



# NUTRITIONAL ANAEMIA AMONG TRIBAL WOMEN IN MANIPUR

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## ABSTRACT

Nutritional anaemia is one major health issues among women in Manipur. Poor density and bioavailability of dietary iron staple foods are the major etiological factors for wide spread prevalence of iron deficiency in India. The prime objective of the study is to understand the Nutritional Anemia among Tribal Women in Manipur. This review paper discusses the prevalence of anaemia among women of pregnant women, non-pregnant, non-lactating women among tribal women in Manipur (15-49years) comparing NFHS-4 and NFHS-5. This paper will explore the current state of anaemia among the top five ST dominant district of Manipur. As tribal community largely depend on a limited number of locally available food items and found missing valuable nutrients which later cause deficiency of iron in the blood which is responsible for the formation of red blood cell to protect from anaemia. Additionally it is difficult to meet ascorbic acid, iron and folic acid requirements unless a good source of these nutrients is added to improve the anaemia status among the tribal community. Some issues like their geographical location, low literacy rate, low socio economic backwardness, high terrain, low status occupation, more children, no family planning and addition to lack of awareness about foods and nutrition can be a major issue in rising the causes of anaemia. Recommended for locally available low-cost seasonal foods preferentially vitamin C, iron, folic acid rich food items etc. are guiding principles for better anemia management. In order to improve nutritional related disease and health issues, studies of different health problems, study on nutritional status, and program based like intervention programme on nutrition should be encourage to bring health solution among the rural tribal community.

**Key words:** Nutritional, Anaemia, Health, Tribal, Women, Manipur, Community

## INTRODUCTION

Nutritional anaemia may be defined as the condition that results from the inability of the erythropoietic tissue to maintain a normal haemoglobin concentration on account of inadequate supply of one or more nutrients leading to reduction in the total circulating haemoglobin. Poor density and bioavailability of dietary iron staple foods are the major etiological factors for wide spread prevalence of iron deficiency in India <sup>[1]</sup>. Women in urban areas are slightly less likely to be anaemic (54%) than those in rural areas (59%). The prevalence of anaemia among women in Manipur is (29% each) <sup>[2]</sup>. About half of the global maternal deaths due to anemia occur in south Asian countries <sup>[3]</sup>. The prevalence of anemia also varies with population characteristics such as age, sex, socio-economic status, and bio-demographic factors such as pregnancy and lactation <sup>[4]</sup>. Studies have reported that lower educational level is associated with low occupation, low socio-economy, and dietary iron deficiency, thereby affecting the nutritional status and increasing the risk of anemia <sup>[5]</sup>. The prevalence of anemia among the reproductive age group women of various tribal communities of Kom, Chothe, and Vaiphei of three districts of Manipur was 32.29%, 17.58%, and 38.95%, respectively <sup>[6]</sup>. It is also found in the previous study that anemia was found higher among the lactating women (62.0%) as compare to non-pregnant (56.8%) among tangkhul women and it is also observe that anemia was higher in the age group of 36-45 yeas among lactating women (70.3%) compare to non-pregnant women (59.9%) as compare to the other age group <sup>[7]</sup>. The prime objective of the study is to understand the nutritional anemia status among tribal women in Manipur.

## SCHEDULED TRIBE IN MANIPUR

As per Census 2011, the Scheduled Tribe (ST) population is 11 lakhs (40.8%), respectively. Around 70.79% of the population reside in rural areas, while the rest constitute the urban population. Top five ST dominant districts account for 95.12% of ST population in the State. Agriculture contributes a major share to the State Domestic Product where around 52.81 % of the workers in Manipur are engaged as cultivators and Agricultural Laborers <sup>[8]</sup>. The table 1 shows the ST dominant district in Manipur <sup>[9]</sup>.

**Table 1**

**Top 5 Schedule Tribe Dominant District in Manipur**

Sl.No.	ST Dominant District	Percentage %
1.	Tamenglong	95.71
2.	Ukhrul	94.35
3.	Churachandpur	92.93
4.	Chandel	88.97
5.	Senapati	87.49
<b>Total</b>	ST Dominant District accounts	95.12
<b>Total</b>	ST Population (in crore)	0.11 (40.88%)

(Source: Health dossier 2021) <sup>[9]</sup>

## ANAEMIA STATUS AT A GLANCE

Anaemia is defined as haemoglobin concentration below established cut-off levels in the blood. The haemoglobin cut-offs which are used for diagnosing anaemia across ages are described in Table 2. <sup>[10, 11]</sup>

**Table 2**  
**Haemoglobin levels to diagnose (g/dl)**

Population	Anaemia			
	Non-anaemia	Mild	Moderate	Severe
Children 6-59 months of age	≥11.0	10-10.9	7-9.9	<7
Children 5-11 years of age	≥11.5	11-11.4	8-10.9	<8
Children 12-14 years of age	≥12.0	11-11.9	8-10.9	<8
Non-pregnant women (15years of age and above)	≥12.0	11-11.9	8-10.9	<8
Pregnant women	≥12.0	10-10.9	7-9.9	<7
Men (15 years of age and above)	≥11.0	11-12.9	8-10.9	<8

**Source:** WHO-Nutritional Anemia: Tools for Effective prevention and control, 2017 <sup>[10]</sup> and WHO VMNIS, 2011 <sup>[11]</sup>

## STATUS OF ANAEMIA AMONG TRIBAL POPULATION IN MANIPUR- FIVE ST DOMINANT DISTRICT IN MANIPUR

The five district wise analysis shows that across all districts, prevalence of anaemia among all vulnerable groups is on the rise indicating a concerning trend. The table 3 below presents the five district wise comparative data of NFHS 4 and NFHS 5 <sup>[12]</sup>.

**Table 3**  
**Status of anaemia among tribal population in Manipur**

Anaemia among women (15-49years)								
Name of District	Non-pregnant women age 15-49years who are anaemic		Pregnant women age 15-49 years who are anaemic		All women age 15-49 years who are anaemic		All women age 15-49 years who are anaemic	
	NFHS-4 (2015-16)	NFHS-5 (2019-20)	NFHS-4 (2015-16)	NFHS-5 (2019-20)	NFHS-4 (2015-16)	NFHS-5 (2019-20)	NFHS-4 (2015-16)	NFHS-5 (2019-20)
Tamenglong	26.4	<b>26.9</b>	<b>36.6</b>	31.4	27	<b>27.3</b>	16.9	<b>29.1</b>
Ukhrul	16	<b>21.6</b>	16.7	<b>25.7</b>	16	<b>21.9</b>	17	<b>20.6</b>

Chandel	23.9	<b>27.7</b>	15.2	<b>20.3</b>	23.5	<b>27.3</b>	22.5	<b>37.8</b>
Churachandpur	19.9	<b>31</b>	26.9	<b>51.8</b>	20.3	<b>32</b>	16.2	<b>28.7</b>
Senapati	25.3	<b>27.9</b>	<b>22.4</b>	18.3	25.1	<b>27.4</b>	<b>26.6</b>	23.8

The morbidity and mortality risks associated with anaemia calls for an urgent need to address. The decline in anaemia prevalence will in turn contribute to improved maternal and child survival rates and improved health outcome for other population groups.

For the State of Manipur, as per NFHS-5 anaemia affects:

Women in reproductive age group (15-49 years) – 29.4%

Pregnant women- 32.4%

Children 6-59 months- 42.8%, and

All women 15-19 years- 27.9%. <sup>[13]</sup>.

### PREVENTION OF ANAEMIA AMONG WOMEN

The recent NFHS-5 data indicates anemia prevalence has not improved compared to NFHS-4 data across all categories <sup>[14]</sup>. Health for All's goal cannot be achieved fully unless given equal importance on health, especially tribal women's health and nutritional status <sup>[15]</sup>. Anemia is a significant community health problem between women age 15 – 49 during reproductive period (non-pregnant and pregnant) <sup>[16]</sup>. Table 4 shows RDA of iron, folic acid and ascorbic acid for women <sup>[17]</sup>.

**Table 4**  
**RDA of Iron, Folic acid & Ascorbic acid (ICMR, 2020) <sup>[17]</sup>**

Individuals	Age group	Body weight (kg)	Iron (mg/day)	Folate (u/day)	Vit-C (mg/day)
Women	Non pregnant non-lactating	55	29	220	65
Women	Pregnant	55+10	40	570	80
Women	Lactation (0-6month)	55+10	23	330	115
Women	7-12 month)	55+10	23	330	115

Health education and nutrition awareness are cost-effective strategies to reduce anemia prevalence <sup>[18]</sup>. Anemia is a preventable disease through dietary intervention, socioeconomic improvements etc. Dietary approach can become a successful tool in order to achieve healthy blood hemoglobin level. Vitamin-C is an important water-soluble substance, which increase non haem iron absorption by 20- 25%. It is a cost benefit dietary intervention <sup>[19]</sup>. However, a vitamin-C rich food is seasonal availability and some foods are expensive. In many tribal

household a whole day's food supplies is cooked only once, providing two meals as per as 12 hours apart. Under such circumstance, it is difficult to meet ascorbic acid, iron and folic acid requirement unless a good source of these nutrients is added. Incorporation of iron rich foods in the daily diet is the easiest and most necessary step. List of common Iron, Folic acid and vitamin-C rich foods are presented in table-5, 6, and 7 respectively <sup>[20]</sup>

**Table 5**

**List of common iron rich foods (ICMR, 2017) <sup>[20]</sup>**

SL No.	Iron rich foods	Scientific name	Amount (mg/100g edible portion)
1	Raisin dried, golden	<i>Vitisvinifera</i>	4.26±0.6
2	Raisin dried black	<i>Vitisvinifera</i>	6.81±0.91
3	Dates dry, pale brown	<i>Phoenix dactylifera</i>	3.20±0.45
4	Dates dry, dark brown	<i>Phoenix dactylifera</i>	4.79
5	Tamarind, pulp	<i>Tamarindusindicus</i>	9.16±1.71
6	Coriander leaves	<i>Coriandrumsativum</i>	5.30±1.55
7	Curry leaves	<i>Murray koenigii</i>	8.67±0.09
8	Mint leaves	<i>Menthaspicata</i>	8.56±3.21
9	Asafoetida	<i>Ferula assafoetida</i>	15.68±4.51
10	Cardamom green	<i>Elettariacardamomum</i>	8.33±1.44
11	Chillies red	<i>Capsicum annum</i>	6.23±0.79
12	Cloves	<i>Syzygiumaromaticum</i>	9.41±2.10
13	Coriander seeds	<i>Coriandrumsativum</i>	17.64±6.74
14	Cumin seed	<i>Cuminumcyminum</i>	20.58±4.24
15	Pepper, black	<i>Piper nigrum</i>	11.91±3.48
16	Turmeric powder	<i>Curcuma domestica</i>	46.08±1.83
17	Gingelly seeds black	<i>Sesamumindicum</i>	13.9±1.60
18	Mustard seeds	<i>Brassica juncea</i>	13.49±3.95
19	Egg, poultry yolk boiled	<i>Gallus gallus</i>	4.92±0.33
20	Poultry chicken liver	<i>Gallus gallus</i>	9.92
21	Goat spleen	<i>Capra aegagrus</i>	51.41±17.21
22	Beef spleen	<i>Bostaurus</i>	31.68±4.50
23	Pork spleen	<i>Susscrofa</i>	27.21±6.43
24	Pork liver	<i>Susscrofa</i>	20.74±7.24

25	Amaranth seed black	<i>Amaranthuscruentus</i>	9.33
26	Ragi	<i>Eleusinecoracana</i>	4.62±0.36
27	Rice flakes	<i>Oryza sativa</i>	4.46±0.81
28	Puffed rice	<i>Oryza sativa</i>	4.55±1.03
29	Wheat flour atta	<i>Triticumaestivum</i>	4.10±0.67
30	Bengal gram, dal	<i>Cicerarietinum</i>	6.08±0.27
31	Bengal gram whole	<i>Cicerarietinum</i>	6.78±0.75
32	Horse gram Whole	<i>Dolicusbiflorus</i>	8.76±1.16
33	Lentil whole brown	<i>Lens culinaris</i>	7.57±0.67
34	Soyabean brown	<i>Glycine max</i>	8.29±0.51
35	Beet green	<i>Beta vulgaris</i>	5.8±0.57
36	Fenugreek leaves	<i>Trigonellafoenumgraecum</i>	5.69±1.37
37	Drumstick leaves	<i>Moringaoleifera</i>	4.56±1.09
38	Pumpkin leaves	<i>Cucurbita maxima</i>	5.58±0.39
39	Onion stalk	<i>Allium cepa</i>	3.09±0.54

Table 6

List of common folate iron rich foods (ICMR, 2017) <sup>[20]</sup>

SL No.	Iron rich foods	Scientific name	Amount (mg/100g edible portion)
1	Bengal gram whole	<i>Cicerarietinum</i>	233±12.9
2	Black gram whole	<i>Phaseolusmungo</i>	134±14.2
3	Cow pea brown	<i>Vignacatjang</i>	231±27.3
4	Cow pea white	<i>Vignacatjang</i>	249
5	Field bean white	<i>Phaseolus vulgaris</i>	289±27
6	Moth bean	<i>Vignaconitifolia</i>	349±10.8
7	Rajmah brown	<i>Phaseolus vulgaris</i>	330±29.6
8	Red gram whole	<i>Cajanuscajan</i>	229±19
9	Soyabean brown	<i>Glycine max</i>	297±26.1
10	Parsley	<i>Petroselinumcrispum</i>	197±13.9
11	Drumstick leaves	<i>Moringaoleifera</i>	42.89±5.31
12	Mustard leaves	<i>Brassica juncea</i>	110±6.6
13	Spinach	<i>Spinach oleracea</i>	142±10.3

14	Tamarind leaves tender	<i>Tamarindusindica</i>	91.82±9.56
15	Capsicum, green	<i>Capsicum annuum</i>	51.85±3.38
16	Capsicum red	<i>Capsicum annuum</i>	62.54±2.15
17	Ladiesfinger	<i>Abelmoschuseculentus</i>	63.68±10.76
18	Mango ripe himsagar	<i>Magniferaindica</i>	90.98±6.12
19	Papaya ripe	<i>Carcia papaya</i>	60.90±6.64
20	Beetroot	<i>Beta vulgaris</i>	97.37±7.06
21	Curry leaves	<i>Murrayakoenigii</i>	117±19.3
22	Garlic, big clove	<i>Allium sativum</i>	85.77±15.61
23	Mint leaves	<i>Menthaspicata</i>	106±6.3
24	Poppy seeds	<i>Papaversomniferum</i>	78.73±7.90
25	Gingelly seeds brown	<i>Sesamumindicum</i>	92.63±5.90
26	Paneer	----	93.31±14.37
27	Khoa	-----	94.25±8.57
28	Egg yolk raw poultry	<i>Gallus gallus</i>	112±6.1
29	Egg yolk boiled poultry	<i>Gallus gallus</i>	110±6.1
30	Sheep liver	-----	206±26.8
31	Beef liver	<i>Bostaurus</i>	1744±71.2
32	Calf liver	-----	1473
33	Aluva	<i>Parastromateusniger</i>	1132±159
34	Betki	<i>Latescalcarifer</i>	2079
35	Bombay duck	<i>Harpadonnehereus</i>	2784
36	Hilsa	<i>Tenualosailisha</i>	2875
37	Silver carp	<i>Hypophthalmichthysmolitrix</i>	2462
38	Carb	<i>Menippemercenaria</i>	2304
39	Octopus	<i>Octopus vulgaris</i>	2087
40	Catla	<i>Catlacatla</i>	1926±277
43	Rohu	<i>Labeorohita</i>	1263±101
44	Tiger prawns	<i>Macrobrachium sp.</i>	1875

Table 7

## List of common vitamin C rich foods (ICMR, 2017) [20]

Sl. No.	Vitamin-C rich foods	Scientific name	Amount (mg/100g edible portion)
1	Agathi leaves	<i>Sesbaniagrandiflora</i>	121
2	Amaranth leaves, red	<i>Amaranth gangeticus</i>	86.20
3	Amaranth leaves	<i>Amaranth viridis</i>	179
4	Brussels sprouts	<i>Brassica oleraceavar.gemmifera</i>	89.45
5	Drumstick leaves	<i>Moringaoleifera</i>	108±16.7
6	Parsley	<i>Petroselinumcrispum</i>	133±16.3
7	Ponnaganni	<i>Alternantherasessilis</i>	103
8	Raddish leaves	<i>Raphanussativus</i>	65.76±18.69
9	Bitter gourd, jagged, smooth ridge elongate	<i>MomordicaCharantia</i>	54.30
10	Capsicum green	<i>Capsicum Annuum</i>	123±7.8
11	Capsicum red	<i>Capsicum Annuum</i>	112±5.5
12	Capsicum yellow	<i>Capsicum Annuum</i>	127±12.5
13	Drumstick	<i>Moringaoleifera</i>	71.86±19.13
14	Knol-Khol	<i>Brassica oleracea</i>	64.70±10.78
15	Mango green raw	<i>MagniferaIndica</i>	90.24±10.47
16	Currants, black	<i>Ribesnigrum</i>	182
17	Gooseberry (Amla)	<i>Emblicaofficinalis</i>	252±30.4
18	Guava, white flesh	<i>Psidiumguajava</i>	214±13.6
19	Guava, pink flesh	<i>Psidiumguajava</i>	222±27
20	Manila tamarind	<i>Pithecellobiumdulce</i>	55.78
21	Strawberry	<i>Fragaria X ananassa</i>	50.20±4.97
22	Cillies, green- all varieties	<i>Capsicum annum</i>	94.07±11.67

Anemia is a major public health problem in India [21]. About 65% of tribal females having age between 15-49 years are anemic. A significant proportion of anemia is result of nutritional inadequacy. Therefore, anemia is preventable disease. NFHS technical report 2009 had shown average daily household intake of food stuffs by ST population does not meet RDA (%) such as green leafy vegetables 56%, other vegetables 69%, milk and milk products 14%, fats and oils 50%, sugar and jaggery 30% and pulses 75% of RDA. Average daily



household nutrient intake by ST population was below than RDA (%), such nutrients are iron 44%, folic acid 51%, 36% riboflavin, 46% vitamin A and protein 78% of RDA as per tribal health report 2018, India <sup>[22]</sup>.

## SUGGESTIONS

- Tribal women largely depend on a limited number of locally available food items and found missing valuable nutrients for formation of red blood cells later cause anaemia. Low literacy rate, low socio economic backwardness, high terrain, low status occupation, more children, no family planning, no awareness about food can be a major issue in rising the causes of anaemia.
- As per WHO for India, health services enhancement and food supplementation are effective strategy for anemia prevention. With that community based screening for Hb level, monitoring of IFA distribution especially adolescent and reproductive women at ground level will produce better results. Above all these efforts along with community participation commitment will necessary to assure desire outcome. Recommended for locally available low-cost seasonal foods preferentially vitamin C, iron, folic acid rich food items etc. are guiding principles for better anemia management <sup>[23]</sup>.
- The government and health department of the state should encourage professional doctors, non-governmental organisation and researcher to further study on nutritional related diseases and health problems among rural tribal women of Manipur. In order to improve health issues, studies of different health problems, study on nutritional status, and program based like intervention programme on nutrition should be encourage to bring health solution among the tribal community.

## CONCLUSION

The tribal communities of Manipur have unique dietary pattern, which are associated with their natural habitats. They depend on the locally available foods and wild leafy vegetables, mushrooms, mustard, cabbage, squash, potato, tapioca, sweet potato, pumpkin, bitter gourd, ladies finger, brinjal, broad bean, pea, ash gourd, bottle gourd, onion, garlic, and coriander. Since they mainly focus on seasonal food items than from outside foods. But some high quality nutrients foods are expensive and due to backward socioeconomic and ignorance. Under such circumstances, it is difficult to meet ascorbic acid, iron and folic acid requirements unless a good source of these nutrients is added to improve the anaemia status among the tribal community.

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