



Knowledge, Attitudes and Practices towards the Use of Iron and Folic Acid Supplements among Pregnant and Lactating Women in Dar es Salaam

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Abstract

The current study investigated knowledge, attitudes and practices (KAP) regarding the use of iron and folic acid (IFA) supplements among pregnant and lactating women living with Human Immunodeficiency Virus (HIV) in Dar es Salaam. A cross-sectional survey involved 294 pregnant and lactating women attending Prevention of Mother-To Child Transmission (PMTCT) clinics. A semi-structured questionnaire was used to collect data from the subjects. The data were analysed using SPSS. Multivariate regression analysis was carried out to determine factors associated with IFA supplement use among the study subjects. The findings indicated that knowledge of IFA supplement use among the subjects was good (92.2%). Most of the respondents (89.8%) had appropriate perceptions of IFA supplements. The subjects also showed positive attitudes towards the use of IFA supplements during pregnancy and lactation. However, practices towards the use of supplements were not satisfactory. It was further revealed that only 15.2% of the women received supplements during pregnancy and a few weeks after delivery as recommended. Women claimed the main barriers towards using the supplements were bad taste (46.7%) and nausea (45.2%). The multivariate logistic regression model showed that factors like being a businesswoman, comfortable use of the supplements and experiencing any barriers were significantly associated with practices on the use of the supplements. Thus, healthcare workers should clear up the misconceptions about using the supplements and instruct women on how to manage their potential side effects as they have been doing with other conditions or illnesses.

Keywords: Iron, folic acid, anaemia, supplements, knowledge, attitude, practice, pregnant, lactating women.

Introduction

Maternal micronutrient deficiency is common among pregnant women in low- and middle-income countries partly contributed by inadequate dietary intake. A study by the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC)-Tanzania, Ministry of Health (MoH)-Zanzibar, National Bureau of

Statistics (NBS), Office of the Chief Government Statistician (OCGS), and Inner City Fund (ICF) in Tanzania revealed that 57% of pregnant women were anaemic (MoHCDGEC et al. 2016). This has significant impacts on mothers and foetus health (Erhabor 2013). Some of the widely known consequences of anaemia include birth defects, low birth weight, increase

abnormalities such as Neural Tube Defects (NTDs) and foetal deaths. Other consequences are toxemia, inadequate maternal weight gain and delivery complications, and increased risks of maternal deaths (Popa et al. 2013). In addition, these deficiencies may lead to physical and cognitive impairments; thus, stalling social and economic development. Anaemia in pregnancy is widely associated with poor nutrition such as inadequate intake of iron, folic acid and other micronutrients, low income and older maternal age. Other risk factors are parasitic infestations, chronic infections such as HIV infections, illiteracy, and short pregnancy intervals (Okeke 2011). Under normal circumstances, pregnant women are advised to take adequate amounts of foods rich in energy, protein, vitamins, minerals, dietary fibres and water. As with other chronic infections, HIV infection causes disturbances in iron metabolism and anaemia (WHO 2003). They are also independent predictors of mortality and death (O'Brien et al. 2005). Furthermore, many drugs used to treat HIV infections can cause anaemia. Thus, people with HIV infections are at increased risks of developing anaemia (Volberding et al. 2004). In addition, being pregnant or lactating increases the body's nutritional needs (Marangoni et al. 2016). Therefore, in order to prevent micronutrient deficiencies and birth defects, pregnant and lactating women are advised to use iron and folic acid (IFA) supplements.

Daily oral iron and folic acid supplementation is recommended for the purpose of improving pregnancy outcomes and reducing maternal anaemia during pregnancy (WHO 2012). In addition, folic acid is required to synthesise, repair and methylate DNA, and acts as a cofactor in some biological reactions. It is important in cell division and growth during pregnancy and infancy (Hisam et al. 2014). Therefore, in order to prevent IFA deficiencies and maintain good nutritional status, pregnant and lactating women living with HIV should consume foods rich in adequate amounts of iron and folic acid. However, these should be complemented with IFA supplements in order

to cope with the increased demands of the body.

Despite the WHO recommendation on IFA supplements, their uses are still low in some developing countries. For instance, in Eswatini, 22.5% of participants did not consume or consumed a few IFA supplements (Mabuza et al. 2021). A study in Kenya revealed that many women did not take IFA supplements because they were not well informed about their importance (Kimiye et al. 2017). While Tanzania has made positive progress in maternal anaemia reduction, there are still barriers to the uptake of IFA supplements through the focused antenatal care (ANC) package (Lyoba et al. 2020). National Demographic and Health Survey data indicated that only 28.5% of women between 15-49 years of age; with children under five years of age took IFA supplements for 90 days or longer during their previous pregnancy (MoHCDGEC et al. 2018). This implies that there is low compliance to IFA supplements. Very few studies have been conducted on knowledge, attitudes and practices (KAP) as well as factors that affect the utilization of IFA supplements among pregnant and lactating women in Tanzania (Ogundipe et al. 2012, MoHCDGEC et al. 2018, Lyoba et al. 2020, Moshi et al. 2021). Furthermore, little is known particularly on the same in the context of pregnant and lactating women with HIV who are probably more affected; bearing in mind that HIV causes disturbances in iron metabolism, hence increasing the risks of developing anaemia. Therefore, the current study was conducted to determine KAP, adherence and barriers to the use of IFA supplements among pregnant and lactating women who are HIV positive.

Materials and Methods

This was a cross-sectional study based on a hospital setting. Both quantitative and qualitative techniques were employed in the assessments of KAP towards IFA supplements in women attending Prevention of Mother-To Child Transmission (PMTCT) clinics. Quantitative data were collected through face-to-face interview using a semi-

structured questionnaire. The questionnaire consisted of various sections, namely general information about the respondents and socio-demographic and economic characteristics of the respondents. Other sections solicited information on the general health status of the subjects, KAP and barriers to the use of IFA supplements among the subjects. A sample of 294 HIV-infected pregnant and lactating women (i.e., 1:1 pregnant and lactating women) was used for the current study. This sample size was calculated by using Daniel (1999) formula, considering the estimated prevalence of iron supplement use (85.5%) in Dar es Salaam (MoHCDGEC et al. (2016), marginal error of 0.05 for a 95% confidence level and the desired level of precision of 0.05. Pregnant and lactating women attending PMTCT clinics were conveniently selected to participate in the study on one of their clinic days. Qualitative data was collected using focus group discussions (FGDs) and key informants' interview (KII). The FGD checklist and KII guide were used to solicit information on KAP and barriers towards the use of IFA supplements. FGDs were conducted among HIV-positive pregnant and lactating women who did not take part in the interview. Six FGD sessions comprising 6–7 pregnant and lactating women living with HIV were conducted. Key informants interview was conducted among nurse midwives and medical doctors working in PMTCT clinics in the study area. Each session lasted for about 60 to 90 minutes.

Data analysis

Data analysis was done using IBM SPSS (Version 24). Association between various independent variables such as socio-economic status and KAP towards the use of IFA supplements were examined using multivariate logistic regression. Variables with $p \leq 0.20$ were used in the multivariate models. Differences were considered significant at $p < 0.05$. The thematic analysis method was used for qualitative data.

Ethical considerations

Ethical procedures were observed when the current study was conducted. The permit

for the study was approved by The Open University of Tanzania (OUT). The researcher sought approval from the three municipal authorities, namely; DMO-Temeke, DMO-Mwananyamala, DMO-Ilala municipality, and the medical officers in charge of each of the selected hospitals. Before commencing data collection, the purposes of the study were explained to the participants and consent was sought from the subjects before participating in the study. The participants were given important clarifications and they were allowed to ask questions. The interviews commenced after their questions were thoroughly answered. Interviews were conducted in privacy and confidentiality was observed throughout. Questionnaires were managed and administered by the research team throughout the data collection period and the data collected were safely and securely kept. The worked questionnaires were stored in a locked cabinet accessible only to the research team. Data were entered into a password-protected computer accessible only to the research team.

Results

Socio-demographic and economic characteristics of the respondents

A total of 294 pregnant and lactating women living with HIV who were attending PMTCT clinics were interviewed. The mean age \pm standard deviation (SD) of the studied women was 28.7 ± 6.7 years ranging from 16 to 40 years. A quarter (25%) of the respondents had no formal education. Regarding the sex of the household heads, 53.4% of households were headed by males. The mean \pm SD household size was 4 ± 2.1 , ranging from 1 to 7 people (Table 1). With regards to the source of light, 94.2% of the respondents were mainly using electricity, while 3.8% used kerosene. Furthermore, 56.1% of the respondents owned houses whereas 43.9% rented. With regards to water supply, 56.8% of the respondents used tap water, while 43.2% used borehole water daily.

Table 1: Socio-demographic and economic characteristics of the subjects

<i>Parameter</i>		<i>Number (%)</i>
<i>Marital status</i>	Single	82 (27.9)
	Married/cohabiting	157 (53.4)
	Divorce/separated/widowed	55 (18.7)
<i>Education level</i>	No formal education	74 (25.2)
	Primary	110 (37.4)
	Secondary and above	110 (37.4)
<i>Occupation</i>	Civil servant	42 (14.3)
	House wife	69 (23.5)
	Business	169 (57.5)
	Casual labourer	14 (4.7)
<i>Assets ownership</i>	Television	285 (96.9)
	Radio	186 (63.3)
	Motorcycle	51 (17.3)
	Bicycle	11 (3.7)

General health status of the respondents

The respondents interviewed had their HIV-positive status diagnosed between 2006 and 2018 and they were currently receiving antiretroviral therapy (ART) (Figure 1). The findings revealed that most (97.6%) of the respondents were regularly receiving PMTCT care, and none of them was hospitalised.

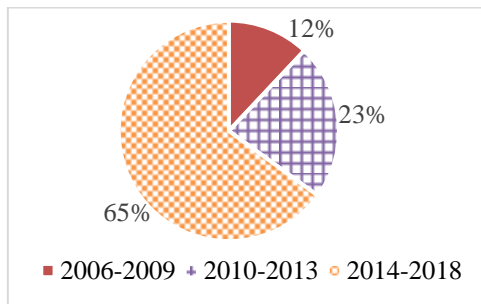


Figure 1: Distribution of respondents by the year diagnosed with HIV infections.

Knowledge of iron and folic acid supplementations among HIV-infected pregnant and lactating women

The findings revealed that 98% of the studied pregnant women and 74.4% of the studied lactating women did not know the kinds of foods required to eat during these physiological status. It was also established that 92.2% of women had heard of "micronutrients", however, 54.1% of them were unable to mention any examples of micronutrients they know. This limited

understanding of the types of micronutrients was also reported by subjects who participated in the FGD and KII interview sessions as presented here:

“Micronutrients is not a new term to us since we always use it in clinics and often hear from our health workers during nutritional education but, honestly we do not know exactly what micronutrients are” (FGD participants).

“To make mothers follow the session during health education and nutritional counselling, we go further referring to specific micronutrient supplements such as iron (red tablet) for increasing blood level and folic acid (yellow tablet) for prevention of birth defects instead of using the word micronutrients” (KII participants).

Nearly all respondents (99.6%) admitted to have heard about anaemia. Among them, 66% knew the causes for anaemia were lack of iron in the diet, HIV/AIDS, other infections, and a few (10%) mentioned heavy bleeding. Most of the respondents affirmed that they were able to recognize someone with anaemia. Some of the manifestations mentioned were paleness of the body (95.9%) and general body weakness (47.9%). In addition, 86% of the respondents were aware of the way anaemia can be prevented. Some of the preventive measures mentioned were: taking food rich in iron such as red meat and

dark green leafy vegetables (25.2%); consuming food rich in vitamin C such as oranges (14.3%); taking iron supplements (26.1%); and treating other infections such as malaria and hookworms (21%). Conversely, 14% of the subjects were not aware of the prevention of anaemia. With regards to the benefits of iron supplements, 72.4% of the respondents stated that it was helpful in mental and physical development of the foetus, while 27.6% stated that it was for preventing maternal anaemia. Most of the respondents (93.9%) admitted that they were aware of the benefits of using folic acid supplements during pregnancy. Some of the benefits mentioned include normal development of the nervous system of the foetus (94.5%) and prevention of birth defects (93.9%). However, some few respondents (6.1%) failed to mention any benefits of folic acid supplements.

Women's attitudes towards the use of iron and folic acid supplements

Variations in the respondents' attitudes towards the use of IFA supplements were observed in the current study. It was established that 76% of pregnant and lactating women attending PMTCT clinics had positive attitudes towards the benefits of using IFA supplements. Furthermore, positive attitudes toward the use of IFA supplements were demonstrated through willingness of the majority of the respondents (89.8%) taking them accordingly. The findings revealed that 76.9% of the respondents had positive attitudes towards the use of IFA supplements in combating the consequences of micronutrient deficiency to both mothers and their children. Subjects who participated in the FGD and KII sessions presented positive and negative attitudes, respectively as they reported their attitudes towards the use of IFA supplements in the context presented below:

"We all know the consequences of not taking IFA tablets during pregnancy and lactating, however, the majority of us are unaware of even the taste of these supplements" (FGD Participants).

"These supplements have a bad taste which discourages most of our clients from using them. In addition, most of our clients do not take these supplements simply because they perceive not to be sick and therefore they see no reasons of using them". "In some cases, the clients have the supplements but do not use them as prescribed" (KII Participants).

The use of iron and folic acid supplements among pregnant and lactating women in Dar es Salaam

The findings revealed that few respondents (15.2%) were using IFA supplements throughout their pregnancy and a few weeks after delivery as recommended. However, 30% of the respondents did not use IFA supplements at all during their previous pregnancy. Furthermore, 25.8% of the respondents did not know even the taste of IFA supplements despite their physiological status. These findings were confirmed by participants in the KII session as reported here:

"These IFA supplements are like a lifesaver to most pregnant women especially the ones diagnosed to have low haemoglobin (Hb) level, however, most of the women are not using them" (KII Participants).

Barriers against the use of iron and folic acid supplements among women

The findings established that many respondents (51%) were not using IFA supplements due to various reasons. Some of the reasons given were: bad taste (46.7%), nausea (45.2%) and other reasons (8.1%) including constipation, dark colour of the stool, vomiting, long administration time and unavailability of the supplements. It was also established that 58% of the respondents faced barriers in using IFA supplements because they were advised to buy the supplements from private pharmacies when the stock was out. However, most of them could not afford them. These findings were supported by the FGD and KII responses as presented here:

"We are advised to use these tablets because of the benefits they have to our

bodies; however, their taste discourages us from using them". "I hardly take these tablets because they induce vomiting". "Yes! These tablets are offered free of charge in clinics, however in some cases, they are not available, hence we are forced to buy from private pharmacies" (FGD Participants).

"Due to limited supply of these IFA supplements, we advise our clients to buy them from private pharmacies" (KII Participants).

Factors associated with iron and folic acid supplements use among pregnant and lactating women attending PMTCT clinics

The findings revealed that some factors influenced the use of IFA supplements among pregnant and lactating women. The factors were occupation of a woman, namely business ($p \leq 0.01$) and experiencing no difficulty in using IFA supplements ($p \leq 0.0001$). These factors were significantly associated with the use of IFA supplements among pregnant and lactating women residing in Dar es Salaam as summarised in Table 2.

Table 2: Factors associated with IFA supplement use among pregnant and lactating women

Determinant		OR (95% CI)	P value
Education level	Secondary or higher	1	
	No formal education	0.82 (0.31, 2.13)	0.46
	Primary education	1.25 (0.57, 2.72)	0.35
Occupation	Housewives	1	
	Civil servant	0.51 (0.12, 2.27)	0.71
	Business	0.23 (0.04, 1.24)	0.01
	Casual labourers	1.00 (0.27, 3.78)	0.07
Difficulties in taking IFA	Experienced difficulties	1	
	No difficulties	4.82 (2.42, 9.58)	<0.0001
Barriers to taking IFA supplements	No barriers	1	
	Reported barriers	3.17 (158,6.38)	0.001

Discussion

Knowledge, attitudes and practices towards the use of iron and folic acid supplements among the studied women

The findings established that knowledge regarding the use of IFA supplements among pregnant and lactating women living with HIV in the current study was adequately good. However, this good knowledge was hardly translated into practices as the majority of participants remained aware of IFA supplements without using them. Similar findings were reported in the study by Kimiywe et al. (2017). Most of the respondents in the current study perceived that it was good for them to take IFA supplements due to their health benefits. However, only a negligible proportion of women took IFA supplements throughout their pregnancy and a few weeks after delivery as recommended by WHO. The WHO (2012) recommends a daily intake of

30–60 mg of iron and 400 µg folic acid. Limited use of IFA supplements among pregnant women is supported by studies in Northern Tanzania (Ogundipe et al. 2012) and Ghana (Gosdin et al. 2020). This could be partly due to the perceived side effects such as nausea and bad taste experienced after taking IFA supplements. Another reason could be the burden of taking many tablets, namely, iron and folic acid among women who are already on Anti-Retroviral Therapy (ART) treatments, which are all taken on a daily basis. Furthermore, Mgonja et al. (2014) revealed that some women deliberately stopped taking folic acid supplements due to the smell or the feeling experienced just after taking them.

In the current study, it was noted that the extent of taking IFA supplements among the studied women did not meet the WHO (2012) recommendations. The WHO recommends that pregnant women should start taking iron

supplements (30-60 mg a day) when they have their first prenatal appointment and folic acid (400 µg a day) as early as possible (ideally before conception) to prevent birth defects. The inadequate intake of IFA supplements experienced in the current study could be partly influenced by the perceived side effects of the supplements. These findings therefore, concur with MoHCDGEC et al. (2018).

Women and health workers perceived barriers to the use of IFA supplements

The current study revealed several barriers to the use of IFA supplements among women. Several studies reported similar findings, including side effects of the tablets (Mabuza et al. 2021), changing colour of stool, bad taste and nausea (Gosdin et al. 2020). Other barriers include the poor supply of IFA supplements in PMTCT clinics (Ogundipe et al. 2012, Nisar et al. 2014), and costs attached to purchasing the supplements (Popa et al. 2013, Nisar et al. 2014, Siekmans et al. 2018, Sedlander et al. 2020). Other relevant barriers were forgetting (Lyoba et al. 2020, Mabuza et al. 2021) and distance between home and the health facility (Kimiye et al. 2017, Lyoba et al. 2020). Women experiencing barriers in using IFA supplements were significantly associated with practices towards the use of the supplements. This could be attributed to the attitudes towards the use of IFA supplements among women. These findings agree with the study by Kimiye et al. (2017) carried out in Kenya which indicated that few women reported continuing taking IFA supplements despite their side effects. Likewise, health providers identified some barriers to administering IFA supplements. This included negative attitudes, limited use of the tablets among women and perceived side effects such as nausea and vomiting. These findings corroborate the findings in the study by Siekmans et al. (2018) which revealed various barriers to the use of IFA supplements. Other barriers were the reliance of health workers on signs and symptoms of anaemia for diagnosis and inadequate supply of IFA tablets in health facilities (Sedlander

et al. 2020). Several factors like being a businesswoman, experiencing no difficulties in using IFA tablets and reported barriers in using IFA supplements were significantly associated with practices towards the use of IFA supplements among pregnant and lactating women residing in Dar es Salaam.

Strengths and limitations of the study

Few studies have been conducted on KAP regarding IFA supplements in Tanzania among pregnant and lactating women. This study was conducted in Dar es Salaam region where no such study had been conducted before. The use of mixed research methods in the current study provided a broader spectrum of ways to better understand complex research problems in a more different context than it could be done through either quantitative or qualitative approach alone. Another strength of the current study was on the sources of data used. The data were collected from three regional referral hospitals, namely Amana, Temeke and Mwananyamala, which had the largest influx of women coming from all over Dar es Salaam. Therefore, the outcomes of this study can be generalised to the wider population. Furthermore, data collection was done by female researchers to avoid some psychological barriers. Consequently, the subjects who were all women became very expressive in front of their fellow women who worked as field assistants for collecting data. Some limitations of the current study addressed the fact that due to the cross-sectional nature of this study, establishing a true cause and effect relationship between the use of IFA supplements and associated factors would be impossible. This study might also have been affected by recall bias.

Conclusion and recommendations

The knowledge and attitudes towards the use of IFA supplements among pregnant and lactating women were adequately good. Despite good knowledge and positive attitudes toward the use of IFA supplements, the practices on the use of IFA supplements among the subjects were not satisfactory. This is because only a small proportion of the

studied subjects received IFA supplements during pregnancy and a few weeks after delivery. Additionally, women identified barriers to the use of IFA supplements, which include bad taste and nausea. However, women who felt comfortable using IFA supplements and those who reported barriers on using them were significantly associated with practices on the use of the supplements. Provision of more knowledge on managing barriers to the use of IFA supplements among pregnant and lactating women living with HIV would be beneficial. For instance, healthcare workers should clear up misconceptions about the use of supplements and instruct women how to manage their potential side effects as they have been doing with other pregnancy-related conditions or illnesses.

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Competing interests

The authors declare that they have no competing interests.

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