

Original Article

Prevalence of Anemia and Associated Risk Factor Among Pregnant Women in Al Bayda City - Libya

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ABSTRACT

Background and aims. Anaemia is considered a major public health problem; playing an important contributor to mortality and morbidity among pregnant women globally, especially in developing countries and is considered a major factor responsible for low birth weight. This study was conducted to determine the prevalence of anaemia among pregnant women in AL-Bayda city, Libya and to identify their associated factor. **Methods.** Descriptive cross-sectional study was carried out from April 2022 to August 2022. A total of 430 pregnant women were selected using a systematic random sampling technique. The participants were included only after confirmation of the pregnancy. Data for participants accepted in this study were collected using pretested interviewer administered questionnaire, which contains socio demographic characteristics, obstetric and gynecological history, the number of days of the menstrual cycle, the period between each birth, birth method, and hemoglobin level. The analysis was performed by using the Statistical Package for social sciences SPSS version 26. **Results.** The percent of anaemia in the total study sample is 56.5 %. **Conclusion.** Awareness regarding balanced diet, regular antenatal checkups, regular intake of iron and folic acid tablet is highly recommended.

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INTRODUCTION

Anaemia is considered a major public health problem; playing an important contributor to mortality and morbidity among pregnant women worldwide, especially in developing countries [1]. According to world health organization (WHO) survey, over 38 % of pregnant women are anaemic worldwide, with 18% in high – income countries and 35-75% in low- and middle - income countries. The rate of deficiency seems to increase as pregnancy progresses [2]. The nutritional anaemia is the most important cause of maternal anaemia. Iron deficiency (ID) and folate deficiency (FD) are considered as the first two causes of nutritional anaemia. Furthermore, iron deficiency anaemia (IDA) is the most important public health problem in haematology in the developing countries [3]. Anaemia was one of the main pregnancy- related complications (62.3%) from the total pregnancy complication [4].

Anaemia in pregnancy has negative effects on children's due to a reduced oxygen delivery to the fetus, subsequently causing intrauterine growth retardation, stillbirth, low birth weight, neonatal deaths, preterm birth, and consequent impaired growth and cognition of the child [5,6]. Mental development, inadequate growth, and high maternal mortality, among other serious nutritional and health issues. Moreover, anaemia may lead to premature birth, low birth weight, and fetal growth restriction are all risks that anaemia during pregnancy increase perinatal mortality and decreased mother and child infection resistance [2].

Early detection and effective management of anaemia in pregnancy would add to planning appropriate strategies aimed at reducing the burden of maternal morbidity and mortality [7,8]. In developing countries, the main cause of anaemia during pregnancy is nutritional deficiencies of iron, folate, and vitamin B12 and also parasitic diseases, such

as malaria and hookworm [8,9]. The mother with severe anaemia may have increased the risks of cardiac failure or death from peripartum haemorrhage [10]. It has been reported that the percent of anaemia in pregnant women in Nigeria 54.5%, in Ethiopia 56.8% and in Kenya 57% [11,13]. Additionally, in Egypt the prevalence was 30%, 31% in Iraq, Morocco 32%, Qatar 28%, Saudi Arabia 40%, Tunisia 29% and United Arab Emirates 26% [2].

Inadequate data are available in Libya, WHO in 2011 estimated that 28% of pregnant women in Libya suffer from anaemia. In 2005, the percent of anaemia in pregnant women was 34% [2]. Hence, the purpose of this study was to estimate the prevalence of anaemia in pregnant women with its associated factors in Al-Bayda city in Libya.

METHODS

Study design and setting

Descriptive cross sectional study was carried out from April 2022 to August 2022. A total 430 pregnant women visiting the AL-Bayda medical center were included in the study by systematic random sampling technique, medical and obstetric data of the study participants were collected using structured questionnaire. The participants were included only after confirmation of the pregnancy. The first test used to diagnosis anemia was complete blood count (CBC). The test checks hemoglobin level which consider primary target for anemia and for this reason hemoglobin is consider as the primary outcome in this study for measuring anemia percent among pregnant women. Anemia in this study is defined by using the WHO criteria of hemoglobin values of less than 11g/dl. [14,15] (Mild anemia 10 -10.9 g/dl, moderate anemia 9.9 – 7 g/dl, and severe anemia less than 7g/dl).

Participants

Data were collected using pretested interviewer administered questionnaire, which contains socio demographic characteristics (age, education, occupation, BMI, and others), obstetric and gynecological history including history of recurrent miscarriage, pregnancy stage (first three months, second three months, third three months), the number of days of the menstrual cycle, the period between each birth, birth method (natural, by surgery) and dietary factors including consumption of red meat, poultry and fish, consumption of vegetable and fruit, previous infection with a parasite (if found what parasite name), hemoglobin level. Excluded from the study the subject which suffering from bleeding disorder as hemophilia A (factor VII deficiency, hemophilia B (factor IX deficiency), von will brand disease, the participant with bleeding disorder in previous pregnancy and take iron and folic acid supplement before registrations were excluded from the study.

Statistical analysis

Data analysis was performed using SPSS software version 20. Descriptive statistics, including percentage, mean, range, and standard deviations, were calculated for all variables. Proportions were compared using Chi-square tests and P-value less than 0.05 was considered statistically significant. Logistic regression analysis was performed to estimate the association between the potential risk factors and anaemia among pregnant women.

Our study was conducted after approval from AL-Bayda medical center faculty of pharmacy, Omar al mukhtar university written approval (informed consent) was obtained from all study participants. The study was conducted at the AL-Bayda medical center, Al-Bayda, Libya.

RESULTS

Percentage of anaemia in total sample

Anaemia determines by haemoglobin level; in this study the total sample was 430 participants. 187 cases which represent 43.5% were non – anemic pregnant women in which hemoglobin equal 11 mg –dl, 243 cases which represent 56.5% with haemoglobin less than 11 mg –dl were anaemic pregnant women, meaning the percent of anaemia in the total study sample is 56.5% in this search. 56.5% anaemic cases divided into three group according haemoglobin level into mild anemia 67 cases by percent 15.6%, moderate anemia form 148 cases by percent 34.4%, severe anemia 28 cases which form 6.5% from the total sample as show in figure 1

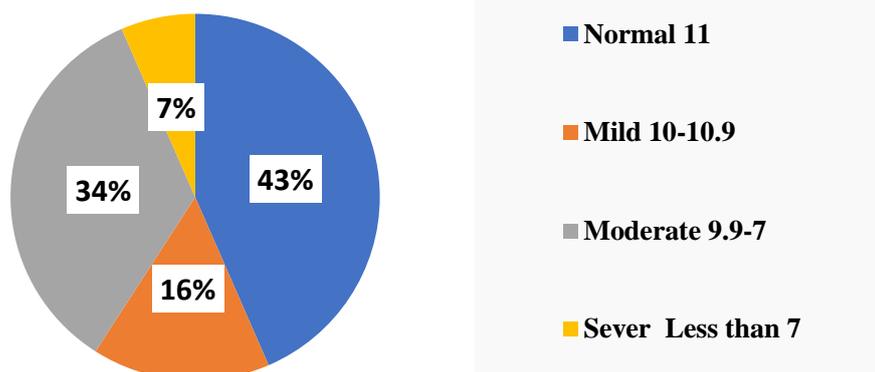


Figure 1. Percentage of anemia in total sample

In figure 1 the overall prevalence of anemia among pregnant women was found to be 56.5 % the prevalence of mild, moderate, severe anemia were observed as 15.6 % ,34.4 % ,6.5 respectively. The prevalence of moderate anemia was high in comparison with other degree of anemia.

Table 1. Demographic characteristic of the total study sample (N=430)

Parameter	Total subject
Number of participants	430
Age in years	
18-26	219 (50.93%)
26-34	164 (38.13%)
More than 34	47(10.94%)
Occupation	
Housewives	191(44.4%)
Employed	176(40.90%)
Student	63(14.70%)
BMI*	
underwight	15(3.49%)
Normal	163(37.91%)
Overweight	146(33.95%)
Obese	106(24.65%)
Residence	
Urban	345(80.2%)
Rural	85(19.8%)
Education state	
Uneducated	1(0.20%)
Elementary	8(1.90%)
High school	61 (14.20%)
University	360(83.70%)

*BMI (Body Mass Index): BMI >20kg/m²underweight, BMI < 25kg/m² normal weight, BMI >25kg/m² are overweight and BMI > 30 are obese) [2].

Table 2: Obstetric and gynecological history of the total study sample (N=430)

Parameter	Total subject
Number of participants	430
History of miscarriage	
Yes	89 (20.70%)
No	341 (79.30%)
History of heavy cycle	
Less than 5 days	131 (30.50%)
More than 5 days	299 (69.50%)
Trimester	
First (0-3)	93 (21.60%)
Second (3-6)	135 (31.40%)
Third (6-9)	202 (47.00%)
Birth interval	
0-2 years	186(43.25%)
2-4 years	154(35.82 %)
More than 4 years	30 (6.97%)
First pregnant	60(13.96%)
Mood of delivery	
Normal vaginal delivery	259(60.20%)
Caesarean section	115(26.70%)
Before labor	56 (13.10%)
Intestinal parasite	
Yes	30 (7.00%)
No	400 (93.00%)

Table 3 shows the distribution of participants from different aspects, such as history of miscarriage, history of heavy cycle, trimester, birth interval, mood of delivery, intestinal parasite

Table 3: Demographic characteristics of anemic pregnant women's (N=243) and our association risk factors

Parameter	Total subject	P Value
Number of anemic pregnant woman's	243	
Age in years		0.897
18-26	128(52.67%)	
26-34	90 (37.03 %)	
More than 34	25 (10.30 %)	
Occupation		0.732
Housewives	111(45.68 %)	
Employed	94(38.68 %)	
Student	38 (15.64 %)	
BMI		0.126
Underweight	9(3.71%)	
Normal	81(33.33%)	
Overweight	86(35.39%)	
Obese	67(27.57 %)	
Residence		0.624
Urban	191(78.60%)	
Rural	52(21.40%)	
Education state		0.126
Uneducated	0(0.00%)	
Elementary	5(2.05%)	

High school	37(15.23%)	
University	201(82.72%)	

A total of 430 participants, 234 subjects with anaemic. Where the age is divided into three groups (18-26) (26-34) and more than 34, By using Linear Regression, we found no a significant association between the anaemia and Age. In all, 243 (56.5%) of the 430 participants were reported no a significant association between the anaemia and BMI (P value = 0.126).

Table 4. Obstetric and gynecological history of anemic pregnant women's (N=243) and our association risk factors

Parameter	Total subject	P Value
Number of anemic pregnant woman's	243	
History of miscarriage		
Yes	48(19.75%)	0.777
No	195(80.25%)	
History of heavy cycle		
Less than 5 days	73(30.04%)	0.777
More than 5 days	170(69.96%)	
Trimester		
First (0-3)	50(20.57%)	0.044
Second (3-6)	74(30.46%)	
Third (6-9)	119(48.97%)	
Birth interval		
0-2	103(42.38%)	0.819
2-4	82(33.74%)	
More than 4	20(8.23%)	
First pregnant	38(15.65%)	
F.V con		
Yes	201(82.72%)	0.137
No	42(17.28%)	
R.P.F con		
Yes	144(59.26%)	0.594
No	99(40.74%)	
Mood of delivery		
Normal vaginal delivery	145(59.68%)	0.924
Caesarean section	63(25.92%)	
Before labor	35(14.40%)	
Intestinal parasite	18(7.40%)	
Yes	225(92.60%)	0.345
No		
Take anemic treatment	204(83.96%)	
Yes	39(16.04%)	0.000
No		
What is the name of the drug?		
feroxyl	85(34.97%)	0.000
Glovit	54(22.21%)	
Venofer	37(15.21%)	
Jectofer	18(7.40%)	
Fefol	12(4.94%)	
None	37(15.27%)	

DISCUSSION

This data was gathered from pregnant women from Albayda city/Libya. Libya is classified as a developing country with a Human Development Index HDI of 0.784 and Libya estimate of prevalence was higher and lower than other studies estimates. There is an agreement in the literature that anemia is a common problem in pregnant women in most of developing countries. The preliminary estimate of prevalence of anaemia in Albayda was 56.5% Using WHO criteria, anaemia in pregnant women is when haemoglobin concentration in the blood less than 11 g/dl. Furthermore, anaemia considered as a severe public health problem among pregnant women when the prevalence is 40.0% and more by WHO [13]. The prevalence of anemia is high in this study, however, 15.6 % had mild anaemia which Hb level ranged from (10 -10.9 g/dl), 34.4 % had moderate anaemia (Hb 9.9-7 g/dl) and 7 % had severe anaemia(Hb less than 7 g /dl). The prevalence estimate of anaemia in Albayda / Libya was higher to the overall prevalence of anaemia among pregnant women in the world which was 38.2% and a slight similar to the overall prevalence among pregnant women in Africa, 44.6% [13]. Nevertheless, Albayda estimate is within a range of the prevalence in some Africa countries for example in Nigeria was 54.5% [14]. Ethiopia was 56.8%, Kenya was 57% [15,16], and lower compared with what was obtained in similar studies conducted in Nigeria (62.6%) and (62.2%) in Egypt [17,18] and lower in women attended to antenatal clinic at hospital of Potro Novo-Cape Verde, Benin 38.8% and in other two studies in Nigeria 23.2% and 29%,16.6% in Northwest Ethiopia [19.,20-22].

Interestingly, this finding is higher to the overall prevalence found among pregnant women than other studies in the Middle East and North Africa,40.08 % in Algeria, 26.2% in Bahraini, 27.1% in East Anatolian Province, Turkey, Jordan (34.7%) and (39%) in Makkah, Saudi Arabia [23-27].

In our study divided age to three group (18-26 y) (26-34 y) (more than 34y), higher anaemia percent found in age group (18-26 years) with percent 50.9 %, severe anaemic condition is seen among the pregnant women with age group between26-34 followed the age group18-26 years. when measuring multiple regression analysis for the relation between age and anaemia found 95 % CI =2.235 P value = 0.897. The age of the pregnant women was not significantly associated with anaemia. This is similar to other study carried out in the west Algeria which indicated no relation found between the age and anaemia [22]. In this study when calculated the relationship between residence and Anaemia by using SPSS 20 measuring multiple regression analysis demonstrate that CI= 95%Chi-Square = 1.756 P value = 0.624 meaning no significance association between residence and anaemia. Urban: anaemic 191(44%), non-anaemic 154 (35%) Rural anaemic: 33(7.67%) non anaemic 52(12%). At the same time there is no significance association was found between Anaemia and Educational levels, P value= 0.126 This is in accordance with study in performed in Jordan and Nigeria [26,17].

In our study was not significant different between socio-economic classes and anaemia which similar to other study [26,28]. This appears to be at variance with other studies in which it is expected to be more in the lesser socio-economic class more prevalent [29,17].

In our study when calculated p value = 0.126 found no significant association between education and anemia but the prevalence of anemia was higher amongst pregnant women in the university. Anaemic: 201(46.7%), non-anaemic 159 (36%) while another study carried out in Derna indicated that the higher percent was in the secondary education [30]. In our study we found there was no relationship between Anaemia and BMI P value =0.126 and the prevalence of anemia was higher in Overweight(25-29.9) : anemic 86 (20%) non anemic 60(13.9%) and in our data underweight(less than 18.5) anaemic 9(2%) , non-anaemic 6 (1.4%) while normal (25-29.9) anaemic 81(17.8%) non anaemic 82(19%) and Obese (More than 30) anaemic 67(15.58%) non anaemic 39 (9%) p value for the relation between BMI and anaemia p value = 0.126 mean no relation between BMI and anaemia, but in study documented in Saudi Arabia p value was = 0.002 [31]. In this study, there was no significance association between anaemia and miscarriage, p value=0.777 similar to other study recorded in Ethiopia [32]. History of heavy cycle in this study there is no significance association between Anemia and heavy cycle p value = 0.777 this in contrast with other study documented in Saudi there is a significance association, p value =0.042 [31]. In our study no relationship has been found between anaemia and mode of delivery P value=0.924 in contract to study in Korea [33].

In our study no significance association between anemia and birth interval P value=0.819 in the contrast with other study in Egypt [26].

The prevalence of anaemia in this study increase with increase trimester of pregnancy like other study (Jordan, Saudi, Egypt) [34]. This is may be due to increase demand for micronutrients during the last trimester There are significance association between Anaemia and trimesters P value = 0.04. Meat consumption: there is no significance association with anaemia, P value =0.137, while in other study recorded in Derna indicated that low intake of red meat was significant association with anemia, in pakistan P value=0.05 there is significance association [35].

In this study we found that there is no significance association between anaemia and Intestinal Parasites P value = 0.345 in contrast with another study carried out in southeast Ethiopia recorded that there was a significant association p value = 0.019 [36].

In our study was relationship between take iron supplement and haemoglobin level found P value = 0.000 in other study found that a higher rate of preterm birth was found in anaemic pregnant women without iron treatment but this adverse birth outcome was prevented with iron supplementation [37].

CONCLUSION

Our study showed that the prevalence of anaemia in pregnant women was 56.5 % in Al-Bayda, Libya. The prevalence of anaemia among pregnant women in Libya is comparable to that considered as a severe public by WHO suggesting those anaemia among pregnant women is public health problem in Libya. So, awareness regarding balanced diet, regular antenatal checkups, regular intake of iron and folic acid tablet, it is highly recommended.

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انتشار فقر الدم وعوامل الخطر المصاحبة له بين الحوامل بمدينة البيضاء - ليبيا

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المستخلص

الخلفية والأهداف: يعتبر فقر الدم مشكلة صحية عامة كبرى. تلعب دوراً مهماً في الوفيات والأمراض بين النساء الحوامل على مستوى العالم، وخاصة في البلدان النامية، وتعتبر عاملاً رئيسياً مسؤولاً عن انخفاض الوزن عند الولادة. أجريت هذه الدراسة لمعرفة مدى انتشار فقر الدم بين الحوامل في مدينة البيضاء بليبيا والتعرف على العامل المصاحب له. **طرق الدراسة:** أجريت دراسة مقطعية وصفية في الفترة من أبريل 2022 إلى أغسطس 2022. تم اختيار ما مجموعه 430 امرأة حامل باستخدام تقنية أخذ العينات العشوائية المنهجية. تم تضمين المشاركات فقط بعد تأكيد الحمل. تم جمع بيانات المشاركين المقبولين في هذه الدراسة باستخدام استبيان تم اختياره مسبقاً بواسطة المحاور، والذي يحتوي على الخصائص الديموغرافية الاجتماعية، والتاريخ التوليدي وأمراض النساء، وعدد أيام الدورة الشهرية، والفترة بين كل ولادة، وطريقة الولادة، ومستوى الهيموجلوبين. تم إجراء التحليل باستخدام الحزمة الإحصائية للعلوم الاجتماعية الإصدار 26 من SPSS. **النتائج:** بلغت نسبة فقر الدم في عينة الدراسة الإجمالية 56.5%. **الخاتمة:** يوصى بشدة بالتوعية بشأن النظام الغذائي المتوازن، والفحوصات المنتظمة قبل الولادة، والتناول المنتظم للحديد وأقرص حمض الفوليك.

الكلمات المفتاحية: الحمل، الانتشار، عامل الخطر، الهيموجلوبين.