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Prevalence of Anemia among Pregnant women in Tarhuna District, Libya

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ABSTRACT

Background: Anemia is one of the most frequent medical conditions during pregnancy, it is cause about one - fifth maternal deaths worldwide, and is a major factor responsible for low birth weight babies. Objective: The aim of the current study was evaluating the prevalence of anemia among pregnant women in Tarhuna region, western of Libya. Materials and Methods: The study was conducted on a group of 229 pregnant women at Tarhuna district, Libya during November and December 2022. Venous blood samples from all study participants "supported by a questionnaire containing main information" were collected and checked for complete blood count (CBC). According to the guidelines recommended by the WHO, a hemoglobin level in the blood of less than 11.0 g/dL is considered anemia. Results: The findings of current study showed that the prevalence of anemia among pregnant women was 44.98%, out of which 42.80% had mild anemia, and 2.18% had severe anemia. Conclusions: There is a significantly high prevalence of anemia among pregnant women in third trimester in Tarhuna region, this study had also elucidated some of socio demographic factors that contribute to such high ratio, e.g. consuming irregular diet do not contain the sufficient quantity of vitamin B12 and folic acid, drinking coffee and/or tea with meals, and lack of health education.

1. INTRODUCTION

Anaemia is a medical condition characterized by low levels of red blood corpuscles (RBCs), or the oxygen-carrying protein "hemoglobin" which resides within them. A reduced presence of erythrocytes will cause insufficient levels of oxygen in the various body tissues. Decreased oxygen-carrying capacity of the blood reduces the metabolic capacity of the tissues in proportion to the severity of anemia. Common anemia symptoms include dyspnea, weakness, paleness, hypotension, chest pain, irregular heart rhythms, and even heart failure [Lee and Okam, 2011; Rogers, 2011]. When blood diminishes patient gets anemia and will not be able to combat the diseases, during the accidents the patient bleeds too much, this bleeding leads to heart failure that leads to death [Laura, 2005]. Causal agents of anemia include iron deficiency,

deficiency of folic acid and vitamin B-12, rare genetic disorders, or severe infections during pregnancy such as malaria. [Kidanto et al, 2009; Ouédraogo et al, 2013]. Anemia can occur in any individual, but it most effects women and children globally, because it is most often a micronutrient deficiency disorder [Murphy Murphy et al, 2002]. For women of childbearing age, anemia during pregnancy poses a risk to both the mother and fetus, so it is considered one of the most common complications of pregnancy worldwide [Awaluddin et al, 2017]. Numerous studies around the world have shown that, anemia is common in pregnant women, the World Health Organization (WHO) estimates that more than 40% of pregnant women worldwide suffer from anemia at some point during pregnancy [Awaluddin et al, 2017]. In other report for WHO, about 50% of pregnant women in low- and middle income countries and 25% in high-income countries are anemic [Raut et al, 2014]. In India, a prospective study was conducted on 356 pregnant women who were admitted to the Department of Obstetrics and Gynecology at the Integrated Institute of Medical Sciences and Research from February to December 2021, 55.61% of them were anemic, 45.45% of them were in their second pregnancy [Lata et al, 2022]. In Southern Europe, a longitudinal study of 11259 pregnant women was conducted in primary health care centers between 2007 and 2012 to determine the prevalence of anemia. The results showed that anemia increased from 3.8% in the first trimester to 21.5% in the third trimester [Ribot et al, 2018]. The prevalence of anemia among pregnant women in Iraq is about 38% as estimated by the World Bank Group (WBG), while the WHO estimates it at about 31%. In other hand, a cross-sectional descriptive survey runs on 500 mothers in several primary health care centers in Babylon, the prevalence of anemia among study sample was 48.6% [Hussain, et al 2020]. In Kingdom of Saudi Arabia, Alrasheedi et al 2020, was conduct a cross-sectional study at the Maternity and Children's Hospital in Buraidah city on 233 pregnant women, the prevalence of anemia was 29.3%. In a study conducted in Sudan in 2016 to assess the prevalence of anemia among Sudanese women in childbearing, 4271 women were studied, the overall anemia prevalence was 35.6% [Elmardi et al, 2020]. In the Arab Republic of Egypt, the results of a cross-sectional study conducted by Eweis et al in 2021 in the antenatal clinic at Beni Suef University Hospital on 383 pregnant women in their third trimester showed that the prevalence of anemia among the study sample was 72%. In Libya, several studies were conducted to identify the prevalence of anemia among pregnant women in different regions of the country, such as the study conducted by MohyAldeen 2022 at Brack General Hospital, which showed that 49.7%. out of 197 women were anemic. The results of cross-sectional conducted by Elzahaf and Omar in 2016 on 595 pregnant women in Derna city elucidate that, 54.6% were anemic, higher prevalence of anemia was in the third trimester of pregnancy (59.6%). The results of other study conducted on 200 pregnant women in Derna showed that 54.5% of them had anemia, the highest prevalence was in women in the third trimester of pregnancy (80%), the prevalence of mild anemia was also found to be high compared to other grades of anemia (75.2%) [Rrhaiam et al, 2021]. In 2020, Alawaini et al found that 72% of 100 pregnant women in the northwest part of Libya participated in study were had anemia, (66.6%, 30.5%, and 2.9% had mild, moderate, and severe anemia, respectively). Finally, a retrospective study, carried out by reviewing files of 400 Libyan pregnant women admitted for delivery at the Central Hospital of Tarhuna showed that 47% of them were anemic, out of them 14.2% had mild anemia, 31.8% had moderate anemia and only1% had severe anemia [Mazughi et al, 2018].

Most of the previous studies “whether in Libya or abroad” agreed that anemia is one of the most important health conditions affecting people all over the world, anemia during pregnancy carries risks of premature delivery, low birth weight and fetal abnormalities. Accordingly, this study conducted to find out the prevalence of anemia among pregnant women in Tarhuna region (especially with the scarcity of previous studies in this region). Aim of the study: This study aims to determine the prevalence of anemia among pregnant women in Tarhuna district.

2. METHOD

Study area and population: This study was conducted on pregnant women in Tarhuna region, western Libya during November and December 2022.

Study sample: This study targeted 229 pregnant women aged 17 -43 years, in the final four months of pregnancy whom attending the obstetrics and gynecology departments in privet clinics within Tarhuna area. The study's participants responded to a questionnaire written in Arabic, included the mothers' sociodemographic characteristics, menstrual and obstetric history and the possible association of these characteristics with the of anemia.

Analysis of blood samples: CBC testing was performed for all samples, the most attention was to evaluation Hgb and erythrocytes as they are the most important variables in this study CBC testing was performed for all samples, the most attention was to evaluation Hgb and erythrocytes as they are the most important variables in this study based on the recommendations of the WHO which recommended that the rate of blood hemoglobin in pregnant women is considered anemic if it is less than 11.0 g/dL [Gwarzo and Ugwa 2013].

3. RESULT

The current study's findings showed that 103 (44.98%) of 229 pregnant women in the last four months of their pregnancies were anemic "5 (2.18%) of them being severely anemic, and 98 (42.80%) being mildly anemic", and in 123 (53.71%) of cases the hemoglobin level was normal, while it was found that only 3 cases (1.31%), had hemoglobin levels higher than the normal. As in tables 1 and 2.

Table 1: Results of hemoglobin in study sample.

Hg b	frequency	Percent
Low	103	44.98%
Norma lHL	123	53.71%
High	3	1.31%
Total	229	100%

Table 2: Distribution of anemic, and un-anemic cases.

Anemic cases			Un-anemic cases		
Total	Severe	Mild	Total	Normal	High
103	5	98	126	123	3

The results of this study showed that, 189 out of 229 cases have bodies weights higher than the optimal rate according to tall, including 107 un-anemic cases, 82 cases of anemia 3 of which suffered from severe anemia, 34 cases had an optimal bodies weight, 17 of which are anemic only one of them is severe anemic, while 6 cases suffer from underweight, including 4 cases of anemia, one of which suffers from severe anemia. As shown in figure 1.

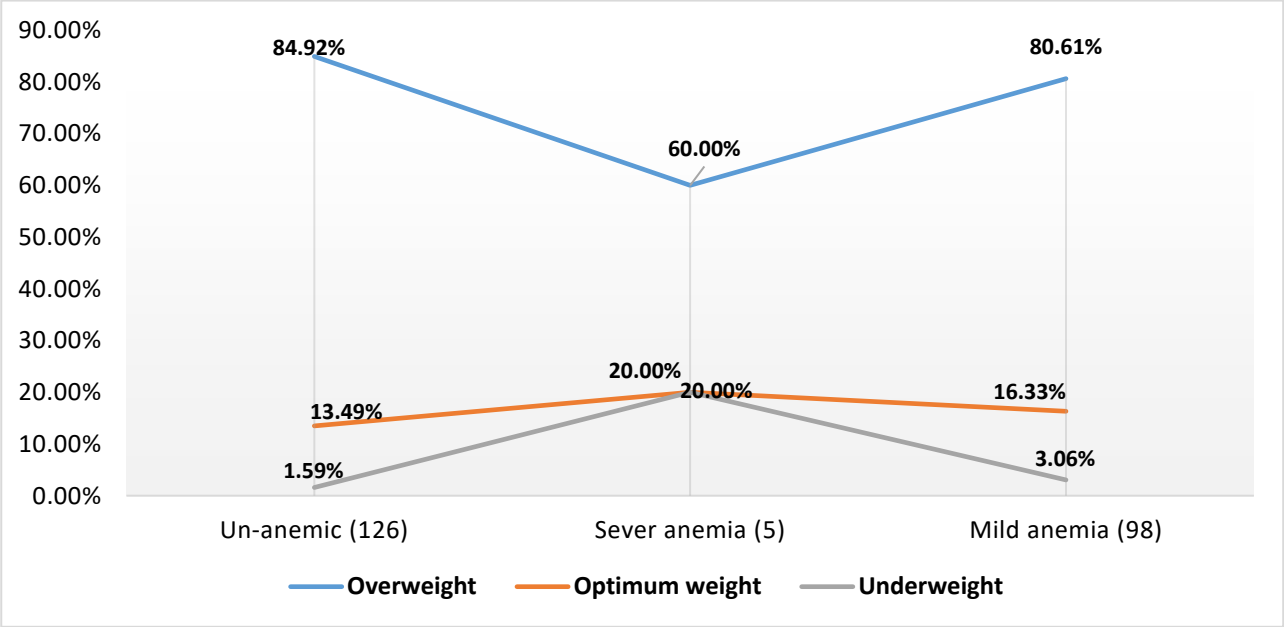

Figure 1: Distribution of cases based on optimal weight according to tall.

Regarding to RBCs, the findings revealed that 118 (51.53%) of the total cases had a number of RBCs within the normal level, while 111 (48.47%) had a number of RBCs less than normal. Whereas, 36 (34.95%) of the 103 anemic cases had a normal RBC count and 67 (65.05%) had a lower than normal number of RBCs "include 4 of severe anemic cases". As elucidate in table 3.

Table 3: Distribution of RBCs levels among total and anemic cases

RBCs	Total cases (229)	Anemic cases (103)
Low	111 (48.47%)	67 (65.05%)
Normal	118 (51.53%)	36 (34.95%)

It was also found that 21 (9.17%) cases had a low blood platelets count, 17 (7.42%) of them had excessive menstruation (9 cases had low RBCs count by 3.93%, 5 cases had a low Hgb by 2.18% and 3 (1.31%) cases had a low of both RBC and Hgb.
As shown in figure 2, the results of this study showed that there were no significant differences between anemic and normal cases with regard to the intervals between the current pregnancy and the previous pregnancy for each case.

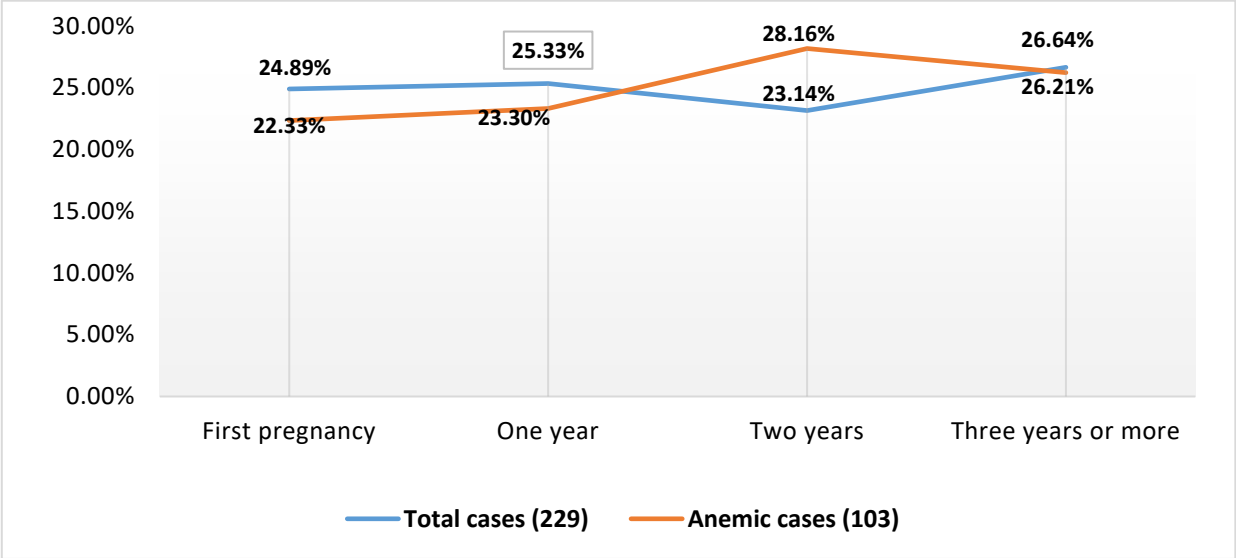

Figure 2: Distribution of anemic and non-anemic cases according to pregnancies intervals.

As table 4 illustrates, most of the cases (whether anemic or non-anemic cases) reported that they are usually consuming foods containing iron (218 of the total cases and 96 of anemic cases), where 47 of them reported that they consuming 4 or more of the foods that contain iron, while 49 cases reported that they consuming 3 or less of iron containing foods, accurately, it has been shown that 4 of the 5 severe anemia cases consume iron-containing foods and that the fifth case does not consume these foods, and that 92 of the cases of mild anemia consume foods rich in iron, while 6 of them do not consume these foods. In the same context, the vast majority of cases were consumed foods rich in folic acid and vitamin B12, and most of them took folic acid as a nutritional supplement.

Table 4: Anemic and normal cases according to (consume or not consuming iron-containing foods, foods rich in folic acid and vitamin B12, and Folic acid as a food supplement).

	Total cases (229)			**Anemic cases (103)**		
	Iron containing foods	**Folic acid as a food supplement**	**Foods rich in folic acid and vitamin B12**	**Iron containing foods**	**Folic acid as a food supplement**	**Foods rich in folic acid and vitamin B12**
Yes	218 (95.20%)	204 (89.08%)	227 (99.13%)	96 (93.20%)	92 (89.32%)	101 (98.06%)
No	11 (4.80%)	25 (10.92%)	2 (0.87%)	7 (6.80%)	11 (10.68%)	2 (1.94%)

This study's results also showed that, 47 (20.52%) of the study sample took treatments for chronic diseases, including 20 cases of anemia (19.42%) two of them suffer from severe anemia, while 182 (79.48%) cases did not take treatments for chronic diseases, including 83 anemic cases (80.58%) "Three of which suffer from severe anemia", based to figure 3.

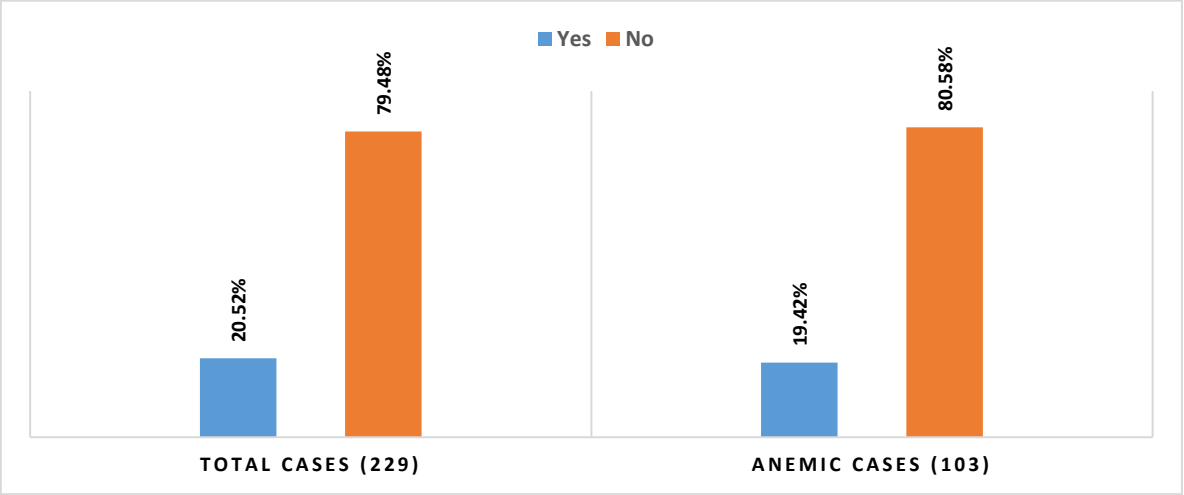

Figure 3: Using treatments for chronic diseases among anemic and non-anemic cases.

As for drinking tea and coffee with food, the figure 4 shows that, about half of the cases (56.33% of the total cases and 55.34% of the cases of anemia) take coffee and/or tea with food.

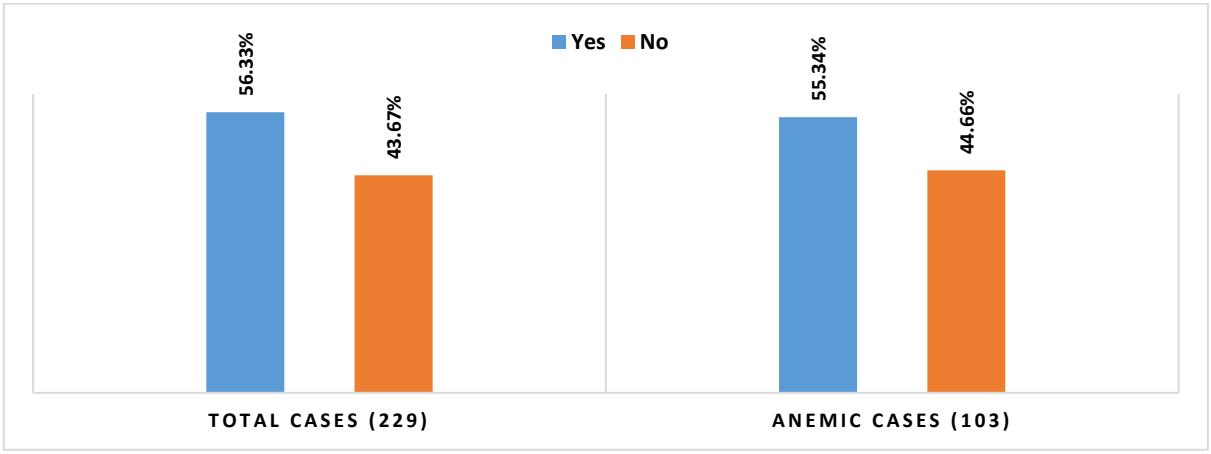

Figure 4: Drinking tea or coffee with food among anemic and non-anemic cases.

As elucidated in the table 5, the number of cases suffering from hereditary blood diseases among total cases as well as among the cases of anemia was relatively minimal by (3.06% and 2.91%) correspondingly. The data also indicated that the ratio of cases whom suffering digestive disorders was little (17.47% and 16.50%) among the total cases and anemic cases respectively.

Table 5: Distribution of hereditary blood diseases and disorders of the digestive system in the study sample.

	Total cases (229)		**Anemic cases (103)**	
	Hereditary blood diseases	**Digestive disorders**	**Hereditary blood diseases**	**Digestive disorders**
Yes	7 (3.06%)	40 (17.47%)	3 (2.91%)	17 (16.50%)
No	222 (96.94%)	189 (82.53%)	100 (97.09%)	86 (83.50%)

Studies showed that 13 (5.68%) out of 229 cases, and 4 (3.88%) cases out of 103 anemic cases suffer from excessive menstruation. As shown in figure 5.

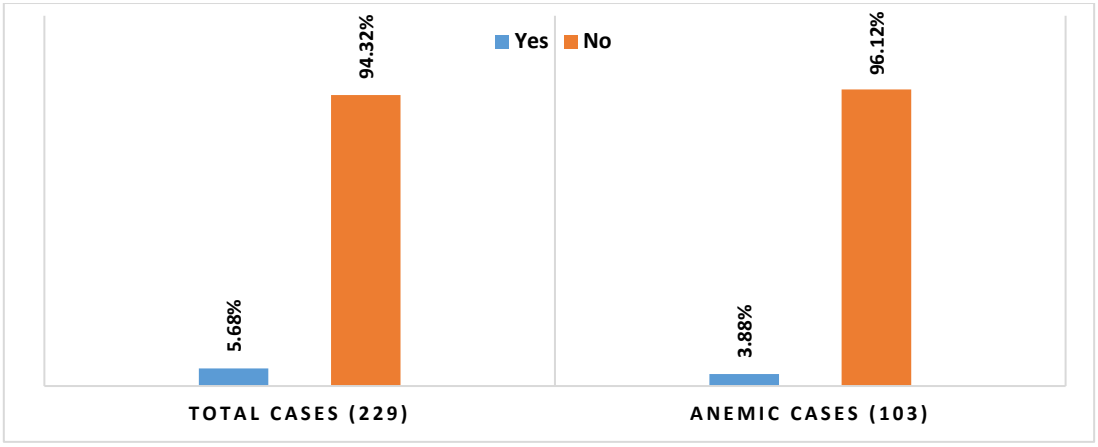

Figure 5: shows the distribution of those who suffer from excessive menstruation

The study showed that, those who complains from 4 or more symptoms of anemia were 157 out of the total cases, and 72 out of anemic cases, while the number of cases those suffering from 3 symptoms or less was 72 and 31 respectively. As shown in figure 6.

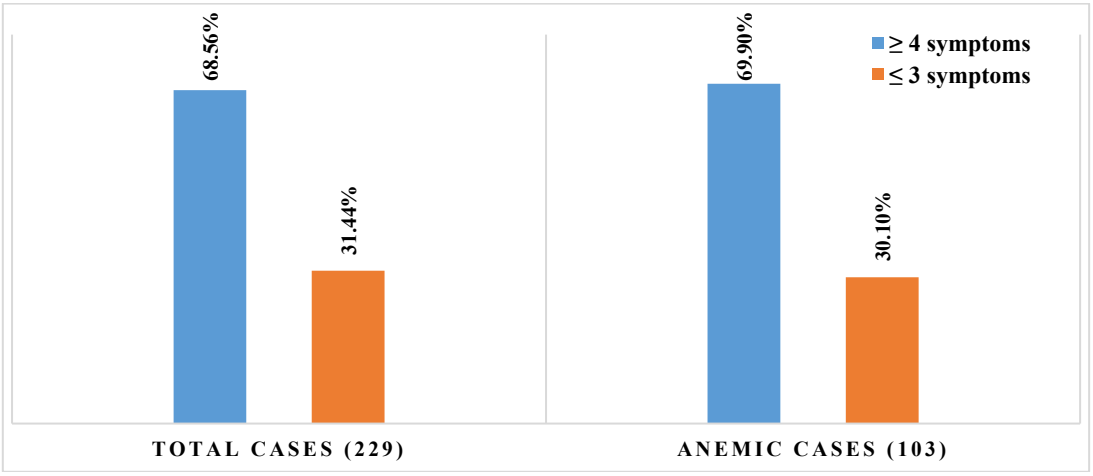

Figure 6: shows the distribution of number of anemia symptoms that cases were suffer from.

4. DISCUSSION

Early diagnosis of anemia during pregnancy is important to prevent the consequences of anemia, especially maternal and neonatal mortality and morbidity. This study provided some information regarding the frequency of anemia among pregnant women in department of obstetrics and gynecology at a variety of private clinics in Tarhuna city. The sample was targeting specific population (pregnant women at the last four months of pregnancy). The direct blood samples were collected from 229 volunteers who were attending these clinics. The technique had been used has a high sensitivity and accuracy and widely used in Libya in diagnosis of CBC. The overall results of this study found that 103 cases out of 229 had low Hgb levels which represents a rate of 44.98%, 5 (2.18%) of them were severe anemia, and 98 (42.80%) were mild. These findings appear to be in accordance with the high rates of anemia which reported by most of the previous studies e.g. Mangla and Singla, 2016 in India, showed that, the prevalence of anemia was 98%, while in China, 19.8% out of 12403 pregnant women participated in a cross-sectional survey were anemic, the prevalence increased with each succeeding month of pregnancy [Tan et al, 2020], and in the review conducted by Karami et al, in 2022, on 52 research with a combined sample size of 1244747 participants were included, the Karami findings revealed that 36.8% of pregnant women worldwide had anemia particly in the third trimesters of pregnancy, the cross-sectional descriptive survey runs by Hussain et al, 2020 on 500 Iraqi mothers in Babylon, the prevalence of anemia among study sample was 48.6%.

Finally, the WHO estimates that more than 40% of pregnant women worldwide suffer from anemia at some point during pregnancy [Awaluddin et al, 2017]. The current findings also agree with many studies conducted in Libya such as: that conducted in Derna by Elzahaf and Omar in 2016 on 595 pregnant women which found that, 54.6% of them had anemia, and the higher prevalence of anemia was in the third trimester of pregnancy, in the same context, in northwest part of Libya in 2020, Alawaini et al reported that 72% of 100 pregnant women were anemic, also in Brack General Hospital 49.7% out of 197 women were suffering from anemia as MohyAldeen study`s mentioned in 2022, eventually, results of retrospective study conducted on 400 Libyan pregnant women at the Tarhuna Central Hospital showed that 47% of them were anemic, out of them 14.2% had mild anemia, 31.8% had moderate anemia and only1% had severe anemia [Mazughi et al, 2018].

There were no statistically significant differences in the ages of the subjects in this study, whose aged from 17-43 years. The results of this study found that, 4 out of 5 cases of severe anemia and 67 of 103 anemic cases had a number of RBCs below normal, the current study's findings also showed that 21 of the study's participants had low platelet counts, and 17 of them had excessive menstruation (3 cases had a decrease in hemoglobin and RBCs, and 9 had a low number of RBCs only), this might be as a result of the body's inability to produce enough RBCs or an increase in RBC losses from bleeding. The ratio of anemic cases suffering from hereditary blood diseases or digestive disorders was 2.91% and 16.50% respectively, this may be one of the reasons that contributed to the high number of anemia cases among pregnant women in the Tarhuna region, as genetic blood disorders cause the body to not be able to produce enough RBCs, or they cause bleeding that leads to the loss of blood, while disorders of the digestive tract result in insufficient absorption of nutrients essential for the production of RBCs. The results also showed that the intervals between the present pregnancy and the preceding pregnancy did not appear any statistically significant differences, these findings are not consistent with study of Mohammed and Ali, 2022 in Egypt. Only 47 (20.52%) of the study sample reported that they consume enough iron containing foods, in the same vein, the vast majority of instances were consuming meals rich in folic acid and vitamin B12, and most of them took folic acid as a nutritional supplement. While 56.33% of the total cases and 55.34% of the cases of anemia take tea and/or coffee with food, these results are compatible with the results from Lata et al, 2022 in India, which reported that the vegetarian group had a higher prevalence of anemia than patients on a mixed diet, and study of Rrhaiam et al, 2021 in Derna Libya, Alrasheedi et al, 2020 in Kingdom of Saudi Arabia, and Mohammed and Ali, 2022 in Egypt.

It is believed that not consumption of enough healthy foods those rich in iron, folic acid and vitamin B12, in addition to nutritional supplements, not to mention the intake of quantities of tea and coffee, is considered one of the main factors in the high incidence of anemia in the study population, as many people find it challenging to maintain a healthy diet due to their low standard of living and economic condition.

Eventually, the findings of the current study revealed that, 4 or more of anemic symptoms are appeared on 72 of 103 instances of anemic case, while the number of cases those suffering from 3 symptoms or less were 31, this validates the study's findings, as the number of pregnant women who had anemia symptoms in the past is very close to the number of anemia cases that appeared in the analysis's findings of this study.

5. CONCLUSION

This study concluded that there is a significantly high prevalence of anemia among trimester’s pregnant women in Tarhuna region. Irregularity in following a balanced healthy diet comprises the required amounts of vitamin B12 and folic acid had an impact on the high rate of anemia. This study has also revealed a some of the socio demographic factors contribute to the high prevalence of anemia among Tarhuna residents, such as drinking coffee and/or tea with meals.

The lack of health education about risks of anemia and ways to avoid it among pregnant women or those whom of childbearing age has a role in the high rates of anemia, thus, educating girls can help to reduce anemia in communities.

Early diagnosis of anemia during pregnancy is important to prevent the consequences of anemia, especially maternal and neonatal mortality and morbidity. This study recommended spreading health education among pregnant women about anemia, its risks and complications, and how to reduce it, such as maintaining a healthy diet and taking nutritional supplements throughout pregnancy, in addition to conducting the periodic examinations during pregnancy. It is also recommended to conduct further studies to detect the real causes of anemia and learn more about the relationship between anemia and various diseases.

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