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PREVALENCE OF ANEMIA AND ITS ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CENTER IN SHARJAH, UAE

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ABSTRACT: Anemia during pregnancy is a common complication which can involve a mother's health, baby's health, or both. Socioeconomic status is affecting the prevalence of maternal anemia, which is varied substantially across regions and countries. Although, the prevalence of maternal anemia in UAE has not yet been well documented nationwide. Therefore, knowledge of the prevalence and determinants of low hemoglobin (Hb) levels will improve the health of pregnant women and upcoming generations. This study aimed to assess the prevalence of anemia and associated factors among pregnant women in UAE, Sharjah. The present study showed that the overall prevalence of anemia (Hb < 11 g/dl), was estimated to be 28.0%. The majority (16%) had mild anemia. There was no statistically significant difference between the anemic and nonanemic groups regarding socioeconomic and obstetric factors. Since, anemia among pregnant women is considered a moderate public health problem based on the World Health Organization classification of anemia. We recommend further studies to represent the whole nation and to assess the geographic location differences.

INTRODUCTION: Prenatal care is essential preventive healthcare, which decreases the risk of pregnancy complications. Pregnancy complications are health problems which can involve a mother's health, baby's health, or both. One of the most common maternal health conditions a woman may experience during pregnancy is Anemia. However, anemia is defined as a hemoglobin (Hb) level of less than 11 g/dL, or hematocrit less than 33%, at any point during pregnancy [1]. According to the Centers for Disease Control and Prevention CDC, anemia is defined as hemoglobin and hematocrit lower than 11% and 33% in the first trimester, 10.5% and 32% in the second trimester, and 11% and 33% in the third trimester.

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Many parameters can be changed due to the regular physiologic adjustment during pregnancy such as hemoglobin, hematocrit, reticulocytes, plasma ferritin, and unsaturated iron binding capacity. Therefore, diagnosing true anemia and determining the cause of anemia is challenging. Anyhow, in investigating iron status in women in the Middle East, most studies have used decreased serum hemoglobin to indicate anemia, decreased serum/plasma ferritin with normal hemoglobin levels to indicate iron deficiency or depleted iron stores, and decreased plasma ferritin together with decreased hemoglobin levels to indicate iron deficiency anemia IDA [2].

Iron deficiency anemia is the most predominant cause of anemia during pregnancy [3]. Approximately 50% of anemia's due to iron deficiencies [4], and the remaining cases of anemia due to micronutrient deficiencies (*e.g.* folate, riboflavin, vitamins A and B12), acute and chronic infections (*e.g.* malaria, cancer, tuberculosis and HIV), and inherited or acquired disorders that

affect haemoglobin synthesis, red blood cell production or red blood cell survival (*e.g.* haemoglobinopathies) [5].

Besides there are many other risk factors associated with maternal anemia that contribute to adverse fetal outcomes such as unhealthy lifestyle, age (<20 years or >35 years old), twin or multiple pregnancies, smoking or alcohol use and history of menstrual disorders [6]. Anemia resulting from iron deficiency associated with low birth weight and increased risk of maternal and perinatal mortality [7].

In developing regions, 3.0 million deaths in 2013 were due to maternal and neonatal mortality, which was considered a significant contributor to overall global mortality [1]. Also, the Global overall prevalence for low birth weight infants due to Iron deficiency anemia is 15.5% - 20% [1]. In the UAE, the rates of low birth weight infants are widespread because of the high prevalence of Iron Deficiency Anemia in pregnancy [8]. Moreover, maternal anemia may cause vaginal bleeding during the first trimester and high risk of preterm delivery [9]. Therefore, anemia during pregnancy has shown to cause quite substantial consequences.

The Eastern Mediterranean Region had the third highest anemia burden for pregnant women, accounting for 3.9 million (95% CI: 3.3-4.6) women with anemia in 2011. A cross-sectional study was conducted on 6539 pregnant women from KSA by Mahfouz et al.and the overall prevalence of anemia was found to be 31.9% [10]. In Egypt, Rezk *et al*. reported a prevalence of IDA at 51.3% in pregnant women [11]. In another survey of 270 pregnant Egyptian women, Ibrahim et al. found that 75% were mildly anemic (Hb 9-11 g/dL) and 23.2% were moderately anemic (Hb 7-9 g/dL) [12].

Of those diagnosed with anemia, only 35.7% compiled with recommendations to supplement with folic acid plus iron. According to the Egypt Demographic and Health Survey reports, the increased use of iron supplements caused a marked reduction in IDA among pregnant women.

UAE is a pro-natal society, and there are high numbers of grand multiparous mothers among the obstetric population [13]. Therefore, a high rate of anemia would be expected among pregnant women in the UAE. Although the prevalence of maternal anemia in UAE has not yet been well documented nationwide, limited data indicate that the prevalence of this burden among pregnant women [3]. Therefore, knowledge of the prevalence and determinants of low hemoglobin levels will improve the health of pregnant women and upcoming generations. This study aims to assess the prevalence and associated factors of anemia among pregnant women in UAE, Sharjah.

METHODS:

Study Setting and Design: A retrospective Cross-sectional descriptive study was conducted in the antenatal center, Sharjah, UAE, with the duration of the study being six months. The data was collected from consecutive check-up examination records of apparently pregnant women in different age groups.

According to the World Health Organization (WHO), the degree of anemia was determined as mild (Hb = 10- 10.9 g/dl), moderate (Hb = 7- 9.9 g/dl) and severe anemia (Hb < 7 g/dl) [14].

The study included all pregnant women who attended the antenatal center, in the period from 1 January 2018 till the end of June 2018. All the participants are from Arab nationality, and their ages range from 17 to 45 years.

All Arab Pregnant women in the first trimester who came for the antenatal center during the study period were included in the study. Pregnant women with no history of thalassemia or any genetic diseases were included. Pregnant women in the second and third trimester were excluded. Pregnant women with previous abortion were also excluded. Cases of dysfunctional uterine bleeding and any other diagnosed diseases, especially hemoglobinopathies, renal and liver disease, were excluded.

Data Collection: Relevant sociodemographic data, medical (obstetric) history, details of the delivery, and laboratory data were obtained from the medical records of the patients including: age, occupation, type of previous deliveries, number of living children, last birth interval, RBC: Red Blood Cell count, Hb: hemoglobin, HCT: Hematocrit, MCV: Mean corpuscular volume MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration.

Ethical Principles: The study was conducted only after getting the approval and Permission from the main office in the antenatal center, Sharjah to gain access to previous medical records. The relevant data were collected from the Medical records department based on the ICD-10 definition of anemia in pregnancy from all the records of pregnant women during 1st Jan 2018 - 30th June 2018.

Statistical Analysis: The data management and analysis were initiated by presenting data in the Excel and were transferred into the Statistical Package for Social Science (SPSS) statistics software for further analysis. The data were presented by tables, graphs, and charts. Data were summarized using mean and standard deviation values for anemia and associated factors, number and percentage for categorical variables.

Chi-square test was done for associations. A t-test was done to compare mean values. A p-value<0.05 was considered significant.

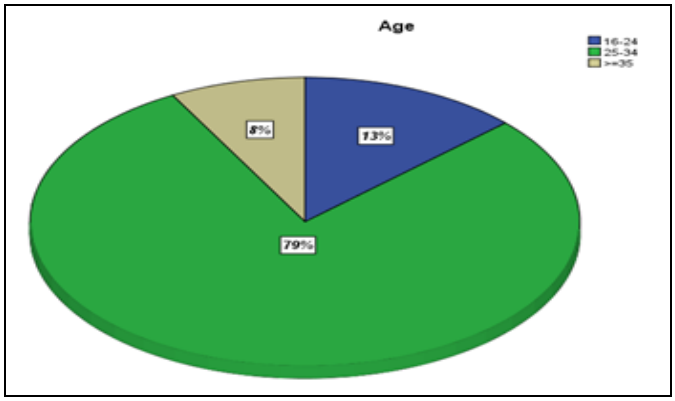

FIG. 1: DISTRIBUTION OF PARTICIPANTS ACCORDING TO AGE

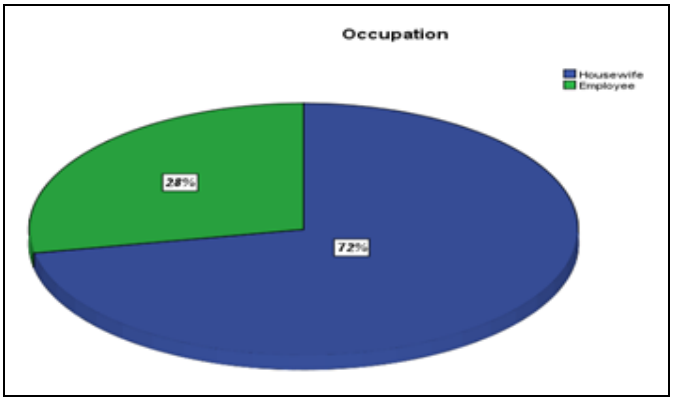

FIG. 2: DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE OCCUPATION

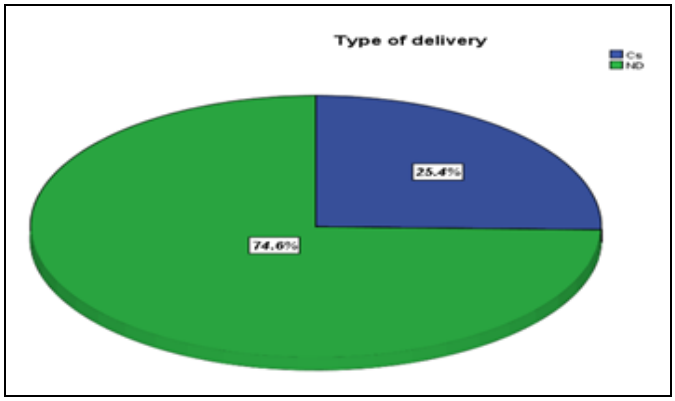

FIG. 3: DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE TYPE OF DELIVERY

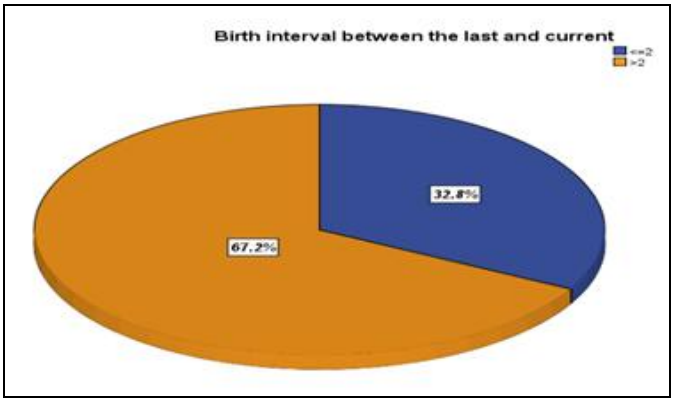

FIG. 4: DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE BIRTH INTERVAL

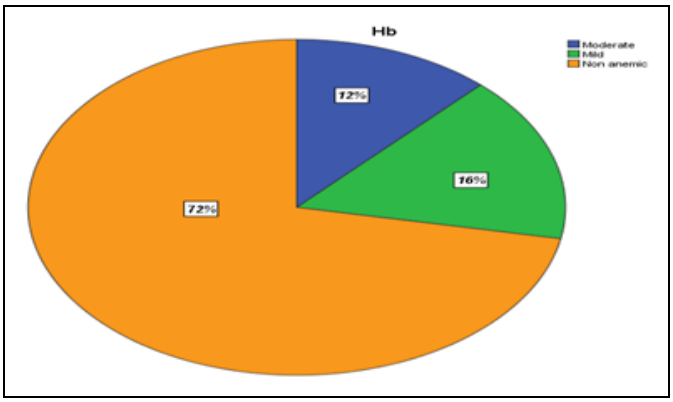

FIG. 5: DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE DEGREE OF ANEMIA

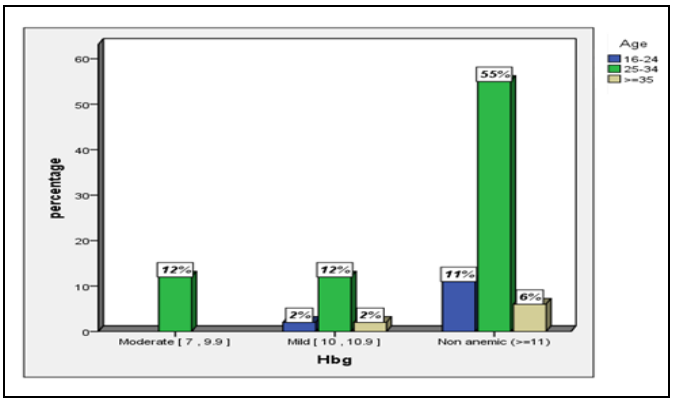

FIG. 6: DISTRIBUTION OF ANEMIA ON THE BASES OF AGE

RESULTS:

Socio-demographic Characteristics of the Participants: As shown in **Table 1**, A total of 100 representative health clinic attendees participated in the study. The mean ± SD age of the participants was 29 ± 4. The majority, 79(79.0%), of the participants, were within the age range of 25-34. Out of the 100 participants, 13(13.0%) and 8(8%) were in the age group of 16-24 years and 35 or above years, respectively. Most of the participants were housewives (72.0%), and about 28.0% of them were employees.

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PREGNANT WOMEN IN THE ANTENATAL CENTER, SHARJAH (No. = 100)

Socio-demographic Characteristics	N	%
Maternal age Years		
16 – 24	13	13.0
25 – 34	79	79.0
≥ 35	8	8.0
Occupation		
Housewife	72	72.0
Employee	28	28.0

TABLE 2: OBSTETRIC CHARACTERISTICS OF PREGNANT WOMEN (No. = 100)

Obstetric Characteristics	N	%
History of previous births		
Yes	67	67.0
No	33	33.0
type of delivery		
normal	50	74.6
Cesarean	17	25.4
number of births (living children)		
1-2	54	80.6
3-4	12	17.9
≥ 5	1	1.5
The birth interval between the last and current		
≤ 2	22	32.8
> 2	45	67.2
No of cesarean surgery		
0-1	94	94.0
≥ 2	6	6.0
Total	100	100.0

Obstetric Characteristics of the Participants: Sixty-seven (67.0%) of the antenatal center attendees had a previous history of pregnancy. From those who had the previous history of birth, 50(74.6%) and 17(25.4%) had a history of normal and cesarean deliveries, respectively. Also, from those who had the previous history of birth, the majority, 54(80%), had 1-2 living children, 12(17.9%) had less than four children, and one attendee had five or more at the time of the study. Moreover, from those who had a history of birth, 22(32.8%) and 45(67.2%) had a birth interval of fewer than two years and more than two years between the last and the current pregnancy, respectively. Only 6(6.0%) of the participants had two or more cesarean deliveries.

Prevalence and Severity of Anemia: Prevalence and degree of anemia among pregnant women are shown in **Table 3**. Among the 100 study participants, the overall prevalence of anemia (Hb < 11 g/dl), was estimated to be 28.0%. The mean Hb concentration was 11.5 ± 1.2 g/dl with a range of 9 to 13.9g/dl. The degree of anemia among pregnant women was estimated based on the classification of WHO for the severity and degree of anemia in pregnancy: mild anemia (Hb = 10-10.9 g/dl), moderate anemia (Hb = 7- 9.9 g/dl), and severe anemia (Hb< 7 g/dl). The result of this study indicated 16% mild anemia, 12% moderate anemia, and 0% severe anemia among pregnant women.

TABLE 3: PREVALENCE AND DEGREE OF ANEMIA AMONG PREGNANT WOMEN

Variable	N	%
Level of anemia		
Non anemic (≥ 11)	72	72.0
Mild (10-10.9	16	16.0
Moderate (7-9.9)	12	12.0
Severe (less than 7)	0	0
Total	100	100.0

Factors Associated with Anemia Among Pregnant Women: Anemic and non-anemic pregnant women were categorized into three age groups 16-24 years, 25-34, and more than 35 years. Out of 28 anemic women, four were in 1st, and third groups and 24 were in the 2nd group. While out of 72 non-anemic pregnant women 11 were in the 1stgroup, 55 in the 2nd group and 6 in the 3rd group. It was seen that the prevalence of anemia is higher in the 25-34 years age group as compared to other age groups **Table 4**. There was no statistically significant difference between the anemic and non-anemic groups regarding maternal age and occupation.

Anemia status in pregnant women was shown in **Table 5** according to the obstetric factors, which include: type of delivery, number of births, the interval of last birth, and number of cesarean surgeries. There was no statistically significant difference between the anemic and non-anemic groups regarding obstetric characteristics.

RBC: Red Blood Cell count, Hb: Hemoglobin, HCT: Hematocrit, MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: Mean corpuscular hemoglobin concentration

Patients were distributed based on complete blood count (CBC) parameters. Out of 100 patients, MCV was low (microcytic) in 31 women, normal (normocytic) in 68 and high (macrocytic) in one woman. The majority, 87 women, had normal MCHC, 12 women had high MCHC, and one had low MCHC at the time of the study. Moreover, 3 and five women had low and high MCH, respectively. While 92 had normal MCH (normochromic). HCT was low in 75 women, and it was average in 2 women and high in 23. R.B.C was low in 90 women, and it was normal in 10 women.

Out of 28 anemic women, the majority had normocytic (55%) and normochromic (92%) anemia. However, there is no statistically significant difference between anemic and non-anemic groups regarding CBC parameters.

TABLE 4: CROSS TABULATION BETWEEN THE SOCIO-DEMOGRAPHIC CHARACTERISTICS AND LEVEL OF Hb (N=100)

		Level of Hb			Total	χ^2	P
		Moderate (7- 9.9) g/dL	Mild (10-10.9) g/ dL	Non-anemic (>=11) g/dL			
Age	16-24	0	2	11	13	3.990	0.407
	25-34	12	12	55	79		
	>=35	0	2	6	8		
Total		12	16	72	100		
Occupation	Housewife	6	12	54	72	3.274	0.195
	Employee	6	4	18	28		
Total		12	16	72	100		

TABLE 5: CROSS TABULATION BETWEEN THE OBSTETRIC CHARACTERISTICS AND LEVEL OF Hb (N = 100)

		Level of Hb			Total	χ^2	P
		Moderate (7- 9.9) g/dL	Mild (10-10.9) g/ dL	Non-anemic (>=11) g/dL			
Type of delivery	Normal	5	7	38	50	0.718	0.698
	Cesarean	3	2	12	17		
Total		8	9	50	67		
Number of births (living children)	1-2	8	7	39	54	0.791	0.940
	3-4	1	2	9	12		
	>=5	0	0	1	1		
Total		9	9	49	67		
Last birth interval	<=2 years	5	2	15	22	2.676	0.262
	>2 years	4	7	34	45		
Total		9	9	49	67		
No of cesarean surgery	0 – 1	11	16	67	94	1.251	0.535
	>=2	1	0	5	6		
Total		12	16	72	100		

P: level of significance; *Significant association (P < 0.05)

TABLE 6: DISTRIBUTION OF PATIENTS ON THE BASIS OF CBC PARAMETERS

S. no.	Variable	Range of variable	No. of patients	Mean ± SD
1	MCV	Low (<76 fl)	31	37.97 ± 16.28
		Normal (76 - 96 fl)	68	85.79 ± 4.65
		High (>96 fl)	1	96.8
		Total	100	71.08 ± 24.36
2	MCHC	Low (<30%)	1	30
		Normal (30 - 35 %)	87	33.54 ± 0.9
		High (>35 %)	12	37.29 ± 2.29
		Total	100	33.95 ± 1.72

3	MCH	Low (<20Pg)	3	17.57 ± 2.5
		Normal (20 - 32 Pg)	92	28.1 ± 2.69
		High (>32 Pg)	5	32.8 ± 1.23
		Total	100	28 ± 3.37
4	RBC	Low (<4.5 Mill/Cu.mm)	90	3.9 ± 0.37
		Normal (4.5-6.5 Mill/Cu.mm)	10	4.8 ± 0.2
		Total	100	3.98 ± 0.44
5	HCT	Low (<40 %)	75	33.9 ± 2.87
		Normal (40-54 %)	2	41 ± 0
		High (>54 %)	23	85.3 ± 4.09
		Total	100	45.87 ± 21.9

TABLE 7: CROSS TABULATION BETWEEN THE CBC PARAMETERS AND LEVEL OF Hb

		Level of Hb			Total	χ^2	P
		Moderate [7, 9.9]	Mild [10, 10.9]	Non-anemic			
MCV	Low (<76 fl)	6	7	18	31	4.691	0.320
	Normal (76 - 96 fl)	6	9	53	68		
	High (>96 fl)	0	0	1	1		
	Total	12	12	72	100		
MCHC	Low (<30%)	0	0	1	1	1.171	0.883
	Normal (30 - 35 %)	10	15	62	87		
	High (>35 %)	2	1	9	12		
	Total	12	16	72	100		
MCH	Low (<20Pg)	2	0	1	3	2.872	0.175
	Normal (20 – 32)	10	16	65	91		
	High (>32 Pg)	0	0	5	5		
	Total	12	16	71	99		
RBC	Low (<4.5 Mill/Cu.mm)	11	15	64	90	0.215	0.898
	Normal (4.5-6.5)	1	1	7	9		
	Total	12	16	71	99		
HCT	Low (<40 %)	10	11	54	75	1.674	0.795
	Normal (40-54 %)	0	0	2	2		
	High (>54 %)	2	5	16	23		
	Total	12	16	72	100		

DISCUSSION: The present study was conducted to assess the prevalence of anemia and its associated risk factors among pregnant women attending the antenatal center in Sharjah. According to WHO, the prevalence of anemia is high among pregnant woman with high rates of prevalence (35 to 75%) in many developing countries [14].

In the present study based on the blood picture of 100 pregnant women, the overall prevalence of anemia is 28%. This prevalence is considered a moderate public health problem [14]. Our findings are close to the results reported from neighboring countries which specified that prevalence of anemia among pregnant women in Qatar 28%, Syrian Arab Republic 30%, Jordan 27%, Lebanon 27%, Libya 28%, United Arab Emirates 26%, Sri Lanka 26% and Iran, Islamic Rep 26% [14, 15].

On the other hand, the prevalence of anemia in the present study was lower than that reported in India (87-100%), Boditi (61.6%), Gode town, Eastern Ethiopia (56.8%), Tanzania (58.2%), Yemen (58.09%), Sudan (57.745), Guinea-Bissau (57.7%), Senegal (57.58%), Vanuatu (57.3%), Cambodia (57.1%), and Angola (57.07%) [15, 16]. This difference could be resulting from the geographical variation of factors across different areas, food consumption, and due to the time gap between the current study and other studies.

The present study specifies that out of all pregnant women involved in this study, 16% had mild anemia, and 12% had moderate anemia, and no one had severe anemia. Majority of women had mild anemia followed by moderate anemia. These findings are also comparable with the results from other studies [17, 18].

In the current study, the mean age of pregnant women was 29 ± 4 years. A study from Karachi has informed a similar mean age of the pregnant women as 28 ± 5.20 years [19]. The anemic and non-

anemic pregnant women further divided based on age into three groups' (16-24, 25-34, and more than 35 years).

In the present study, there was no statistically significant difference between the anemic and non-anemic groups regarding maternal age. This is inconsistent with a result of a case-control study conducted by Zama *et al*., [20,] which found that no statistically significant difference between the anemic group and the non-anemic group regarding maternal age.

The majority of pregnant women were housewives (72%) while the employees were (28%). In the current study, there is no statistically significant difference between the anemic group and the non-anemic group regarding occupation. This is in contrast to a result of a study conducted by Hala M *et al*., which found that the risk of anemia was higher among housewives as compared with employees [21]. This difference may be due to the small sample size in the present study compared to other studies.

Moving onto the obstetric history of the patient, our study depicted that the majority of cases of anemia underwent normal deliveries. When associating anemia with the type of previous deliveries of the patient, it was concluded that no statistical y significant difference between the anemic and non-anemic group regarding the type of delivery.

From those who have previous deliveries (67), most of the participants had (1-2) previous births or living children (54), birth interval more than 2 years (45) and one or less cesarean surgery (94%). However, investigating the possible risk factors associated with anemia among the participants revealed that no statistically significant difference between the anemic and non-anemic group regarding a number of births, birth interval and number of cesarean surgeries.

On the contrary to our results, a study conducted among pregnant women in Sokoto, Nigeria specified that anemia was highly prevalent in women with multiple previous births. It also stated a number of living children as being one of the potential etiological factors of anemia in pregnancy [22]. Another study revealed that the risk of getting anemia increase as the number of births increase [23]. Also, a cross-sectional study revealed that pregnant women having birth interval less than two years were at higher risk of becoming anemic as compared to those with a birth interval for more than two years [17]. These differences are according to the small sample size and the setting (one medical center) of the current study.

Moreover, a study conducted in Yemen showed that pregnant women who underwent two or more cesarean surgeries were found to have an increased risk of anemia during pregnancy [24]. Another study revealed that cesarean sections are accompanied by the risk of suffering serious complications, including hemorrhage, infection, and rupture of the uterus [25].

Patients were distributed based on CBC parameters. Majority of participants have a normal size of red blood cell (normal MCV) and normal size of hemoglobin concentration in the red blood cell (normal MCH, MCHC). Also, from those who had anemia, the majority had normochromic, normocytic anemia. It is shown in **Table 6** that there is no statistically significant difference between the anemic and non-anemic groups regarding CBC parameters or red blood cell indices.

CONCLUSION: The overall prevalence of anemia among women attending the antenatal center in Sharjah was 28%, so anemia is considered a moderate public health problem. Sociodemographic factors (age, occupation), obstetric factors (a type of delivery, number of births, birth interval, number of cesarean surgeries), and CBC parameters were not significantly associated with anemia. We recommend further studies to represent the whole nation and to assess the geographic location differences.

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COMPETING INTEREST: The authors declare no conflict of interest.

REFERENCES:

1. World Health Organization. "Iron deficiency anemia. assessment, prevention, and control." A guide for program managers 2001: 47-62.

2. Hwalla, N, Al-Dhaheri AS, Radwan H, Alfawaz HA, Fouda MA, Al-Daghri NM and Blumberg JB: The prevalence of micronutrient deficiencies and inadequacies in the Middle East and approaches to interventions. Nutrients 2017; 9(3): 229.
3. Stevens GA, Finucane MM, De-Regil LM, Paciorek CJ, Flaxman SR and Branca F: Nutrition Impact Model Study Group (Anaemia). Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population- representative data. The Lancet. Global Health 2013; 1(1): e16–e25.
4. Ezzati M, Lopez AD, Rodgers AA and Murray JL: Comparative quantification of health risks: the global and regional burden of disease attributable to selected major risk factors. OMS 2004. http://www.who.int/iris/handle/ 10665/42770.
5. Moayad S: Vitamin D impact on human health and its relation with several diseases. Journal of Applied Pharmaceutics 2018; 10(6): 60-64.
6. Baysal E: Molecular basis of β-thalassemia in the United Arab Emirates. Hemoglobin 2011; 35(5-6): 581-88.
7. Kozuki, Lee AC and Katz J: No conflicts of interest. Moderate to Severe, but Not Mild, Maternal Anemia Is Associated with Increased Risk of Small-for-Gestational-Age Outcomes. The Journal of Nutrition 2011; 142(2): 358-62.
8. Ahmed A, Nasir H, Shafiq QA, Naeem B, Ghelani Y and Shaikh RB: The Effect of Anemia on Pregnancy and Fetal Outcome: GMC Hospital, Ajman, UAE. President's Message 2015: 75.
9. Lawn JE, Cousens S and Zupan J: Lancet Neonatal Survival Steering Team. 4 million neonatal deaths: when? Where? Why? The Lancet 2005; 365(9462): 891-00.
10. Mahfouz AA, El-Said MM, Alakija W, Badawi IA, Al-Erian RA and Moneim MA: Anemia among pregnant women in the Asia region, Saudi Arabia: an epidemiologic study. Southeast Asian Journal of Tropical Medicine and Public Health 1994; 25(1): 84-7.
11. Rezk M, Marwan H, Dawood R, Masood A and Abo-Elnasr M: Prevalence and risk factors of iron-deficiency anemia among pregnant women in rural districts of Menoufia governorate, Egypt. Journal of Obstetrics and Gynaecology 2015; 35(7): 663-66.
12. Ibrahim ZM, EL-Hamid SA, Mikhail H and Khattab MS: Assessment of adherence to iron and folic acid supplementation and prevalence of anemia in pregnant women. The Medical Journal of Cairo University 2011; 79: 2.
13. Farah OI, Rizk DEE, Thomas L and Berg B: Obstetric impact of anemia in pregnant women in the United Arab Emirates. J of Obstetrics and Gynecol 2005; 25(5): 440-44.
14. World Health Organization (WHO). The global prevalence of anemia in 2011. Geneva Switzerland: WHO 2015: 1-6.
15. Stevens GA, Finucane MM and De-Regil LM: Global, regional, and national trends in hemoglobin concentration and prevalence of total and severe anemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. The Lancet Global Health 2013: e16-e25.
16. Bekele A, Tilahun M and Mekuria A: Prevalence of anemia and its associated factors among pregnant women attending antenatal care in health institutions of Arba Minch Town, Gamo Gofa Zone, Ethiopia: a cross-sectional study. Anemia 2016: 1-9.
17. Mulugeta M, Zelalem A, Meseret A and Bamlaku E: "Prevalence and Predictors of Maternal Anemia during Pregnancy in Gondar, Northwest Ethiopia: An Institutional Based Cross-Sectional Study. Anemia 2014: 1-9.
18. Ugwuja EI, Akubugwo EI, Ibiam UA and Onyechi O: Impact of maternal iron deficiency and anemia on pregnancy and its outcomes in a Nigerian population. The Internet Journal of Nutrition and Wellness 2010; 10: 1-11
19. Taseer IH, Mirbahar A, Safdar S and Awan Z: Anemia in pregnancy: Related risk factors in the underdeveloped area. Professional Med J 2011; 18: 1-4.
20. Zama I, Argungu IB, Yakubu A, Taylor JR, Osaro E and Suzette U: Socio-demographic and obstetric factors associated with anemia among pregnant women in Sokoto, no Western Nigeria. Health Sci Res 2014; 1: 119-26.
21. El-Moselhy, Hala M, Khalil NA and Abd-Elhaleem RF: Anemia among pregnant women attending the family health center in Kafr Al-Sheikh city, Egypt (an intervention study). Menoufia Medical Journal 2017; 30(3): 784.
22. Nwizu EN, Iliyasu Z, Ibrahim SA and Galadanci HS: Sociodemographic and maternal factors in anemia in pregnancy at booking in Kano, Northern Nigeria. Afr J Reprod Health 2011; 15: 33-41.
23. Ahmed and Anam: The Effect of Anemia on Pregnancy and Fetal Outcome: GMC Hospital, Ajman, UAE. President's Message 2015: 75.
24. Akabat and Yahya M: Prevalence and associated factors of anemia among pregnant women residing at high altitude in Yemen. American Journal of Health Research 2017; 5(4): 93-98.
25. Waterstone M: Incidence and predictors of severe obstetric morbidity: a case-control study. BMJ 2001; 322: 1089-94.

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