



**INVESTIGATIONAL COHORT STUDY ON IRON
DEFICIENCY ANAEMIA IN URBAN, RURAL COMMUNITIES
OF LOCALS IN WARANGAL DIST, TELANGANA STATE-
EVALUATION OF CONTRIBUTING FACTORS**

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Abstract

The iron deficiency anemia is the leading cause of declines birth rate and other complications in women. The underlying causes for the prevailing disease include lack of proper nutrition, awareness, low socio economic status and negligence of government. This critical illness is one of the most addressing concerns globally to save the life of women and child. Many initiatives as proposed by WHO need to be reinforced in each country. The levels of Hb in iron complex protein has to be clearly defined to understand the level of illness and to ensure proper treatment. Thus the present study was conducted to define the levels of anemia in local Warangal rural area and also to suggest suitable remedies to the women in association with the government agencies in enforcement of the women empowerment programmes. Thus the critical study initially identified 523 local women population with inclusion criteria aimed to take pregnant and non pregnant women in the 20-40 age groups. The study questionnaire was developed based on standard SF22 format and the study was evaluated to know the underlying causes and issues for the progression of disease. Further the investigation of biochemical parameters was carried out using Sahlis method of estimation of Hb which gave the clear understanding of women of different age groups who have risk of developing complications. Thus the significance of study was statistically evaluated. The results of the study are communicated to local governing body for strict enforcement of programmes. The study investigations clearly define the lack of nutrition in case of working women, lack of awareness of health condition (Negligence of Family and Govt initiatives). Thus the study results suggest the infringement of local government to take necessary initiatives to empower women and child health in Warangal dist.

Keywords: Anemia; Hb levels; Warangal Dist; Women and child; Govt. initiatives

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1. INTRODUCTION

The Iron deficiency anemia is the most common cause of deaths and decreased birth rates in women which is affecting about one third of the population. The anemia symptoms are severe especially in the middle age groups which as a major concern led to establish proper Hb levels determining the correct identity[1,20]. The WHO reports suggest that most affected groups include 42% amongst the preschool age which include toddlers and infants. Further 46 % women were reported with severe anemia in world epidemiological survey by WHO in 2016. Data Reports the critical thresholds of Hb levels as reported[2,19] in Table 1 which can identify the illness. Anemia is a condition which occurs due to decreased Hb levels as the Hb(Hemoglobin) plays a major role in carrying oxygen levels to tissue ultimately[3,18] leading to decreased RBCs. Decreased Hb levels include severe complications i.e., include fatigue, breathlessness, inflammation of tissues, low birth weight, thalassemia, heart palpitations etc based on the Hb cutoff thresholds. The pregnant women can experience low birth weight, less brain

development, delayed child development, neonatal and pre natal mortality[4,17]. The initial stage identification and treatment can prevent the complications and negative impacts pertaining to preschool children and reproductive age group women. The underlying causes of the anemia include the most common determinants as nutritional deficiencies, low socio-economic status, poor hygiene and sanitation and Chronic Hb disorders as shown in Table 1 [5,16]. The potential causes can be classified as two types chronic and acquired. The chronic causes as shown in Figure 1 include heavy bleeding during menses, blood infections in GI tract and urinary bladder like ulcers, schistosomiasis and hookworm infection. the acquired proximate for the anemia include immune mediated deficiencies like Folate deficiency, B12 deficiency, thalassemia[6], sickle cell anemia. In order to create awareness and also to report the underlying issues of women in the Warangal local area the present study was aimed to report the anemia levels in local population and also extend the support the local NGO organization to clear the deficiencies leading to anemia [7, 13].

Figure 1: Contributing factors for anemia in women worldwide(WHO health data)

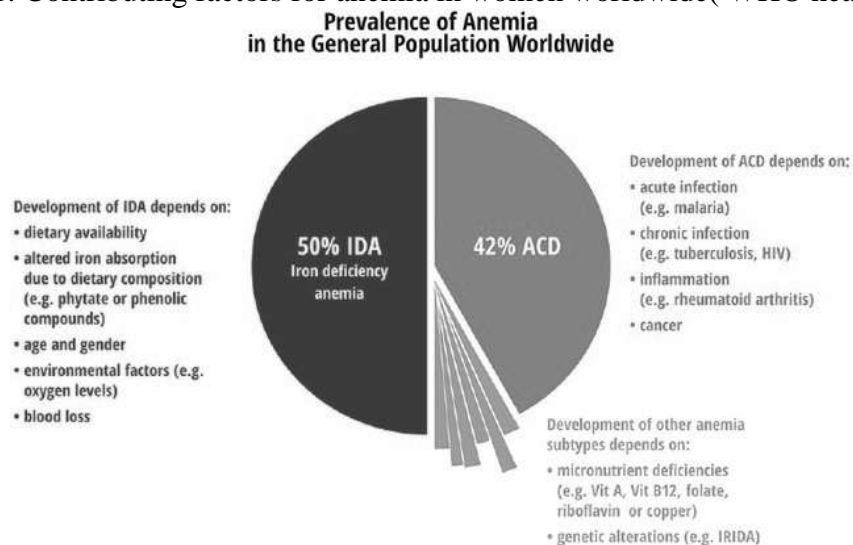


Table 1: WHO cutoffs for identifying anemia in all age groups

S. no	Normal Hb levels(g/L)	Age group	Cut offs		
			Mild	Moderate	Severe
	≥110	Neonates below 4 years	99-109	69-99	<69
	≥115-120	Children 5-11 years	109-114	80-109	<80
	≥120	Children 12-14 years	110-119	90-109	<90
	≥120	Women of reproductive age (>15 years)	110-119	90-109	<90
	≥110	Pregnant women	99-109	69-99	<69
	≥130	Men (> 15 years)	120-129	100-119	<100

2. METHODOLOGY

Materials and Methods

After institutional ethical approval a cross sectional study was planned at the rural field practice areas of Pharmacy college in Warangal. The study subjects were girls and women attending the outpatient clinics from these areas. The females in these areas were approached and screened for their eligibility for the study. The inclusion criteria[8] for the study include the women with their hemoglobin report and willingness to participate in the study. The study subjects were tested for hemoglobin reports at the laboratory of urban health centers by the respective laboratory technicians using the Sahlis method. The laboratory technicians were trained in the standardized testing and all the study subjects were evaluated by respective technician at health care center by Sahlis method which has been followed for all the women who get registered and seek treatment. This method of hemoglobin

estimation has been standardized[9] and used under the program for testing of hemoglobin under RCH program. The study period[10] was from December 2021 to February 2022. The methodological survey followed standard formats of Questionnaire SF 36. The tool for data collection was a semi structured questionnaire. It had two parts with the first part pertaining to socio demographic history and second part pertaining to the women care service utilization and examination[11-15]. In this method our team consisting of five members distributed into two groups. Our experimental area selected consists of totally sixty homes. The cohort of population in this particular area under consideration was about 523. The survey data obtained is given below and was statically analyzed using chi square test and regression analysis.

Criteria for determining Anaemia condition as per WHO and ICMR criteria

Hemoglobin (Hb) <11 g %2 (WHO)

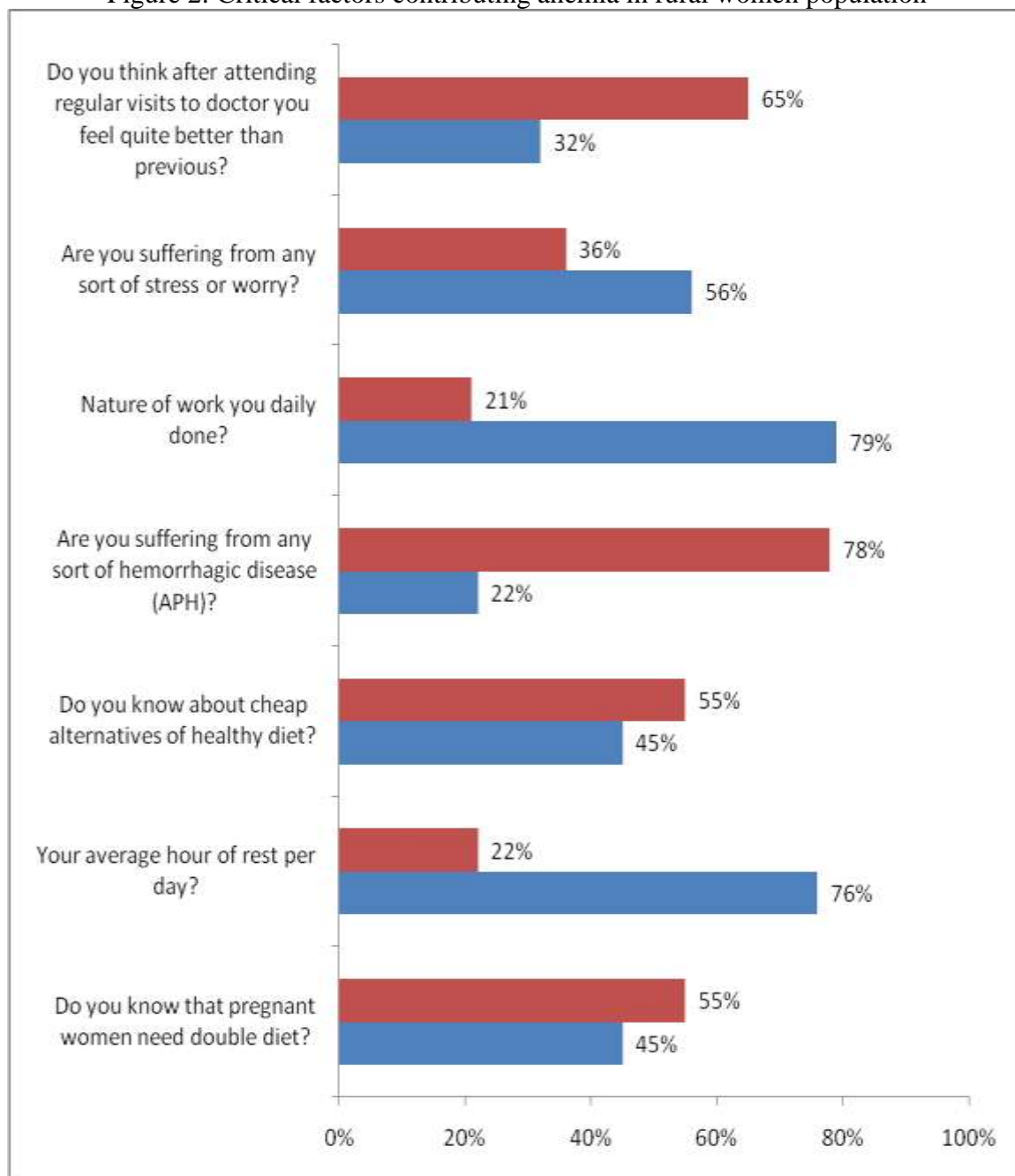
These definitions were used to classify and grade the subjects for anemia. The study subjects were evaluated for the standard routine care and health care center utilization.

Statistical analysis based on the Questionnaire

S. no	Questions	Response	Response		Analysis
			Yes	No	
	Age of the respondent	a. 15 - 20 b. 21 - 25 c. 26 - 30 d. 31 - 35 e. Above 35	65%		Most of them are middle age
	Age at the time of marriage	a. Less than 15 b. 16 - 20 c. 21 - 25 d. 26 - 30 e. Above 30	68% in b,c	25% in d	Middle age group
	Education of the respondent	a. Illiterate b. Primary c. Middle d. Matric e. Intermediate	78% a,b	22% d,c	Low education
	Number of children you have	a. 1 - 3 b. 4 - 7 c. above 7	82%	15%	82% have 2 kids
	Type of pregnancy	a. Single b. Twin c. Triple d. Quarterplet	79%	22%	79% have single pregnancy
	Hb% of the respondent	a. 3 - 4 g/dl b. 5 - 6 g/dl c. 7 - 10 g/dl d. above 10 g/d	76%	23	Most have Low hb
	LFTs of the respondent	< Normal b. Normal c. More than normal	62% in b	35% in a	Most of them have normal LFT,s
	Gestational month	a. 1 - 3month b. 4 - 5 month c. 6 - 7 month d. 8 - 9 month	66%	32%	Most of them have 1-3 months
	Age of last children born	a.<1year b. 1 year c. 2 year d. Above 2 year	69%	21%	Most of them have children from 1-5 years
	Type of family you have?	a. Nuclear b. Joint c. Extended d. any other	65%	35%	Most of them have
	Monthly income of the household?	a.<10,000 b. 11,000 - 15,000 c. 16,000 - 20,000 d. Above 20,000	78.6%	18%	Most of them have annual income of 5lacs
	Current status of the respondent?	a. House wife b. Doing job c. Both A and B	73%	20%	Most of them are working
	Eating habits of the respondent?	a. 2 times a day b. 3 times a day c. 4 times a day d. More frequently	74%	23%	All of them eat 3 times a day

	Daily tea intake of the respondent?	a. Once a day b. Twice a day c. Thrice a day d. More frequent	59%	41%	Most of them take twice
	How often you eat fresh fruits, vegetables and milk?	a. Daily b. 2 times week c. Weekly d. Very rare	34%	62%	Most of them are negligent of eating fruits and vegetables
	Are you using any sort of iron supplement?	a. Yes b. No	12%	87%	Most of them not using iron supplements
	Are you suffering from frequent nausea and vomiting?	a. Yes b. No	75%	20%	No signs as such in majority
	Your daily eating habits are:	a. Just like previous b. Double then previous c. Less than previous	55% in a	42% in c	55% normal diet 45% less diet
	Do you know that pregnant women need double diet?	a. Yes b. No	45%	55%	Most of them are ignorant
	Your average hour of rest per day?	a. 5 - 6 hours b. 7 - 8 hours c. Above 8 hours	76%	22%	Most of them have 7- 8 hours of work
	Do you know about cheap alternatives of healthy diet?	a. Yes b. No %	45%	55%	Most of them are ignorant
	Do you have previous history of miscarriage?	a. Yes b. No	45%	55%	Most of them have miscarriage in first trimester
	Are you suffering from any sort of hemorrhagic disease (APH)?	a. Yes b. No	22%	78%	Most of them have no hemorrhagic diseases
	Nature of work you daily done?	a. Light and normal b. Exhaustive	79%	21%	Most of them have exhaustive work
	Are you suffering from any sort of stress or worry?	a. Yes b. No	56%	36%	Most of them are stressful
	Do you think after attending regular visits to doctor you feel quite better than previous?	a. Yes b. No	32%	65%	Most of them take self care

Figure 2: Critical factors contributing anemia in rural women population



3. RESULTS AND DISCUSSION

In the present study, a total of 140 subjects participated and were interviewed. The overall prevalence of anaemia in the study subjects is 66.6% with 8gm%. In this study it was observed that in pregnant women overall prevalence of anemia was 66.7%. Important contributing factors

responsible for high incidence of anemia (Figure 2) in our country include early marriage, teenage pregnancy, multiple pregnancies, less birth spacing, phytate rich Indian diet, low iron and folic acid intake and high incidence of worm infections in Indian population. However, lower prevalence of anemia was reported by few studies in India. The reasons for

this finding could be difference of Diet. As the number of pregnancies increase the risk of anemia & its severity goes on increasing, if adequate preventive care is not taken. The reason for this finding could be frequent pregnancies & lack of optimum spacing between two births leads to exhaustion of already scarce iron stores. This leads to anemia of increasing severity as the sources are not replaced in due course. Earlier starting of iron supplementation seems to be the most important strategy. Similar observations were seen by other investigators. In this study the prevalence of anemia was much more in women belonging to rural areas (81%) as compared to urban areas (51%). The various plausible reasons for this finding could be diet and less ignorance, poverty, lack of health care facilities, poor utilization of health care services, etc. In this study it was observed that the prevalence of anemia was more in individuals belonging to low socio-

economic status group, poorly nourished group and individuals who were illiterate. This inverse relationship of educational status & socioeconomic status with anemia has been proven by many studies across the globe. These factors stress the importance of timely health education to adolescent girls and married women on issues like importance of literacy, delaying the age at marriage, family spacing, small family norm etc. This study proves significant relationship of anemia with vegetarian diet and calorie intake as determined mainly by number of meals taken. In India mostly females don't take any other foods other than cereal based food. It is major factor for high prevalence of anemia and this is particularly more in pregnant women of low socio-economic status & poor nourished women. Although dietary habits were not studied in detail but it is likely that individuals in these groups take nutritionally deficient diet.

Table 1: Population details with number of males and females

S. no	Population information	Numbers in the area
	Total number of homes in the area present	60
	Total number of people present in the area	523
	Number of Males present	210
	Number of Females present	313

Table 2: Grades Of Anaemia In Study Subjects as per ICMR classification

Grades Of Anaemia	Haemoglobin [Gm/Dl]	Anaemic Patients[N=120]%
Mild	8-11	82[68.3]
Moderate	5-8	32[26.7]
Severe	<5	6[5.0]

Table 3: Association of Socio-Demographic Variables And Anaemia

Correlates	Anaemic	Non Anaemic
Illiterate	74[61.7]	10[16.7]

Literate	46[38.3]	50[83.3]
Meals[<3/Day]	40[33.3]	42[17]
Veg Diet	52[43.3]	10[16.7]
Mixed Diet	68[56.7]	50[83.3]

4. CONCLUSION

Anemia is condition which has been proved by the results of this study that the incidence of anemia has strong relation with residence (urban/rural), literacy level, social status, monthly income and dietary habits. The limitation of this study is that it was done on a smaller sample size and was not designed specifically to study all the risk factors for anemia in this population. There is a need for further exploration on the genetical factors contributing to the anemia. The critical address on the contributing factors and necessary government initiatives to empower the nutrition supplements along with certain awareness programmes is necessary.

Conflicts of interest

The authors declare there are no conflicts of interest

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