A Comparative, Prospective and Observational Study of Anemia Prevalence in Both Rural and Urban Regions in a Teritary Care Hospital and Impact of Patient Counselling

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Abstract: The study aims at the identifying the occurrence of Anemia in the Rural and the Urban region people, to provide the medical adherence and proper patient counselling accordingly. Anemia is defined as a reduction in the haemoglobin concentration of the blood, which consequently reduces the oxygen – carrying of the red blood cells such that they are unable to meet the body physiological needs. several reports have indicated that anaemia mostly occurs in the patients according to their age, gender, life style, food habits and sleep pattern. while limited studies have reported that occurrence of anaemia prior to any of these condition hence the study aims at identify the anaemia condition in the patient and providing the medical adherence and the providing the patient counselling accordingly.

Keywords: Anaemia, Insomania, Hypertension, Haemoglobin, Diabetes mellitus, Iron supplements.

1. Introduction

Anemia is defined as a reduction in the haemoglobin concentration of the blood, which consequently reduces the oxygen – carrying of the red blood cells such that they are unable to meet the body physiological needs. several reports have indicated that anaemia mostly occurs in the patients according to their age, gender, lifestyle, food habits and sleep pattern.

2. Etiology

At a biological level, anaemia develops because of an imbalance in erythrocyte loss relative to production; this can be due to ineffective or deficient erythropoiesis (e.g., from nutritional deficiencies, inflammation, or genetic Hb disorders) and/or excessive loss of erythrocytes (due to haemolysis, blood loss, or both). Anaemia is frequently classified based on the biological mechanism of causation (e.g., IDA, haemolytic anaemia, and anaemia of inflammation) and/or the RBC morphology. a partial list of several common anaemias and the biological mechanisms distinguish them from each other. Most anaemias have a characteristic RBC appearance, which can provide insights to the diagnosis of anaemia. However, multiple factors can cause a similar type of RBC morphology. Furthermore, as anaemia may have multiple causes, even in the same individual, haematological

manifestations of a particular cause can be masked by another. For example, the hallmark of anaemia caused by vitamin B12, or folate deficiencies is macrocytic anaemia. Concomitant ID, which causes microcytosis, may mask entirely the effects of the B12 or folate deficiency. Although indices exist in clinical practice for distinguishing anaemia etiologic based on RBC parameters (e.g., IDA versus β-thalassemia—both cause hypochromic and microcytosis), their reliability for discriminating between causes varies.

3. Epidemology:

1. Anaemia is possibly one of the most common conditions in the world and results in significant morbidity and mortality, particularly in developing nations.
2. Worldwide, more than 45% of pregnancy women and 55% of infants are facing anaemia and which is been untreated.
3. The prevalence of anaemia among six group as per the national family health survey,2019-21 is 25% in men, 50% in women, 31.1% in teenagers, and 59% in pregnant women.

SYMPTOMS:
a. Fatigue and Weakness: Reduced oxygen delivery to tissues can result in persistent fatigue and weakness, even with adequate rest.
b. Pale Skin: Anaemia can cause the skin to appear pale or have a whitish complexion due to decreased blood flow.
c. Shortness of Breath: Insufficient oxygen supply to the lungs can lead to difficulty breathing, especially during physical exertion.
d. Dizziness and Headache: Reduced oxygen delivery to the brain can cause dizziness, light-headedness, and headaches.
e. Cold Hands and Feet: Poor circulation resulting from anaemia may cause extremities to feel cold to the touch.
f. Brittle Nails: Anaemia can affect nail health, leading to brittle, spoon-shaped, or ridged nails.
g. Pica: Some individuals with iron deficiency anaemia may experience cravings for non-food items such as ice, dirt, or starch.

Diagnosis
a. Blood Tests: Diagnosis typically involves measuring levels of haemoglobin, haematocrit, serum iron, ferritin, and transferrin saturation through blood tests.
b. Medical History and Physical Examination: Healthcare providers may inquire about symptoms, medical history, dietary habits, and perform a physical examination to assess for signs of anaemia

Treatment Options:
a. Iron Supplementation: Oral iron supplements are often prescribed to replenish iron stores in the body. In cases of severe anaemia or when oral supplementation is ineffective, intravenous iron therapy may be necessary.
b. Dietary Changes: Increasing intake of iron-rich foods can help support iron levels in the body. Incorporating foods such as lean meats, poultry, fish, legumes, leafy greens, and fortified cereals into the diet is recommended.

c. Treating Underlying Causes: Addressing the underlying cause of iron deficiency, such as treating gastrointestinal disorders or managing heavy menstrual bleeding, is essential for long-term management.
d. Monitoring and Follow-Up: Regular monitoring of iron levels and response to treatment is important to assess progress and adjust management as needed.

4. Methodology:

Materials and Methods:
Source of Data: Data will be collected from:
1.Case records of the patient's in the hospital.
2.By evaluating the patient questionnaire collected from patients who presented with anaemia.

Study Design: -
The current study is a prospective and observational study conducted over a period of 6 months from June 2023to March 2024 at Lalitha Specialty Hospital in the in-patient General Medicine, Cardiology and Nephrology. About the impact of patient counselling on medication adherence and quality of life in Anaemic patients. The patients are included according to their interests and willingness to carry out the study.

Study Site: Lalitha Super Specialty Hospital, Guntur.
Study Duration: Study will be carried out for a period of 6 months.
Study Population: All patients of age 25-85 years. SAMPLE SIZE: - The sample size consists of 150 patients who are admitted to the Lalitha super specialty hospital.
Study Criteria: - The study will be carried out by considering the following criteria.

Inclusion Criteria: -
1. Patients with age groups of 25-85 years from rural and urban region.
2. History anaemia confirmed by blood picture investigation.
3. Both genders (male and female).
4. Patients with comorbid conditions like hypertension, diabetes, pregnant, CAD, Thyroid, Kidney diseases.
5. The sleep pattern, lifestyle of the patient was also taken into consideration.

Exclusion Criteria: -
1. Patients with bacterial and viral infections.
2. Neonates, infants & children.

5. Results And Disccusion:

The results are obtained after 6 months duration in general medicine department of tertiary care hospital of 180 patients enrolled in the study

Table 1: Distribution based on the Region of the patients.

REGION	NUMBER	PERCENTAGE
URBAN	77	42.7%

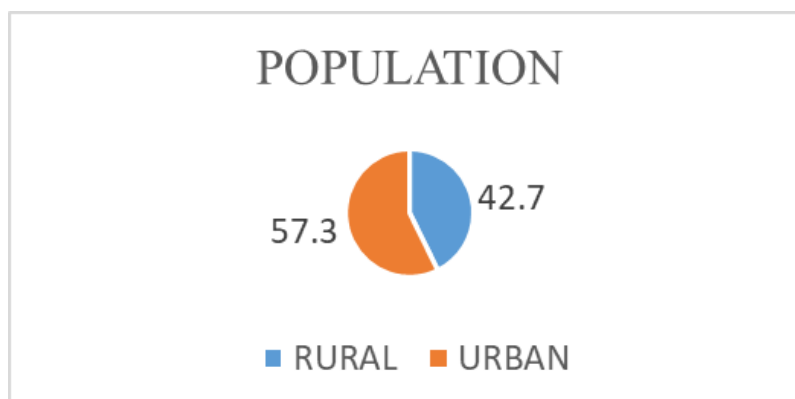| RURAL	103	57.3%
TOTAL	180	100%

Fig no 1. distribution based on the region of patients

Table 2: Distribution based on the Age of the patients in rural Region

AGE GROUP	MALE	PERCENTAGE	FEMALE	PERCENTAGE
25-35	4	3.8%	27	26.4%
35-45	11	10.6%	11	10.7%
45-55	17	16.5%	19	18.5%
55-65	14	13.5%	0	0%
TOTAL	46	44.4%	57	55.6%

Table 3: Distribution based on the Age of the patients in Urban Region

AGE GROUP	MALE	PERCENTAGE	FEMALE	PERCENTAGE
25-35	7	9.1%	11	14.2%
35-45	15	19.4%	8	10.3%
45-55	9	11.6%	9	11.6%
55-65	10	12.9%	8	10.3%
TOTAL	41	53.3%	36	46.7%

Table 4: Distribution Based on the comorbidities.

COMORBIDITIES	RURAL	URBAN
CAD	34	17
HYPERTENSION	27	19
THYROIDISM	7	3

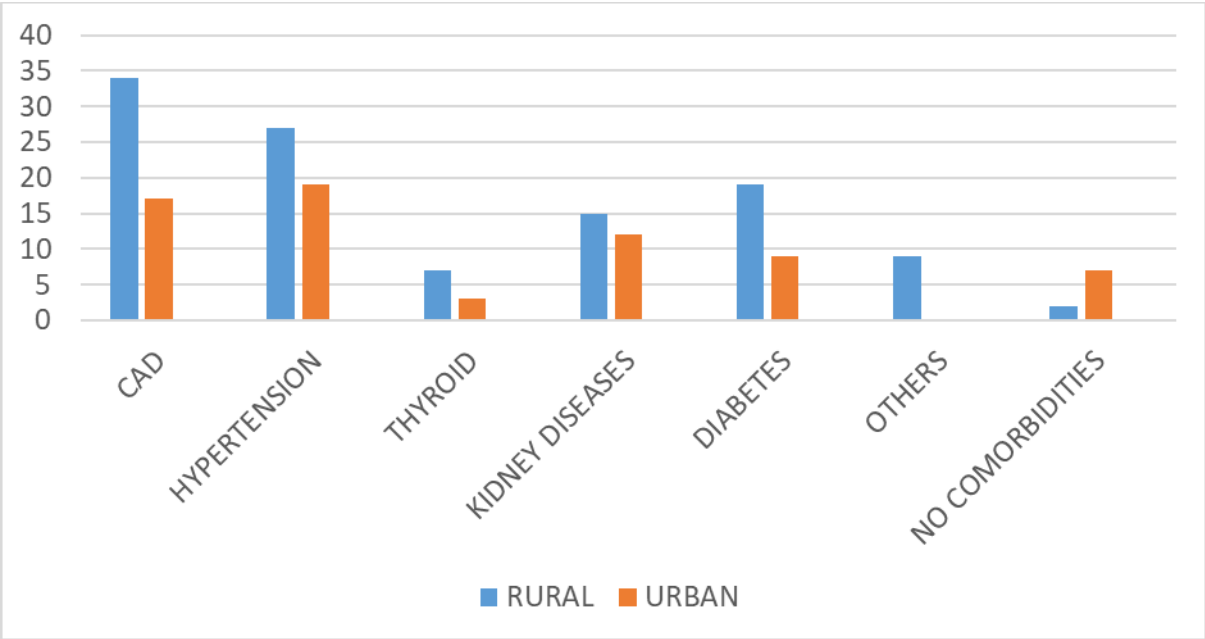| DIABETES MELLITUS	19	9
KIDNEY DISEASE	15	12
OTHERS	9	0
NO COMORBIDITIES	2	7

Fig no 2. distribution based on the comorbidities of the patients
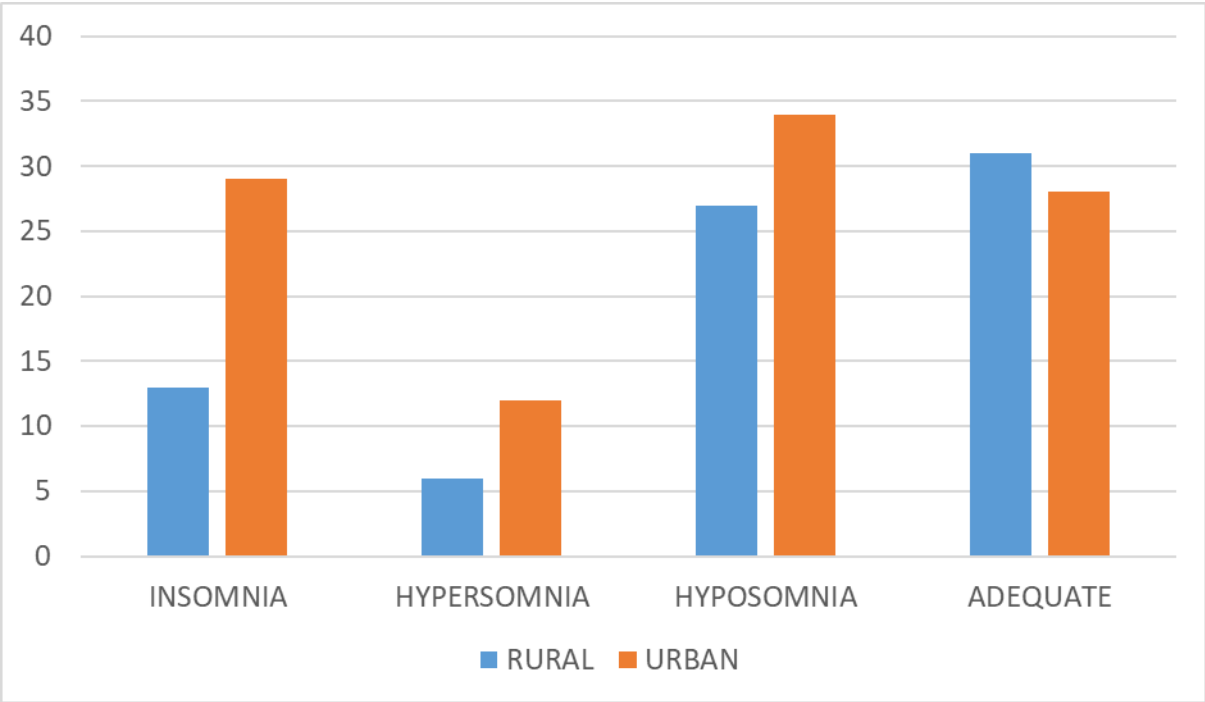

Fig no 3. distribution based on the sleep duration of patients.

Table 5: Distribution based on the sleeping condition of the rural patients.

CONDITION	NUMBER	PERCENTAGE
INSOMNIA	29	28.1%
HYPERSOMNIA	12	11.6%
HYPOSOMNIA	34	33.2%
ADEQUATE	28	27.1%
TOTAL	103	100

Table 6: Distribution based on the sleeping condition of the patients in urban patients.

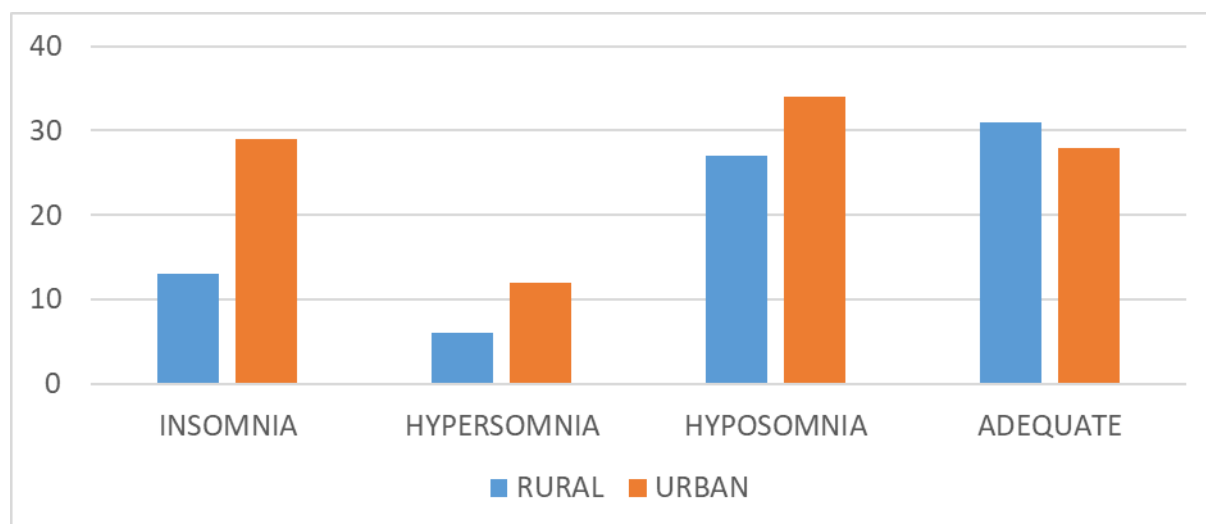| CONDITION	NUMBER	PERCENTAGE
INSOMNIA	13	16.8%
HYPERSOMNIA	6	7.7%
HYPOSOMNIA	27	35.3%
ADEQUATE	31	40.2%
TOTAL	77	100%

Fig no 4. distribution based on the sleep duration of patients.

Table 7: Distribution Based on the Hemoglobin levels in rural region

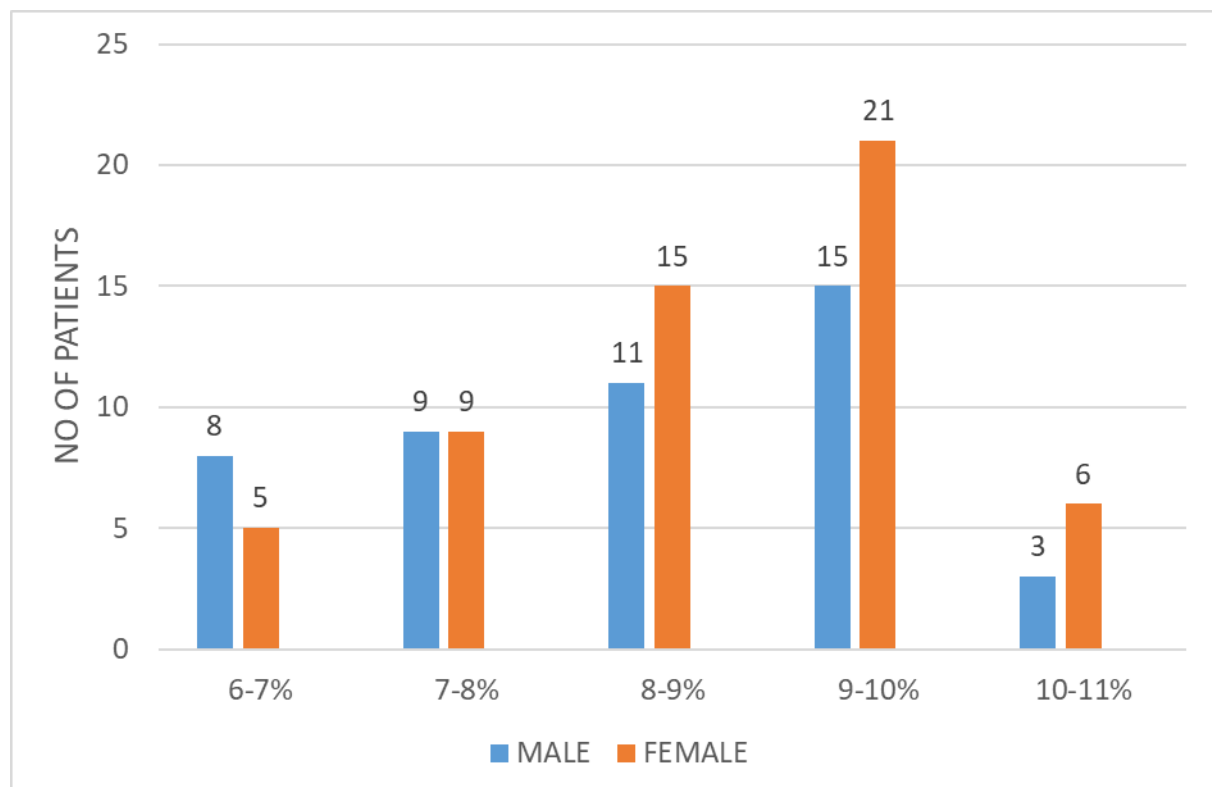| SI NO	RANGE	MALE	FEMALE
1	6-7 %	8	5
2	7-8%	9	9
3	8-9%	11	15
4	9-10%	15	21
5	10-11%	3	6
6	TOTAL	46	57

Fig 5. distribution based on the haemoglobin levels of the rural region patients.

Table 8: Distribution Based on the Hemoglobin levels in Urban region

SI NO	RANGE	MALE	FEMALE
1	6-7 %	4	7
2	7-8%	11	1
3	8-9%	7	10
4	9-10%	17	15
5	10-11%	2	3
6	TOTAL	41	36

Table 9: Distribution Based on the diet pattern in rural and urban regions.

REGIONS/DIET	VEG	NON-VEG
RURAL	4	99
URBAN	38	39
TOTAL	42	138

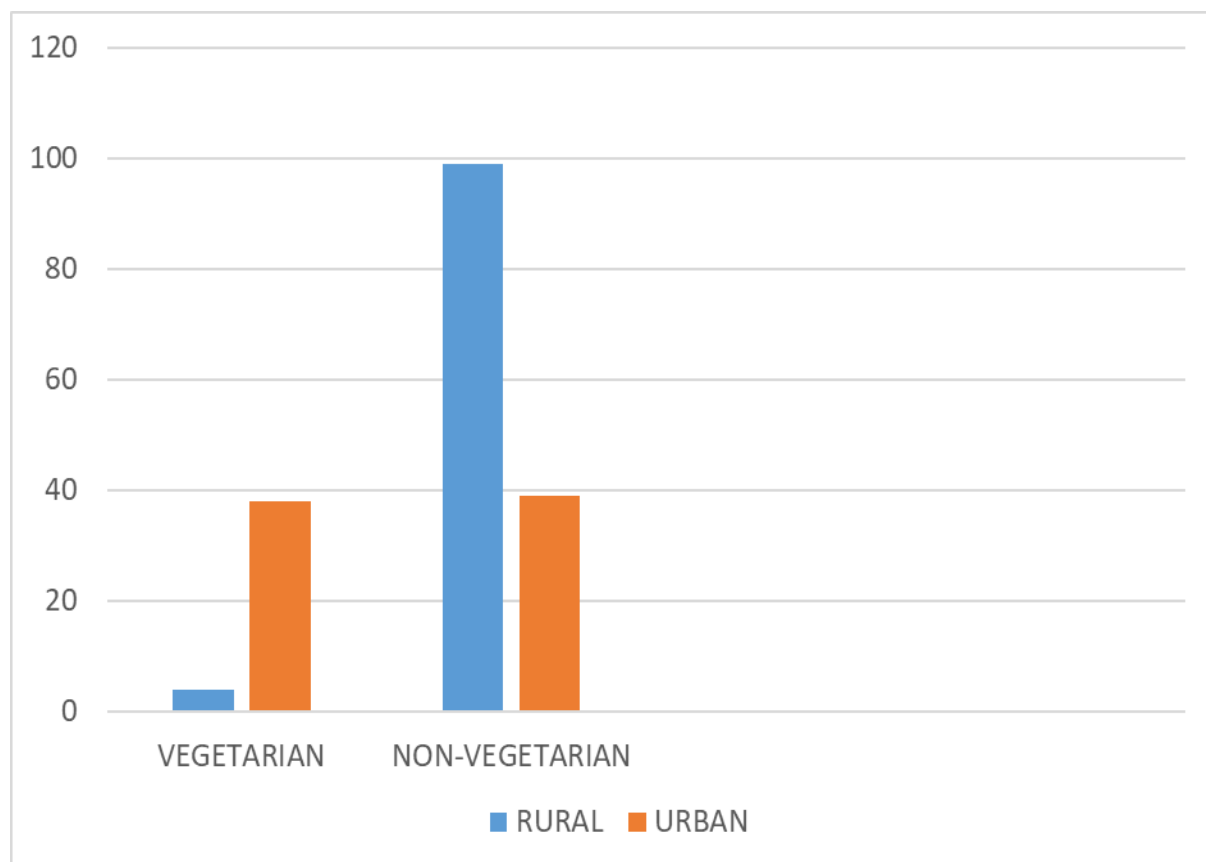| Risk factors	Cad	Thyroid	htn	dm	kidney	others	no
Rural	**34**	**7**	**27**	**19**	**15**	**9**	**2**
Urban	**17**	**3**	**19**	**9**	**12**	**0**	**7**
Total	**51**	**10**	**46**	**28**	**27**	**9**	**9**

Fig no 6. distribution based on the haemoglobin levels of the urban region patients.

Statistical Test:
To Assess the impact of comorbidities in anaemic patients in both rural and urban regions.
performed.

Null Hypothesis:
There is no chance of association between the impact of comorbidities on anaemic condition

Alternative Hypothesis:
There is a chance of significant association between the comorbidities on anaemic condition.
(%) = ∑ (Observed Value - Expected Value)2

Expected Value
[X^2] Calculated value = 15.06
[X^2] Tabulated value=12.592
The X^2 Calculated value (15.06) is greater than X^2 tabulated value (12.592) null hypothesis
was rejected. alternative hypothesis was accepted.
There is a significant association between the impact of major risk factors in anemia.

O	E	O-E	(O-E)2	(O-E)2/E
34	29.1	4.9	24.01	0.82
27	26.32	0.68	0.46	0.01

7	5.77	1.28	1.63	0.28
19	16.02	2.98	8.88	0.55
15	15.45	-0.45	0.20	0.01
9	5.15	3.85	14.82	2.87
2	5.15	-3.15	9.92	1.92
17	21.81	-4.81	23.13	1.06
19	19.67	-0.67	0.44	0.02
3	4.27	-1.27	1.61	0.37
9	11.97	-2.97	8.82	0.73
12	11.55	0.45	0.20	0.01
0	3.85	-3.85	14.82	3.84
7	3.85	3.15	9.92	2.57

Null Hypothesis
There is no chance of association between the impact of diet in anaemic condition

Alternate Hypothesis
There is chance of significant association between the diet and anaemic condition.

Null Hypothesis
There is no chance of association between the impact of diet in anaemic condition.

Alternate Hypothesis
There is chance of significant association between the diet and anaemic condition.

O	E	O.E	(O.E)2	(O.E)2/E
29	24	5	25	1.04
12	6.86	5.14	26.41	3.84
34	34.9	-0.9	0.81	0.11
28	33.76	-5.76	33.17	0.98
13	17.96	-4.96	24.60	1.36
6	7.7	-1.7	2.89	0.37
27	26.09	0.91	0.82	0.03
31	25.23	5.77	33.29	1.31

X^2 Calculated Value 9.04

X^2 Tabulated Value   7.85

The X^2 Calculated value (9.04) is greater than X^2 tabulated value (7.85) null hypothesis was rejected. alternative hypothesis was accepted.

Null Hypothesis

There is no chance of association between the impact of hours of sleep in anaemic condition

Alternate Hypothesis

There is chance of significant association between the hours of sleep an
d anaemic condition.

0	E	O-E	(O-E)2	(O-E)2/E
4	24	-20	400	16.6
99	78.96	20.04	401.60	5.08
38	17.96	20.04	401.60	22.36
39	59.03	-20.03	401.20	6.79

X^2 Calculated value = 96.55

X^2 Tabulated value =3.841

The X^2 Calculated value (96.55) is greater than X^2 tabulated value (3.841) null hypothesis was rejected. alternative hypothesis was accepted.

6. Discussion

1. The above results are collected for about 6 months in tertiary care hospital in general department in tertiay care hospital about 180 cases were enrolled in the hospital.
2. A comparative,prospective and observational study of prevalence of anemia in both rural and urban regions in tertiary care hospital and impact of patient counselling data was collected in lalitha super speciality hospitals through data questionaire forms .
3. We collected 180 cases who are suffering from anaemia and patient counselling was given for better medical adherence and reduce furthure complicatins .
4. The total 180 cases are suffering from anemia and with different comorbid conditions.
5. Age of the patients in rural region the age group of 25-35 males are 4(3.8%) and females are 27(26.4%).35-45 male are 11(10.6%) female are 11(28%),45-55 male are 17(16.5%)female are 19(18.5%),age group 55-65 male are 14(13.5%)female are 0 and the total male are 46 (44.4%) and female are 57(55.6%) of the total study population.
6. Age of the patients in urban region the age group of 25-35 males are 7(9.1%) and females are 11(14.2%).35-45 male are 15(19.4%) female are 8(10.3%),45-55 male are 9(11.6%)female are 9(11.6%),age group 55-65 male are 10(12.9%)female are8(10.3%) and the total male are 41(53.3%) and female are (46.7%) of the total study population.
7. The comorbidities of the patients in rural and urban region of total population of the study data where CAD rural where 34 and urban 17, in hypertension rural where 27 and

urban where 19, thyroidism rural where 7 and urban where 3, in diabetes mellitus rural where 19 and urban where 9,in kidney disease rural where 15 and urban where 12 ,and other comorbidities where rural 9 and urban 0 of the total population.

8. The sleeping condition of the patients of urban region. Insomnia are 13(16.8%) hyper somnia are 6(6.99%), hyposomnia are 27(35.3%), adequate are 31(40.2%) and total are 77 of study population.

9. The sleeping condition of the patients of rural region. Insomnia are 13(16.8%) hyper somnia are 6(6.99%), hyposomnia are 27(35.3%), adequate are 31(40.2%) and total are 77 of study population.

10. The haemoglobin levels in rural region of the total population of the study males where 46 and female where 57. In there from 6-7 % male where 8 and female where 5,from 7-8% male where 9 and female where 9,from 8-9% male where 11 and female where 15 ,from 9-10% male where 15 and female where 21 ,from 10-11% male where 3 and female where 6 of the rural region of the total study population.

11. The haemoglobin levels in urban region of the total population of the study males where 41 and female where 36. In there from 6- 7 % male where 4 and female where 7,from 7-8% male where 11 and female where 1,from 8-9% male where 7 and female where 10from 9-10% male where 17 and female where 15 ,from 10-11% male where 2 and female where 3 of the urban region of the total study population.

12. The diet pattern of both rural and urban region from the data from rural regionwhere vegetarian are 4 and non vegetarian are 99. From urban region where vegetarian are 38 and non vegetarian are 39 from the population.Hence the total vegetarian from rural and urban are 42, and non vegetarian are 138.

7. Conclusion

The main aim of this study is to promote awareness to the patients who have comorbid factors like coronary artery disease,Hypertension,Diabetes Mellitus,thyroid,kidney disease, diet,Etc are more likely to develop aneamia. Provide patient counselling to reduced further complications. anemia turns out to be highly common in individuals who might be hospitalised.Early detection and treatment by primary care clinicians is important. In this we have discussed about anemia and other comorbid conditions with anemia and they causes, clinical manifestion and risk factors.life style modifications particularly diet is a critical component of treatment for this condition. Diet intervention in relation with anemia and other complicated comorbidities is real complicated topic.Based on the study conucted rural people are more prone to anemia and comorbidities than the urban people.the factors caused for the condition more probably due to the diet changes, sleeping conditions and age factors .

8. References

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