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Factors Associated With Anaemia among Pregnant Women in Mandera County Referral Hospital, Kenya

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Abstract: ***Background:*** Anaemia is a nutrition-related disease that mostly affects pregnant women and is among the most common diseases associated with deficiency that are observed globally, affecting more than a quarter of the global population. ***Objectives:*** The aim of the study was to assess the factors associated with anaemia among pregnant women in Mandera County Referral Hospital, Kenya. ***Methods:*** The study used hospital based cross-sectional descriptive design. Structured questionnaires were administered to collect quantitative data (n=382) from pregnant women who attended Mandera County Referral Hospital, Kenya. ***Results:*** About 68.9% of the respondents indicated unawareness on the sources of iron (p value <0.05) while 44.2% of the respondents were aware of the sources of iron. The study also indicated that, 63.8% of the women faces challenges of access and availability of iron rich foods and thus the need for IFAS or other iron rich supplements while 79.8% of women were aware of various sources of Vitamin A which was significant at 5%. The study also indicated that, only 64.1% of women have knowledge of health problem linked to lack of enough folic acid that which results in 'Neural Tube Defects' such as spina bifida and Goiter (enlargement of thyroid glands). ***Conclusion:*** The study concludes that there is need to educate and create awareness on anaemia, its effects in pregnancy, influence and the importance attached to the supplements for the pregnant women in Mandera County Referral Hospital.

Keywords: Anaemia; nutrition; deficiency; health; pregnancy; referral.

INTRODUCTION

Anaemia is one of the commonest diseases related to nutritional diseases in the global context. It has greatly affected a large part of the global population. It is alleged that worldwide, about 41.8% of expectant females and approximately 30.2% non-expectant women suffer from anaemia. This has contributed to about 20% maternal fatalities and it intensifies foetal risks, neonatal and general infant mortalities (Okube, O.T. *et al.*, 2016). Anaemia amongst women who have reached the childbearing age was defined by the World Health Organization (WHO) as a condition where haemoglobin levels are at < 12.0 g/dL at the sea level. Anaemia among expecting females has been defined as levels of about< 11.0 g/dL. The limits of concentration of haemoglobin that define anaemia differ by age, physiological status, smoking status, gender as well as and the altitude lived by the assessed population. Expectancy related Anaemia is linked with adversative neonatal and maternal health consequences related to stillbirths, miscarriage, and intrauterine restrictions of growth as well as for small gestational ages, maternal mortality and perinatal anaemia (Jufar, A.H., & Zewde, T. 2014; & Fiedler, *et al.*, 2014).

This problem affects both developed and developing nations and causes greatly adverse outcomes on health of humans and socio-economic characteristics. Several studies have agreed that anaemia causes in the course of pregnancy in countries that are developing varies from a geographical location to the other. The causes are multi-factorial, which include; iron deficiencies, in addition to vitamin B12 and folate deficiencies, as well as parasitic ailments such as hookworms and malaria (Okube, O.T. *et al.*, 2016; Fiedler, *et al.*, 2014; & Tulu, B.D. *et al.*, 2019). In Africa, folate and iron insufficiencies are among the significant anaemia causes in expectant women (Okube, O.T. *et al.*, 2016; & Kenya Demographic and Health survey. 2014). Deficiency of Vitamin B12 has been recognized as a leading contributor to the anaemic condition in Africa as a result of overreliance of the people on grains as nutritional as well as low intake of foods originating from animals that are known to be the primary dietary vitamin B12 sources (Hakizimana, D. *et al.*, 2019).

In the Kenyan context, the rate of prevalence of anaemia amongst expectant women is about 55 percent, and this makes it a serious problem in public health as has been explained by the standards of WHO. In regarding to the severity of anaemia, most cases occurring amongst expectant and non-expectant women in the nation have been categorized as either moderate or mild. Only approximately 2.1% and 4.4% of cases of Anaemia amongst expecting non-expecting females are diagnosed with severe cases. Having been disaggregated by geographically divided regions, anaemia prevalence rates could be considerably higher. A study carried out in the western part of Kenya amongst pregnant women visiting a big, city hospital in the Kisumu district for a first ANC stated that the occurrence of the moderate anaemic condition amongst the tested women was at 69% and 12% correspondingly.

Despite several policy guidelines and interventions in Kenya, there are high cases reported by the Kenya Demographic Health Survey indicated that there are many cases associated with anaemia during pregnancy in Kenya. The factors associated with this problem vary across sub counties, counties and regions. If the problem is unaddressed, it will keep growing despite the many interventions from the government through the ministry of health to improve the health of the population.

Nonetheless, it has not been clear whether there are women who benefit in a direct way from the set policy guidelines or not. It is also not clear if anaemia in pre-pregnancy, characteristic maternal factors, poor compliance of patients to treatments or unsuitable accounts of treatment lead to a determinedly great anaemia burden. Nevertheless, early ANC initiation has been recognized as one that results to early detection as well as and treatment of anaemic conditions in pregnancy (Fiedler, *et al.*, 2014). Efforts in policy need therefore to aim at reassuring early ANC initiation. Present awareness on factors linked with anaemia amongst expectant females in the Mandera County Referral Hospital is deadly for informing policy makers as well as the government. This is because many households in Mandera County are vulnerable to food and nutrition insufficiency, illiteracy, poverty as well as drought, which lead to minimal accessibility of critical services to the majority of the inhabitants of the county. Anaemia related problems are accelerated by factors such as difficulties in the access of quality maternal health services which include antenatal services, delivery services and post-natal services. Moreover, marginalization, poor health care, lack of transparency and accountability, negative cultural and religious practices are other factors affecting efforts put in place to curb anaemia (Weldekidan, F. *et al.*, 2018; Kenya Demographic and Health survey. 2014; & Kassa, Z. Y. *et al.*, 2019).

Some studies have been done in Kenya addressing issues linked with anaemia amongst expectant women (Sawe, F. 2001; & Khadija, K. 2006). To the researcher's knowledge, no study has been done to establish the factors associated with anaemia among pregnant women in Mandera County Referral Hospital. This study therefore seeks to determine the factors associated with anaemia among pregnant women at the first antenatal clinic visit in Mandera Referral Hospital North Eastern Kenya. In order to understand of the associated factors of anaemia in Mandera county referral hospital, the study examined the following four specific areas:

1. The socio demographic characteristics of pregnant women attending Mandera County Referral Hospital, Kenya.
2. The intake of dietary iron among pregnant women attending Mandera County Referral Hospital.
3. The intake of dietary folate among pregnant women attending Mandera County Referral Hospital.
4. The intake of dietary vitamin A among pregnant women attending Mandera County Referral Hospital.

MATERIALS AND METHODS

Study Design

The in this study, a hospital based cross-sectional descriptive design was adopted. Mandera County Referral Hospital located in Bulla Power Sub-location, Bulla Jamhuri location, Central Division; Mandera East Constituency situated in the previously Northern Eastern Province of Kenya was selected. The reason for choosing the design was due to its ability to obtain information concerning the current status and to enable the researcher to describe what exists with respect to situational variable. It also enabled the researcher to study variables and test them only a single time and establish the interrelationships (Bryman & Bell, 2003).

Sample Size and Sampling Techniques

The study applied Fisher's formula to for computation of sample size. A total of 382 respondents was obtained through single population proportion formula by assuming a 95 % confidence level, 5% margin of error and p (proportion) of 0.46. The study targeted a population of 3651 pregnant women aged 15-49 in Mandera County Referral Hospital. Simple and Convenience sampling technique were employed to enrol the participants where every third pregnant woman was selected. These techniques was selected due to their ability" accessibility" and nature (Beryman & Bell, 2003). The researcher explained to the women the aims of the study, and those who willingly agreed to take part in the study gave a consent that was signed. The study did not include respondents were to move/relocate after delivering, as well as ones who did

not give consent for participation. A structured questionnaire was used to collect the study's data. The researcher administered the questionnaires with the help of trained research assistants, who included qualified nurses and doctors. The data gathered included; social demographic characteristics of respondents, economic characteristics, history of reproductive health, practices of feeding and desired place of delivery.

Data Analysis

Data on respondents' socio-demographic characteristics and factors associated with anaemia was gathered through questionnaires. The researcher administered the structured questionnaire to every eligible woman to establish the socio-demographic characteristics as well as awareness on the sources iron, vitamins and folate. Data was also gathered in regard to challenges of accessibility and availability of diets rich in iron. The study was carried out during the months of October and November 2016 targeted 382 pregnant women. Only 312 women were able to respond which translated to 81.7%.

Data was cleaned in readiness for analysis. Cleaned data was coded and entered in SPSS software version 20 that was used for analysis. The analysed data was then summarized through descriptive statistics, where parameters like percentage, frequencies, mean, standard deviation and range univariate analysis were utilized for summarizing data. Inferential statistics was done by use of chi square test for determination of significant associations between the study's variables.

Ethical Consideration

The researcher had sort permission from the Kenya Methodist University (KeMU) Ethical Research Committee which issued an introduction letter addressing the study hospital to allow the research to carry out the study. The participants' consent was sort using a written consent form before the study was undertaken. The names of the participants were concealed by use of numbers as a replacement for respondents' names in the data collection tool (questionnaires) and hence, data collection tools kept safely in a place only reachable by the principle researcher.

RESULTS AND DISCUSSION

Records of a total of 382 pregnant women who were given self-administered structured questionnaire whom 312 provided their response through drop and pick technique. Table1shows the bio- data of the respondents of the pregnant who participated in the study from Mandera Referral Hospital.

Table:1 Bio Data of the Respondents

Variable	Responses	Frequency	Percent
Age bracket	Less than 20 years	34	10.9
	Between 21-30 years	76	24.4
	Between 31-40 years	126	40.4
	More than 40 years	76	24.4
Marital status	Single	24	7.7
	Married/cohabiting	243	77.9
	Divorced/ Separated	33	10.6
	Widow	12	3.8
Highest level of education achieved	Primary level	127	40.7
	Secondary level	63	20.2
	University level	12	3.8
	Postgraduate	12	3.8
	None	42	13.5
	College level	56	17.9
Average monthly income	Less than Ksh 30, 000	151	48.4
	Between Ksh 31,000-60,000	121	38.8
	Between Ksh 61,000-90,000	35	11.2
	More than Ksh 90,000	5	1.6

Table 1 indicates that, majority of the respondents were between 31-40 years [40.4%] compared to 24.4% who were between 21-30 years. On their marital status, the study found that most of the respondents [243, 77.9%] were either cohabiting or married as opposed to those who were in single motherhood [24, 7.7%] and those who were either divorced or separated constituted 10.6%. Approximately 190[60.9%] of the respondents had less than secondary level education and this indicated that the illiteracy level in the county is high. The last query concerned the monthly income of the respondents. It was established that majority [151, 48.4%] of the respondents had an average income of less than Ksh 30,000 while 121[38.8%] indicated that they earned between Ksh 31,000-60,000 and thus most of the women could afford balanced diet.

Table 2: Responses on the Awareness and Frequency of Intake of Iron Rich Foods

Variable	Responses	Frequency	Percent	Chi Square Value	Sig. (2-tailed)
Aware of iron	Yes	215	31.1	44.628	**.000**
	No	97	68.9		
Know the sources of iron	Yes	138	44.2	17.154	.000
	No	82	26.3		
	Not sure	92	29.5		
Intake frequency iron rich foods	Daily	74	23.7	94.872	**.000**
	Weekly	130	41.7		
	Monthly	96	30.8		
	Never	12	3.8		
Challenges in terms of access and availability of iron rich source of iron	Yes	199	63.8	23.705	**.000**
	No	113	36.2		

Table 2 shows the responses on the awareness and frequency of intake of iron rich foods whereby majority (68.9%) of the respondents were not aware of iron (p value <0.05) and further that 44.2% of the respondents knew the sources of iron compared to 55.8 who neither knew or not sure on the sources (p value >0.05). On the frequencies, the respondents took the iron rich foods, it was established that majority (130, 41.7%) indicated they took them weekly compared to 30.8% who cited they took them on monthly basis. It was established majority (199, 63.8%) faced challenges to access and availability of iron rich foods and thus the need for IFAS or other iron rich supplements.

Table 3: Intake of Vitamin A

Variable	Responses	Frequency	Percent	Chi Square Value	Sig. (2-tailed)
Aware of Vitamin A	Yes	249	20.2	110.885	**.000**
	No	63	79.8		
Aware of sources of Vitamin A	Yes	300	3.8	265.846	**.000**
	No	12	96.2		
Intake frequency of those foods	Daily	132	42.3	67.385	**.000**
	Weekly	144	46.2		
	Monthly	36	11.5		
Challenges in terms of access and availability of Vitamin A	Yes	230	73.7	70.205	**.000**
	No	82	26.3		

Table 3 presents the responses on the intake of Vitamin A among the pregnant women in Mandera Referral County Hospital. Most of the women (249, 79.8%) were not aware of Vitamin A and further 96.2% were not aware of the various sources of Vitamin A and these responses were significant at 5%. On the query about frequency of intake of Vitamin A, it was established that majority 46.2% and 42.3% took foods rich in Vitamin A on weekly and daily basis. Further, most (230, 73.7%) of the respondents indicated that they experienced challenges in terms of access and availability of Vitamin.

Table 4: Folic Acid Awareness among pregnant women

Variable	Responses	Frequency	Percent	Chi Square Value	Sig. (2-tailed)
Aware of Folate or Folic Acid	Yes	224	28.2	59.282	**.000**
	No	88	71.8		
Types of foods and drinks do you think are good sources of folate	Fruit	288	92.3	138.481	**.000**
	Green vegetables	123	39.4		
	Milk	89	28.5		
	Fish/Seafood	36	11.5		
	Meat	78	25		

	Breakfast cereals	8	0.025		
	Bread	39	12.5		
Health problems are associated with lack of enough folate/folic acid in the diet	Arthritis	39	12.5	4.459	**.000**
	Neural Tube Defects (Spina bifida)	200	64.1		
	Goiter (enlarged thyroid gland)	73	23.4		

Approximately 72% the respondents who indicated that they were not aware of folate or folic acid compared to 28.2% who indicated that they were aware. Among the foods, the respondents were aware or knew as good sources of folate, 92.3% indicated fruits compared to 39.4% who indicated green vegetables while 28.5% indicated milk. Assessing knowledge relating to health issues linked to lack of sufficient folic acid, majority (64.1%) indicated Neural Tube Defects (for example, Spina bifida) compared to 23.4% who said Goiter (enlarged thyroid gland). All the responses were significant at 5% level.

Majority (68.9%) of the respondents were not aware of iron (p value <0.05) and further that 44.2% of the respondents knew the sources of iron compared to 54.8% who neither knew or not sure on the sources (p value >0.05). This concurred with Brabin *et al.*,., (2008) who noted that most of women in developing countries especially in the marginalized areas were not aware of iron. On the frequencies, the respondents took the iron rich foods, it was established that majority (130, 41.7%) indicated they took them weekly compared to 30.8% who cited they took them on monthly basis. It was established majority (199,63.8%) faced challenges to access and availability of iron rich foods and thus the need for IFAS or other iron rich supplements. most of the women (249,79.8%) were aware of Vitamin A and further 96.2% were aware of the various sources of Vitamin A and these responses were significant at 5%. On the query about frequency of intake of Vitamin A, it was established that majority 46.2% and 42.3% took foods rich in Vitamin A on weekly and daily basis. Further, most (230, 73.7%) of the respondents indicated that they experienced challenges in terms of access and availability of Vitamin A. The study agrees with Milman *et al.*,., (2013) who noted that per week's supplementation of vitamin A decreased maternal mortality rate by about 40%, and further most women may not know they have deficiency of the vitamin and presented in this study.

Approximately 72% the respondents who indicated that they were aware of folate or folic acid compared to 28.2% who indicated that they were not aware. Among the foods, the respondents were aware or knew as good sources of folate, 92.3% indicated fruits compared to 39.4% who indicated green vegetables while 28.5% indicated milk. Assessing knowledge relating to health issues linked to lack of sufficient folic acid, majority (64.1%) indicated Neural Tube Defects (like spina bifida) compared to 23.4% who said Goiter (enlarged thyroid gland). All the responses were significant at 5% level. Though few studies have assessed the folate knowledge, Cook (2004) indicated that requirements of folate are 5-to 10-fold greater in pregnant women than in those who are not pregnant women. This implies that women who are pregnant could be in a risky condition to contract deficiency of folate, and from this study, it is evident that women from Mandera community have little knowledge, their practice is sub optimal on it, and thus they may be suffering from its deficiency.

CONCLUSION

Most of the respondents were in their second or other pregnancies as they had been pregnant before compared to those in their first pregnancy. On the stage of their pregnancies, slightly more than half were in their second trimester compared to a quarter in their first trimester. That majority of the respondents were aware of iron and further that less than half of the respondents knew the sources of iron compared to more than half who neither knew or not sure on the sources. Majority faced challenges to access and availability of iron rich foods and thus the need for IFAS or other iron rich supplements. It was also evident that most women who are pregnant lack knowledge relating to anaemia as well as the effects it has on pregnancy, and this affects the significance to which they are attached to supplements.

Most of the women were not aware of Vitamin A and further some of them were aware of the various sources of Vitamin A and these responses were significant at 5%. Majority they don't take foods rich in Vitamin A on daily basis. Most respondents who indicated that they were not aware of folate or folic acid compared to 28.2% who indicated that they were aware. Among the foods, the respondents were aware or knew as good sources of folate, most indicated fruits compared to a third who indicated green vegetables while 28.5% indicated milk.

RECOMMENDATIONS

Health practitioners in health facilities ought to sensitize pregnant women concerning the need for continuously taking all types of supplements throughout the pregnancy period. To ensure that the pregnant women actually take the supplements, education on anaemia in relation to pregnancy should be done. Training to the health professionals and community health workers in regard to anaemia, nutrition during

pregnancy and counselling skills to be applied when they come in contact with the mothers.

Education on prevention of anaemia ought to be emphasized on in communities to inspire and encourage modifications of diet and advocate for environmental governing of infections that lead to Anaemia.

REFERENCES

1. Fiedler, Jack, D'Agostino, Alexis, & Sununtnasuk, C. (2014). *Nutrition Technical Brief: A Rapid Initial Assessment of the Distribution and Consumption of Iron–Folic Acid Tablets through Antenatal Care in Kenya.* Arlington, VA: USAID/Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING) Project.
2. Hakizimana, D., Nisingizwe, M. P., Logan, J., & Wong, R. (2019). Identifying risk factors of anemia among women of reproductive age in Rwanda–a cross-sectional study using secondary data from the Rwanda demographic and health survey 2014/2015. *BMC public health*, *19*(1), 1662. https://doi.org/10.1186/s12889-019-8019-z
3. Jufar, A.H., & Zewde, T. (2014). Prevalence of Anaemia among Pregnant Women Attending Antenatal Care at Tikur Anbessa Specialized Hospital, Addis Ababa Ethiopia. *J Hematol Thromb Dis 2,* 125 doi: 10.4172/2329-8790.1000125
4. Kassa, Z. Y., Awraris, T., Daba, A. K., & Tenaw, Z. (2019). Compliance with iron folic acid and associated factors among pregnant women through pill count in Hawassa city, South Ethiopia: a community based cross-sectional study. *Reproductive Health*, *16*(1), 1–8.
5. Kenya Demographic and Health survey. (2014). North Eastern: Key Indicators from the 2014 KDHS. pp. 17-18.
6. Khadija, K. (2006). Iron requirements in normal pregnancy as assessed by serum ferritin, serum transferrin saturation and erythrocyte protoporphyrin determinations. *British Journal of Obstetrics and Gynaecology*; *90,* 101-7.
7. Okube, O.T., Mirie, W., Odhiambo, E., Sabina, W., & Habtu, M. (2016). Prevalence and Factors Associated with Anaemia among Pregnant Women Attending Antenatal Clinic in the Second and Third Trimesters at Pumwani Maternity Hospital, Kenya. *Open Journal of Obstetrics and Gynecology*, **6**, 16-27.http://dx.doi.org/10.4236/ojog.2016.61003
8. Sawe, F. (2001). Kericho CLinic-Based ART Diagnostic Evaluation (CLADE): Design, Accrual, and Baseline Characteristics of a Randomized Controlled Trial Conducted in Predominately Rural, District-Level, HIV Clinics of Kenya.
9. Tulu, B.D., Atomssa, E.M., & Mengist, H.M. (2019). Determinants of anaemia among pregnant women attending antenatal care in Horo Guduru Wollega Zone, West Ethiopia: Unmatched casecontrol study. *PLoS ONE 14*(10), e0224514.https://doi.org/10.1371/journal.pone.0224514
10. Weldekidan, F., Kote, M., Girma, M., Boti, N., & Gultie, T. (2018). Determinants of Anaemia among Pregnant Women Attending Antenatal Clinic in Public Health Facilities at Durame Town: Unmatched Case Control Study. *Anaemia (20901267)*, 1–8.