Effectiveness of Instruction Program on Pregnant Women's Knowledge regarding Anemia at Primary Health Care Centers in Baquba City

فاعلية البرنامج الارشادي على معارف النساء الحوامل فيما يتعلق بفقر الدم في مراكز الرعاية الصحية الاولية في مدينة بعقوبة

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المستخلص:

الهدف : تهدف الدراسة الحالية الى معرفه تأثير البرنامج الارشادي على معارف النساء الحوامل حول فقر الدم

المنهجية : أستخدم تصميم شبه تجريبي مع تطبيق الاختبار القبلي و البعدي لمجموعة الدراسة و الضابطة لفاعلية البرنامج إلا رشادي على معارف النساء الحوامل المصابات بفقر الدم . تم اختيار عينة تتكون من (٦٠) امرأة حامل مصابة بفقر الدم في أربعة مراكز للرعاية الصحية الاولية في مدينة بعقوبة . .تم اعتبار ثلاثين (٣٠) امرأة (مجموعة دراسة) و (٣٠) امرأة (مجموعة الضابطة). تعرضت عينة الدراسة الى الاختبار القبلي والبرنامج الارشادي والاختبار البعدي ،بينما العينة الضابطة تعرضت الى الاختبار القبلي والبعدي فقط . كما اجريت دراسة استطلاعية على(١٠) من النساء الحوامل لاختبار ثبات الاستمارة للفترة من ١٣ **الى** ٢٠ كانون الاول لسنة٢٠١٨ . كما تم استخدام الاستبيان كأداة لجمع البيانات. واستخدمت التحليلات الإحصائية الوصفية والاستنتاجية لتحليل البيانات.

النتائج : أظهرت النتائج إلى أن مستوى الهيموغلوبين ازداد بعد البرنامج بين النساء في مجموعة الدراسة ، حيث (٤٦,٧ ٪) من النساء كشفن عن مستوى (٨,١–٩) جم / ديسلتر أقل من المعدل الطبيعي قبل البرنامج و زيادة المستوى إلى المستوى العادي ما بعد البرنامج بمعدل يتراوح ما بين (١٠,١ – ١١) جم / ديسلتر في (٥٣,٣ ٪) ، و (< ١١) جم / ديسلتر في (٣٠ ٪) من النساء الحوامل. تظهر النتائج أيضًا أن النساء الحوامل في مجموعة الدراسة يظهرن مستوىً متوسطاً من المعرفة حول فقر الدم قبل البرنامج وزيادة مستواهن إلى (١٠٠٪) بعد البرنامج . في حين أن مستوى المجموعة الضابطة لم يتغير.

التوصيات: تشجيع النسائل لحوامل على القيام بزيارات منتظمة قبل الولادة للكشف عن فقر الدم المبكر ولتحسين حالة صحة الام

الكلمات المفتاحية : فقر الدم ، المرأة الحامل ، مركز الرعاية الصحية الاولية ، المعارف

Abstract

Objective: to identify the effect of the Instruction program on the knowledge of pregnant women who suffering anemia.

Methodology: A quasi-experimental design was carried out with the application of pre- post test for the study and the control group. Purposive sample, consists of (60) pregnant women diagnosed with anemia attending four health care centers in Baquba city.

Result: The findings indicate that the level of hemoglobin is increasing post instructional program among women in the study group, in which (46.7%) of women are reveal a level of (8.1-9) g/dl that is less than normal pre instructional program and the level is increased to normal level post instructional program (10.1-11) g/dl in (53.3%) , and to (> 11) g/dl in (30%) of pregnant women. The results also present that the pregnant women in study group showing fair level of

knowledge about anemia in pre-instructional program and their level increased to (100%) in post-instructional program. While the level of control group did not changed.

Recommendation: Encourage the pregnant women to attained regular antenatal visits to detect early anemia and to upgrade maternal health status.

Keywords: Anemia , Pregnant women ,Primary Health Care Center ,Knowledge .

Introduction

Anemia is public health problem that effects countries with low, middle, or high income[(1)]. Anemia during pregnancy is defined by the World Health Organization (WHO) as a hemoglobin concentration less than 11 g/dL. Also anemia is considered as a condition in which the number and size of red blood cells, or the hemoglobin concentration, falls below an established cut-off value, as a result lead to impairment of the capacity of the blood to transport oxygen around the body[(2)]. It occurs at all age groups, but is more prevalent in pregnant women and children [(3)]. Anemia is observed as an indicator of both poor nutrition and poor health, and several factors have been associated with anemia in pregnancy as documented in medical and allied literature. Socio demographic variables such as age, parity and gravidity, personal and household income, household size, level of education, a low socioeconomic status, short birth intervals, and higher gestational age [(4-9)].

Methodology

A quasi-experimental design was carried out throughout the present study to identify the effect of the Instruction program on the knowledge of pregnant women who suffering anemia with the application of a pre-test and post –test for the study and the control group for the effectiveness of instruction program on the knowledge of pregnant women concerning anemia .The study was conducted at primary health care centers in Baquba city that include: Altakia health care center , Alsaraay health care center, Altahrer health care center, Almostapha ideal health care center. The Study implemented for the period of 23th October to 15th April 2018. Non-probability sample, consists of (60) pregnant women diagnosed with anemia attending four health care centers in Baquba city . thirty (30) women considered as (study group) and another (30) women were considered as (control group). The study sample group was exposed to pretest, instructional program, and posttest, while the control sample group just exposed to pretest and posttest. The steps of the Study carried by assessment of pregnant women's needs for knowledge regarding anemia and by using questionnaire format to fulfill with objective of the study and consisted of demographic, and reproductive characteristics, Hb levels, and their knowledge concerning anemia. An instrument was constructed through the use of (3) levels of Likert scale for the assessment of anemic pregnant women's knowledge. The rating score of the instrument was (2) for I know, (1) for uncertain and (0) for I don't know, with cut-off point=1.5, and their Assessment, Poor= 0-0.66, Fair= 0.67-1.33, Good= 1.34-2. A pilot study was carried out between December 13thto 20th, 2018, on (10) anemic pregnant women, attending alsarai health

care center , to determine the reliability of the questionnaire and content validity was carried out through 17 experts. Descriptive and inferential statistical analyses were used to analyze the data.

Ethical Considerations

The Institutional Review Board (IRB) at the University of Baghdad, College of Nursing approved the study to be conducted. The study protocol meets both the global & the Committee on Publication Ethics(COPE) standards of respecting humans subjects' rights.

Results:

Table (1): Distribution of the Sample According to Socio-demographic Characteristics: No. (30 for each group)

No.	Characteristics		Study group		Control group	
			F.	%	F.	%
1	Age/ years	15-19	6	20	6	20
		20-24	6	20	9	30
		25-29	9	30	10	33.3
		30-35	5	16.7	4	13.3
		35 ≤	4	13.3	1	3.3
2	Education	Illiterate	1	3.3	2	6.7
		Read & write	2	6.7	2	6.7
		Primary	8	26.7	11	36.7
		Intermediate	9	30	7	23.3
		Secondary	4	13.3	1	3.3
		College	6	20	7	23.3
3	Occupation	Housewife	29	96.7	30	100
		Employee	1	3.3	0	0
		Total	*30*	*100*	*30*	*100*
4	Socio-economic status	Low	20	66.7	24	80
		Moderate	10	33.3	6	20
		High	0	0	0	0

F.: Frequency, %: Percentage

Table (1) reveals that, the highest percentages (30%) (33.3%) respectively for both study and control groups their age (25-29) years old, (30%) for study group are intermediate school graduate, and (36.7%) for control group are primary schools graduates, (96.7%)(100%) in both study and control groups were housewives. Concerning Socio-economic status the highest percentages (66.7%) (80%) respectively for both study and control groups within low category (low socio economic status).

Table (2): Pregnant Women Hemoglobin Levels in Pre and Post Instructional Program:

No. (30 for each group)

Levels		Study group		Control group	
		F.	%	F.	%
Pre	7-8 g/dl	5	(16.7)	4	(13.3)
	8.1-9 g/dl	14	(46.7)	10	(33.4)
	9.1-10 g/dl	11	(36.6)	16	(53.3)
Post	7-8 g/dl	*0*	*0*	0	*0*
	8.1-9 g/dl	*0*	*0*	0	*0*
	9-10 g/dl	5	(16.7)	4	(13.3)
	10.1-11 g/dl	16	(53.3)	18	(60)
	> 11 g/dl	9	(30)	8	(26.7)

F.: Frequency, %: Percentage

Table (2) show level of hemoglobin in pregnant women pre instruction program and post instruction program (before delivery), the findings indicate that the level of hemoglobin is increasing post instruction program among women in the study group, in which (46.7%) of women are reveal a level of (8.1-9) g/dl that is less than normal pre instructional program and the level is increased to normal level post instruction program that is (10.1-11) g/dl in (53.3%) , and to (> 11) g/dl in (30%) of pregnant women. The level of hemoglobin was (9.1-10)g/dl among women in the control group (53.3%) pre-test and post-test is 10.1-11 g/dl (60%) that show moderate increasing also.

Table (3): Distribution of the Sample According to Reproductive Characteristics (n:30 for each group)

List	Characteristics		Study group		Control group	
			f	%	f	%
1	Age at marriage	15-19 yrs	17	56.7	17	56.7
		20-24 yrs	7	23.3	9	30
		25-29 yrs	6	20	4	13.3
2	Gravida	1-2	13	43.3	17	56.7
		3-4	10	33.4	8	26.7
		5-6	4	13.3	4	13.3
		7 ≤	3	10	1	3.3
3	Parity	Primipara	6	20	14	46.7
		1-2	11	36.7	10	33.3
		3-4	9	30	5	16.7
		5-6	4	13.3	1	3.3
4	No. of Abortion	None	17	56.7	23	76.7
		1-2	13	43.3	7	23.3
5	Pregnancy Interval	Primi	6	20	13	43.3
		> I year	8	26.7	10	33.3
		1 year	4	13.3	3	10
		2 years	4	13.3	2	6.7
		3 ≤ years	8	26.7	2	6.7
6	Prenatal visits	Regular	22	73.3	24	80
		Irregular	8	26.7	6	20
7	Source of Information about anemia	None	16	53.2	14	46.7
		Doctor	2	6.7	2	6.7
		Nurse	0	0	1	3.3
		Family	1	3.3	1	3.3
		Education	5	16.7	5	16.7
		Doctor & Media	2	6.7	3	10
		Family & doctor	2	6.7	4	13.3
		Family & media	2	6.7	0	0

F.: Frequency, %: Percentage

Table (3) showed the distribution of the pregnant women according to age at marriage, results indicate that the highest percentage (56.7%) of pregnant women for both groups, their age at marriage (15-19) years old, (43.3%) (56.7%) respectively for study and control groups having(1-2) pregnancies, (36.7%) for study group have (1-2) deliveries , and (46.7%) in control group were primipara, (43.3%) (23.3%) respectively in both groups confirm that they got (1-2) abortions. Regarding period between pregnancies, the highest percentages are distributed between less than year and three years and more (26.7%) in the study group, but in the control group, (43.3%) were primipara, and (33.3%) of them have less than one year period between pregnancies, (73.3%) (80%) respectively on regular visits to prenatal health care centers. Regarding to source of information, (53.3%) of women in the study group confirmed that they have no information about anemia from any source and only (16.7%) of them got the information from their education and the remaining are varied in their source of information.

Table (4): Assessment of Pregnant Women Knowledge about Anemia during their Pregnancy: No. (30 for each group)

Knowledge Item		Study Group						Control Group					
		Pre			Post			Pre			Post		
		MS	SD	Ass.	MS	SD	Ass.	MS	SD	Ass.	MS	SD	Ass.
Definition	Anemia is decrease RBC from their normal rate	1.60	(.498)	Good	1.93	(.365)	Good	1.40	(.498)	Good	1.47	(.507)	Good
	Normal rate is 11-12 gm/dl	1.57	(.568)	Good	2.00	(.000)	Good	1.80	(.408)	Good	1.80	(.407)	Good
Causes of Anemia	Do not eat iron –rich foods like red meats ,white meat,	1.73	(.450)	Good	2.00	(.000)	Good	1.90	(.305)	Good	1.87	(.346)	Good
	Pregnancy with more than one child	1.33	(.661)	Fair	2.00	(.000)	Good	1.53	(.507)	Good	1.63	(.490)	Good
	Hereditary blood disease (Thalassemia)	1.20	(.484)	Fair	1.97	(.183)	Good	.93	(.521)	Fair	1.03	(.556)	Fair
	Lack of pregnant for main diets	1.30	(.596)	Fair	1.97	(.183)	Good	1.13	(.571)	Fair	1.17	(.592)	Fair
	Folic acid deficiency	1.13	(.571)	Fair	2.00	(.000)	Good	1.07	(.583)	Fair	1.07	(.521)	Fair
	Don't eat the amount of food required	1.13	(.681)	Fair	2.00	(.000)	Good	1.07	(.583)	Fair	1.00	(.643)	Fair
	Drink tea or coffee during meals or after eating directly	1.07	(.640)	Fair	2.00	(.000)	Good	1.07	(.583)	Fair	1.03	(.490)	Fair
	Malnutrition diseases	1.20	(.714)	Fair	2.00	(.000)	Good	.97	(.490)	Fair	1.03	(.414)	Fair
	Pregnancy at an early age	.90	(.607)	Fair	2.00	(.000)	Good	1.03	(.490)	Fair	1.10	(.481)	Fair
	Repeated surgeries	.93	(.640)	Fair	2.00	(.000)	Good	.97	(.414)	Fair	1.03	(.320)	Fair
	Frequent abortion	1.00	(.525)	Fair	2.00	(.000)	Good	1.03	(.507)	Fair	.87	(.507)	Fair
	Approximation of pregnancy periods (> two years)	1.03	(.414)	Fair	2.00	(.000)	Good	.97	(.504)	Fair	.83	(.461)	Fair
	Using IUD	1.07	(.521)	Fair	2.0	(.000)	Good	.87	(.466)	Fair	.73	(.450)	Fair
	Hyper emesis gravid arum	.97	(.615)	Fair	1.93	(.245)	Good	.77	(.626)	Fair	.77	(.568)	Fair
	Recurrent bleeding during previous birth	1.00	(.643)	Fair	1.97	(.183)	Good	.70	(.551)	Fair	.80	(.669)	Fair
	Taking antacid together with iron tablet	.80	(.664)	Fair	1.97	(.183)	Good	.77	(.699)	Fair	1.03	(.626)	Fair
Symptoms of Anemia during Pregnancy	Pale skin &Lips	1.40	(.621)	Good	2.00	(.000)	Good	.80	(.691)	Fair	1.23	(.592)	Fair
	Palpitation	1.33	(.606)	Fair	2.00	(.000)	Good	1.17	(.591)	Fair	1.17	(.679)	Fair
	Nausea	1.20	(.664)	Fair	2.00	(.000)	Good	1.27	(.596)	Fair	1.23	(.571)	Fair
	Loss of appetite	1.20	(.664)	Fair	2.00	(.000)	Good	1.17	(.548)	Fair	1.13	(.629)	Fair
	Weak concentration	1.03	(.718)	Fair	1.97	(.183)	Good	1.30	(.664)	Fair	1.13	(.662)	Fair
	Difficult of breathing	1.10	(.607)	Fair	1.97	(.183)	Good	1.10	(.662)	Fair	1.10	(.106)	Fair
	Fatigue &Loss of energy	1.27	(.640)	Fair	2.00	(.000)	Good	1.20	(.669)	Fair	1.33	(.568)	Fair
	Feeling numbs in the feet	1.00	(.643)	Fair	1.97	(.183)	Good	1.10	(.583)	Fair	.77	(.669)	Fair
	Dizziness	1.20	(.664)	Fair	2.00	(.000)	Good	1.03	(.662)	Fair	1.03	(.643)	Fair
	Loss hair	1.00	(.587)	Fair	2.00	(.000)	Good	.73	(.615)	Fair	1.00	(.583)	Fair
	Headache	1.43	(.626)	Good	1.97	(.183)	Good	.90	(.556)	Fair	.93	(.691)	Fair
	Dryness &stiffening of nails	1.20	(.664)	Fair	1.97	(.183)	Good	1.03	(.681)	Fair	1.07	(.568)	Fair
Types of Anemia	Iron deficiency anemia	1.47	(.776)	Good	1.87	(.346)	Good	.97	(.563)	Fair	1.57	(.403)	Good
	Vitamin B12 deficiency anemia	.50	(.731)	Poor	1.63	(.490)	Good	1.13	(.403)	Fair	1.10	(.403)	Fair
	Folic acid deficiency anemia	.60	(.675)	Poor	1.77	(.430)	Good	1.60	(.450)	Good	1.03	(.320)	Fair

MS: Mean Score, SD: Standard deviation, Assess: Assessment, Poor= 0-0.66, Fair= 0.67-1.33, Good= 1.34-

This table indicates that women showing good level of knowledge, regarding definition of anemia in both groups; study and control during the period of pre and post application of instructional program. Regarding knowledge about causes of anemia, the study group show fair level of knowledge pre-instructional program that increase to good during the post-instructional program, while the control group showing fair level of knowledge pre and post instructional program among most items, regarding the symptoms of anemia, the study group showing fair level of knowledge pre-instructional program and increase to good level in all items post instructional program, while the control group showing fair level in all item pre and post period. Regarding knowledge about types of anemia, the study group show good knowledge toward iron deficiency anemia and poor knowledge toward other type during pre-instructional program, their knowledge is good post-instructional program among all items. The control group showing fair to good level of knowledge about the type of anemia during the pre and post-period .

Table (5): Overall Assessment of Knowledge about Anemia among Pregnant Women

Levels	Study Group (N=30)								Control group (N=30)							
	Pre				Post				Pre				Post			
	F.	%	MS	SD	F.	%	MS	SD	F.	%	MS	SD	F.	%	MS	SD
Poor	0	0	2.20	.407	0	0	3.00	0.00	0	0	2.07	.254	0	0	2.10	.305
Fair	24	80			0	0			28	93.3			27	90		
Good	6	20			30	100		0	2	6.7			3	10		
Total	30	100			30	100			30	100			30	30		

F: Frequency, %: Percentage, MS: Mean score, SD: Standard Deviation, Poor= 0-22, Fair= 22.1-44, Good= 44.1-66

This table reveals those pregnant women in the study group showing (80%) fair level of knowledge about anemia in pre-instructional program and their level of knowledge are increased to (100%) good knowledge in post-instructional program. While the level of knowledge among women in the control group did not changed in which they show fair level of knowledge pre and post period (pre=93.3% and post=90%). Such findings indicate an effective program that modifies women knowledge.

Discussion:

The analysis of demographic variable in **table (1)** reveals that relative to age groups, the highest percentages (30%) (33.3%) respectively for both study and control groups are (25-29) years old. The finding of the study agree with study about "anemia among pregnant attending labor units in two maternity hospitals in Mosul" ,the study reported that the age range is (15-43) years , with mean± SD were (28.17± 5.57) [(10)].

Regarding to women's level of education, the highest percentages (30%) for study group are intermediate school graduate, and (36.7%) for control group are primary schools graduates. With respect to women's occupation, the highest percentage (96.7%)(100%) in both study and control groups were housewives. The study results agree with study about "Prevalence of anemia and its associated factors among pregnant women receiving antenatal care at

Aymiba Health Center, northwest Ethiopia" Most of the study participants were educated up to the level of primary school (59.7%) **,** also found about (38.8%) of participants were housewives [(11)]. Additionally with the results "about the effect of one-to-one counseling to pregnant women's knowledge about anemia in Semarang" that found about(52,1%) of women were housewives [(12)]. Concerning Socio-economic status the highest percentages (66.7%) (80%) respectively for both study and control groups within low category (low socio economic status). The finding agree with a study about "Incidence of Anemia and its Socio-demographic determinants among pregnant women attending for antenatal care in Nepal"; also shows that pregnant have low socioeconomic [(13)].

Table (2) show level of hemoglobin in pregnant women pre instruction program and post instruction program (before delivery), the findings indicate that the level of hemoglobin is increasing post instruction program among women in the study group, in which (46.7%) of women are reveal a level of (8.1-9) g/dl that is less than normal pre instructional program and the level is increased to normal level post instruction program that is (10.1-11) g/dl in (53.3%) , and to (> 11) g/dl in (30%) of pregnant women. The level of hemoglobin was (9.1-10)g/dl among women in the control group (53.3%) pre-test and post-test is 10.1-11 g/dl (60%) that show moderate increasing also. This finding agree with a prospective study on prevalence of anemia among pregnant women and its outcome; The number of women having various grades of anemia reduced and the number of women with normal HB increased during the follow-up at 10.3-10.72 g% in control group [(14)].

Table (3) showed the distribution of the pregnant women according to reproductive history. Relative to age at marriage, results indicate that the highest percentage (56.7%) of pregnant women for both groups, their age at marriage (15-19) years old. This finding agree with the finding**s** which reported that the highest percentage (75.7%), is at age group of (14-16) years [(15)]. Concerning gravid, the highest percentage (43.3%) (56.7%) respectively for study and control groups having (1-2) pregnancies. Regarding to Parity, the highest percentage (36.7%) for study group have (1-2) , and (46.7%) in control group were primipara. The results agree with study which reported that the average number of pregnancy about (45.2%) of the mother are in their second pregnancy[(16)] . Additionally, A Prospective study done on the prevalence of anemia of pregnant women and its outcome; the study reported that (45.9%)of the mother are in their primi pregnancy in study sample ,and (30.4%) in control sample [(14)]. Regarding to no. of abortions (43.3%) (23.3%) respectively in both groups confirm that they got (1-2) abortions. The study at GMC Hospital, Ajman, UAE" , found that the highest percentage (41.8%) of their findings of one abortion [(17)]. Regarding period between pregnancies, the highest percentages are distributed between less than year and three years and more (26.7%) in the study group, but in the control group, (43.3%) were primipara, and (33.3%) of them have less than one year period between pregnancies. The finding agree with study which reported that most (55.38%) of those with pregnancy ; having birth interval

≤ 2 years [18]. Regarding to prenatal visits, the women in both group reveal that they are on regular visits to prenatal health care centers (73.3%) (80%) respectively. Regarding to source of information about anemia, (53.3%) of women in the study group confirmed that they have no information about anemia from any source and only (16.7%) of them got the information from their education and the remaining are varied in their source of information, a closed percentages are seen in the control group that reveal (46.7%) did not get information and (16.7%) get information from their education. This finding agree with a study done about prevalence of anemia and its associated factors among pregnant women attending antenatal care (ANC) South West Ethiopia; the study has reported that the majorities (68.3%) were have on information about anemia[19].

Recommendations:

The study recommended:

1. Instruction classes should be given for pregnant women in each primary health care center to encourage them to take daily oral iron and folic acid supplementation to prevent maternal anemia.

2. In each primary health care center follow up should be carried out for early detection of anemia in pregnancy.

3. Encourage the pregnant women to attained regular antenatal visits to detect early anemia and to upgrade maternal health status.

Table(4)(5) shows that pregnant women in the study group showing (80%) fair level of knowledge about anemia in pre-instructional program and their level of knowledge are increased to (100%) good knowledge in post-instructional program. While the level of knowledge among women in the control group did not changed in which they show fair level of knowledge pre and post period (pre=93.3% and post=90%). Such findings indicate an effective program that modifies women knowledge. This finding agree with a study done about knowledge regarding anemia during pregnancy among antenatal mothers show that the majority of antenatal mothers (54%) had knowledge on anemia during pregnancy, 38% had poor knowledge[20] , while study showed that there's good knowledge towards prevention of anemia during pregnancy and (42.7%) of them had poor knowledge [21].

References:

1.World Health Organization. (2015). World health statistics 2015. World Health Organization.

2.World Health Organization (2014) Essential nutrition actions–improving maternal, newborn, infant and young child health and nutrition.

3. World Health Organization (WHO). Hemoglobin Concentrations for the Diagnosis of anemia and Assessment of Severity; World Health Organization: Geneva, Switzerland, 2011.

4. Idowu, O. A., Mafiana, C. F., & Dopu, S. (2005). Anaemia in pregnancy: a survey of pregnant women in Abeokuta, Nigeria. African health sciences, 5(4), 295-299.

5.Melku, M., Addis, Z., Alem, M., & Enawgaw, B. (2014). Prevalence and predictors of maternal anemia during pregnancy in Gondar, Northwest Ethiopia: an institutional based cross-sectional study. Anemia, 2014.

6.Msuya, S. E., Hussein, T. H., Uriyo, J., Sam, N. E., & Stray-Pedersen, B. (2011). Anaemia among pregnant women in northern Tanzania: prevalence, risk factors and effect on perinatal outcomes. Tanzania journal of health research, 13(1), 33-39.

7.Olubukola A, Odunayo A, Adesina O.(2011). Anemia in pregnancy at two levels of health care in Ibadan, South West Nigeria. Ann Afr Med. 10:272–7.

8.Dim, C. C., & Onah, H. E. (2007). The prevalence of anemia among pregnant women at booking in Enugu, South Eastern Nigeria. Medscape General Medicine, 9(3), 11.

9. Dairo MD, Lawoyin TO.(2004). Socio-demographic determinants of anemia in pregnancy at primary care level: A study in urban and rural Oyo State, Nigeria. Afr J Med Med Sci. 33:213–7

10. Al Mukhtar, S. H. (2009). Anemia status of the pregnant and lactating women In Mosul city. Medical Journal of Tikrit, 1(151), 163-167.

11. Asrie, F. (2017). Prevalence of anemia and its associated factors among pregnant women receiving antenatal care at Aymiba Health Center, northwest Ethiopia. Journal of blood medicine, 8, 35.

12. Egryani, N. P. R., Saktini, F., Susilaningsih, N., Puspitasari, V. D., & Gumay, A. R. (2017, February). The Effect of One-to-one Counseling to Pregnant Women's Knowledge about Anemia in Semarang. In IOP Conference Series: Earth and Environmental Science (Vol. 55, No. 1, p. 012036). IOP Publishing.

13. Prakash, S., Yadav, K., Bhardwaj, B., & Chaudhary, S. (2015). Incidence of Anemia and its socio-demographic determinants among pregnant women attending for antenatal care: a cross sectional study. Int J Med & Health Res, 1(3), 12-7.

14. Suryanarayana, R., Chandrappa, M., Santhuram, A. N., Prathima, S., & Sheela, S. R. (2017). Prospective study on prevalence of anemia of pregnant women and its outcome: A community based study. Journal of family medicine and primary care, 6(4), 739.

15. Abu-Hasira, A. (2007). Iron deficiency anemia among pregnant women in Nablus district; prevalence, knowledge, attitude and practices. An-Najah National University Faculty of Graduate Studies Nablus, Palestine, 27(03).

16. Obse, N., Mossie, A., & Gobena, T. (2013). Magnitude of anemia and associated risk factors among pregnant women attending antenatal care in Shalla Woreda, West Arsi Zone, Oromia Region, Ethiopia. Ethiopian journal of health sciences, 23(2), 165-173.

17. Ahmed, A., Nasir, H., Shafiq, Q. A., Naeem, B., Ghelani, Y., & Shaikh, R. B. (2015). The Effect of Anemia on Pregnancy and Fetal Outcome: GMC Hospital, Ajman, UAE. Gulf Medical Journal, 4, S76-S82.

18. Urvashi Miglani, Priya Bhangadia, V. K. Kadam, Poonam Laul ,2018.Anaemia in term pregnancy: influence on maternal and perinatal outcome and role of demographicfactors.DOI:http://dx.doi.org/10 .18203/2320-1770.ijrcog20185434.

19.Zekarias, B., Meleko, A., Hayder, A., Nigatu, A., & Yetagessu, T. (2017). Prevalence of Anemia and its Associated Factors among Pregnant Women Attending Antenatal Care (ANC) In Mizan Tepi University Teaching Hospital, South West Ethiopia. Health Science Journal, 11(5), 1-8.

20. Srinivasan, K., Thomas, T., Kapanee, A. R. M., Ramthal, A., Bellinger, D. C., Bosch, R. J., ... & Duggan, C. (2017). Effects of maternal vitamin B12 supplementation on early infant neuro-cognitive outcomes: a randomized controlled clinical trial. Maternal & child nutrition, 13(2), e12325.

21. Jayanthigopal, M., & Demisie, M. D. B. (2018). Assessment of Knowledge and Practice Towards Prevention of Anemia Among Pregnant Women Attending Antenatal Care at Government Hospitals in West Shoa Zone, Ethiopia. Assessment, 50.