

Barriers to Optimal Iron Supplementation by Pregnant Women Attending the Mutare City Clinic, Manicaland, Zimbabwe

Plaxcedia Mahundi

<https://orcid.org/0000-0003-3821-6205>
University of KwaZulu-Natal, South
Africa
mahundi.placky@gmail.com

Kirthee Pillay

<https://orcid.org/0000-0003-3161-1050>
University of KwaZulu-Natal, South
Africa
pillayk@ukzn.ac.za

Nicola Wiles

<https://orcid.org/0000-0002-5250-3553>
University of KwaZulu-Natal, South
Africa
wilesn@ukzn.ac.za

Abstract

The optimal use of iron supplements by pregnant women is important in ensuring healthy pregnancy outcomes. However, some barriers may prevent the optimal use of iron supplements by pregnant women in developing countries, subsequently resulting in iron deficiency anaemia, threatening the health of the pregnant woman and the fetus. This study aimed to identify possible barriers to optimal iron supplementation among pregnant women and possible strategies for alleviating these barriers. This cross-sectional study was conducted at the Mutare City Clinic in Manicaland, Zimbabwe. A total of 64 Black African pregnant women aged between 17 and 39 years participated in 8 focus group discussions. The pregnant women identified several barriers to the optimal use of iron supplements. The major barriers were poor compliance mainly due to erratic supplies of iron supplements at the healthcare centre, inadequate nutrition education on the benefits of iron supplements, side effects, and religious and cultural beliefs. Poverty and the influence of family members were other barriers. Most pregnant women were accustomed to receiving iron supplements free of charge from the healthcare centres and could not afford to buy them from private pharmacies. Despite erratic supplies at healthcare centres, continuous reinforcement of positive iron supplementation could motivate pregnant women to take iron supplements. Intensive nutrition



Africa Journal of Nursing and Midwifery
<https://upjournals.co.za/index.php/AJNM/index>
Volume 23 | Number 1 | 2021 | #6948 | 17 pages

<https://doi.org/10.25159/2520-5293/6948>
ISSN 2520-5293 (Online), ISSN 1682-5055 (Print)
© Unisa Press 2021



Published by Unisa Press. This is an Open Access article distributed under the terms of the Creative Commons Attribution-ShareAlike 4.0 International License (<https://creativecommons.org/licenses/by-sa/4.0/>)

education programmes may help to improve perceptions of women towards iron supplements. This could possibly help to overcome barriers to optimal iron supplementation, and thus reduce the prevalence of iron deficiency anaemia among pregnant women in Zimbabwe.

Keywords: iron supplements, barriers, pregnant women, compliance

Introduction

Iron deficiency anaemia (IDA) remains the most common and prevalent global public health nutritional disorder. This is despite many efforts by health ministries worldwide to increase the availability of iron supplements to women during pregnancy (Bilimale et al. 2010; Habib et al. 2009; WHO 2018). It is most prevalent in developing countries, where nutritional deficiency owing to poverty and parasitic infections contribute to increased maternal and perinatal mortality and morbidity (Alam et al. 2015; WHO 2018). Pregnant women are among the most vulnerable populations affected by IDA, despite the recommended routine iron supplementation during pregnancy (Bilimale et al. 2010; Ugwu et al. 2014; WHO 2018). Therefore, because of nutritional deficiencies affecting the developing world, pregnancy presents a nutritional challenge because inadequate micronutrient intake during preconception and pregnancy affects fetal organ development and maternal health (Milman et al. 2016). Pregnant women in particular are at a high risk of IDA caused by inadequate nutrient intake. The inadequate nutrient intake usually occurs even before conception, and is worsened by the significantly increased iron requirements during pregnancy (Alam et al. 2015; Bilimale et al. 2010; Habib et al. 2009; WHO 2018).

Regardless of large-scale anaemia interventions, the prevalence of IDA continues to rise in developing countries (Bilimale et al. 2010). The highest prevalence rate (61.3%) was found among pregnant women in Africa, with 52.5 per cent among women in South East Asia (Gebre and Mulugeta 2015; WHO 2008; 2015; 2018). There is evidence to suggest that over 90 per cent of maternal anaemia may be due to inadequate consumption of dietary iron, thus reflecting the increased demands for iron in pregnancy (WHO 2008; 2015). Increased blood loss due to hookworm, bleeding, vitamin deficiencies, human immunodeficiency virus (HIV) and genetic disorders such as sickle cell anaemia, also add to the prevalence of anaemia in pregnant women (WHO 2015).

Iron supplementation during pregnancy is currently the most common strategy used to redress IDA, especially in developing countries, where diets usually lack iron and are not varied (Sanghvi, Harvey, and Wainwright 2010; Ugwu et al. 2014; WHO 2015; 2018). Iron supplementation increases ferritin levels and haemoglobin (Hb) by 1.13 g/dl during pregnancy and also improves maternal iron stores in the puerperium (Alam et al. 2015; Bilimale et al. 2010; Sanghvi, Harvey, and Wainwright 2010). The optimal use of iron supplements during pregnancy is beneficial to both the pregnant woman and the fetus. Most of the irreversible damage in children due to malnutrition occurs during gestation and in the first 24 months of life (Sanghvi, Harvey, and Wainwright 2010;

UNICEF 2017). Iron deficiency causes hidden hunger, which is insidious and not visible to the naked eye. It does not produce typical hunger symptoms and is also not felt physiologically (UNICEF 2017). A person with hidden hunger may appear to be consuming an adequate amount of food, especially staples, yet it has a negative impact on their health and nutritional status (HarvestPlus 2018; Sadore, Gebretsadik, and Hussen 2015; UNICEF 2017).

Although iron supplements are prescribed during pregnancy, there are many barriers preventing optimal use of supplements by most women (Ugwu et al. 2014). The major barrier to iron supplementation among pregnant women is poor compliance (Habib et al. 2009; Ugwu et al. 2014). Compliance with iron supplementation is one of the most important factors that affect the efficacy and outcome of an iron supplementation programme, especially during pregnancy. Compliance can be defined as the extent to which a person's behaviour coincides with medical advice (Bilimale et al. 2010). However, non-compliance is a major threat and contributing factor to inadequate iron supplementation in developing countries, despite iron supplies being erratic in most instances (Alam et al. 2015; Bilimale et al. 2010; Kamau, Mirie, and Kimani 2018; Nisar et al. 2014; Sadore, Gebretsadik, and Hussen 2015). Inconsistent compliance with therapy requirements is a potential driver of the persistent high prevalence of IDA in pregnancy (Habib et al. 2009; Ugwu et al. 2014).

The major threats to compliance with iron supplementation include inconsistent availability of iron supplies at healthcare centres, gastrointestinal side effects from iron supplements, and religious and cultural factors (Bilimale et al. 2010). The high cost of iron supplements, poor antenatal care (ANC) service delivery from healthcare centres, forgetfulness, and inadequate nutrition education for pregnant women also affect compliance. Other barriers include the shortage of motivated staff at healthcare centres and a lack of healthcare resources, such as equipment to test Hb levels at clinics. Most pregnant women get to the point of delivering their infants without knowledge of their Hb status, owing to the unavailability of the equipment needed for testing (Bilimale et al. 2010; Habib et al. 2009; Ugwu et al. 2014).

Despite the many barriers that prevent the optimal use of iron supplements, iron supplementation during pregnancy remains a key strategy for controlling IDA (Sanghvi, Harvey, and Wainwright 2010; WHO 2008; 2018). The prevalence of maternal anaemia can be reduced substantially if action is taken to launch focused large-scale iron supplementation programmes, especially in developing countries (HarvestPlus 2018; Sanghvi, Harvey, and Wainwright 2010; WHO 2008; 2015). It is therefore important to identify the barriers that prevent the optimal use of iron supplements by pregnant women during pregnancy. Identifying the barriers and suggesting possible strategies to overcome them may improve the use of iron supplements during pregnancy and prevent IDA during pregnancy. The high prevalence of IDA in developing countries such as Zimbabwe has resulted in increased maternal and perinatal mortality and morbidity (WHO 2010; 2015). Therefore, this study was significant in that it aimed to identify

barriers to optimal iron supplementation by pregnant women attending the Mutare City Clinic in Manicaland, Zimbabwe, and to suggest possible strategies for alleviating these barriers.

Methods

This study employed a qualitative approach using eight focus group discussions (FGDs). Sixty-four pregnant participants were purposively selected from all pregnant women receiving ANC at the Mutare City Clinic. These women were recruited when they came in for their routine ANC visits. The nurses at the clinic used the health records of pregnant women to establish whether the women met the inclusion criteria for the study, based on the gestation stage. The participants were either in their second or in their third trimester of pregnancy.

The FGDs were conducted on Mondays and Fridays consecutively for four weeks at the Mutare City Clinic premises. The researcher ensured that FGDs were not repeated with the same participants, who would come for their ANC check-up after every four weeks. The number of participants depended on the attendance on that particular day. There was a fixed designated place and time at the clinic premises, in which the discussions were held. The FGD questions were generated before the study in English and translated into Shona. The FGD questions were then translated back to English to check for accuracy in translation. Before participating in the discussions, the participants gave consent to participate, to be photographed and to be audio-recorded by signing consent documents in English or Shona. The FGD sessions were conducted by a trained facilitator, the researcher and two research assistants, who were fluent in both Shona and English. The discussions were recorded using a digital voice recorder. All the recordings were translated from Shona into English verbatim by the FGD facilitator, before being cross-checked by another Shona- and English-speaking person for accuracy.

Data Analysis

In this study, the focus group data were analysed using the inductive analysis approach. With an inductive- or open-coding approach, major themes and concepts arising from findings are generated using the grounded theory (Alshenqeeti 2014; Guest, Namey, and McKenna 2017; Jamshed 2014). In this study, theories and philosophies were then drawn from four themes that emerged from the FGDs.

Ethics Approval

Ethics approval was obtained from the Humanities and Social Sciences Ethics Committee at the University of KwaZulu-Natal, (HSS/0369/016D). The Department of Health of the Mutare City Council issued a letter of approval for the study to be

conducted at the Mutare City Clinic. Before participating in the discussions, the participants gave consent to participate, to be photographed and to be audio-recorded by signing consent documents.

Results and Discussion

Demographic Characteristics of Participants

The demographic characteristics of the participants in the study are presented in Table 1.

Table 1: Demographic characteristics of participants ($n = 103$)

Variable	<i>n</i>	%
Age (years)		
16–17	2	1.9
18–20	10	9.7
21–25	28	27.2
26–30	39	37.9
31–35	17	16.5
> 35	7	6.8
Marital status		
Married	101	98.1
Single	2	1.9
Divorced	0	0
Religion		
Christian	103	100
Highest education level		
Grade 7	1	0.9
Form 1–2	8	7.8
Ordinary level	64	62.1
Advanced level	12	11.7
Diploma	12	11.7
Bachelor's degree	5	4.9
Master's degree	1	0.9
Employment status		
Unemployed	54	52.4
Formally employed	32	31.1
Informally employed/self-employed	17	16.5

The 64 participants were all female, pregnant and aged between 17 and 39 years. The participants were either in their second ($n = 41$; 64.1%) or in their third ($n = 23$; 35.9%) trimesters of pregnancy. Almost all the participants ($n = 101$; 98.1%) were married. The majority ($n = 64$; 62.1%) had achieved ordinary level academic qualifications, even

though they were mostly unemployed. There was a 100 per cent Christian religion affiliation, with varied denominations.

The findings from the FGDs on the influence of indigenous knowledge systems (IKS) on the use of iron supplements are presented in Table 2. Table 3 presents findings on the impact of attitudes and perceptions of the participants on iron supplementation.

Table 2: Influence of indigenous knowledge systems on the use of iron supplements

Discussion topics	Theme	Concept	Responses	Quotes
Influence of culture and tradition on the use of iron supplements	Indigenous knowledge systems Culture and tradition	Knowledge as influenced by traditional norms and values	Pregnant women are often forced by tradition and culture to take alternative supplements, which are supposedly meant to make delivery less complicated. There are often threats that if one does not take these traditional “concoctions”, one is likely to experience complications such as delivery through caesarean section. Failure to take the traditional medications is usually regarded as insubordination to family authority. Therefore, pregnant women develop a fear of being blamed should any complication arise owing to failure to take traditional medication.	“The mothers-in-law force us to drink homemade concentrated concoctions, usually avocado, guava and mango leaves boiled in a big pot.” “Culture is still very powerful in giving us directions on what to eat, and sometimes it’s better to take the concoctions than to have complications.” “Tsika dzedu dzine problem, iri kutotisunga vazhinji vedu, titori kukwikwidzana. Vanotiti imwai maHerbs. We don’t know who will win the match.” [Our culture has a problem, forcing many of us to drink the homemade herbs when we do not want to. We are actually competing and we will see who the winner will be]
Belief systems vs scientific systems	Indigenous knowledge systems Religion	Traditional ways as influenced by a deity	Religious beliefs and respect for a deity are often in conflict with scientific knowledge in most cases. Spirituality is often perceived in traditional communities as superior and incomparable to scientific knowledge. The food recommended during pregnancy, such as meat, is usually discouraged by some denominations. This may cause some church	“Religion is very powerful to the extent that some pregnant women are not even coming here for check-up. They are not allowed even to come to collect the tablets.” “Havana kwekuto awanira chero vachimada” [Women cannot access iron supplements] “I told them at my church that when I am pregnant like now, they should forgive me, because I will not stop eating meat, like

Discussion topics	Theme	Concept	Responses	Quotes
			members to take the foods or supplements privately or else they risk being malnourished. Some religious sects are gradually opening up to the concept of scientific interventions related to the use of supplements. They have become more liberal in allowing their followers to take supplements and food they wish to consume. The participants felt that religion should not be very restrictive, but rather help its members to stay healthy.	pork, because I like it. It is also very appetising. Or else I will stop going to church until I have delivered my baby.” “But some, especially the Apostolic sects are slowly changing. Some members are now coming to the clinic.” “The church should help teach us when we go for ladies’ meetings how to cook good food for our families, not to blame us.”

Table 3: Impact of attitudes and perceptions of women on iron supplementation

Discussion topics	Theme	Concept	Responses	Quotes
Awareness and importance of iron supplements during pregnancy	Attitudes and perceptions towards supplements: 1. Educational level 2. Myths and truths derived from culture, e.g. pica 3. Reaction to side effects 4. Forgetfulness	Personal perceptions towards supplements	Educational level and knowledge of the importance of iron supplements have a positive influence on the attitudes and perceptions towards compliance. Most women knew the importance of supplements in boosting blood volumes. However, their continued acceptance and use of supplements were entirely dependent on their perceptions and attitudes towards the supplements. This is also based on myths and truths they acquired from their culture. Others discontinued use of iron supplements because of the side effects and they ended up preferring indigenous alternatives, perceived to	“When I deliver, I may lose a lot of blood, so I must have enough to avoid complications.” “Since there will be sharing between the mother and child, it means mother need to have more blood.” “Oxygen moves with the blood, so if the mother has enough, the baby and mother will breath very well.” [Ropa rikawanda zvinobatsira kuti mwana namai vake vafeme zvakanaka] “Anomisa moyo, dzimwe nguva kurutsisa iro dzungu, nechirungurira” [They cause nausea, sometimes they induce vomiting, dizziness, heartburn] “Running stomach or diarrhoea.” “Haanakidze, anoda

Discussion topics	Theme	Concept	Responses	Quotes
			be healthier and with minimal side effects. Although some acknowledged the importance of supplements, they forgot to take the supplements consistently.	kumwa wave kurara kuti asakutambudza, anoita kakurwarisa.” [Sometimes I experience excessive hunger] “The main challenge is that I forget them home when travelling. This disturbs the pattern.” “Sometimes, even when I am home I may forget to take them because I will be very busy.”

Findings from the FGDs with the participants revealed that the attitudes of the participants towards the intake of iron supplements during pregnancy had a strong influence on compliance (Table 3). The lack of adequate nutrition education about anaemia was found to reduce compliance with iron supplementation. A few participants indicated that in some instances they would be given the supplements without any explanations on their use and importance.

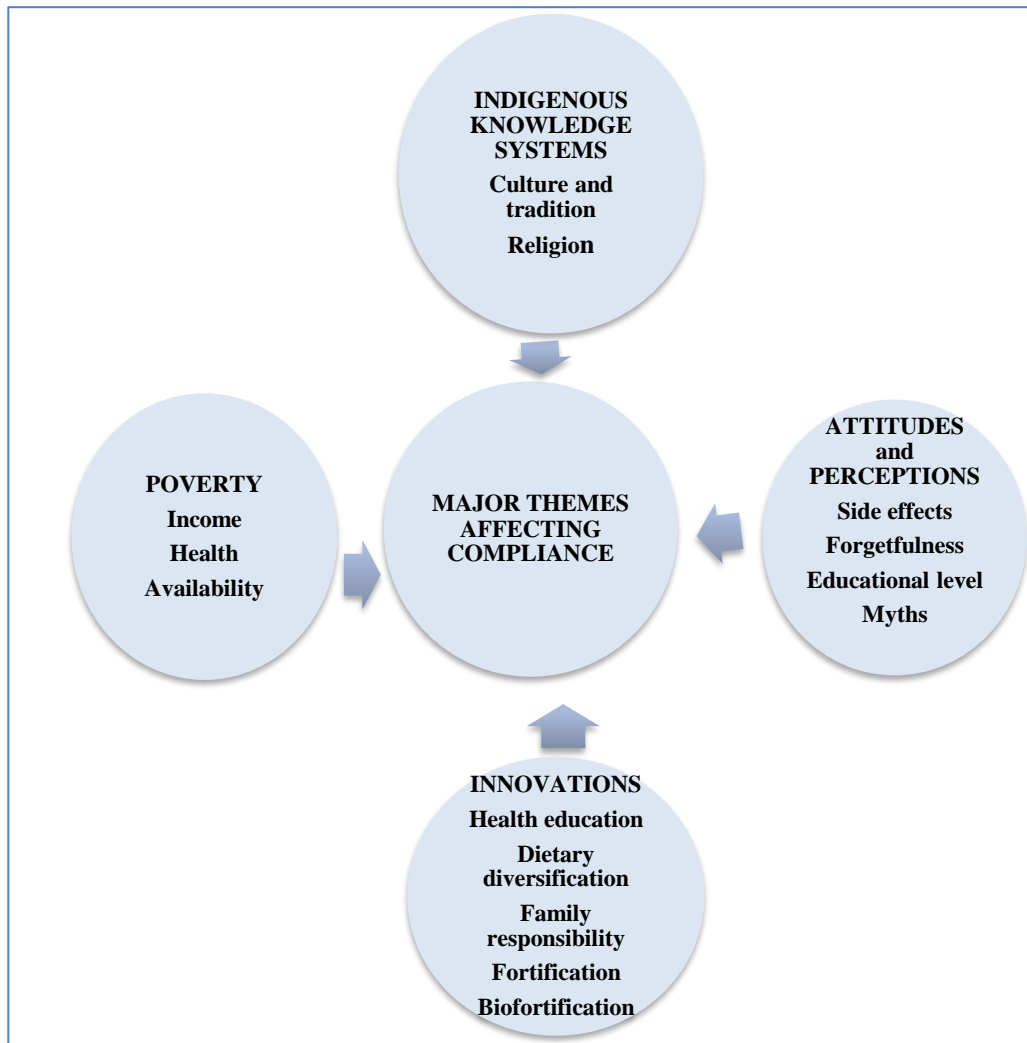
In the current study, inadequate and erratic supplies of iron supplements from the clinic were a major barrier to optimal use of supplements. This resulted in most participants failing to take their supplements consistently. The poor socio-economic status of the country has triggered poverty among most women, thus making iron supplements from private pharmacies expensive and inaccessible. Poverty is a challenge that is most prevalent in developing countries, including Zimbabwe (World Bank 2017).

The results of this study (Table 3) revealed that whenever some of the participants travelled away from home, they forgot to take their iron supplements with them. Others would be home, but still forgot to take them, as they would be distracted with very busy schedules at home.

Discussion

Four major themes were generated from the findings on the barriers to optimal iron supplementation and the possible strategies for alleviation of IDA, namely, IKS, attitudes and perceptions, poverty, and innovations (Figure 1).

Figure 1: Major themes generated from barriers to optimal iron supplementation



Culture and religion have a very strong influence on the use of iron supplements by pregnant women because the behaviour is generally moulded along the traditional practices and their religious belief systems (Group 2016). Likes and dislikes of food are usually based on cultural and religious beliefs and are passed down from one generation to the next (Group 2016; Siamonga 2016) (Table 2). Therefore, IKS, which include cultural and religious influences, are a major barrier to optimal iron supplementation by pregnant women.

Culture encompasses worldview, art, dress, marriage, music, food and dance (Chirozva, Mubaya, and Mukamuri 2010; Group 2016; Siamonga 2016). People connect to their cultural groups through similar food patterns, since food is used in society as a means of retaining cultural identity (Group 2016). Thus, culture dictates food taboos,

regardless of the health consequences these may have (Bilimale et al. 2010; Chirozva, Mubaya, and Mukamuri 2010; Group 2016). These food taboos affect mostly pregnant women and female children (Milman et al. 2016; Siamonga 2016). For instance, the use of iron supplements is usually discouraged in the Shona culture, as supplements are believed to cause overweight babies, leading to complications at delivery such as caesarean section, which is not culturally acceptable (Sinyoro 2017).

In the Zimbabwean culture, fish, eggs, *kapenta* (dried salted small fish), mopani worms (*madora*), sugar cane, sweets, pepper, leftover thick porridge (*sadza*) and okra are all forbidden during pregnancy (Sinyoro 2017). Eggs and okra are believed to cause baldness, and eggs are also believed to contribute to infertility in women (Siamonga 2016; Sinyoro 2017). Fish and *kapenta* are said to cause scales on the skin of the newborn, which may also develop into ringworm and eczema. Mopani worms are also believed to contribute to rough, dry and itchy skin. Pregnant women are discouraged from consuming sugar cane and sweets for fear of causing excessive discharge of fluids by the mother during delivery (Sinyoro 2017).

Married pregnant women are expected to comply with the family cultural doctrines and to be submissive to their husbands and in-laws. They may only eat what is socioculturally accepted and recommended, even though it may lack nutritional benefits (Siamonga 2016; Sinyoro 2017). Therefore, the decision to use iron supplements in pregnancy and the onset and duration of supplementation are not decisions made by the pregnant women alone. These are family responsibilities, which are governed by their cultural and traditional norms and values. However, some norms and values are also positive, for instance, the assertion by Sinyoro (2017) that pregnant women should be discouraged from consuming sugar cane and sweets. The pregnant woman's husband, who is also the head of the family, usually authorises such decisions with the assistance of his mother (Group 2016; Siamonga 2016).

Religion refers to beliefs and practices relating to unseen things (Chirozva, Mubaya, and Mukamuri 2010). In Zimbabwe, the Christian religion is most dominant and it helps to shape families' ideologies towards gender and defines the way in which they ought to live and behave (Chirozva, Mubaya, and Mukamuri 2010; Siamonga 2016). Therefore, some food beliefs and practices are due to religious beliefs (Chirozva, Mubaya, and Mukamuri 2010; Group 2016; Siamonga 2016; Sinyoro 2017). Thus, religion has an important role in forbidding the consumption of certain foods. For instance, Muslims do not eat pork, and Hindus do not eat beef and are commonly vegetarians (Chirozva, Mubaya, and Mukamuri 2010; Sinyoro 2017). Christians, especially orthodox Catholics observe holy days and months such as Lent, which are devoted to prayer and fasting (Chirozva, Mubaya, and Mukamuri 2010; Group 2016). Consumption of meat is not allowed during these months and this also pertains to pregnant women, regardless of their physiological needs (Chirozva, Mubaya, and Mukamuri 2010; Group 2016; Sinyoro 2017).

The behaviour, attitudes and perceptions of the pregnant women determine the outcome of iron supplementation programmes (Kamau, Mirie, and Kimani 2018; Nisar et al. 2014; Dwumfour-Asare and Kwapong 2013; Najafi, Roudsari, and Hejazi 2013). Some pregnant women may not want to take the tablets and their attitudes may be influenced by ethnicity, myths and truths derived from their culture and religion, previous side effects experienced, and levels of knowledge acquired (Kamau, Mirie, and Kimani 2018; Onyeneho et al. 2016; Nisar et al. 2014; Dwumfour-Asare and Kwapong 2013; Najafi, Roudsari, and Hejazi 2013).

The lack of adequate health education about anaemia is another serious barrier to optimal iron supplementation by most pregnant women. Reduced compliance with iron supplementation among pregnant women may be due to poor and ineffective communication skills of some health professionals. Pregnant women need to be informed of the importance of iron supplements and even the need to purchase should they be depleted at the clinic (Kamau, Mirie, and Kimani 2018; Nisar et al. 2014; Onyeneho et al. 2016). Women who have good patient–doctor relationships are usually knowledgeable about anaemia, and their adherence to iron supplements is positive (Kamau, Mirie, and Kimani 2018; Nisar et al. 2014; Onyeneho et al. 2016; Sadore, Gebretsadik, and Hussen 2015). Clear explanations help to enhance understanding and improve knowledge among pregnant women. On the other hand, a lack of knowledge of anaemia and its prevention during pregnancy affects compliance and is one of the main causes of the high prevalence of IDA. Inadequate counselling of pregnant women may also result in the misunderstanding of instructions regarding optimal iron supplementation (Kamau, Mirie, and Kimani 2018; Kumar and Priya 2018; Onyeneho et al. 2016). According to the WHO (2016), there is a need for behaviour change communication to improve compliance with iron supplementation among pregnant women.

Regardless of the gastrointestinal side effects associated with iron supplementation, ferrous sulphate remains the most commonly prescribed oral iron therapy, specifically ideal for pregnant women. However, it is associated with nausea, dizziness and diarrhoea (Birhanu, Birarra, and Mekonnen 2018; WHO 2012; 2015). Other side effects are constipation, black stools, and excessive hunger. Reducing the dosage to less than or equal to 50–60 mg iron/day, or offering the supplement intermittently, may help to reduce the side effects (Birhanu, Birarra, and Mekonnen 2018; Onyeneho et al. 2016; WHO 2008; 2012; 2015). Since gastrointestinal side effects of iron supplements are a major barrier to compliance, it is necessary to inform pregnant women that these side effects are generally transient and not harmful. If the side effects are intolerable, they could be significantly ameliorated by taking the supplements with food (Bilimale et al. 2010; Birhanu, Birarra, and Mekonnen 2018; Chowdhury et al. 2015; Habib et al. 2009; WHO 2012).

Forgetting to take the supplements is a significant barrier to optimal use of iron supplements by pregnant women (Bilimale et al. 2010). It negatively affects compliance

and may cause IDA during pregnancy (Kamau, Mirie, and Kimani 2018; Nisar et al. 2014). Thus, it is necessary to counsel women during their clinic visits on possible strategies that they could adopt to help them remember to take their supplements regularly. For instance, placing supplements on common areas such as the breakfast table or the bedside table that they would see every day (Bilimale et al. 2010). Pregnant women who are married could be reminded by their spouses to ensure that they take their iron supplements daily (Chowdhury et al. 2015).

Poverty or poor socio-economic status can be a potential barrier to iron supplement compliance among many pregnant women (FAO 2016; UNICEF 2017). Low-income groups usually consist of a higher portion of anaemic patients, as compared to high-income groups (FAO 2016). The majority of the women are not gainfully employed, and do not usually control the family finances or determine compliance with the iron supplementation programme (FAO 2016; UNICEF 2017). In general, when females rather than males have control over finances, the family diet is likely to be healthier, since women generally spend more time with the family and have better appreciation of individual needs (UNICEF 2017). However, Zimbabwe has failed to curb the continuously escalating unemployment crisis, resulting in poverty. Most women, despite having high literacy levels, are unemployed and thus have little control over family finances. This subsequently leads to the consumption of unbalanced meals (FAO 2016; HarvestPlus 2018; UNICEF 2017).

To improve iron supplementation regimens, the need to employ innovations and strategies that are practical and effective in improving compliance among pregnant women must be fulfilled. These strategies, when employed tactfully, may help to reduce the prevalence of IDA in pregnant women by ensuring optimal iron supplementation among them (WHO 2008; 2015; 2018). To improve compliance, the need to develop specific tools and approaches to deal with the difficulties of a daily regimen must also be fulfilled, and the strategies should include assessments of Hb levels (WHO 2015; 2018).

Although pregnant women may be aware of the symptoms of IDA, they need to be convinced that these symptoms are not a normal part of pregnancy and that they can be prevented or cured. According to Milman et al. (2016), iron supplementation should be given without food to maximise absorption. However, it has been noted that although absorption is enhanced when given on an empty stomach, side effects such as nausea and epigastric pain sometimes occur (Milman et al. 2016; WHO 2015). Alleviation of these side effects can be achieved by lowering the dose given between meals (WHO 2008; 2015). Another strategy to improve compliance is to give the iron supplement together with meals. However, food reduces the absorption of medicinal iron by about two-thirds. Alternatively, oral iron supplements can be taken intermittently, every few days (WHO 2008; 2018).

Effective communication strategies to convey information regarding diet and healthy eating to pregnant women are essential in order to improve compliance with iron

supplementation among them (Bilimale et al. 2010; Sanghvi, Harvey, and Wainwright 2010; WHO 2018). This is vital for improving the acceptability and adherence by pregnant women to iron supplementation. This can be achieved through training health personnel or volunteer distributors. If feasible, they could assist with home visits to pregnant women in their first few days of taking the supplements. The home visits should include the counselling of pregnant women and their families to motivate compliance (Bilimale et al. 2010; WHO 2018). Pregnant women should also be informed about the importance or purpose and benefits of iron supplements and to be persuaded that IDA has serious consequences for both themselves and their unborn children.

Therefore, despite the many barriers to iron supplementation mentioned before, the provision of adequate nutrition education is critical. This promotes awareness among pregnant women, thus helping them to comply with iron supplementation. Explanations given by nurses during ANC help to reinforce the importance of iron supplements and to demystify some beliefs, attitudes and perceptions that pregnant women may have regarding iron supplements. It should be explained to pregnant women that the gastrointestinal side effects of iron supplements are transient and not harmful. In fact, pregnant women need to be enlightened on the notion that the beneficial aspects of iron supplements far outweigh the side effects. To overcome the challenge of erratic iron supplies, timely procurement and delivery of supplements to clinics will ensure that most women access them, thereby improving their compliance. In addition, the combination of effective communication strategies on healthy eating, the positive aspects of IKS and optimal iron supplementation can be effective in the management of IDA.

Conclusion

This study has identified many barriers to the optimal use of iron supplements by pregnant women. The major barriers noted were erratic and inadequate supplies of iron supplements at the healthcare centre, and a strong influence of IKS. Cultural limitations and religious restrictions were found to be very strong determinants of whether or not pregnant women would take iron supplements consistently. Other notable barriers were poor communication and inadequate counselling by health professionals on the importance of iron supplements. Owing to financial constraints, most women could not afford to buy supplements from private pharmacies once the clinic supplies had run out. For those who were fortunate to obtain their supplies from the clinic, compliance remained a serious barrier. This may have been due to fear of side effects, inadequate nutrition education, forgetfulness or ignorance. However, nutritional interventions could be employed to ensure optimal use of iron supplements during pregnancy and post-partum.

Women need to be motivated to obtain iron supplements and to be reminded to take the supplements consistently. Strategies for the management of side effects and duration of

iron supplementation need to be clarified for increased compliance. The major barrier that remains is that some religious affiliations and cultural groups restrict their followers from taking any form of medication, nutritional supplements and even certain types of food. Women are also expected to submit to the authority of their husbands, even in matters concerning their own health. Thus, it can be conclusively noted that some women will not attend ANC sessions at healthcare clinics, or take iron supplements as long as their churches and husbands do not approve. This points to the strong impact of religion on influencing supplementation programmes, either positively or negatively.

References

- Alam, A., S. Rasheed, N. U. Khan, T. Sharmin, T. M. Huda, S. E. Arifeen, and M. J. Dibley. 2015. "How can Formative Research Inform the Design of an Iron-Folic Acid Supplementation Intervention Starting in First Trimester of Pregnancy in Bangladesh?" *BMC Public Health* 2015 (15): 374–86. <https://doi.org/10.1186/s12889-015-1697-2>.
- Alshenqeeti, H. 2014. "Interviewing as a Data Collection Method: A Critical Review, English Linguistics Research." *Scienu Press* 3 (1): 39–45.
- Bilimale, A., J. Anjum, H. N. Sangoli, and M. Mallapur. 2010. "Improving Adherence to Oral Iron Supplementation during Pregnancy." *Australasian Medical Journal* 3 (5): 281–90. <https://doi.org/10.4066/AMJ.2010.291>.
- Birhanu, T. M., M. K. Birarra, and F. A. Mekonnen. 2018. "Compliance to Iron and Folic Acid Supplementation in Pregnancy, Northwest Ethiopia." *BioMed Central* <https://doi.org/10.1186/s13104-018-3433-3>.
- Chirozva, C., C. P. Mubaya, and B. Mukamuri. 2010. "The Traditional African Family in the Age of Globalization." *Review Report for Centre for Rural Development, Barefoot Education for Africa Trust*. Accessed 1 May 2018. <https://www.beatafrica.org>.
- Chowdhury, H. A., K. R. Ahmed, F. Jebunessa, J. Akter, S. Hossain, and M. Sharjahan. 2015. "Factors associated with Maternal Anaemia among Pregnant Women in Dhaka City." *BMC Women's Health* 77. <https://doi.org/10.1186/s12905-015-0234-x>.
- Dwumfour-Asare, B., and M. A. Kwapong. 2013. "Anaemia Awareness, Beliefs and Practices among Pregnant Women: A Baseline Assessment at Brosankro Community in Ghana." *Journal of Natural Sciences Research* 3: 1–9.
- FAO (Food and Agriculture Organization of the United Nations). 2016. *Family Farming in Sub-Saharan Africa: Its Contribution to Agriculture, Food Security and Rural Development*. Working paper number 150, October 2016. <http://www.fao.org/family-farming/detail/en/c/431947/>.

- Gebre, A., and A. Mulugeta. 2015. "Prevalence of Anaemia and associated Factors among Pregnant Women in North Western Zone of Tigray, Northern Ethiopia: A Cross Sectional Study." *Journal of Nutrition and Metabolism*. Accessed September 27, 2018. <https://doi.org/10.1155/2015/165430>.
- Group, E. 2016. "How Culture and Society Influence Healthy Eating." *Global Healing*, 11 August 2016. <https://globalhealing.com/natural-health/how-culture-and-society-influence-healthy-eating/>.
- Guest, G., E. Namey, and K. McKenna. 2017. "How Many Focus Groups are Enough? Building an Evidence Base for Non-Probability Sample Sizes (FieldMethods)." *Sage Journals* 29 (1): 3–22. <https://doi.org/10.1177/1525822X16639015>.
- Habib, F., E. H. Alabdin, M. Alenazy, and R. Noo. 2009. "Compliance to Iron Supplementation during Pregnancy." *Journal of Obstetrics and Gynaecology* 29 (6): 487–92. <https://doi.org/10.1080/01443610902984961>.
- HarvestPlus. 2018. *Biofortification: The Nutrition Revolution is now*. Accessed 25 August 2018. www.harvestplus.org/biofortification-revolution-now.
- Jamshed, S. 2014. "Qualitative Research Method – Interviewing and Observation." *Journal of Basic and Clinic Pharmacy* 5 (4): 87–88. <https://doi.org/10.4103/0976-0105.141942>.
- Kamau, M. W., W. Mirie, and S. Kimani. 2018. "Compliance with Iron and Folic Acid Supplementation (IFAS) and associated Factors among Pregnant Women: Results from a Cross-Sectional Study in Kiambu Country, Kenya." *BioMed Central Public Health*. <https://doi.org/10.1186/s12889-018-5437-2>.
- Kumar, P. S., and Y. B. Priya. 2018. "Compliance to Iron Folic Acid Supplementation among Antenatal Mothers attending a Primary Health Centre." *International Journal of Advance Research and Development* 3 (2): 223–32.
- Milman, N., T. Paszkowski, I. Cetin, and C. Castelo-Branco. 2016. "Supplementation during Pregnancy: Beliefs and Science." *Journal of Gynaecological Endocrinology* 32 (7): 1–7. <https://doi.org/10.3109/09513590.2016.1149161>.
- Najafi, F. T., R. L. Roudsari, and M. Hejazi. 2014. "Iron Supplementation Protocols for Iron Deficiency Anemia: A Comparative Review of Iron Regimens in Three Countries of India, Iran and England." *Journal of Midwifery and Reproductive Health* 1 (2): 89–96.
- Nisar, Y. B., A. Alam, B. Aurangzeb, and M. J. Dibley. 2014. "Perceptions of Antenatal Iron-Folic Acid Supplements in Urban and Rural Pakistan: A Qualitative Study." *BioMed Central (BMC) Pregnancy and Child Birth* 2014 (14): 344–345. <https://doi.org/10.1186/1471-2393-14-344>.

- Onyeneho, N. G., N. I'Aronu, N. Chukwu, U. P. Agbawodikeizu, M. Chalupowski, and S. V. Subramanian. 2016. "Factors associated with Compliance to Recommended Micronutrients Uptake for Prevention of Anaemia during Pregnancy in Urban, Peri-Urban and Rural Communities of South East Nigeria." *Journal of Health, Population and Nutrition*. <https://doi.org/10.1186/s41043-016-0068-7>.
- Sadore, A. A., L. A. Gebretsadik, and M. A. Hussen. 2015. "Compliance with Iron-Folate Acid Supplement and associated Factors among Antenatal Care Attendant Mothers in Misha District, South Ethiopia: Community Based Cross-Sectional Study." *Journal of Environmental and Public Health* 2015 (2): 1–7. <https://doi.org/10.1155/2015/781973>.
- Sanghvi, T. G., P. W. Harvey, and E. Wainwright. 2010. "Maternal Iron-Folic Acid Supplementation Programs: Evidence for Impact and Implementation." *Food and Nutrition Bulletin* 31 (2s): s100–s107. <https://doi.org/10.1177/15648265100312S202>.
- Siamonga, E. 2016. "Western Influence on Taboos associated with Zimbabwean Food." *The Patriot*, 4 February 2016. https://www.thepatriot.co.zw/old_posts/western-influence-on-taboos-associated-with-zimbabwean-food/.
- Sinyoro, N. T. 2017. "Foods Recommended and Discouraged during Pregnancy." Proceedings from interview conducted with an older woman on 'Culturally accepted and prohibited foods in Zimbabwe.' Mutare, Zimbabwe, 5 August 2017.
- Ugwu, E. O., A. O. Olibe, S. N. Obi, and A. O. Ugwu. 2014. "Determinants of Compliance to Iron Supplementation among Pregnant Women in Enugu, South Eastern Nigeria." *Nigerian Journal of Clinical Practice* 17 (5): 608–612. <https://doi.org/10.4103/1119-3077.141427>.
- UNICEF (United Nations Children's Fund). 2017. "Families Battling Hunger and Malnutrition in Rural Zimbabwe." *Report from UN Children's Fund*. Accessed 1 May 2018. <https://reliefweb.int/report/zimbabwe/families-battling-hunger-and-malnutrition-rural-zimbabwe>.
- WHO (World Health Organization). 2008. "Global Anaemia Prevalence and number of individuals affected." *Bulletin of the World Health Organization* 2008(86): 480-487.
- WHO (World Health Organization). 2010. Iron and Folate Supplementation. Standard no. 1.8 In: *Standards of Maternal and Neonatal Care. Making Pregnancy a Safer Initiative*. Geneva, WHO.
- WHO (World Health Organization). 2012. *Intermittent Oral Iron Supplementation during Pregnancy*. Geneva: WHO.
- WHO (World Health Organization). 2015. *The Global Prevalence of Anaemia in 2011*. Geneva: WHO.
- WHO (World Health Organization). 2016. "Strategies to Prevent Anaemia: Recommendations from an Expert Group Consultation 5–6 December 2016." Geneva: WHO.

WHO (World Health Organization). 2018. *Daily Iron and Folic Acid Supplementation during Pregnancy. E-Library of Evidence for Nutrition Action (e-LENA)*. Accessed 21 May 2018. https://www.who.int/elena/titles/daily_iron_pregnancy/en/.

World Bank. 2017. *Zimbabwe Economic Update: The State in the Economy*. Harare: World Bank Research and Publications.