Nutritional Status And Socio-Economic Conditions Influencing Prevalence Of Anaemia In Pregnant Women

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Abstract: Globally, about two hundred million people suffer from anaemia per annum with the highest prevalence rates found among women of reproductive age, infants and young children, and especially those of poor socioeconomic status. This study is a survey-based descriptive study conducted among 400 pregnant women to determine the prevalence of anaemia and the influence of some factors associated with anaemia during pregnancy such as age, socio-economic status, nutrition, awareness, child spacing and spouse's level of education. The concentration of haemoglobin is collected from analytical data and the personal, nutrition and socio-economical information was recorded using questionnaire interview. The investigation indicated that the prevalence of anaemia was 91.25% among the interviewed women with 27.5% of mildly anaemic (11.0-9.0g/dl), 28.5% moderately anaemic (9.0-7.0g/dl), 32% severely anaemic (7.0-4.0g/dl) and 3.25% very severely anaemic (<4.0g/dl). More studies are needed to explore the cause of the failure to prevent anaemia among pregnant women. The main recommendations of the study included implementing more efforts to improve the quality of health services, improve the awareness about anaemia, improve family planning and birth spacing program to diminish maternal iron losses, intensify measures to improve public awareness and implement an advocacy program to increase utilization of health services.

Index Terms: Anaemia, women, pregnancy, nutrition, awareness, socio-economic status.

1 INTRODUCTION

Pregnancy induces some physiological changes that often confuse the diagnosis of several disorders and the assessment of the suitable treatments. This is especially true in case of anaemia. Anaemia during pregnancy is defined as a reduction in haemoglobin (the molecule which carries oxygen in the blood) concentration of less than 11 g/dl [1], during which plasma volume increases disproportionately compared with red cell mass resulting in a physiological disorder. To produce red cells, the women body needs (among other things) iron, vitamin B12 and folic acid. If there is a lack of one or more of these ingredients, anaemia will develop [1], [2]. Anaemia during pregnancy is a major public health problem and one of the leading causes of disability [3], [4]. The World Health Organization estimates that 58% of pregnant women in developing countries are anaemic. In spite of the fact that most ministries of health in developing countries have policies to provide pregnant women with iron in a supplement form, maternal anaemia prevalence has not declined significantly where large-scale programs have been evaluated[5]. During pregnancy, anaemia is defined as a haemoglobin concentration of less than 10.2g/dl [6]. In fact, anaemia itself is not a disease but it is considered as a sign of underlying disorders. Anaemia during pregnancy can be classified either as acquired or hereditary. The acquired anaemia includes iron deficiency anaemia, anaemia associated with acute blood loss or anaemia caused by infection [3].

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The two most common causes of anaemia during pregnancy are iron deficiency and acute blood loss. Iron deficiency anaemia is the most common nutritional disorder in the world that affects particularly women of reproductive age and preschool children in tropical and sub-tropical zones, and constitutes a major health issue in many developing countries [7]. If uncorrected, leads to anaemia, which was defined as the reduction of haemoglobin (Hb) concentration to a critical level [8]. Diminishing of iron storage results from an imbalance between iron absorption and the body's needs. Such an imbalance can generally arise from low dietary iron intake, poor absorption/utilization of ingested iron or increased demand. Demand is increased in the case of growth, blood loss related to menstruation, childbirth and chronic parasitic infections [9]. The normal physiologic iron losses among non-pregnant women and the substantial increase in iron needed during the second and third trimester of pregnancy makes it inevitable that, without supplemental iron, women will become anaemic[2], [8] especially among poor urban pregnant woman [10]. In many developing countries anaemia is primarily a result of lack of bio-available iron in the diet and can serve as a useful indicator of iron deficiency despite there being several other nutritional deficiencies that can cause anaemia such as folate and vitamin B12 deficiency, and other non-nutritional causes such as infection, inherited disorders and chronic disease. If the woman is otherwise healthy, she will rarely have any symptoms of anaemia unless her haemoglobin is below 8g/dl. The first symptoms of anaemia will be tiredness and paleness, though they are unusual, palpitations, breathlessness and dizziness can also occur. If the anaemia is severe, (the Hb levels less than 6g/dl) it may also cause chest pain or headache. The knowledge about the prevalence of anaemia is based largely on the data collected globally from pregnant women. Globally, two hundred million people suffer from anaemia per annum, with the highest prevalence rates found among women of reproductive age, infants and young children, and especially those of poor socioeconomic status [5]. Anaemia in pregnancy is associated with maternal morbidity and mortality. In Sudan, anaemia among pregnant women is one of the five causes of maternal deaths [6]. Common symptoms include tiredness and general weakness.

If anaemia is prolonged, other signs of iron-deficiency anaemia may develop such as, weight loss, indigestion, palpitations, and a smooth shiny, swelling of legs, tongue and tenderness of the skin at the corners of the mouth. In addition, it is classified as a major cause of referring during pregnancy of the total of referred cases, and it is 26% during labour[11]. The cause of anaemia among pregnant women is commonly due to low socio-economic status, customs and nutritional habits. Maternal anaemia results in intrauterine growth retardation, low birth weight, increased maternal morbidity and mortality, early delivery (by two or three weeks), affects the birth weight and iron stores of the child and impairment of the mother's immune system is [2], [11], [12]. There is no doubt that iron-deficiency anaemia during pregnancy should be prevented rather than cured, in view of the fact that at least 70% of women develop some degree of iron deficiency during gestation, justifying reasons for giving all women iron orally during pregnancy and lactation [2]. Folic acid forms stable complexes with iron, which result in the slow release of iron and small amounts being available for absorption in the upper part of the intestine, so reducing the discomfort of iron therapy [13]. In addition to early detection of anaemia deficiency and identifying its type, strategies involved in management of anaemia includes avoidance of frequent child births, intake of supplementary iron tablets and eating food rich in iron. A balanced diet, rich in proteins, iron and vitamins from good sources like liver, meat, eggs, green peas, figs, beans, whole wheat and green bananas is very critical to tackle the problem. The most effective treatment is to cure the problems causing anaemia. For example, material nutrition education could help to increase iron intake and haemoglobin levels in children [14]. In spite of these efforts in developing countries, the problem persists essentially unabated. Many reasons have been given for this relative failure, including late start of iron supplementation, inefficient administration by the health centres, insufficient daily doses, poor adherence to the required daily dosage, misconceptions on the effect of iron supplementation and the development of side-effects [9]. This study was designed to estimate the magnitude and severity of anaemia among pregnant women in the Gazira state region of the Sudan and the main factors leading to the occurrence of this problem. The purpose is to find out the association between anaemia during pregnancy and the following variables: age, stage of pregnancy, education levels of wife and husband, parity, child spacing and folic acid intake during pregnancy. Results provide a baseline data for monitoring and evaluating the effectiveness of intended interventions and contribute towards planning and designing appropriate programs to help reduce rates of anaemia in pregnant women.

2 MATERIALS AND MEHTODS

2.1 Women sample and questionnaire

A structured questionnaire as the main methodological tool was used to collect the required data and information. A random selection of women attending the clinic in the maternity hospital was chosen. Sampling is the method by which study cases or records are selected from the target population or database in which 400 pregnant women were selected for this study. More than half of the mothers (n=224) were in the middle stage of pregnancy (the second trimester) with 114 and 62 women in the first and the third trimester, respectively. This normally distributed feature for the number of mothers in their current pregnancy implied the reliability of the obtained data. A questionnaire was used to gather and collect all information required. In this study all questions were answered with full consent of respondents. It is important to note that no woman refused to participate in the study and therefore no participation bias was found. Accordingly, a coded questionnaire was prepared to obtain the following information from the interviewed pregnant women: personal data (weight, age), frequency of pregnancy, stage of pregnancy, education levels of wife and husband, profession of wife and husband and family size. The results were directly presented, and the respondents at risk were advised to go to the nearest health unit for treatment and follow-up.

2.2. Measurements

Data of haemoglobin status and values of blood pressure were taken from the general practitioner in the clinic for each interviewed women. Haemoglobin is a constituent of the red blood cells that carries out the important function of transportation of oxygen for the body. The assessment of haemoglobin was performed by testing the peripheral blood.

2.3. Statistical analyses

Data were computerized in columns and row to facilitate extracting the relevant descriptive statistics for each parameter corresponding to each question. Frequency distribution, percentages, mean, standard deviation, and confidence limits for haemoglobin levels were tabulated. Prevalence of anaemia was based on the World Health Organization recommended cut-off thresholds. Data were also analysed by using chi-square method (χ^2) at a significant level of P=0.05 by using the software Program Statistical package for the Social Sciences (SPSS) to examine the influences of socio-economic factors on the prevalence of anaemia[15].

3 RESULTS AND DISCUSSIONS

3.1. General statistics

3.1.1. Age distribution of mothers

As shown in Table 1, women differed in their ages from very young mothers (15-25 years old) to very old women (more than 50 years old). The majority of the mothers were in the age range of 26-35 years old (55%) which reflects the traditional marriage age of women in the province. Mothers of age range of 36-45 and 46-50 years old represented percentages of 22% and 4.5 % of the examined mothers, respectively. Although the sample of mothers was not normally distributed in an ideal manner, the wide range of their ages gave a better change to study the influences of age on anaemia conditions related to eating habits, education and overall awareness.

3.1.2. Haemoglobin level

Haemoglobin is the protein molecule in red blood cells that carries oxygen from the lungs to the body's tissues and returns carbon dioxide from the tissues to the lungs. Haemoglobin levels indicate the oxygen carrying capacity of the blood. Anaemia occurs when the blood does not have enough haemoglobin because the blood does not carry enough oxygen to the rest of the women's body [16]. Therefore, anaemia is a medical condition in which the red blood cell count or haemoglobin is less than normal. The normal level of

haemoglobin is generally different in males and females as well as in pregnant females. For women, anaemia is typically defined as haemoglobin level of less than certain thresholds. In this study, the normal level of haemoglobin in pregnant women was set at 11 g/dl which cannot be diagnosed as anaemia. Anaemia in pregnancy is defined by World Health Organization as haemoglobin level of less than 11.0 g/dl and often classified as: Mild degree (9.0-11.0g/dl), Moderate (7.0-9.0g/dl), Severer (7.0-4.0g/dl), Very Severe (<4.0g/dl). Based on this classification, the examined women samples were classified according to the measured haemoglobin in their blood analyses. As shown in Table 1, about 35.25% (161 women) were suffering from severe and very severeanaemia. The same result reported by [17] who said about one-third of the pregnant women living in Tanzania were anaemic and out of these, 1.4% were severely anaemic. However, more than this percentage reported by [18] who reported that approximately two-thirds (63.1%) of pregnant women (in rural Uganda) had sub-optimal haemoglobin levels (<11g/dL). The problem of anaemia makes women feel cold, weak, dizzy and irritable during pregnancy. In addition, about 56 % of the investigated women sample was suffering from mild and moderate anaemia. In total, more than 90% of the examined women had anaemia during pregnancy leading to a negative influence on their ordinary life activities.

3.1.3. Education level of mothers and husbands

Table (1) and associated Fig. 1 demonstrate the percentage of women and their husbands receiving different levels of education. The most interesting notice that can be Fig. d out from these data is the fact that about 10.75% of women and 8.5% of their husbands were illiterate without any level of education which represents an obstacle for health-improvement programs. Moreover, about 72.75% of women and 60% of husbands were under university education level meaning that the majority of women and their husbands was either illiterate or just receiving secondary and primary educations.

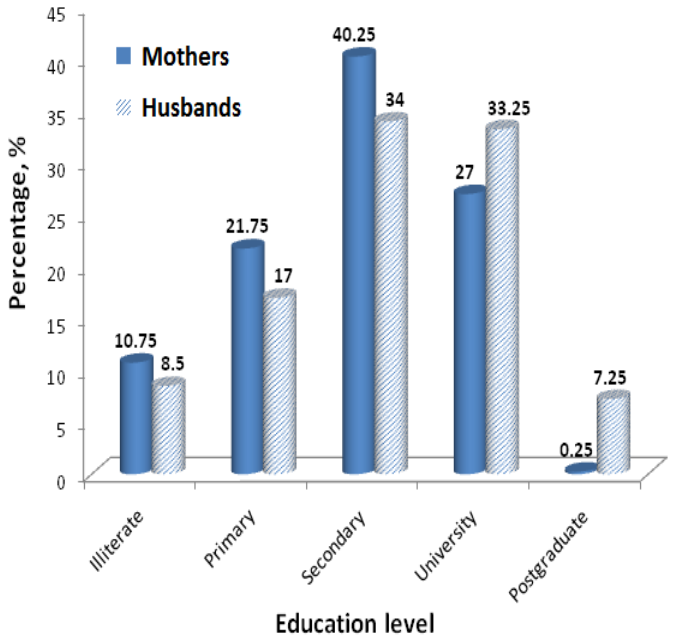

Fig. 1 Education levels of mothers and their husbands.

In addition, women receiving postgraduate education was only 0.25%; meanwhile husbands entered this high level of education was 7.25%. Indeed, these unoptimistic Fig. s indicated that hindered features could be expected from the examined society as will be explained later in the association section between education and presence of anaemia. At the same time maternal education had a significant influence on nutritional status as reported by [19].

3.1.4. Types of mothers' diet

Diet and nutritional status of the pregnant women is another angle of the problem that has been dealt with in this study because it is well known that there are differentials in the anaemia rates by nutritional characteristics. As exposed, in Fig. 2, the majority of the mothers had a poor diet (50.25%) or a very poor diet (17.25%) indicating the very poor nutritional conditions of the interviewed mothers. The reverse finding was reported by [17] who studied factors influencing pregnancy outcomes who said the majority of the studied women (63.7%) knew the right types of foods they were supposed to eat during pregnancy. Moreover, this result probably can explain the very high percentages of anaemic mothers in this study since it is extremely associated to the nutrition condition of the mothers.

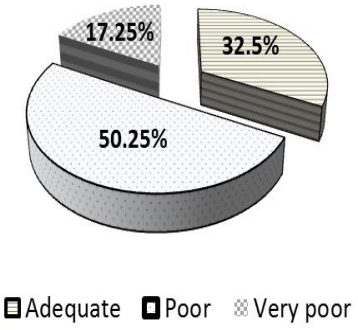

Fig. 2 Distribution of interviewed mothers in percentage based on their quality of diets.

3.1.5. Child spacing

Child spacing means the period between two consecutive pregnancies of the same mother. Because the nutritional burden on the mother between pregnancies depends on the extent of breastfeeding, the inter-pregnancy interval and the 'recuperative interval' (duration of the non-pregnant, non-lactating interval) could measure whether the mother has had a chance to recover from the pregnancy. Therefore, it is expected an increased risk for maternal anaemia when the inter-pregnancy interval is very short. The collected data indicated about 63 % of mothers had more than two years between repetitive pregnancies and 37% of women had a child spacing of less than two years. Time interval between pregnancies strongly influences the outcome of the subsequent pregnancies. Short birth interval does not give the mother enough time to recuperate from the nutritional burden of the previous pregnancy, which may lead to poor pregnancy outcomes [20]. This interesting distribution will be associated with anaemia in the subsequent part of this paper. Good pregnancy outcomes are expected when there is a gap of at least 18 – 23 months between the consecutive pregnancies [21].

TABLE 1

ESSENTIAL DATA COLLECTED FORM THE INTERVIEWED PREGNANT WOMEN VIA ANALYSIS AND QUESTIONNAIRE

Parameter	Number (percentage)	
Age		
15-25	73 (18.25%)	
26-35	220 (55%)	
36-45	88 (22%)	
46-50	18 (4.5%)	
>50	1 (0.25%)	
Haemoglobin level		
> 11.0 g/dl	35 (8.75%)	
11.0-9 g/dl	110 (27.5%)	
9.0-7.0 g/dl	114 (28.5%)	
7.0-4.0 g/dl	128 (32%)	
<4.0 g/dl	13 (3.25%)	
Education level	*Women*	*Men (Husbands)*
Illiterate	43 (10.75%)	34 (8.5%)
Primary	87 (21.75%)	68 (17%)
Secondary	161 (40.25%)	136 (34%)
University	108 (27%)	133 (33.25%)
Postgraduate	1 (0.25%)	29 (7.25%)
Child spacing		
> 2 years	148 (37%)	
< 2 years	252 (63%)	
Folic acid intake		
Positive	82.5 (330%)	
Negative	17.5 (70%)	

3.1.6. Percentages of folic acid intake by mothers

Having a healthy baby means that mothers must be healthy too. Folic acid, sometimes called folate, is a B vitamin (B9) found mostly in leafy green vegetables like kale and spinach, orange juice, and enriched grains. Mothers' body needsfolate to make normal red blood cells and prevent anaemia. One of the most important things mothers can do to fulfil their body needs and to help prevent serious problems is to get enough folic acid every day- especially during early pregnancy. Folic acid is also essential for the formation and maturation of red blood cells and necessary for cell growth and repair. Deficiency of folate reduces the rate of DNA synthesis with consequent impaired cell proliferation and intramedullary death of resulting abnormal cells; this shortens the lifespan of circulating red blood cells and results in anaemia[22]. There is, however, little evidence that folic acid deficiency may be a public health problem in many developing countries. The percentage of mothers who were practicing folic acid intake during their pregnancy stage is shown in Table 1. It is very obvious to notice that the majority of mothers (82.4%) were practicing folic acid intake; meanwhile the rest (17.6%) did not take folic acid at all. The main aspect of care for persons affected by anaemia involves early treatment intervention of preventable health problems such as analgesics, antibiotics, vitamins, folic acid supplementation and high fluid intake are periodically used [23].

3.2. Influence of nutritional and socio-economic parameters on anaemia

3.2.1. Effect of age and education level

Table 2 shows anaemia levels among the interviewed women aged from 15 to more than 50 years old. The results revealed that only 8.75% of the interviewed women had a normal level of haemoglobin concentration and therefore they were not suffering from anaemia. The level of anaemia was severe in about 4% of women, while 27.5% and 28.5% had a mild and a moderate level of anaemia and 33 % and 3.25% of the examined women had severe and very severe level of anaemia, respectively. Statistical analysis indicated that age was strongly associated with anaemia levels (χ^2=45.254 and P-value = 0.000) and it was inversely related to the presence of anaemia with older women being somewhat more likely to be moderately or severely anaemic than younger women. For instance, women older than 46 years old (in the age category of 46-50 and >50) were all suffering from anaemia from mild to very severe conditions. Strictly speaking, the rate of severe and very severe anaemia condition among women aged 36-50 years was almost five times as high as among women age 15-25 years. On the other hand, women education has a great influence on their attitude of haemoglobin deficiency leading to anaemia disaster. As shown in the second part of Table 2, about 96.0% of the illiterate women had anaemia from mild to very severe levels with about 83.72% having anaemia from moderate to very severe level. Women with a higher education are less frequently anaemic than illiterate women or women with a primary or secondary education. Surprisingly, the only women who had postgraduate study was suffering from very severe level of anaemia but this could be attributed to some other factors not to her educational level. In spite of this misleading result, women with university, secondary and primary educations had moderate to very severe level of anaemia of 48.15, 64.59 and 71.25 % respectively indicating that when the women were well educated the anaemia level reduced significantly (χ^2=80.462 and P-value = 0.000). In brief, anaemia decreases steadily with the increases in the level of educational attainment in the interviewed women. Low education level has indirect effects on the understanding of nutrition and food aspects as well as improvement of the socio-economic conditions [24]. Now, the question that should be investigated is that whether the husband education also affects the anaemia level of the interviewed women or not. The third part of Table (2) has the answer of this question. In general, husband education has a significant effect (χ^2 =69.901 and P-values =0.000) on anaemia level of the interviewed women. About 91% of illiterate husband their wives had anaemia from mild to very severe conditions. On the contrary, educated wives of highly educated husband had a lower rate of anaemia. Wives of husbands with postgraduate education had the lowest level of anaemia. In general, the rate of moderate to very severe anaemia in wives of husbands who had postgraduate, university, secondary and primary educations were 28.0, 56.39, 68.39 and 75.0 % respectively indicating that when the education level of women's husband was high the anaemia level reduced considerably. The same result was reported by Nagaraj[25] who found that the risk factor, which had significant association with severe anaemia at 10% level of significance on univariate analysis, are husband's educational status (p=0.017).

TABLE 2

INFLUENCES OF AGE AND EDUCATION ON ANAEMIA LEVEL ON PREGNANT WOMEN.

Terms of Influence	Percentage of women with anaemia					Total No. (n=400)
	Normal >11.0g/dl	Mild anaemia 9.0-11.0g/dl	Moderate anaemia 7.0-9.0g/dl	Severe anaemia 4.0-7.0g/dl	Very severe anaemia <4.0g/dl	
Age						
15-25	10.96	23.29	28.77	31.51	5.48	73
26-35	8.64	28.64	27.27	34.54	0.91	220
36-45	9.1	30.68	31.82	22.72	5.68	88
46-50		16.67	27.78	50.00	5.55	18
>50					100	1
Women Education						
Illiterate	6.65	11.62	16.28	55.81	11.63	43
Primary	6.90	21.84	26.43	41.38	3.44	87
Secondary	6.21	29.19	32.92	31.05	0.62	161
University	15.74	36.11	28.70	16.67	2.78	108
Postgraduate					100	1
Husband Education						
Illiterate	8.82	11.76	17.64	50.0	11.76	34
Primary	8.82	16.18	20.59	50.0	4.41	68
Secondary	2.94	28.68	36.03	30.15	2.21	136
University	9.02	34.59	30.08	24.81	1.50	133
Postgraduate	34.48	34.78	14.24	10.34	3.45	29

Family income was another important factor related to the anaemia level since it improves some other related factors such as nutrition, education, awareness and hygienic conditions. At the same time [18] found that the pregnant women from households in the lower three relative wealth quintiles were 2.15 times more likely to have anaemia than those from higher category rankings.

3.2.2. Influence of awareness, diet and folic acid

The results shown in Table (3) revealed that awareness had a very significant effect on the presence of anaemia among pregnant women. In fact, it was not an astonishing matter to find that more than half of the interviewed women (about 63.25%) were not aware or had a little awareness about the danger of anaemia due to that fact that the majority (about 75 %) of these women was either illiterate or had a primary or secondary education as described before (Table 1 and Table 2). In fact, interaction between influencing factors should be investigated in more details. Awareness in this context indicated to the state and the ability to perceive the danger of anaemia and its negative consequences during and after pregnancy. The only way to realize the dangers of anaemia would be throughout better awareness either during education or by increasing this knowledge by organized campaigns. Maternal education level therefore influences the food choices and feeding patterns of family members. Majority of the women in this study had attained only primary level education. Marital status has been reported to influence pregnancy outcome [26]. The awareness of these facts responded by the interviewed women is shown in Table 3. It is obvious to Fig. out that the majority of mothers were either not aware (26.25%) or aware to some extent (37%) about the danger of anaemia. The same finding was stated by [18] whose results established that awareness of anaemia as a health problem during pregnancy is relatively widespread. Indeed, this result is a disaster in itself as it hampers the improvement of health conditions and must be overcome before starting in any health-improvement programs. Generally speaking, awareness had an inverse effect on the presence of anaemia, when the awareness increased the existence of anaemia among women decreased significantly (χ^2=37.319 and P-value = 0.000). As a matter of fact, the inadequate nutritional practices usually lead to anaemia particularly in pregnant women. On the other hand, adequate amounts of protein, fat, carbohydrates, vitamins, and minerals are required for a well-balanced diet. Table 3 shows that the prevalence of anaemia was higher among women who have intake of very poor diet. Considering differentials by women's nutritional status, the greatest variation in anaemia was observed when the diet was rather poor. When the diet enhanced the haemoglobin level in the interviewed women was improved very significantly (χ^2=23.251 and P-value = 0.003). The ratio of women having very poor diet with normal haemoglobin level was only 1.45 %. The percentage of the presence of anaemia (in all levels altogether) was 90, 89.55 and 98.55 % for women having adequate, poor and very poor diet respectively. Actually, it was unusual to notice that even women having adequate diet were also suffering from anaemia which could be attributed to some other interacted factors. In general, poverty has a negative effect on the consumption of nutritious types of food. Women in households with a low standard of living are less likely than other women to eat various foods, and their diet is particularly deficient in fundamental element. It was foreseen that women residing in urban areas should be less likely for substantial anaemia conditions than women residing in rural areas because they have access to every type of food in their diet, particularly nutritious foods, and access to more advanced public and private clinics. The dietary intake of rural pregnant women was lower than the recommended level [27]. Becauseanaemia usually results from a nutritional deficiency of iron, folate, vitamin B12, or some other nutrients, it is quite vital to look after of the women's diet especially during pregnancy. The consumption of a wide variety of nutritious foods is important for women's health. For example, green, leafy vegetables are a rich source of iron, folic acid, vitamin C, carotene, riboflavin, and calcium. It is reported that riboflavin deficiency may be quite common in developing countries where intake of animal products is low, and especially during seasons when there is less intake of vegetables [28]. Vitamin B12 is necessary for the synthesis of red blood cells and its deficiencies have been associated with anaemia. Therefore, diets with little or no animal protein, as it is often the case in the developing world, coupled with malabsorption related to parasitic infections of the small intestine, might result in Vitamin B 12 deficiency [22].

TABLE 3

RELATIONSHIP BETWEEN AWARENESS, DIET AND FOLIC ACID ON THE PRESENCE OF ANAEMIA

Terms of Influence	Percentage of women with anaemia					Total No. (n=400)
	Normal >11.0g/dl	Mild anaemia 9.0-11.0g/dl	Moderate anaemia 7.0-9.0g/dl	Severe anaemia 4.0-7.0g/dl	Very severe anaemia <4.0g/dl	
Awareness						
Very aware	12.0	36.0	14.0	34.0	4.0	50
Aware	15.46	32.99	29.90	20.62	1.03	97
Aware to some extent	7.43	29.05	32.43	28.37	2.70	148
Not aware	2.85	16.19	28.57	46.67	5.71	105
Diet						
Adequate	10.0	36.92	23.85	26.15	3.08	130
Poor	10.45	25.37	31.34	30.35	2.49	201
Very poor	1.45	15.94	28.99	47.82	5.80	69
Folic acid						
Intake	9.71	27.18	27.18	32.04	3.88	330
No intake	3.03	36.36	31.82	28.79		70

Usually, iron and folic acid tablets are provided to pregnant women in order to prevent anaemia during pregnancy. The provision of iron and folic acid supplements to pregnant women has undoubtedly reduced the overall prevalence of anaemia in pregnant women. However, the result tabulated in Table (3) revealed that intake of folic acid was insufficient (χ^2=7.596 and P-value = 0.108) for reducing the prevalence of anaemia in the interviewed women because both women who intake or did not intake folic acid are suffering from anaemia. This result could be elucidated to the low amount of folic acid taken by the women which was not enough to beat this epidemic dominant problem. In fact, the ratio of women who had a normal haemoglobin level was 9.71 and 3.03 % for women having folic acid and those women who did not practice folic acid uptake, respectively. Supplementation of iron during pregnancy is one of the main components of the anaemia control and prevention strategy. The provision of iron and folic acid supplements to pregnant women will undoubtedly reduce the overall prevalence of anaemia in pregnant women [16]. Because folic acid is an essential element that usually used to alleviate the problem of anaemia, this strategic component was investigated in the current study. As declared in Table 3, although the percentage of women taking folic acid during pregnancy stages was much higher than those who did not acquire it, there is no significant difference (χ^2=4.162 and P-value = 0.125) among women in their response to folic acid during all stages of pregnancy. This could be attributed to the little uptake of folic acid by the interviewed women [29].

4 CONCLUSION

In this study, the prevalence of anaemia among pregnant women was investigated under the influence of some nutritional and socio-economic factors. The health services is available and accessible in general, but a major constraint is that the people could not afford to utilise it, because of the quality of the service, delivered there is poor quality awareness of women about the health services. The prevalence was higher in poorly educated women, women with large family size, and those who do not use family planning services. The study revealed that the prevalence of anaemia was the same among women who attend clinical units and using iron supplementation and women who do not attend or use iron supplementation. These findings strongly raise the issue of the awareness of mothers towards their health and family. More studies are needed to explore the causes of the failure to prevent anaemia among pregnant women. It is recommended to redistribute the health services according to needs of the population, to train clinical providers to deliver services up to the standard of the guidelines recommended by the World Health Organization, to increase the awareness of midwives regarding diagnosis, treatment and referral system of anaemia cases, to implement advocacy programmes to increase the utilization of family planning services, and iron supplementation in reproductive age and to revitalize the cooperation and coordination between school health and health education departments to raise the awareness of women in reproductive age, particularly girls in secondary schools for better anaemia prevention.

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