6, N=341)  $p=0.001$ .

### Regression Analysis

Binary logistic regression analysis was further used to test hypothesis. Table 7 illustrates that the level of education A.O.R=3.331 (CI 2.0119-5.496)  $p=0.0001$ , level of knowledge A.O.R=1.886 (CI 1.317-2.701)  $p=0.001$  and number of pregnancies A.O.R=0.154, (CI 0.010-1.413) were significant predictors of use of Iron folate supplementation.

**Table 1: Social demographic characteristics**

Age	Frequency	Percent
<18	16	4.7
18-22	99	29
23-27	109	32
28-32	83	24.3
33-37	28	8.2
38-42	6	1.8
Total	341	100
Marital status	Frequency	Percent
Married	257	75.4
Single	79	23.2
Divorced	5	1.5
Total	341	100
Level of education	Frequency	Percent
None	5	1.5
Primary	92	27
Secondary	185	54.3
Tertiary	59	17.3
Total	341	100
Employment Status	Frequency	Percent
Not employed	263	77.1
Employed	78	22.9
Total	341	100
Religion	Frequency	Percent
Islam	52	15.2
Christians	275	80.6
Other	14	4.1
Total	341	100

**Table 2: Expectant mothers' knowledge on IFAS**

IFAS supplements prevents Anaemia	Frequency	Percent
No	222	65.1
Yes	119	34.9
Total	341	100
IFAS usage enhance maternal health		
No	33	9.7
Yes	308	90.3
Total	341	100
IFAS usage has some side effects		
No	188	55.1
Yes	153	44.9
Total	341	100
IFAS supplementation is beneficial during pregnancy		
No	36	10.6
Yes	305	89.4

Total	341	100
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**Table 3: Knowledge of IFAS usage**

Knowledge Items	Responses		Percent of Cases
	N	Percent	
IFAS supplements prevents Anaemia	119	13.40%	34.9%
IFAS usage enhance maternal health	308	34.80%	90.30%
Side effects experienced after use of IFAS	153	17.30%	44.9%
Information on the benefits of daily ingestion of IFAS during pregnancy	305	34.50%	89.4%
Total	885	100.00%	

**Table 4: Level of Knowledge on Use of IFAS Supplementation**

level of Knowledge	Frequency	Percent
Poor Knowledge	162	47.5
Good Knowledge	179	52.5
Total	341	100

**Table 5: Cross-tabulation: Demographic characteristics and use of IFAS**

Age	Use of IFAS		$\chi^2$ (df)	p-value
	No	Yes		
<18	4(25%)	12(75%)	2.183(5)	0.823
18-22	31(31.3)	68(68.7%)		
23-27	34(31.2%)	75(68.8%)		
28-32	20(24.1%)	63(75.9%)		
33-37	10(35.7%)	18(64.3%)		
38-42	2(33.3%)	4(66.7%)		
Marital status	No	Yes	0.401(2)	0.818
Married	75(29.2%)	182(70.8%)		
Single	25(31.6%)	54(68.4%)		
Divorced	1(20%)	4(80%)		
Level of Education	No	Yes	15.15(3)	<b>0.002</b>
None	4(80%)	1(20%)		
Primary	33(35.9%)	59(64.1%)		
Secondary	56(30.3%)	129(69.7%)		
Tertiary	8(13.6%)	51(86.4%)		
Employment status	No	Yes	2.160(1)	0.15
Not employed	83(31.6%)	180(68.4%)		
Employed	18(23.1%)	60(76.9%)		
Household Income	No	Yes	3.639(4)	0.457
<10000	81(30.7%)	183(69.3%)		
10001-20000	16(25.8%)	46(74.2%)		
20001-30000	3(23.1%)	10(76.9%)		
30001-40000	1(100%)	0(0%)		
>40001	0(0%)	1(100%)		
Religion	No	Yes	0.268(2)	0.875
Islam	15(28.8%)	37(71.2%)		
Christianity	81(29.5%)	194(70.5%)		
Other	5(35.7%)	9(64.3%)		

\*significant at 0.05

**Table 6: Cross-tabulation: Level of Knowledge and use of IFAS supplementation**

Level of Knowledge	Using IFAS for current pregnancy		Total	$\chi^2$ (df)	p-value	Odd Ratio	
	No	Yes				Upper	Lower
Poor Knowledge	68(42%)	94(58%)	22.6(1)	<b>0.001*</b>	3.201	1.961	5.224
Good Knowledge	33(18.4%)	146(81.6%)					

\*Significant  $p < 0.05$

**Table 7: Logistic Regression Analysis**

Variable in the Equation	Sig.	Exp. (B)	95% C.I. for EXP(B)	
			Lower	Upper
level of Knowledge	0.001	3.358	2.031	5.552
Age	0.989	1.002	0.793	1.265
Marital status	0.99	0.997	0.586	1.695
Level of education	0.001	1.896	1.298	2.768
Employment status	0.537	1.259	0.606	2.617
Household Income	0.433`	0.817	0.492	1.355
Number of Pregnancies	<b>0.018</b>	0.154	0.010	1.413
level of Knowledge	<b>0.001</b>	3.331	2.019	5.496
Level of education	<b>0.001</b>	1.886	1.317	2.701
Constant	0.001	0.128		

#### 4. Discussion

Many mothers (93%) were aware that IFAS usage enhances maternal health (Table 4.6). Mothers had information on the benefits of daily ingestion of IFAS during pregnancy. Further, mothers were aware that frequent use of IFAS during pregnancy could minimize dangers associated with maternal anaemia and spina-bifida among children (Table 4.6). Knowledge from different sectors including formal education, experience, and sensitization was vital in use of IFAS. Mothers with no formal education were 25.5%, 3.6%, and 3% less likely to take up IFAS compared to mothers who had tertiary, secondary and primary education respectively. This implied that higher levels of education increased the use of IFAS. Expectant mothers' knowledge on the benefits of daily ingestion of IFAS during pregnancy; knowledge that IFAS usage enhances maternal health increased use of IFAS by 4.3 times; and knowledge that frequent use of IFAS during pregnancy could minimize dangers associated with maternal anaemia and spina-bifida among children increased use of IFAS by 3.5 times significantly increased the use of IFAS. In Pakistan, non-maternal knowledge and lack of formal education increased chances of not using IFAS. Acquaintance on the paybacks of IFAS reduced fear of side effects and discarded the belief that the tablet was a contraceptive (Nisar et al., 2014). A decline in adherence to IFAS was caused by a lack of understanding regarding the advantages of IFAS (Mithra et al., 2014). According to the findings of a study that was carried out in Kenya, there was not a significant link found between the degree of education and the uptake of IFAS. However, lack of information that IFAS is a requirement to ensure adequate nutrients was among the reasons for not taking the IFAS (Dinga et al., 2013). This implied that knowledge was fundamental and should be used to enhance uptake of IFAS. In this study, the number of pregnancies was not significantly associated with IFAS uptake. Similarly, a different study in northern Tanzania reported that multiparous mothers were unlikely to use supplementations as compared to primiparous women (Ogundipe et al., 2012). The study asserts that casual attitude could be a contributory factor to decreased uptake of iron folate supplements

In this study it was observed that there was adequate accessibility to health facilities that were operational and met health care needs. IFAS was affordable and most mothers were able to access IFAS whenever needed. This implied that the low use of IFAS was not due to unavailability. Health care workers in the facilities were also indicated to be hospitable and offered satisfying prescription of IFAS. Better service delivery defined by hospitability and patient satisfaction increased the odds of IFAS use. This implied that health workers and patient attitude and satisfaction were a major component in of IFAS use. Similarly, a study done in Pakistan observed that trust in the health care providers increased odds of taking IFAS among expectant mothers (Nisar et al., 2014).

#### Conclusion and recommendations

Majority mothers were aware that IFAS usage enhance maternal health (83.3%). Most mothers (87.1%) had information on the benefits of daily ingestion of IFAS during pregnancy. In addition, 92.4% mothers were aware that frequent use of IFAS during pregnancy could minimize dangers associated with maternal anaemia and spina-bifida among children. Formal education and mothers' knowledge on use of IFAS significantly increased the odds three folds using IFAS. Use of IFAS reduced the chances to experience of anaemia in life or during pregnancy.

#### Conflicts of interest

The authors declared no conflicts of interest during and after the study.

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