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Knowledge, Attitudes and Practices Regarding Anemia in Women of Reproductive Age Group in Perspective to the Madhepura District of Bihar

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Abstract

Objective: The present study aimed to assess the knowledge, attitudes and practices of women of reproductive age group (18-40years) toward anemia and factors influencing anemia.

Design: This was a community-based cross-sectional study. Information regarding knowledge, attitudes and practices was collected using a questionnaire and information on food was collected using food frequency. A multivariate regression analysis was performed to predict the variables influencing knowledge, attitudes and practices related to anemia. Pearson's correlation was performed to test the relationship of income, age and education with knowledge, attitudes and practices related to anemia.

Setting: This research was carried out in the rural area of Madhepura.

Results: The mean age of the respondents was 28.65 years, most of the respondents (30.5%) were in lower middle class and the knowledge score of the respondents was between 5 and 13. The respondents exhibited poor health-seeking behavior. Dietary habits were found to be mainly cereal-based; the consumption of animal food was inconsistent and low. r value of -0.002 was found between age and attitude and r value of -0.07 was found between age and practice. Income can predict the knowledge of the respondents (p value = 0.01) whereas education can predict the attitudes and practices as the p were 0.009 and 0.0001 respectively. No linear relationship (p value = 0.86) was observed between socioeconomic status and dietary score.

Keywords: Dietary pattern, women of reproductive age group, health-seeking behavior.

Statement of Significance: To our knowledge, this study is the first to assess the knowledge, attitudes and practices related to anemia and the factors influencing anemia in the Madhepura District of Bihar.

Introduction:

The Sustainable Development Goals (SDGs-10) stress ending all forms of malnutrition and reducing inequality as the utmost priority. India faces the problem of dual burden of malnutrition. The easy availability and consumption of carbohydrate rich fast foods, has led to a shift from the traditional foods. Youngsters prefer consuming fast foods. This trend is deleterious and causing micronutrient deficiency among children at an early age. Micronutrient deficiency is a viscous cycle that step in during childhood and continues throughout the life. Gender inequality in food distribution among household members, is the leading cause of micronutrient deficiency among women of reproductive age. According to the World Health Organization pregnant women are considered anemic if their hemoglobin concentration is less than 11.0 g/dl, while non pregnant women are considered anemic if their hemoglobin concentration is below 12.0 g/dl [1]. Iron deficiency anemia is the most prevalent type of anemia in developing nations. Global analysis indicates that anemia affects 27% of the world's population, with iron-deficiency being the primary cause [2, 3]. Women of reproductive age (WRA) are most vulnerable to nutritional anemia caused by poor dietary intake of essential micronutrients, heavy menstruation, unhygienic living conditions, poverty and illiteracy. Among WRA, anemia is associated with several adverse health outcomes, including poor pregnancy outcomes, preterm birth, stillbirth, low birth weight, low iron stores in infants, fatigue, breathlessness, dizziness, maternal mortality and morbidity. Anemia negatively impacts infants' and children's cognitive and physical development [4, 5, 6]. According to the NFHS-5 data, the prevalence of anemia in Bihar is 63.6% which is higher than the national average. There is a 3.2% increase in the prevalence rate of anemia in Bihar from NFHS- 4 to NFHS -5. Nutritional anemia occurs due to lack of nutrient intake especially protein, iron and vitamin C; strong relationship between the diet quality and anemia among young women exists [7]. This study aimed to determine the knowledge attitudes and practices regarding anemia among women aged 18-40 years and the effects of different variables on the knowledge, attitudes and practices towards anemia.

MATERIALS AND METHODS:

This was a community-based cross-sectional study conducted on women of reproductive age (18-40 years). A total of 200 women were enrolled in the study via simple random sampling in Madhepura, district of Bihar. The questionnaire was used to assess participants' knowledge, attitudes and practices. The questionnaire included personal information, socioeconomic questions, 15 questions to test the knowledge level of the respondents, 4 questions to test the attitudes of the respondents and 10 questions to test the practices of the respondents. Questions seeking information regarding practices were divided into questions about dietary information (n =6) and questions about health-seeking behavior (n=4). Each right answer received 1 point and each wrong answer received 0 points. The maximum scores for knowledge were 15 points, 4 points for attitudes and 4 points for health seeking behaviors. To answer the question regarding the consumption of protective foods (meat, fish, egg, citrus fruits, green leafy vegetables, dal and milk), the daily consumption of protective food was recorded as 1 mark whereas no-consumption recorded 0 marks; the maximum score was 7. Multivariate regression was applied to predict the effect of different independent variables on the KAP score and Pearson's correlation was

applied. This study was performed according to the Helsinki Declaration of 1975 and was approved by the ethical committee of the University Department of Home Science, Bhupendra Narayan Mandal University, Madhepura, Bihar, India. Informed consent was obtained from all the individual participants included in the study.

Results: The mean age of the respondents was 28.65±4.26 years; and the mean number of family members was 5. Of the 200 female respondents 193 were Hindu and only 7 were Muslim; 50 respondents belonged to the general category, 123 respondents belonged to other backward castes, 15 respondents were SC and 12 respondents belonged to scheduled tribes. The general information of the respondents is presented in Table 1.

Table 1

General Information of the respondents

General Information		
Age		28.65 ± 4.26
Members in Family		5.40 ± 1.63
Education	N	%
Literate	166	83
Illiterate	34	17
Religion	N	%
Hindu	193	96.5
Muslim	7	3.5
Caste	N	%
Gen	50	25
OBC	123	61.5
SC	15	7.5
ST	12	6

We used the modified Kuppuswamy socioeconomic scale updated for 2021 to determine the socio-economic status of the respondents. The education of the head of the family, the occupation of the head of the family and the monthly income of the family were considered for the calculation of socioeconomic status. The socio-economic status of the families is shown in Table 2.

Table 2

Socioeconomic Status of the Respondents

Score	Socioeconomic class	n	%
26 – 29	Upper	0	0
16 – 25	Upper middle	12	6
11 – 15	Lower middle	61	30.5
5 – 10	Upper lower	116	58
<5	Lower	11	5.5

From table 2, it is evident that most of the respondents (58%) belonged to the upper lower class followed by the lower middle class (30.5%). The majority of the respondents had a rural background. Male members of most of the households worked as migrant laborer in states such as Punjab and Bangalore. While we collected the data through questionnaires, most of the female respondents said that due to a lack of work opportunities in Madhepura they were left with no option, but to migrate to other states in search of work. Of the 200 female respondents 72% knew that less blood indicates anemia, 64% of the respondents knew that tiredness and dizziness are symptoms of anemia, 55% of the female respondents knew that worm infestation can lead to anemia, 80.5% of the respondents knew about protein and its sources, 72% of the respondents knew that processing techniques such as germination and soaking increase the nutritional content of the pulses. Respondents were aware that the requirement for iron is greater among females than among males and the iron deficiency during pregnancy can be life threatening.

Table 3
Knowledge of the Respondents Regarding Anemia

Knowledge regarding anemia	Yes (n)	%	No (n)	%	Don't Know (n)	%
1. Do you know less blood indicates anemia?	144	72	31	15.5	25	12.5
2. Do you know paleness indicates anemia?	128	64	28	14	44	22
3. Do you know Tiredness and dizzineas are the symptoms of anemia?	151	75.5	21	10.5	28	14
4. Do you know that worm infestation can lead to anemia?	110	55	28	14	62	31
5. Do you know about protein?	164	82	22	11	14	7
6. Do you know deficiency of energy, protein and iron can lead to anemia?	126	63	31	15.5	43	21.5
7. Consumption of Green Leafy vegetables helps in blood formation	163	81.5	21	10.5	16	8
8. Consumption of soyabean, egg and beetroot increase blood formation	149	74.5	22	11	29	14.5
9. Egg contains protein	161	80.5	16	8	23	11.5
10. Animal food increase blood formation	140	70	18	9	42	6
11. Consumption of Iron helps in increasing the absorption of iron	130	65	66	33	4	2
12. Germination enhances the nutritional quality of pulses and cereals	144	72	14	7	42	21
13. Requirement of iron is more for female than male	144	72	52	26	4	2
14. Anemia can be a problem in pregnancy	165	82.5	11	5.5	24	12
15. Consumption of IFA tablet before planning pregnancy	121	60.5	17	8.5	62	31

Table 4
Knowledge Score of the Respondents

Knowledge Score	N	%
≤ 4	12	6
5 – 13	111	55.5
≥ 14	77	38.5

Attitude towards anemia: Forty nine percent of the respondents said that they were not suffering from anemia and 31% of the respondents did not know about anemia, whereas only 20% of the respondents said, that they were suffering from anemia. Most of the respondents did not receive blood tests. Most of the respondents (73.5%) agreed that anemia is a public health problem in India and it can be treated by consuming iron rich foods (71.5%). The details of respondents' attitudes towards anemia are depicted in table 5.

Table 5

Anemia Attitudes of Respondents

Attitude towards anemia	Yes (n)	%	No (n)	%	Do not Know (n)	%
1. Do you have anemia	40	20	98	49	62	31
2. Anemia is a public health problem in India	147	73.5	23	11.5	30	15
3. Consumption of iron rich food helps in anemia	143	71.5	20	10	37	18.5
4. Anemia is a serious problem	151	75.5	19	9.5	30	15

Practice toward anemia: Most of the respondents (68%) were non vegetarian. The dietary pattern of the respondents was mainly cereal based, most of the women did not consume dal, as they preferred consuming rice with curry. The consumption of animal products was inconsistent, and most of the respondents consumed non-vegetarian foods only on weekends. The frequency of food consumption by the respondents and table 6 indicate the amount consumed by the respondents. None of the respondents consumed meat or fish daily, whereas only 2% of the respondents consumed eggs daily. Most of the respondents sometimes consumed animal protein, and 38.5% to 49% of the respondents consumed 1- 2 servings/ day. Fish were preferred over meat, eggs and chickens. Indian foods contain many spices, and the intrinsic factors of vegetarian foods influence iron absorption. The consumption of vitamin C can aid in the absorption of iron, as vitamin C converts ferric iron into ferrous iron so that it can be easily absorbed in the body. Most of the respondents consumed citrus fruit once a week, and 70.5% of the respondents consumed 1-2 servings/day. Citrus fruits are good sources of nutrition and contain ample amounts of vitamin C. Citrus fruits contain dietary fiber, potassium, folate, calcium, thiamine, niacin, vitamin B6, phosphorous, magnesium, copper, riboflavin and pantothenic acid [8]. We found that the consumption of cereals was greater than that of other food items. 65.5% of the respondents consumed dal daily and 88.5% of the respondents consumed 1-2 ser/day. The consumption of animal products ranged from 37.5 g to 260 g with a mean consumption of 150 g but the frequency of consumption was poor, as most of the respondents (20% to 25.5%) sometimes consumed animal products. Most of the respondents consumed eggs once a week and the consumption ranged from 0.25 to 1.75 eggs/week, with a mean consumption of 1 egg/ week. Citrus fruits increase the absorption of ferric iron because it helps convert the insoluble ferric form into the soluble ferrous form. The ICMR recommends the consumption of 100 g of citrus fruits daily, but we found that the consumption of citrus fruits ranged

from 25 g to 100 g with a mean consumption of 100 g once a week. The consumption of dal ranged from 7.5 g to 52.5 g with a mean consumption of 15 g, which was lower than the recommended intake of 30 g/day. The diet of an average woman in Madhepura lacks energy, protein and micronutrients. The consumption of fast food was low among the respondents; details are provided in Table 8.

As depicted in Table 11, a weak yet positive correlation exists between knowledge and income; and between age and knowledge. A relatively strong correlation exists between education and knowledge. Attitude was positively associated with income and education but negatively with age. Practice showed a positive correlation with income and education and a negative correlation with age. Multivariate regression was performed to predict the various independent variables that influence the knowledge, attitudes and practices related to anemia. Income can predict the knowledge of the respondents (p-value=0.001), whereas education can predict the attitudes and practices toward anemia among respondents, as the p values were found to be 0.009 and 0.0001, respectively. There was no linear relationship (p value = 0.86) between the socioeconomic status and the dietary diversity score.

Table 6
Frequency of Food Consumed by the Respondents

Food	Never %	Sometimes %	Once a Month %	Once a Week %	Daily %
Meat	50.5	22.5	15	12	0
Fish	44.5	25.5	7.5	22.5	0
Egg	50	20	6	22	2
Citrus Fruit	7.5	24	11.5	30	27
GLV	1.5	8	4.5	5	81
Dal	4	17.5	7.5	5.5	65.5
Milk	9	5.5	3.5	7	150
Fast food	13.5	50	15.5	11	10

Table 7
Information Regarding the Amount of Food Consumed by the Respondents

Food Items	<1 ser/day (n)	%	1-2 ser/day	%	≥ 3ser/day	%	Never	%
Meat	9	4.5	94	47	3	1.5	94	47
Fish	10	5	98	49	2	1	90	45
Egg	4	2	77	38.5	1	0.5	118	59
Citrus fruit	14	7	141	70.5	5	2.5	40	20
GLV	10	5	169	84.5	15	7.5	6	3
Dal	7	3.5	177	88.5	8	4	8	4
Milk	1	0.5	124	62	12	6	63	31.5
Tea/Coffee	1	0.5	150	75	7	3.5	42	21
Fast Food	2	1	171	85.5	7	3.5	20	10

Table 8
Consumption and Frequency of Protective Foods

Food Items	Range	Median	Frequency
Meat	37.5-260 g	150 g	Sometimes
Fish	37.5-260 g	150 g	Sometimes

Egg (nos.)	0.25-1.75	1	Once a week
Citrus fruit	25-100 g	100 g	Once a week
GLV	25-175 g	100 g	Daily
Dal	7.5-52.5 g	15 g	Daily
Milk	25-175 ml	100 ml	Daily
Tea/Coffee	12.5-87.5 ml	50 ml	Daily
Fast Food	50-150 g	100 g	Sometimes

Health Seeking Behavior: Health seeking behavior of the respondents was poor; only 53% of the respondents had blood tests performed in the previous year, 57% of the respondents took iron folic acid tablet in the previous year and only 49.5% of the respondents took deworming tablets in the past 6 months. This clearly indicates poor health seeking behavior among the respondents.

Table 9
Health Seeking Behavior of the Respondents

Seek medical advice if anemic	Number	Percentage
Yes	163	81.5
No	37	18.5
Blood Test in previous 1 year		
Yes	106	53
No	94	47
IFA tablet in previous 1 year		
Yes	114	57
No	86	43
Deworming tablet in past 6 month		
Yes	99	49.5
No	101	50.5

Table 10
Attitude, Practice and Health Seeking Behaviour Score of the Respondents

Attitude Score	N	%	Practice Score	N	%	HSP Score	N	%
≥3	137	84	≥6	0	0	≥3	44	78
≤3	63	16	≤6	200	100	≤3	156	22

Table 11
Table Indicating Correlation Coefficient with Different Variables (Income, Age and Education)

	Variables	Correlation Coefficient
	Income	0.227534
Knowledge	Age	0.073588
	Education	0.439785
	Income	0.143592
Attitude	Age	-0.00199
	Education	0.270769

	Income	0.148348
Practice	Age	-0.0709
	Education	0.1845

Discussion:

Kulkarni., 2015 [9] conducted a similar study on Indian antenatal women they reported that all the women were taking IFA tablets continuously, however in our study, we found that the women knew about the IFA tablets, but they were not consuming them on a regular basis. They also found that women are anemic before conception because they lack good habits. Therefore, continuous reinforcement of knowledge to women by health workers is important for changing their nutritional habits. In our study we found that despite their knowledge, they fail to practice tasks on a continuous basis. Anemia is a serious health problem among women of reproductive age [10]. High compliance of iron-folic acid was reported in Pondicherry where the literacy rate is high, and low compliance was reported in Bihar and Rajasthan where the literacy rate is low [11]. In the Sirohi district of Rajasthan 12% compliance with IFA tablets was reported; a compliance rate of only 24% was reported in the districts of Bihar. Intergenerational deficiency is observed in the Indian population; usually, mothers are deficient in iron reserves this deficiency is passed from her to the baby and the cycle continues. Iron deficiency anemia generally causes fatigue and weakness due to less oxygen being supplied to the body, leading to impaired work productivity [11]. The prevention of IDA includes lifestyle modifications, especially the consumption of iron rich foods [12]. Among women of reproductive age, iron deficiency anemia is associated with adverse reproductive outcomes such as preterm delivery, low birth weight infants and decreased iron stores for the baby, which may lead to impaired development. In India more than 15 states had a high incidence (>55%) of anemia among socially backward groups in 2019-21. The anemia prevalence was high (>55%) in all the social groups (SC and ST, OBC, general) observed in seven states in the NFHS -3, four states in the NFHS-4 and eleven states in the NFHS-5. Overall, the results revealed that the SC and ST women were more prone to anemia than OBC and the general women. Among all the variables, education, economic status and age predominantly controlled anemia among the social group. In our study, we found that women were familiar with knowledge about anemia, its sign and symptoms and iron rich foods but had problems such as rural residency [13,14], early marriage and pregnancy [15], decreased empowerment [16] and poor economic condition [17] increased their chances of anemia. The main reason for women being anemic as we found in our study, is the consumption of low-quality food and limited consumption of iron supplements. Most of the respondents were nonvegetarian but the frequency of animal protein was low. The respondents mainly consumed cereal-based food, which is low in dairy and animal products [18]. Few respondents knew that the bioavailability of ferric iron can be increased by the consumption of vitamin C and processing techniques such as germination and fermentation. Those who knew the fact were not practicing as they were not having time. Most of the respondents in our study were from rural areas; as a result, they were involved in agricultural activities, and most of the women cooked meals twice a day. The consumption of fast food was low among the respondents; they mostly consumed foods prepared at home. In Indian society gender biases are prevalent particularly in rural

areas; women are responsible for household chores, child rearing, food cooking and agricultural work. They are the last to consume food [19, 20].

Conclusion

The results of the present study highlighted inadequate consumption of foodstuffs and poor diet scores among most of the respondents. Although most of the respondents knew about anemia, they failed to practice healthy eating habits and good health-seeking behavior and most of the women neglected their health; as a result, their nutritional status was affected. There is an urgent need for a massive participatory approach where health workers disseminate information regarding good eating habits and development of nutrigardens so that they can grow cost-effective greens in their backyard.

Conflict of interest: None

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Ethics Declarations

Ethics approval and consent to participate

This is a community based cross sectional study performed in accordance with the Helsinki declaration of 1975. The Research Ethics Committee of the University Department of Home Science, Bhupendra Narayan Mandal University, BNMU., Madhepura, Bihar, India has confirmed that no ethical approval is required. Informed consent was obtained from all the individual participants included in the study.

Consent for publication

Not Applicable

Competing Interests:

The author declares no competing interests