Prevalence and Factors Associated with Non-adherence to Iron and Folic Acid Supplementation among Women for Antenatal Care at Mwembeladu Hospital, Zanzibar

ABSTRACT

BACKGROUND: Daily iron and folic acid supplementation (IFAS) during pregnancy reduces the risk of all types of maternal anaemia and iron deficiency anaemia at term; despite the WHO recommendations, pregnant women are still vulnerable because the use of Iron and Folic Acid Supplementation is still low in many countries including Tanzania. Therefore, the study aims to comprehensively understand the prevalence and factors associated with non-adherence to Iron and Folic Acid Supplementation among pregnant women attending Antenatal Care at Mwembeladu Hospital. Achieving this objective will contribute to developing effective strategies to improve IFAS adherence.

METHODOLOGY: The study was cross-sectional and ANC-based, using questionnaires. Questionnaires were distributed to the 260 pregnant women attending ANC at Mwembeladu Hospital. Data were analyzed using SPSS computer software version 22.

RESULTS: Our study showed that 52.7% had more than 4 ANC visits. Based on self-reported adherence, about (61.9%) of pregnant women were taking IFAS supplementation, and (38.1%) were not taking IFAS completely. Among those taking IFAS, (60.2%) out of 161 pregnant women were taking four tablets per week as recommended by WHO, and (39.8%) out of 161 were not following the WHO recommendations. Therefore, out of 260, zero adherence was 38.1%, poor adherence was 24.6%, and good adherence was 37.3%. Hence, 62.7% were non-adherent to IFAS supplementation as recommended by WHO. Also, the result showed that the major factors militating against pregnant women taking IFAS are lack of knowledge of IFAS

(22.1%), side effects of IFAS (19%), forgetfulness (18.4%), and lack of understanding of anaemia (12.3%).

CONCLUSION: Overall, the adherence to IFAS among pregnant women was low and did not meet the WHO recommendations for preventing and treating anaemia during pregnancy. Socio-demographic factors, including occupation and education level, maternal characteristics, parity, and gestation age, are all significantly associated with adherence to IFAS. Factors associated with poor adherence to IFAS include side effects, failure to access IFAS, forgetfulness, and knowledge about anaemia and IFAS. Healthcare facilities and providers should strengthen the system to create community awareness of IFAS, its benefits, and the side effects as this will help increase the adherence to IFAS amount pregnant women.

Keywords: adherence, iron with folic acid supplementation, Zanzibar

Introduction

Anaemia is a global public health problem affecting both developed and developing countries. It significantly impacts human health, as well as social and economic health. It is associated with increased morbidity and mortality in women and children, poor birth outcomes such as preterm delivery, low birth weight, and perinatal mortality, and decreased productivity of workforces in adults [1]. In 2019, the global prevalence of anaemia was 29.9% in women of reproductive age, equivalent to over half a billion women aged 15 – 49 years. Update global anaemia, 2021; the Prevalence of anaemia was 29.6% in non-pregnant women of reproductive age and 36.5% in pregnant women; hence, pregnant women are at high risk of anaemia [2]. Also, according to the data provided by WHO, the prevalence in Africa is estimated to be 37.8% and 46.3%, respectively. In Tanzania, the prevalence of anaemia in reproductive age between 15 – 49 years is 57%. Also, 50% of all anaemia is estimated to be due to iron deficiency. Hence, anaemia in pregnant remains persistently high. In Zanzibar, 2018, the reported overall prevalence of anaemia was 80.8% [3,4]

Anaemia refers to a haemoglobin (Hb) level of less than 11g/dl for mid anaemia, between 7-9.9g/dl for moderate anaemia, and less than 7g/dl considered severe anaemia. It affects all age groups, but pregnant women are more vulnerable. [5]

The most common cause of anaemia in pregnancy is iron and folic acid deficiency due to physiological changes during pregnancy, foetal growth, and development that increase the need for iron and folic acid. The increased demand for these nutrients cannot be met by diet alone as the availability of nutrients in pregnant women declines. Three factors that may be associated with anaemia among pregnant women are reduced intake of red meat and green vegetables and low, mid-upper arm circumference (MUAC) [6]**.** Folic acid deficiency can occur if food is not replaced with iron and folic acid tablets during pregnancy.

According to WHO, daily oral iron and folic acid supplementation are recommended for antenatal care to reduce the risk of low birth weight, maternal anaemia, and iron deficiency. The suggested schemes for daily iron and folic acid supplementation in pregnant women are [7]:

1. **Supplement composition:** Iron: 30-60mg of iron. Folic acid: o.4mg
2. **Frequency:** One supplement daily
3. **Duration:** Throughout pregnancy and 3 months post-delivery.
4. **Target group:** All pregnant adolescent and adult women
5. **Settings:** All setting

Despite this recommendation, some pregnant women are non-compliant with iron and folic acid supplements. Several factors contribute to non-adherence to IFAS, and different studies highlight them. A study conducted in Ethiopia [8] concluded that factors contributing to low compliance with Iron and Folic Acid supplements were birth intervals, number of children, timing of antenatal visits, forgetfulness, region, and lack of service delivery for antenatal services. Women who begin antenatal visits in the first trimester may also commence IFA supplementation during this time. This usually leads to many disturbances, including gastrointestinal discomfort. This development of side effects may lead to discontinuing IFA supplementation, affecting proper adherence [8].

Women who failed to consume the IFAS tablet, according to the recommendation, would experience iron and folic acid deficiency and associated adverse effects on mothers and

new-borns. Anaemia is reported to have adverse maternal and child health effects and increase the risk of maternal and perinatal mortality. The adverse health effects for the mother include fatigue, poor work capacity, impaired immune function, increased risk of cardiac diseases, and mortality. Anaemia in pregnancy is associated with an increased risk of preterm birth and low birth weight (LBW) babies postpartum haemorrhage and poor birth outcomes. Preterm and LBW are still the leading causes of neonatal death in developing countries like Tanzania, contributing to 30% of deaths. [9]

Broad objective

OBJECTIVE: Our study aimed to comprehensively understand the prevalence and factors associated with non-adherence to Iron and Folic Acid Supplementation among pregnant women attending Antenatal Care at Mwembeladu Hospital. By achieving this objective, we hope to contribute to developing effective strategies to improve IFAS adherence.

Specific objectives

1. To determine the social-demographic characteristics associated with non-adherence to IFAS among pregnant women attending Antenatal Care.
2. To identify the factors associated with non-adherence to Iron and Folic Acid Supplementation among pregnant women attending Antenatal Care.

Methodology

Description of the study area

Mwembeladu Maternity Hospital is about a 10-minute drive from Mnazi Mmoja Referal Hospital (MMH) in Zanzibar. The hospital has 36 beds and conducts an average of 550 monthly births. Only low-risk expecting mothers deliver at the hospital. High-risk and complicated cases are referred to MMH.

Target population

Pregnant women at Mwembeladu Hospital from January 2023 to May 2023.

Study population

The study population included pregnant women attending Antenatal Care at Mwembeladu Hospital.

Study design

A descriptive cross-sectional design was used in this study to determine the proportion of non-adherence to IFAS among pregnant women at ANC.

Sampling technique.

Simple random sampling (SRS) was used to select respondents for the study. In this method, each member of the study population had an equal chance of being chosen as part of the sample. SRS was also used to select pregnant women attending ANC.

Sample size determination

The sample size was determined by using the formula shown below

The sample size was as follows;

$N = Z^2 \times P \times q / E^2$

Where= is the minimum desired sample size

Z = the standard average deviation of 1.96, corresponding to a 95% confidence interval.

P = Proportion of the target population estimated from previous studies is 20.3% [10].

E= expected margin of error is 5%

q = (1-P)

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

$N = (1.96)^2$ X0.203 X (1-0.203)/ $(0.05)^2$

N= 249

Therefore, the minimum sample size was 249.

For convenience and to accommodate the non-response, there were 260 samples.

Inclusion criteria.

All Pregnant women attending a prenatal clinic at Mwembeladu hospital were included.

Exclusion criteria

The Non-pregnant women, pregnant women who had a mental illness, and those who were severely ill and could not respond well were excluded.

Study variable

Dependent variables:

- Number of pregnant women taking IFAS

Independent variables:

- **Social demographic factors:** Age, Educational status, marital status, and occupation status.
- **Obstetric and Health-related factors:** gravidity, number of children, time initiating ANC, knowledge of anaemia, and IFAS.
- **Risk factors for non-adherence such as** availability of IFAS, side effects and socio-cultural feeding practice of pregnant women, hospital-related factors, and family history of anaemia**.**

Definitions

Good adherence to IFAS: pregnant women who were taking more than four tablets per week

Poor adherence: pregnant women who were taking less than four tablets per week

Data collection technique

Primary and secondary data collection techniques and methods were used.

Primary data collection techniques/methods.

This study collected primary data through face-to-face interviews using an adapted validated open questionnaire [10], group discussion with the target group, and personal observation.

Secondary data collection techniques/methods.

Secondary data was collected from up-to-date documentary sources, i.e., published and unpublished books and journal articles.

RESULTS

socio-demographic characteristics

The study consisted of 260 pregnant women attending ANC at Mwembeladu Hospital Zanzibar. Regarding age, about 136 (52.3%) were between the age of 23-32 years, followed by 94 (36.2%) between the age of 33-42 years, 15 (5.8%) were between the age of 13-22 years, 15 (5.8%) were between the age of greater than 42 years. About 150 (57.7%) had secondary education, followed by 54 (20.8%) who attained primary education, then 44 (16.9%) had a university education level and 12(4.6%) never go to school. Relating to marital status, about 212 (81.5%) were married, 23 (8.8%) were single, 18 (6.9%) were widowed, and 7 (2.7%) were divorced. In this group of pregnant women, 139 (53.5%) were homemakers, followed by 88 (33.8%) who were daily labourers, and the remaining 33 (12.7%) were government employees. (Table 1)

Adherence of IFAS on pregnant women and associated factors

Among the pregnant women, 161(61.9%) took IFAS, while 99 (38.1%) did not take the supplementation. Of the 161 gravitas who had taken IFAS, 97 (60.2%) followed the recommendation of more than four tablets per week (good adherence), and 64 (39.8%) did not follow the recommendation of less than four tablets per week (poor adherence), (table 2)

Of 260 participants, 163 (62.7%) had no adherence to IFAS (99 who had not taken IFAS plus 64 who had taken less than four tablets). The factors that contributed to them not taking IFAS were; 3 (1.8%) failed access IFAS, 30 (18.4%) forgetfulness, 11 (6.7%) late initiated ANC, 5 (3.1%) long distance to health facilities, 31 (19%) side effects of IFAS, 8 (4.9%) tiredness, 20 (12.3%) lack of knowledge of anaemia, 36 (22.1%) lack of knowledge of IFAS, 10 (6.1 %) lack of support from partner, 9 (5.5%) others. (Table3)

Factors associated with poor (adherence to treatment

Within the sociodemographic factors, there was no relationship between marital status, level of education, or occupation with treatment adherence. Pregnant women with a small family less adherence to IFAS than those with medium and large family Chi-

Square 4.3473 p 0.037. Having previously suffered from anaemia was associated with better adherence IFAS p0.0004. Not hearing about IFAS correlated with poor treatment adherence: Chi-Square 17.4536 p 0.00. Likewise, not knowing that IFAS is beneficial was associated with poor adherence: Chi-Square 17.4536 p 0.000. (Table 4)

Table 1: Socio-demographic characteristics data

Social demographic data	Frequency	Percentages (%)
Ages(years)		
13-22	15	5.8
23-32	136	52.3
33-42	94	36.2
Greater than 42	15	5.8
TOTAL	**260**	**100.0**
EDUCATIONAL STATUS		
Primary	54	20.8
Secondary	150	57.7
University	44	16.9
Never go to school	12	4.6
TOTAL	**260**	**100**
MARITAL STATUS		
Single	23	8.8
Married	212	81.5
Widowed	18	6.9
Divorced	7	2.7
TOTAL	**260**	**100**
OCCUPATIONAL STATUS		
Housewife	139	53.3
Daily laboured	88	33.8

Government employee	33	12.7
TOTAL	**260**	**100**

Table 2: Prevalence of adherence of IFAS on pregnant Women.

Number of women who are taking IFAS	**Frequency**	**Percentage (%)**
Yes	161	61.9
No	99	38.1
TOTAL	**260**	**100**
Adhere to IFAS as recommended among those who taking IFAS (n=161).		
Less than 4 tabs per week	64	39.8
More than 4 tabs per week	97	60.2
TOTAL	**161**	**100.0**

Table 3. Factors that are associated with non-adherence of IFAS as recommended on pregnant women. (n=163)

	frequency	Percentage (%)	Valid percent	Cumulative percent
failed access IFAS	3	1.8	1.8	1.8
Forgetfulness	30	18.4	18.4	20.2
Late initiated ANC	11	6.7	6.7	26.9
Long distance to health facilities	5	3.1	3.1	30.0
Side effects of IFAS	31	19.0	19.0	49.0
Tiredness	8	4.9	4.9	53.9

Lack of knowledge of anaemia	20	12.3	12.3	66.2
Lack of knowledge of IFAS	36	22.1	22.1	88.3
Lack of support from partner	10	6.1	6.1	94.5
Others	9	5.5	5.5	100
TOTAL		**100.0**	**100.0**	

Table 4. **Factors associated to adherence to IFAS among pregnant women at Mwembeladu Maternity Hospital, Zanzibar**

(n =260) Factors	**Good adherence to IFAS (yes)**	**Poor adherence to IFAS (no)**	**OR**		**Chi – square P**
			OR	**95% CI**	
Marital status					
Married Single	144 (55.4%) 16 (6.2%)	91 (35%) 9 (3.4%)	0.8901	0.3775-2.0989	0.0708 p 0.7901
Education of pregnant woman					
Educated Never go to school	154 (59.2%) 6 (2.30%)	94 (36.2%) 6 (2.30%)	1.6383	0.5134-.2277	0.7077 p 0.4002
Occupation					
House wife Worker	78 (30%) 82 (31.5%)	61 (23.5%) 39 (15%)	0.6082	0.3661-1.0103	3.7116 0.0540
Family size					
Small Médium and large	78 (30%) 82 (31.5%)	62 (23.85 %) 38 (14.61%)	0.583	0.3504-0.97	4.3473 P 0.037
History of anemia					
Yes No	83 (31.92%) 77 (29.61%)	34 (13.07%) 66 (25.38)	0.4779	0.285-0.8015	7.9444 p0.0004

Heard about IFAS					
Yes No	134 (51.5%) 24 (9.23%)	62 (23.84%) 38 (14.61%)	3.422	1.891-6.1926	17.4536 p0.0000
Is IFAS beneficial					
Yes No	143 (55%) 17 (6.54%)	64 (24.62%) 36 (13.84 %)	3.422	1.891-6.1926	17.4536 P0.0000

Discussion

The study consisted of 260 pregnant women attending ANC at Mwembeladu Hospital. There was poor adherence to IFAS in general, similar to that described by other African authors. [11,12,13] but in contrast with [14,15]

Poor adherence to IFAS has severe consequences for pregnant women, as it increases the prevalence of anaemia, hospital admissions, and costs, in addition to the risks associated with blood transfusions. For the fetus, the short-term consequences include low birth weight, the threat of preterm birth, and neural tube closure defects. In the long term, low birth weight is associated with many chronic diseases, such as diabetes, cardiovascular diseases, and dementia. Adherence to IFAS promotes disease prevention throughout the life course.

Based on socio-demographical characteristics, women's educational level and occupational status were significantly associated with good adherence. This contrasts with studies done in Ethiopia [16,17], which showed that women's educational level was associated with poor adherence and the association of anaemia with intestinal parasites. The study recorded an exciting result in the area of adherence; However, more than half of the participants reported taking IFAS, and most showed no adherence to the WHO's recommendations by either not taking it at all or taking it less than four times per week. The findings align with a study by Kasulu Hospital in Tanzania [10], whereby only 20.3% of pregnant women adhered to IFAS as recommended. A survey in Aykel town, Ethiopia [18], showed that only 47.6% adhered to IFAS as recommended. However, this figure contrasted with other studies [19,20], which show that about 56.0% adhered to IFAS. Another study in Assefa, Ethiopia, showed that 59.8% adhered to IFAS.

The result also showed that the major factors militating against pregnant women taking IFAS are lack of knowledge of IFAS (22.1%), side effects of IFAS (19%), forgetfulness (18.4%), and lack of understanding of anaemia (12.3%). These results correspond to the study done at Kasulu Hospital, which showed that the major contributing factors to non-adherence were a lack of knowledge of anaemia and IFAS. This also collaborates with the study done at Yaounde Hospital in 2019, which showed that side effects (19.7%) and forgetfulness (70.1%) contributed to non-adherence to IFAS. However, other workers found other factors associated with low adherence in the Philippines, such as ethnic minorities, religion, and low educational level. [21] In our study, we found a good educational level but this did not influence the pregnant women to have better adherence to the treatment, which means that it is necessary to motivate the pregnant woman and her family more about the importance of IFAS to preserve the health of the mother and fetus. This was similar to other findings in Bangladesh [22,23]

Conclusion

Overall, the adherence to IFAS among pregnant women was low and did not meet the WHO recommendations for the prevention and treatment of anaemia during pregnancy. Socio-demographic factors, including occupation and education level, maternal characteristics, parity, and gestation age, are all significantly associated with adherence to IFAS. Factors associated with poor adherence to IFAS include side effects, failure to access IFAS, forgetfulness, and knowledge about anaemia and IFAS

Recommendation

Healthcare facilities and providers should strengthen the system to create community awareness of IFAS, its benefits, and its side effects, as well as knowledge of how they contribute to increasing the rate of anaemia in pregnant women. This will help improve adherence and access to supplements. Reproductive and Child Health institutions must ensure enough IFAS and that all pregnant women receive IFAS regardless of the distance

from their homes to health facilities. Bringing proper health education to television and radio jingles in the Kiswahili language can help awaken their enthusiasm for this project.

Family support, especially from partners to their pregnant wives, is critical in adhering to IFAS. This will help prevent forgetfulness and tiredness. Overall, family encouragement must be a task to arrest this dangerous trend in maternal health.

Limitation: This study was conducted in an urban area of Unguja Island, Zanzibar, and focused on pregnant women who did not have conditions requiring hospitalization. However, there could have been potential recall bias due to self-reported data.

We extend our gratitude to all the pregnant women and staff who contributed to completing this study.

Ethical approval and consent:

The Zanzibar Health Research Institute, ZAHREC, approved the ethical clearance for conducting health research with **REF NO. ZAHREC/05/MARCH/2023/39**. The collected data were used for this research purpose only and kept completely confidential. Written informed consent was obtained from the study participants, and personal identifiers were excluded during the data collection to ensure confidentiality.

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Details of the AI usage are given below:

1.

2.

3.

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