Original Research Paper **Community Medicine**

PREVALENCE AND ASSOCIATED RISK FACTORS OF ANAEMIA AMONG WOMEN OF REPRODUCTIVE AGE GROUP IN RURAL AREA GUNTUR.

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ABSTRACT **Introduction:** Nutritional status of women affects the overall health and well-being of the family. Women especially those in the reproductive age group are at higher risk of various deficiency disorders among which anaemia holds a substantially higher position. Rural women suffer from anaemia most compared to their counterparts in urban population. Nutritional studies conducted in various parts of the state have reported higher anaemia prevalence among rural women. Though dietary factors are the important cause of anaemia in rural population, distinct social and cultural factors also plays a role. Hence it is important to know anaemia prevalence and factors associated with it among rural women in guntur district. **Methodology:** A cross sectional study was conducted among women of reproductive age group (15-49 years) in rural village, Guntur district ,cluster sampling method using semi structured interview schedule, anthropometric measurements and Hemocue haemoglobin analyser as study tools. Sociodemographic factors and risk factors for anaemia were assessed using the interview schedule and Hemoglobin level of participants were estimated using Hemocue haemoglobin analyser. Anaemia was defined as blood hemoglobin level <12 gm/dl. Data was coded and entered in MS Excel and statistical analysis was done using SPSS version 18 Software. **Results:** A total of 228 rural women were studied. Prevalence of anaemia was found to be 68.4%. Among this 21.1% had mild anaemia, 39% had moderate anaemia and 8.3% had severe anaemia.. Factors such as non-nuclear family, larger family size, overcrowding, open defecation, lower age at menarche, menorrhagia, deworming, regular intake of pulses, green leafy vegetables and meat was found to be protective for anaemia. **Conclusions:** Anaemia among rural women is a major public health problem. Poor dietary intake can be regarded as the prime cause of anaemia in this section of population. Various social and cultural practices also add to the occurrence of the disease. Multipronged approach should be adopted to improve the overall condition of these people focussing primarily on nutrition.

KEYWORDS : Anaemia, prevalence, rural women

INTRODUCTION
Anaemia is a major public health problem among women in India especially in the rural and rural belt. It is prevalent in all age groups of public at large, especially among adolescent girls and women of reproductive age group. Among the women at risk for anaemia indigenous group remain especially vulnerable.

Global Scenario: This report identifies women in reproductive age group as the second largest group having a higher prevalence of anaemia with 29% and children the largest group with 43% prevalence. This prevalence translates to about 496.3 million non-pregnant women and 32.4 million pregnant women, making up a total of 528.7 million, anaemic women in the reproductive age group worldwide[1].

Indian Scenario: Global prevalence of anaemia report 2011 identifies a prevalence of 48% anaemia in Indian women[3]. NFHS 4(2015-16) a comprehensive national level survey reports a prevalence of 53% among females aged 15- 49 years. Lowest prevalence (25%) found in Mizoram and the highest in Jharkhand (65.2%)[2]

Andhra Pradesh Scenario : In Andhra Pradesh the prevalence of anaemia among women in general population was found to be 34% whereas the prevalence of anaemia among rural women of the same age group was much higher 48% as reported by NFHS 4[2]

Objectives
1. To estimate the prevalence of anaemia among women of reproductive age group in rural area of Guntur

2. To determine the associated risk factors for anaemia among the above population

MATERIALS & METHODS
Study Design and Population: A descriptive cross-sectional study was carried out at the rural area of Guntur district,Guntur,in the year 2024(from jan 2024 to march 2024).
Study Population: Study population was women of reproductive age group in the rural village settlements of Guntur district.
Sample Size : Sample size calculated by the formula ND

According to National Family Health Survey 4, prevalence of anemia among rural women of reproductive age group in Guntur is 48%[3]. Hence p is taken as 48, q=100-p=52, d=absolute precision=8 Therefore, Sample size (N) = 4-52-41=156 As it is a cluster sampling, design effect is considered.

Design Effect: This is the factor taken for adjusting the heterogeneity of population in cluster sampling. So, there is an extra requirement of sample size which is calculated using the formula: D= 1+ (b-1) p, where , D is the design effect , b is the number of responses (participants) in a cluster p (Rho)= Intra cluster correlation coefficient (ICC rate of homogeneity) , p=0.02 , D=1+ (b-1).02; 1+ (9x.02) =1.18 , b=number of participants in a cluster =10, Hence, sample size =4pq *D/d2 =156 x 1.18-184 Assuming a dropout rate of 10% the final sample size was rounded off to 210.

Inclusion Criteria
Rural women in reproductive age group (15 to 49 years) who are residing and willing to participate in the study of

selected rural area Guntur district.

Exclusion Criteria
rural women who are not permanent (more than 6 months) residents of Guntur district.

Sampling Method
Cluster sampling method was used. Each rural village was taken as a cluster.

Data Collection Tool
Data was collected using the following tools
1. Interview method using pretested semi structured interview schedule.
2. Anthropometric measurements Height was measured using stadiometer and weight was measured with OMRON weighing scale
3. Hemoglobin estimation was done using Hemocue hemoglobin analyzer.

Data Analysis and Interpretation
The data collected was coded and entered in Microsoft Excel sheet. After rechecking, the data was imported and analysed using SPSS software version 18.

Prevalence of anaemia was estimated. Confidence interval of prevalence was calculated using WinPepi software. Statistical comparison was done using appropriate statistical method and level of significance was estimated with 95% confidence intervals and p value <0.05. Association of risk factors with anaemia was done using Chi square test and Odds Ratio.

RESULTS
Study resulting in a response rate of 99%. Results are discussed under the following headings
1 Sociodemographic characteristics
2 Prevalence of anaemia
3 Risk factors for anaemia

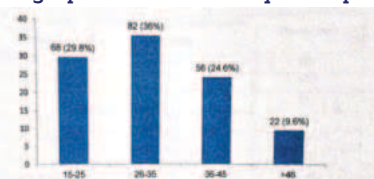### 1: Socio Demographic Details Of Study Participants

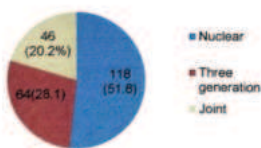Fig 1.1 : Age Group Distribution Of Study Participants According To The Type Of Family

Fig 1.2 : Distribution Of Study Participants

Table 1.1: Educational Status Of The Study Participants

Educational status	Number of study participants (n=228)	Percentage
Illiterate	38	16.7
Primary school	37	16.2
Middle school	54	23.7
Higher school	74	32.5
Higher secondary	20	8.8
Graduate	1	0.4
Post graduate	4	1.8

Although 43.4% of the study participants had an educational status of high school and above, there was a sizeable number (32.9%) of illiterates and those with primary school education

as shown in table

Table 1.2: Occupational Status Of The Study Participants

Occupational status	Number of study participants (n=228)	Percentage
Homemaker	132	57.8
Unskilled workers	65	28.5
Student	16	7
Skilled workers	10	4.3
Rural promoter	4	1.8
Semi professional	1	0.4

More than half of the women were umemployed. Of the rural women who are employed 28.5% were unskilled workers, 14.3% were skilled workers, 1.8% were working as rural promoters and 0.4% as teachers.

Table 1.3 : Distribution Of Participants According To Socioeconomic Status

SES	Number of study participants (n=228)	Percentage
Lower middle	6	2.6
Upper lower	115	50.4
Lower	107	46.9

Table 1.4 : Distribution Of Study Participants According To Family Size

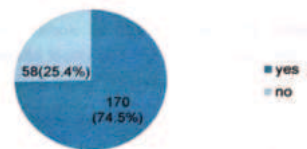| Family size	Number of study participants (n=228)	Percentage
1-5	145	63.6
6-10	80	35.1
≥11	3	1.3

Fig 1.3 : Prevalence Of Overcrowding

Mean number of rooms in houses were found to be 2 and 74.5% were found to have overcrowding in their houses as depicted in the figure
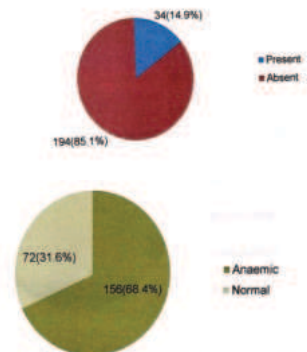
Fig 1.4 : Open defecation indicates the poor socioeconomic and hygiene status. Prevalence of open defecation was found to be 14.9% among the study participants as shown in the figure

2 Prevalence Of Anaemia Among The Study Population
Out of the total 228 women studied 156 were found to be anaemic showing a prevalence of 68.4% (95% CI-57.6 to 79.2) as in figure.

Mean haemoglobin level of the study participants was 10.85 ± 1.88 gm/dl and haemoglobin level ranged between 4.3gm/dl and 15.6gm/dl.

2.1: Grading Of Anaemia In The Study Participants.

Category of anaemia	Number of study participants (n=228)	Percentage
Mild (11-11.9gm/dl)	48	21.1
Moderate (8-10.9gm/dl)	89	39
Severe (<8gm/dl)	19	8.3

Among the study participants majority (39%) were having moderate anaemia, 21 1% with mild anaemia and rest (8.3%) had severe anaemia as in table

2.2: Mean Haemoglobin Level And Prevalence In Age Categories

Age category	Mean haemoglobin ±SD (gm/dl)	Prevalence of anaemia
15-35(n=68)	10.52±1.9	52(76.5%)
26-35(n=82)	11.19±1.8	52(36.4%)
36-45(n=53)	11.04±1.7	35(66%)
>46(n=25)	10.31±2.7	17(68%)

3 Risk Factors For Anemia

Table 3.1 Age at menarche of the study participants.

Age at menarche	Number of study participants (n=228)	Percentage
≤12	54	23.6
13-14	120	52.6
15-16	45	19.7
17-18	9	3.9

Table 3.2 Distribution of study participants according to regularity of menstrual cycle

Regularity of cycles	Number of study participants (n=214)*	Percentage
Regular	173	75.9
Irregular	41	18

Table 3.3 Distribution of study participants according to duration of menstrual flow

Duration of menstrual flow	Number of study participants (n=214)*	Percentage
<3 days	26	12.1
3-5 days	110	51.4
>5 days	78	36.4

3.10 Dietary Details Of The Study Participants

221 (96.9%) were vegetarians among the study participants. As shown in the food frequency table below, almost half of the study population consumed legumes twice per week or more. 21.9% of the participants consumed GLV once daily while other consumed daily by 17.1% and 22.4% never consumed fruits. Milk and milk products were not used by 50.4% of the participants. Egg was consumed daily by 10.1% whereas fish was used daily by 57.5% of the participants. Meat was consumed daily by 1.8% and never consumed by 78.1%.

Table 3.4 Distribution Of Study Participants According To The Frequency Of Food

Food item	Daily (n%)	Twice/week (n%)	Once weekly (n%)	Occasionally (n%)	Not consumed (n%)
Cereals	227(99.6)	1(0.4)			
Legumes	84(36.8)	93(40.8)	38(16.7)	7(3.1)	6(2.6)
GLV	50(21.9)	62(27.2)	75(32.9)	34(14.9)	7(3.1)
Other veg	81(35.5)	67(29.4)	23(10.1)	12(5.3)	45(19.7)
Fruits	39(17.1)	36(15.8)	63(27.6)	39(17.1)	51(22.4)
Milk and milk products	38(16.7)	17(7.5)	22(9.6)	36(15.8)	115(50.4)
Egg	23(10.1)	33(14.5)	73(32)	51(22.4)	48(21.1)
Fish	131(57.5)	49(21.5)	30(13.2)	8(3.5)	10(4.4)
Meat/chicken	4(1.8)	13(5.7)	6(2.6)	27(11.8)	178(78.1)

Table 3.5 Distribution Of Study Participants According To Use Of Footwear

Use of foot wear	Number of study participants (n=228)	Percentage
Regular use	139	61
Irregular use	89	39

Table 3.6 IFA Consumption In Last Year In The Study Participants.

IFA consumption in last one year	Number of study participants (n=228)	Percentage
Yes	84	36.8
No	144	63.2

4 Association Of Anaemia With Selected Factors.

Table 4.1.anaemia In Relation With Age Group Of Study Participants

Age category (n=228)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
≤25 years	52(76.5)	16(23.5)	1.75 (0.1-3.3)	2.90	0.88
>25 years	104(65)	56(35)			

Table 4.2 Anaemia In Relation With Educational Status Of Study Participants

Educational status (n=228)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
Primary school and below (n=75)	54(72)	21(28)	1.2 (0.7-2.3)	0.66	0.41
Middle school and above (n=153)	102(66.7)	51(33.3)			

Table 4.3 Anaemia In Relation With Occupational Status Of Study Participants.

Occupational status (n=228)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
No paid job(n=148)	105(70.9)	43(29.1)	1.4 (0.7-2.4)	1.245	0.265
Employed(n=80)	51(63.8)	29(36.3)			

Table 4.4: Anaemia In Relation With Socioeconomic Status

socioeconomic status (n=228)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
Lower class (n=122)	155(69.7)	67(30.1)	11.5 (1.3-100)	7.63	.006
Middle class(n=6)	1(16.6)	5(83.3)			

Table 4.5 Anaemia In Relation With Age At Menarche

Age at menarche (n=228)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
≤12 (n=54)	43(79.6)	11(20.4)	2.1 (1.0-4.4)	4.114	0.04
>12(n=174)	113(64.9)	61(35.1)			

Table 4.6: Anaemia In Relation With Deworming In Last 6 Months

Deworming in last 6 months (n=178)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
Yes (n=62)	36(58.1)	26(41.9)	0.5 (0.2-0.9)	4.227	0.04
No (n=166)	120(72.3)	46(27.7)			

Table 4.7 : Anaemia In Relation With Use Of Footwear

Use of footwear (n=228)	Anaemia		OR (95%CI)	X2 value	P value
	Yes (n%)	No (n%)			
Occasionally(n=89)	64(71.9)	25(28.1)	1.31 (0.7-2.3)	0.823	0.4
Regularly (n=139)	92(66.2)	47(33.8)			

Table 7.61 Anaemia In Relation Frequency Of Food Consumption (n=228)

Food	Anaemia	Non anaemic	Odds Ratio	95%CI	P value
Pulses					
≤once per week	41(80.4%)	10(19.6%)	2.21	1.036-4.712	0.037
≥once per week	115(65%)	62(35%)			
GLV					
≤once per week	87(75%)	29(25%)	1.869	1.060-3.296	0.030
>once per week	69(61.6%)	21(38.4%)			

Milk					
≤once per week	122(70.5%)	51(29.5%)	1.447	0.783-2.787	0.227
>once per week	34(61.8%)	21(38.2%)			
Fish					
≤once per week	34(70.8%)	14(29.2%)	1.154	0.575-2.316	0.686
>once per week	122(67.8%)	58(32.2%)			
Meat					
≤once per week	148(70.1%)	63(29.9%)	2.642	0.975-7.162	0.048
>once per week	8(47.1%)	9(52%)			

DISCUSSION

In this study prevalence of anaemia was found to be 68.4% with a mean haemoglobin level of 10.85 (SD-1.88). According to NFHS 4, prevalence of anaemia among rural women in guntur is 48%. Prevalence was found to be more in the rural community compared to general population of the district (42.9%) and to the state (34.2%) . This indicates the poor health status of rural women.

Women in lower socioeconomic classes were found to have more anaemia compared to middle socioeconomic class. Rai N et al, observed a higher prevalence of anaemia among pregnant women belonging to class V of B G Prasad's SES classification[5]

Among the study participants, only 27.1% had undergone deworming in the last six months and those who had not undergone deworming recently was found to be more anaemic. This result was statistically significant. Deworming in the last six months was found to be a protective factor for anaemia, with an odds ratio of 0.5 and Cl-0.2-0.9.

In the study by Ghosh Jerath et al in Jharkhand, 90% of the participants were non vegetarians. 33.1% consumed pulses/legumes one or two times weekly which is less than this study, GLV was consumed once daily by 25% while the consumption of other vegetables was reported to be only once or twice weekly by a majority, a result similar to the present study[6]

Majority (52.6%) of the study participants attained menarche between 13 to 14 years, and 23.6% attained it at an age <12 years. Women who attained menarche at an earlier age (s12 years) were found to be more anaemic (78.6%) and early age of menarche was found to be a risk factor for anaemia, with an odds ratio of 2.1 The results are similar to the study among the general population in Tamil Nadu by Ganapati et al where the prevalence of anaemia was 65.7% among those who had menarche at an age <12 years [7]

CONCLUSION

Anaemia among rural women is a major public health problem. Poor dietary intake can be regarded as the prime cause of anaemia in this section of population. Various social and cultural practices also add to the occurrence of the disease. Multipronged approach should be adopted to improve the overall condition of these people focussing primarily on nutrition.

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