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Knowledge and Practice of Anemia among pregnant women attending antenatal clinic in Dr. Prabhakar Kore hospital, Karnataka-A Cross sectional study.

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Abstract: *Background and Objectives: Anemia in pregnancy is defined by World Health Organization (WHO) as a haemoglobin concentration below 11g/dl. Iron-deficiency anemia is the most common form of malnutrition in the world and is the eighth leading cause of disease in girls and pregnant women in developing countries. Materials and Methods: A cross sectional study was conducted Obstetrics and Gynaecological outpatient department of K.L.E.S hospital by taking a total of 400 pregnant women. Results: Out of 400 respondent's majority, 60.5% of the pregnant women were aged between 20-24 years.. Majority 62.7% of the respondents had registered their pregnancy in 1st trimester. Majority 48.5% of the respondents were in the first gravid. Most of the respondents didn't have any children. The study found that there was significant association between women's education and knowledge regarding cause of anemia, knowledge regarding sign and symptoms regarding anemia, knowledge regarding proper diet to prevent anemia, knowledge regarding prevention and treatment of anemia, preventive practice regarding anemia at p<0.001.Conclusion: The study result showed that knowledge regarding cause of anemia, sign and symptoms of anemia, proper diet to prevent anemia was poor. Knowledge regarding prevention and treatment of anemia, knowledge regarding preventive practice of anemia was good.*

Key Words: *Anemia, Pregnant women, ANC, Knowledge, Practice*

I. Introduction:

Anemia in pregnancy is defined by World Health Organization (WHO) as a hemoglobin concentration below 11g/dl.[1] Iron-deficiency anemia is the most common form of malnutrition in the world and is the eighth leading cause of disease in girls and pregnant women in developing countries. Women's health is central to the survival of the society as they give beginning to the new life on the earth and cares for all the family members.[2]Both developed and developing countries are affected by anemia. It has been global public health problem with major consequences for human health. It affects people of all age groups but its prevalence is more in pregnant women and young children. According to WHO, anemia is classified as mild degree (Hb 9.0-11.0 g\dl), moderate (7.0-9.0 g\dl) and severe (4.0-7.0 g\dl).[3]

In developing countries the major cause of anemia is hook worm infestation because many developing countries are located in tropical climate. In this region, low income country like India faces the problem of non-availability of iron rich food.[4] WHO estimates that the prevalence of anemia ranges from 40-60% in the developing countries. Half of those who are suffering from anemia are supposed to be suffering from iron deficiency anemia (IDA). The WHO has estimated that the prevalence of anemia in developed and developing countries in pregnant women is 14% in developed and 51% in developing countries. For example in India, anemia was estimated at 65-75%.[2] Pregnancy anemia is one of the important public health problems not only in India but also in most of the South East Asian countries. [5]

The prevalence of anemia is very high i.e (33-75%) in developing countries to that of 15% in developed countries. According to National Family Health survey-III (2005-2006) prevalence of anemia among pregnant women in India is 58% which is higher as compare to the previous survey (NFHS – II). In India most of the population is predominantly vegetarian and food stuff of Indian diet contain significant amount of phosphates, oxalates.[6]

Very few researches are done in India regarding knowledge and practice of anemia in pregnant women. This research will be fruitful to formulate the policy regarding the vulnerable group of society. Hence, this study was done to assess the knowledge and practice among the pregnant women who are attending antenatal clinic in Dr. Prabhakar Kore Hospital.

II. Material And Methods:

A cross-sectional study was conducted in the "Obstetrics and Gynecological out Patient Department of K.L.E.S Hospital" for a period of 1 year (Feb.2013-Jan.2014) among registered pregnant women attending antenatal clinics. Sample size was calculated by the formula ($n=\mathbf{4pq/d^2}$)(p=Prevalence i.e. 50%, q=100-p, d=10% error of p i.e. 10/100*50 =5). The total sample was 400.

A total of 400 pregnant women attending ANC clinic were randomly selected and included in the Study. All the registered pregnant mothers, those are attending the antenatal clinics were included in the study. Pregnant mother admitted in antenatal ward and associated with complication i.e. bad obstetric history, High risk pregnancies were excluded from the study.

A structured interview schedule was used to collect the required information. Ethical clearance was obtained from Institutional Ethics Committee (IEC) of JNMC, KLEU. A formal permission to conduct the study was obtained from the authorities of the hospital and consent was taken from study participants. The data was entered in SPSS (version 20) and analyzed by using descriptive (percentage, rate) and inferential statistical (chi-square).

III. Results:

Majority of the women were in the age group 20-24 years i.e.60.50%, 26.50% were in the age group 25-18 years, 8.50% and 4.50% women are in the age group 15-19 and 30-34 years respectively. Out of 400 respondents, 37.0% studied up to secondary level, 30.3% studied up to primary level, 13.8%, 8.3% studied up to higher secondary and graduate level respectively. 43(10.8%) women were illiterate. Majority were Hindu i.e.74.30% and 25.30% were Muslim. 67.7% were living in joint family and18.3% in nuclear family. Only 12(3.0%) were living in extended family. Majority i.e. 86.50%were housewife, 4.0% were labor. 62.70% were registered their pregnancy in first trimester, 31.30% had registered in second trimester and 6.0% had registered their pregnancy in third trimester (Table no.1).

34.80% had family's income Rs.5000-10000 per month, 30.50% had family's income less then Rs 5000 per month. 20.80%, 9.20%,3.80% had family income per month Rs.10000-15000, Rs 15000-20000, Rs20000-25000 respectively. Only 1.0% had family's income more than Rs 25000 per month.

Out of 400 respondents, majority 48.50% were in first gravid, 33.20% were in second gravid. 16.0% and 2.30% were in third and fourth gravid respectively. It was found that 46.5% didn't have any child and 39.30 had one child. Similarly, 7.20%, 6.70%, 0.30% had two, three and four children respectively.

The study found that there was significant association regarding knowledge about cause of anemia, sign and symptoms, proper diet to prevent, prevention and treatment and preventive practices with women's education (Table no.2,3,4,5,6).

Table no.1: Distribution of Socio-demographic Variables of Respondents (n=400)

Variables		No.	Percentage (%)
Age in years	15-19	34	8.5
	20-24	242	60.5
	25-18	106	26.5
	30-34	18	4.5
Literacy Status	Illiterate	43	10.8
	Primary	121	30.3
	Secondary	148	37.0
	Higher secondary	55	13.8
	Graduate	33	8.3
Religion	Hindu	187	74.3
	Muslim	102	25.3
	Buddhist	1	0.3
Types of Family	Nuclear	117	18.3
	Joint	161	67.8
	Extended	12	3.0
Occupation	House wife	346	86.5
	Labor	16	4
	Others	38	9.5
Diet	Vegetarian	128	32.0
	Non-vegetarian	162	68.0
Registered during	1st trimester	251	62.7
	2nd trimester	125	31.3
	3rd trimester	24	6.0

Table no.2: Association between knowledge regarding cause of anemia and women's education

	Women's Education	Correct		Incorrect		Total	
		No.	%	No.	%	No.	%
Pregnancy creates large demand of iron which is needed to develop the placenta	Illiterate	0	0	43	100	43	10.75
	Primary	14	11.57	107	88.42	121	30.25
	Secondary	18	12.16	130	87.84	148	37
	Higher secondary	1	1.81	54	98.19	55	13.75
	Graduate	13	39.39	20	60.61	33	8.25
	$\chi 2 = 35.946$, Df = 4, p < 0.001					400	100
Increase of HB % in the blood is known as anemia	Illiterate	0	0	43	100	43	10.75
	Primary	5	4.3	116	95.87	121	30.25
	Secondary	13	8.78	135	91.22	148	37
	Higher secondary	0	0	55	100	55	13.75
	Graduate	9	27.27	24	72.73	33	8.25
	$\chi 2 = 31.465$, DF=4, p=<0.001					400	100
Anemia in pregnancy is nutritional disorder	Illiterate	0	0	43	100	43	10.75
	Primary	0	0	121	100	121	30.25
	Secondary	14	9.45	134	90.55	148	37
	Higher secondary	1	1.81	54	98.19	55	13.75
	Graduate	8	69.69	25	30.31	33	8.25
	$\chi 2 = 39.349$, DF=8, p<0.001					400	100
Iron is an important elements required for Hb for pregnancy	Illiterate	0	0	43	100	43	10.75
	Primary	0	0	121	100	121	30.25
	Secondary	21	14.18	127	85.82	148	37
	Higher secondary	1	1.81	54	98.19	55	13.75
	Graduate	17	24.24	16	75.76	33	8.25
	χ^2 =90.381, DF =4, p<0.001					400	100
Major cause of anemia is malaria	Illiterate	0	0	43	100	43	10.75
	Primary	0	0	121	100	121	30.25
	Secondary	10	6.75	138	85.82	148	37
	Higher secondary	4	7.27	51	98.19	55	13.75
	Graduate	9	27.27	24	75.76	33	8.25
	χ^2 =38.725, DF =4, p<0.001					400	
Repeated pregnancy at a short interval i.e.<2 yrs cause anemia	Illiterate	0	0	43	100	43	10.75
	Primary	2	1.65	121	98.35	121	30.25
	Secondary	20	13.51	128	86.49	148	37
	Higher secondary	4	7.27	51	92.73	55	13.75
	Graduate	13	39.39	20	30.61	33	8.25
	χ^2 =49.383, DF= 4, p<0.001					400	100

Table no.3: Association between knowledge regarding sign and symptoms of anemia and women's education.

	Women's Education	Correct		Incorrect		Total	
		No.	%	No.	%	No.	%
Tiredness and weakness are symptoms of anemia	Illiterate	0	0	43	100	43	10.75
	Primary	2	1.65	119	98.35	121	30.25
	Secondary	8	5.40	140	94.60	148	37
	Higher secondary	14	25.45	41	74.54	55	13.75
	Graduate	13	39.39	20	60.61	33	8.25
	χ^2 =68.23 DF =4, p<0.001					400	100
Pallor of face are sign of anemia	Illiterate	0	0	43	100	43	10.75
	Primary	17	14.04	110	85.96	121	30.25
	Secondary	27	18.24	121	81.76	148	37
	Higher secondary	12	21.81	43	78.19	55	13.75
	Graduate	12	36.36	21	63.36	33	8.25
	χ^2 =25.17, DF =4 p<0.001					400	100
Pallor of eyes is sign of anemia	Illiterate	0	0	43	100	43	10.75
	Primary	13	10.74	108	89.26	121	30.25
	Secondary	22	14.86	126	85.10	148	37
	Higher secondary	16	40.0	39	60.0	55	13.75
	Graduate	8	48.48	25	51.52	33	8.25
	χ^2 =20.34, DF = 4, p<0.001					400	100
Pallor of tongue is sign of anemia	Illiterate	0	0	43	100	43	10.75
	Primary	0	0	121	100	121	30.25
	Secondary	16	10.81	132	91.9	148	37
	Higher secondary	16	29.09	39	67.28	55	13.75
	Graduate	12	36.36	21	63.64	33	8.25
	χ^2 =60.35, DF= 4, p<0.001					400	100
	Illiterate	0	0	43	100	43	10.75

Pallor of nails is sign of anemia	Primary	0	0	121	100	121	30.25
	Secondary	12	8.10	126	91.9	148	37
	Higher secondary	18	32.72	47	67.28	55	13.75
	Graduate	12	36.36	21	63.64	33	8.25
	χ^2 =46.68, DF= 4,p<0.001					400	100
Palpitation and breathing difficulty are sign of anemia	Illiterate	0	0	43	100	43	10.75
	Primary	0	0	121	100	121	30.25
	Secondary	18	12.16	130	87.84	148	37
	Higher secondary	4	7.27	51	92.73	55	13.75
	Graduate	12	36.36	21	63.64	33	8.25
	χ^2 =44.42, DF= 4,p<0.001					400	100

Table no.4: Association regarding knowledge regarding proper diet to prevent anemia and women's education.

	Women's Education	**Correct**		**Incorrect**		**Total**	
		No.	**%**	**No.**	**%**	No.	%
A well balance diet during pregnancy prevents anemia	Illiterate	10	23.3	33	76.7	43	10.75
	Primary	51	42.1	70	57.9	121	30.25
	Secondary	87	58.8	61	41.2	148	37
	Higher secondary	51	92.7	4	7.3	55	13.75
	Graduate	29	87.9	4	12.1	33	8.25
	χ^2 =72.53, DF= 4,p<0.001					400	100
Green leafy vegetables and sprouted grains are rich in iron	Illiterate	0	0	43	100	43	10.75
	Primary	54	44.6	67	55.4	121	30.25
	Secondary	87	58.8	61	41.2	148	37
	Higher secondary	51	92.7	4	7.3	55	13.75
	Graduate	25	75.8	8	24.2	33	8.25
	χ^2 =95.68, DF= 4,p<0.001					400	100
Ragi and Jaggery should be avoided during pregnancy	Illiterate	20	46.5	23	53.5	43	10.75
	Primary	46	38.0	75	62.0	121	30.25
	Secondary	53	35.8	95	64.2	148	37
	Higher secondary	32	58.2	23	41.8	55	13.75
	Graduate	8	24.2	25	75.8	33	8.25
	χ^2 =13.07, DF= 4,p<0.001					400	100
Meat is rich source of iron	Illiterate	25	58.1	18	41.9	43	10.75
	Primary	58	47.9	63	52.1	121	30.25
	Secondary	73	49.3	75	50.7	148	37
	Higher secondary	35	63.6	20	36.4	55	13.75
	Graduate	5	15.2	28	84.8	33	8.25
	χ^2 =21.34, DF= 4,p<0.001					400	100
Liver is rich source of iron	Illiterate	25	58.1	18	41.9	43	10.75
	Primary	50	41.3	71	58.7	121	30.25
	Secondary	71	48.0	77	52.0	148	37
	Higher secondary	43	78.2	12	21.8	55	13.75
	Graduate	5	15.2	28	84.8	33	8.25
	χ^2 =38.20, DF= 4,p<0.001					400	100
Citrus fruits promotes absorption of iron	Illiterate	14	32.6	29	67.4	43	10.75
	Primary	29	24.0	92	76.0	121	30.25
	Secondary	89	60.1	59	39.9	148	37
	Higher secondary	39	70.9	16	29.1	55	13.75
	Graduate	21	63.6	12	36.4	33	8.25
	χ^2 =55.63, DF= 4,p<0.001					400	100

Table no.5: Association regarding knowledge about prevention and treatment of anemia and women's education.

	Women's Education	**Correct**		**Incorrect**		**Total**	
		No.	**%**	**No.**	**%**	No.	%
Regular medical checkup is necessary during pregnancy	Illiterate	24	55.8	19	44.2	43	10.8
	Primary	69	57.0	52	43	121	30.2
	Secondary	123	83.1	25	16.9	148	37.0
	Higher secondary	50	90.9	5	9.1	55	13.8
	Graduate	21	63.6	12	36.4	33	8.2
	χ^2 =38.78, DF= 4,p<0.001					400	100.0
Daily intake of iron and folic acid tablet is necessary	Illiterate	14	32.6	29	67.4	43	10.8
	Primary	76	62.8	45	37.2	121	30.2
	Secondary	117	79.0	31	21.0	148	37.0
	Higher secondary	51	92.7	4	7.3	55	13.8
	Graduate	16	48.4	17	51.6	33	8.2
	χ^2 =56.28, DF= 4,p<0.001					400	100

Adequate treatment is necessary to treat hook worm infestation	Illiterate	20	46.5	23	53.5	43	10.8
	Primary	77	63.6	44	36.4	121	30.2
	Secondary	106	71.6	42	28.4	148	37.0
	Higher secondary	39	70.9	16	29.1	55	13.8
	Graduate	16	48.4	17	51.6	33	8.2
				χ^2 =14.07, DF= 4,p<0.001		400	100
Do you know Free iron tablet is given at time of pregnancy?	Illiterate	39	90.6	4	9.4	43	10.8
	Primary	112	92.5	9	7.5	121	30.2
	Secondary	132	89.1	16	10.9	148	37.0
	Higher secondary	51	92.7	4	7.3	55	13.8
	Graduate	24	72.7	9	27.3	33	8.2
				χ^2 =11.77, DF= 4,p<0.001		400	100

Table no.6: Association between preventive practice regarding anemia and women's education.

	Women's Education	**Healthy Practice**		**Unhealthy Practice**		**Total**	
		No.	**%**	**No.**	**%**	No.	%
Have you changed your normal dietary pattern during pregnancy?	Illiterate	14	32.5	29	67.5	43	10.75
	Primary	68	56.1	53	43.9	121	30.25
	Secondary	102	68.9	46	31.1	148	37
	Higher secondary	42	76.3	13	23.7	55	13.75
	Graduate	28	84.8	5	15.2	33	8.25
				χ^2 =32.83, DF= 4,p<0.001		400	100
Do you include green leafy vegetable in your diet every day?	Illiterate	43	100	0	0	43	10.75
	Primary	113	93.3	8	6.7	121	30.25
	Secondary	141	95.2	7	4.8	148	37
	Higher secondary	55	100	0	0	55	13.75
	Graduate	25	75.7	8	24.3	33	8.25
				χ^2 =27.25, DF= 4,p<0.001		400	100
Do you eat sprouted grains in your diet every day?	Illiterate	43	100	0	0	43	10.75
	Primary	112	92.5	9	7.5	121	30.25
	Secondary	132	89.1	16	10.9	148	37
	Higher secondary	55	100	0	0	55	13.75
	Graduate	25	75.7	8	24.3	33	8.25
				χ^2 =21.35, DF= 4,p<0.001		400	100
Do you include fiber rich food frequently?	Illiterate	34	79.0	9	21.0	43	10.75
	Primary	112	92.5	9	7.5	121	30.25
	Secondary	138	93.2	10	6.8	148	37
	Higher secondary	55	100	0	100	55	13.75
	Graduate	28	84.8	5	15.2	33	8.25
				χ^2 =16.69, DF= 4,p<0.001		400	100
Do you use ragi in your diet?	Illiterate	10	23.2	33	76.8	43	10.75
	Primary	94	77.6	27	22.4	121	30.25
	Secondary	98	66.2	50	33.8	148	37
	Higher secondary	30	54.5	25	45.5	55	13.75
	Graduate	24	72.7	9	27.3	33	8.25
				χ^2 =44.36, DF= 4,p<0.001		400	100
Do you use jiggery in your diet?	Illiterate	14	32.5	29	67.5	43	10.75
	Primary	90	74.3	31	25.7	121	30.25
	Secondary	92	62.1	56	37.9	148	37
	Higher secondary	44	80	11	20	55	13.75
	Graduate	20	60.6	13	39.4	33	8.25
				χ^2 =30.86, DF= 4,p<0.001		400	100

IV. Discussion:

In the present study, Majority 242 (60.50%) women were in the age group 20-24 years followed by 106 (26.50%) in age group 25-18 years, in the age group of 15-19 years 34 (8.50%) and less in 30-34 years 18 (4.50%). A study conducted in Nepal showed that 87.81% women were less than 30 years.[7] Other study in Nigeria noted that majority of the women were 30-34 years (34.1%) followed by of 25-18 years (33.5%), 20-24 years (14.8%), 35-39 years (12.9%) and rest were in other age group which was different from our study.[8]One of the study of Kalyobia showed that 30% women were 18-25 years, 50% were 25-32 years and 20% were more than 32 years of age.[9] Majority 148 (37.0%) of the women had secondary level education followed by primary level education 121 (30.3%), higher secondary 55 (13.8%), illiterate 43 (10.8%) and 33 (8.3%) had graduate level education in this study. A study in Orissa revealed that 16.91% were illiterate, 40.83 were having primary education, 24.16% were having secondary education and 7.08% were having higher secondary education and

above education.[10] A study in Nepal revealed that 16.7% were illiterate, 25.8% were having primary education, 56.1% were having secondary education and above education.[7]

Maximum number of 187 (74.30%) were Hindu, 102(25.30%) were Muslim and 1(0.40%) were Buddhist in this study. A study in Karnataka showed 67.61% were Hindu and 25.71% were Muslim, and 6.66 were others religion followers.[11] In this study 161(67.70%) were living in joint family. 117(18.30%) were living in nuclear family and 12(3.0%) were living in extended family. A study conducted in Orrisa showed that 77.08% were living in joint family and 22.92% were living in nuclear family.[10] 55.23% were living in joint family and 44.76% were living in nuclear family in the study done in Karnataka.[11]

In this study 346 (86.50%) were housewife, 16 (4.0%) were labor. 38(9.50%) of respondent used to do other type of work. A study conducted in Kalyobia showed that 58% were housewife and 42% were doing other work outside.[9] 95.23% were housewife, 2.85% were laborers, 1.9% were Professionals in a study done in Karnataka.[11]

In this study majority of the respondents 162(68.0%) were non-vegetarian whereas 128 (32.0%) were vegetarian. The respondent 73.33% were non-vegetarian and 26.66% were vegetarian in the study done in Karnataka.[11]

Majority 251(62.70%) had registered their pregnancy in first trimester, 125(31.30%) had registered their pregnancy in second trimester and 24 (6.0%) had registered their pregnancy in third trimester in this study. In the study done in Nigeria 14.24% had registered their pregnancy in first trimester, 54.75% had registered their pregnancy in second trimester and 31% had registered their pregnancy in third trimester.[8] In the study done in Karnataka, 56.19% had registered their pregnancy in first trimester, 36.19% had registered their pregnancy in second trimester and 9.52% had registered their pregnancy in third trimester.[11]

Most of the respondents 139 (34.80%) had family's income Rs.5000-10000 per month. 122 (30.50%) had family's income less then Rs 5000 per month. 83(20.80%), 37(9.20%), 15(3.80%) had family income per month Rs.10000-15000, Rs 15000-20000, Rs20000-25000 respectively. Only 4(1.0%) had family's income more than Rs 25000 per month in this study. In the study done in Karnataka, 99.05% had income of less than Rs.5000 and 0.95% had income of more than Rs.5000.[11]

In our study, most of women 194(48.50%) were in first gravid, 133 (33.20%) were in second gravid. 64 (16.0%) and 9 (2.30%) were in third and fourth gravid respectively. A study conducted Iranian 44.44% were in first gravid, 25.9% were in second gravid. 14.2% were in third and 15.5% in fourth and above gravid.[12] In Kalyobia study, 18% were in first gravid, 71% were in multi gravid.[9] Out of 400 respondents, 186(46.5%) didn't have any child. 157 (39.30%) respondents had one child. Similarly 18(7.20%), 16(6.70%), 1(0.30%) had two, three and four children respectively. In the study done in Nigeria, 43.91% didn't have any child, 28.37% had one child, 15.24% had two children, 6.05% had three children and 6.44% had four and more than four children.[27] In Kalyobia study, 50.5% didn't have any child, 49.5% one and more than one children.[9]

None of the women who were illiterate gave any correct answer regarding cause of anemia. Majority of correct answers regarding cause of anemia was given by women who were educated up to graduate. The study found that there was significant association between cause of anemia and women's education at $p<0.001$.

None of the women who were illiterate gave any correct answer regarding sign and symptoms of anemia. Majority of correct answers regarding sign and symptoms of anemia was given by women who were educated up to graduate. The study found that there was significant association between sign and symptoms of anemia and women's education at $p<0.001$. Most of women had knowledge about proper diet to prevent anemia but majority of correct answer was given by women who was educated up to higher secondary and graduate. The study found that there was significant association between prevent anemia and women's education at $p<0.001$.

Most of women had knowledge regarding prevention and treatment of anemia but majority of correct answer was given by women who were educated up to higher secondary level. The study found that there was significant association regarding prevention and treatment of anemia and women's education at $p<0.001$. Most of the women were doing healthy practice to prevent anemia but majority of women who were educated up to higher secondary were doing healthy preventive practice to prevent anemia. The study found that there was significant association regarding preventive practice regarding anemia and women's education at $p<0.001$.

V. Conclusion:

The study result showed that knowledge regarding cause of anemia, sign and symptoms of anemia, proper diet to prevent anemia was poor. Knowledge regarding prevention and treatment of anemia, knowledge regarding preventive practice of anemia was good. The result clearly showed that there was significant association between women's education and knowledge regarding cause of anemia, sign & symptoms of anemia, proper diet to prevent anemia, prevention and treatment of anemia, preventive practice regarding anemia.

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