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A comparative study on awareness and perception about anemia and its contributory social factors among urban and rural pregnant women attending government maternity hospital, Tirupati

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Abstract
Aims & Objectives
1. To study the prevalence and severity of anemia among urban and rural pregnant women aged above 18 years and beyond 12 weeks of amenorrhoea.
2. To compare the awareness and perception about anemia, social factors contributing to it and its health impacts in pregnancy between urban and rural pregnant women.

Methods: An urban, rural based, cross – sectional, comparative study was conducted among 100 urban and 100 rural pregnant women aged above 18 years and beyond 12 weeks of amenorrhea. The data were collected by questionnaire to test their awareness and perception about anemia and its contributory social factors and analyzed using SPSS software.

Results: The prevalence of anemia was 74% and 59% in rural and urban women respectively and this difference was found statistically significant. The severity was more among rural women compared to that of urban women and this difference was statistically significant. Awareness about causes and health impacts of anemia as well as perception of anemia was better among urban women compared to that of rural women.

Conclusion: Prevalence and severity of anemia was more in rural mothers but the awareness and perception about it was better among urban mothers. It is recommended to improve their awareness and perception by intensive health education about anemia and its outcome. Public health education has to be a cornerstone for the successful national campaign to prevent, detect, evaluate, and treat anemia among pregnant women.

Keywords: Anemia, urban, rural, awareness, perception, pregnant women

1. Introduction
Anemia is derived from Greek word 'a' not, 'haima'- blood meaning 'no blood'. Anemia is not a disease by itself but merely an objective sign of the presence of disease. Anemia during pregnancy is a major public health problem throughout the world, particularly the developing countries. Women during pregnancy are more vulnerable for anemia not only because of the synergistic effects of physiological increase in plasma volume (hemodilution) but also because of increased demand and poor bioavailability of iron in the food, predisposed by social factors like preferential feed for men, women eating last with whatever left, being deprived of good food, workload of household chores, etc. [1, 2]

WHO defines anemia in pregnancy as hemoglobin less than 11 g/dl and hematocrit of less than 32% [1].

WHO classifies anemia into three grades according to severity [1].
Mild:10.0-10.9 g/dl
Moderate:7-9.9 g/dl
Severe :< 7 g/dl

The health consequences of anemia during pregnancy are well documented. There is a greater risk of reproductive morbidity and mortality such as abortion, still birth, low birth weight baby, high perinatal mortality, infant mortality, postpartum hemorrhage, intercurrent infection and maternal mortality.

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Anemia during pregnancy contributes significantly to 20% of all maternal deaths in India and in 40%, anemia is a contributory factor because of early marriage, rapid succession of pregnancies at closer intervals and loss of blood in each delivery and chronic blood loss due to hookworm infestation and malaria [3, 4]. Among these, about half of the global maternal deaths occur in South Asian countries out of which 80% is contributed by India [5].

WHO estimates that over two thirds of pregnant mothers in developing countries suffer from nutritional anemia. India continues to be one of the countries with the highest prevalence of anemia. National Family Health Survey 3 (NFHS-3) estimates reveal the prevalence of anemia to be 60-80% in pregnant women [3].

In order to prevent high maternal mortality and high incidence of low birth weight babies, Government of India launched National Anemia Prophylaxis Programme way back in 1970 targeting pregnant and lactating women. Subsequently, the programme was modified and renamed as National Anemia Control Programme in 1991, targeting not only pregnant and lactating women but also preschool children. Even though the programme has been operational for over 40 years, it has made little dent on the overall prevalence of anemia during pregnancy in both urban and rural areas, as per the NFHS-3 report [3].

In this context of combating anemia during pregnancy, with far reaching benefits in terms of safe motherhood and healthier future generations, an attempt has been made to know the prevalence and severity of anemia among urban and rural pregnant mothers and to compare their awareness and perception regarding anemia, social factors contributing to it and its health impacts in pregnancy to meet the challenge of protecting maternal and neonatal health.

2. Aims and Objectives
1. To study the prevalence and severity of anemia among urban and rural pregnant women aged above 18 years and beyond 12 weeks of amenorrhoea.
2. To compare the awareness and perception about anemia, social factors contributing to it and its health impacts in pregnancy between urban and rural pregnant women.

3. Materials and Methods
3.1 Source of data
The pregnant women, aged above 18 years and beyond 12 weeks of amenorrhea, attending government maternity hospital, Tirupati will be registered for the study and they constitute the source of data.

3.2 Sample size
100 rural pregnant women and 100 urban pregnant women

3.3 Method of collection of data
All the study group women will be briefed regarding the purpose of the study and confidentiality maintained.
The data will be collected by interview with each women, in a predesigned, pretested multiple response type of questionnaire, designed for the study. The questionnaire will be addressed on the topics of awareness (i.e. causes, signs and symptoms) of anemia, its health impacts or complications during pregnancy, their perception about anemia. The study variable on the contributory socio demographic factors will be age, age at marriage, age at first pregnancy, gravida status, para status, abortion status, birth intervals, dietary habits, literacy level, religion, type of family and history of worm infestation in the last 6 months. The study variables on awareness of anemia were about the related system, related nutrient, hemoglobin level, and dietary source of the nutrient, causes of anemia, early features and health impacts of anemia during pregnancy.

Every question consisted a response of a right answer, a wrong answer and don't know also, considering it as incorrect. The pregnant mother's educational level was classified into low (no school or primary), middle (complete secondary school) and high (attended or completed college). The prevalence and severity of anemia in clinical terms as mild, moderate and severe are assessed by estimating hemoglobin level. The data is compiled and analyzed using Statistical Package for Social Sciences (SPSS 18) software, for appropriate statistical tests to find out the strength of the association between the two groups.

3.4 Study design
It is an urban, rural based, cross – sectional, comparative study.

3.5 Study period
One month

3.6 Statistical Analysis
'Z' test for Proportion, Odd's ratio, Chi square test, paired t-test

3.7 Inclusion criteria
1. Pregnant mothers above 18 years of age.
2. Pregnant mothers beyond 12 weeks of amenorrhea, attending antenatal clinic of teaching hospital.
3. All those pregnant women who are cooperative will be included in the study.

3.8 Exclusion criteria
a) Pregnant mothers below 18 years of age.
b) Mothers below 12 weeks of amenorrhea.
c) Pregnant mothers with systemic illness and bleeding disorders.
d) Those mothers who were not cooperative were excluded from the study.

4. Results
This study was conducted among 200 pregnant women attending government maternity hospital, Tirupati. Among them 100 belonged to urban area and 100 to rural area. Their age varied from 18 to 35 years. The mean age of the study subjects was 23.27 ± 3.226 years. Majority of the mothers (urban=60%, rural =88%) were less than 25 years. 10% of urban women and 3% of rural women were above 30 years. Majority of them were Hindus in both urban (73%) and rural (84%) women. Majority of the women were housewives (urban: 76%, rural: 84%). Employed women were hardly 23% and 3% in the urban and rural area respectively. Literacy level was higher among urban pregnant mothers than rural mothers. 36% (urban) and 22% (rural) of them studied upto high school. Majority of both the groups had studied upto middle school (urban=54%, rural=48%).

Majority of women lived in joint families (urban: 50%, rural: 64%). 73% of urban pregnant women and 75% of rural pregnant women were non- vegetarians.

Proportion of multigravida was almost equal in urban and rural pregnant mothers (urban: 53%, rural: 54%)

Table 1: Background characteristics of study participants

Characteristics	Urban	Rural
Age(years)		
< 25	60%	88%
25-30	30%	9%
>30	10%	3%
Religion		
Hindu	73%	84%
Christians	5%	3%
Muslim	22%	13%
Others (if any)	-	-
Occupation		
Housewife	76%	84%
Employed	23%	3%
Agricultural Labourer	1%	13%
Literacy		
Low	10%	30%
Middle	54%	48%
High	36%	22%
Family		
Nuclear	35%	13%
Joint	50%	64%
3 Generation	15%	23%
Dietary Pattern		
Vegetarian	27%	25%
Non- Vegetarian	73%	75%
Gravida Status		
Primi	47%	46%
Multi	53%	54%
Parity		
Para 0	47%	46%
Para 1	35%	27%
Para 2	15%	20%
3 or more than 3	3%	7%
Birth Interval		
Less than 2	36%	59%
More than 2	64%	41%
Abortion		
Nil	85%	78%
1	10%	11%
2	3%	6%
3 or more than 3	2%	5%

Number of women decreased as parity increased. Multiparity status was minimally more among rural mothers women.
64% of urban women gave birth at an interval of more than 2 years and 59% of rural women gave birth at an interval of less than 2 years.

Majority of the women had no abortions (urban: 85%, rural: 78%).Whereas, 13% and 17% of the women had 1-2 abortions in urban and rural area respectively.

The prevalence of anemia was more in the rural areas (74%) as compared to that of the urban areas (59%) and difference in the prevalence of anemia was highly significant. ($p<0.001$).

Table 2: Prevalence of anemia among pregnant women

Place	Anemic	Not anemic	Total
Rural	74%	26%	100%
Urban	59%	41%	100%

$P<0.001$

41% of urban and 26% of the rural mothers were not anemic. Among the anemic urban mothers, 31% of them were mildly anemic and hardly 1% were severely anemic. Among rural mothers almost equal percentages of them were mildly and moderately anemic and 8% of them were severely anemic.

Table 3: Showing severity of anemia

Severity	Urban	Rural
No anemia	41%	26%
Mild anemia	31%	34%
Moderate anemia	27%	32%
Severe anemia	1%	8%
Total	100%	100%

$p<0.001$

The overall awareness about the system affected in anemia was poor among both the groups of women. However it was better (32%) among urban women than rural group (18%). Almost similar level correspondingly regarding the nutrient deficiency awareness (ie. Urban=35% and rural =22%). The awareness regarding dietary source and the cause of anemia was extremely poor in both the groups. The relation was highly significant. But the awareness about the adverse effects of anemia during pregnancy in both the groups was better which is contradictory and not significant. Regarding the features of anemia also, the awareness was poor (30% and 22% respectively). But the awareness that anemia is preventable was very good in both the groups, more so among urban women (75%) than rural group (60%) but not significant. The knowledge about protection from anemia was almost same in both the groups and it is very good, but still not significant. However the perception about anemia was better among urban women ($p<0.001$).

Table 4: Showing the awareness and perception about anemia

Awareness	Place	Adequate Knowledge	Inadequate Knowledge	No knowledge	p value
System affected	Urban	32%	68%		
	Rural	18%	82%		0.002
Nutrient Deficiency causing anemia	Urban	35%	65%		
	Rural	22%	78%		0.008
Dietary source	Urban	15%	65%	20%	
	Rural	7%	85%	8%	<0.001
Causes of anemia	Urban	20%	63%	17%	
	Rural	6%	80%	14%	<0.001
Adverse effects during pregnancy	Urban	56%	34%	10%	
	Rural	40%	37%	20%	0.349
Early features of Anemia	Urban	30%	57%	13%	
	Rural	22%	50%	28%	0.012
Is anemia Preventable	Urban	75%	20%	5%	
	Rural	60%	25%	15%	0.049
Knowledge about protection from Anemia	Urban	74%	22%	4%	

	Rural	62%	28%	10%	0.450
Perception about Anemia	Urban	58%	42%		
	Rural	41%	59%		<0.001

Awareness of anemia was more in the urban mothers as compared to that of rural mothers and this difference was not significant (*p*>0.05).

Table 5: Comparison of awareness of anemia (t test)

Place	Mean	Mean difference	p value
Urban	2.11 ± 1.48	0.12912	0.32
Rural	1.98 ± 1.1		

Majority of them had a positive attitude towards anemia because of their literacy level.

Table 6: Showing attitude about anemia

Place	Attitude		p value
	Positive	Negative/ Indifferent	
Urban	80%	20%	0.947
Rural	60%	40%	

Perception of anemia was better in urban mothers and this difference was highly significant (*p*<0.05).

Table 7: Comparison of perception of anemia (t test)

Place	Mean	Mean difference	p value
Urban	2.93 ± 1.01	0.45388	<0.001
Rural	2.48 ± 0.66		

5. Discussion

In this study, the prevalence of anemia was more in the rural areas (74%) as compared to that of the urban areas (59%) and difference in the prevalence of anemia was highly significant. (p <0.001).This is probably because of illiteracy, ignorance and walking barefoot in agricultural fields and deficiency of iron intake in the food among rural women.

Piyush Kalakoti, Nadeem Ahmed and Rubeena Bano in their study among 100 pregnant mothers of 12-20 weeks, of both urban and rural areas, observed a high prevalence of anemia (96%).[6]

Virender P Gautam, Yogesh Bansal, DK Taneja and Renuka Saha in their similar cross-sectional study found out a high prevalence (96.5%) of anemia among rural women of Delhi.[7]

In the present study, 41% of urban and 26% of the rural mothers were not anemic. Among the anemic urban mothers, 31% of them were mildly anemic and hardly 1% were severely anemic. Among rural mothers almost equal percentages of them were mildly and moderately anemic and 8% of them were severely anemic.

Lalitha D Hirematt, AS Dorle, CH Ghatatrgi and KR Kulkarni found in their study among women in Community Health Centre, Bagalkot, Karnataka that out of 218 women, 141(64.68%) had mild anemia, 35(16.05%) and 07(3.21%) women had moderate and severe anemia respectively [8].

K Nagraj, in his study of multivariate analysis of risk factors of severe anemia among pregnant women in Tirupati, Andhra Pradesh, showed that out of 202 women 98.5% were anemic, 11.44% had severe anemia, whereas 78.10% and 8.9% had moderate and mild anemia respectively [9].

Toteja GS, *et al*., in a similar study on pregnant women in 16 districts of India showed that 84.9% of pregnant women were anemic out of which 13.1% had severe anemia and 60.1% had moderate anemia [10].

Devendra W Khandait, Nitin N Ambadekar, Sanjay D Zodpey, Manisha R Koram and Mrs. N Vasudeo, in their case control study of risk factors for anemia in pregnancy, observed that the risk factors like, elderly pregnancy (>30 years of age), parity >2, spacing <2 years were significant for anemia in pregnancy. However literacy level was not found not to be significantly associated with anemia [11].

Virender P Gautam, Yogesh Bansal, D K Taneja and Renuka Saha in their similar cross sectional study found out that the prevalence of severe anemia was found significantly higher in those with age >25 years, educated till high school or less, nuclear family, no history of abortions and birth interval of >36 months [7].

Nadeem Ahmad, Piyush Kalakoti, Rubeena Bano, and Syed M.M. Aarif in their study conducted in the Maternity Clinic of Pravara Rural Hospital (PRH), Loni, Ahmednagar, Maharashtra, India showed that a highly significant association was found between anemia and mother's age, educational status, religion and parity [6].

RG Viveki, AB Halappanavar, PR Viveki, SB Halki, VS Maled, PS Deshpande in a descriptive case series study showed that severity of anemia was more in mothers of 26 years age, from nuclear families, educated upto secondary level, having vegetarian diet, parity two or more & those in third trimester with two or more abortions, although statistically not significant. However, anemia prevalence was significantly higher among those subjects with less than two years of spacing between previous and index pregnancies [12].

Abbasi RM, Ansari S, Devrajni B R, Abbasi S in their study conducted at Liaquqat University Hospital on 1880 pregnant women, showed that anemia was more common in multiparous women (53%), and birth spacing between 1 to 3 years (62%) [13].

Bondevik GT, Ulstein M, Lie RT, Rana G, Kvale G in their study conducted on 2280 pregnant women attending Patan Hospital, Kathmandu showed that risk of anemia increased with gestation and decreased with higher education [14].

Awareness of anemia was more in the urban mothers as compared to that of rural mothers and this difference was not significant (*p*>0.05). Thus the findings call attention to the glaring fact about the existing gap of awareness between the urban and rural pregnant women, which needs to be addressed to discern a positive impact.

Majority of the urban and rural pregnant women had a positive attitude towards anemia. That means they are very much concerned with their health and accept the health education, probably because of their literacy level. 20%of urban women and 40% of rural women had an indifferent attitude probably because of illiteracy. The relation was not significant. Awareness is poor but attitude is positive which is a contradictory observation.

Perception of anemia was better in urban mothers and this difference was highly significant (*p*<0.05), probably because of better literacy level and contact with specialists and discussion with peer groups.

6. Conclusion

The prevalence of anemia was more in the rural area as compared to urban area. The prevalence of mild anemia was almost equal in both urban and rural areas. Whereas moderate and severe anemia was more in the rural area. Awareness about

causes and health impacts of anemia as well as perception of anemia was better in the urban mothers as compared to that of the rural mothers. Factors like age, religion, level of education of women and education of husband, occupation, socioeconomic status, type of family, gravida, parity, abortion, birth interval, dietary pattern, overcrowding, shortage of iron-folate supplements and poor counselling were significantly associated to severity of anemia.

7. Recommendations

As the overall awareness and perception about anemia among the pregnant women of both urban and rural groups was very poor, their awareness and perception have to be improved by intensive health education about pregnancy and its outcome, so that they should perceive pregnancy as a physiological process which if not taken care of timely can lead to pathological consequences.

They should be impressed that there is no diet restriction during pregnancy (unless medically indicated) .Intensive health education should be imparted to all pregnant mothers to improve dietary habits with special emphasis to consume foods rich in iron and folic acid like green leafy vegetables, ragi, jaggery, etc.

They should be educated about the early features of anemia and should be asked to report to the doctor if they develop any health problem. They should be taught that anemia is preventable and to develop a positive attitude towards it, which will go a long way in improving their reproductive health and welfare of the family.

Deworming, should be done at least once during the second trimester.

Fortification of salt with ferric orthophosphate goes a long way in the entire community to prevent anemia not only among pregnant women but also among others. Strict enforcement of "12 by 12" initiative among school girls for their safe motherhood and reproductive health.

8. Limitations

The social correlates like occupation of husband, living conditions and socio- economic status was not studied because most of the women were housewives and did not know the income of their husband and visit was not made to their houses.

Since diet survey was not done, assessment of nutritional status could not be done.

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