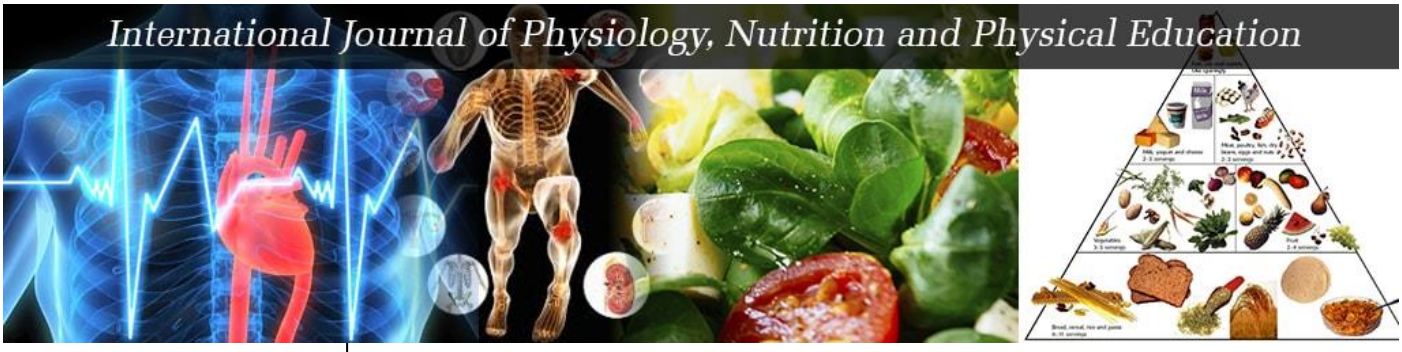

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Nutritional status of anaemic tribal adult women in Yercaud hill, Tamil Nadu

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Abstract
Background: This study's objective was to assess the anthropometric measurement, biochemical, clinical and dietary assessment from the selected tribal adult women.
Methodology: Study was conducted in Yercaud hills of Salem district, Tamil Nadu. Sample of 100 tribal adult women belonging to the age group of 20 to 40 years were selected for the collection of data regarding Anthropometric measurements like height, weight and Body Mass Index was calculated for the selected subjects. 24-hour dietary recall method was used to assess the dietary intake of the subjects, life style pattern and nutritional knowledge was assessed by direct interview and questionnaire method.
Results: Mean height and weight were compared with standard values and found that height was below the standard values of NCHS (2010) and weight was normal. BMI of the subjects found that, 43 percent of the subjects had normal BMI and 30 percent of subjects had BMI of 18.5-24.9; and BMI of from 25-29.9 were of 18 percent & 9 percent of subjects had BMI of more than 30 indicated obesity. The respondents mean height was 158 cm and the mean weight was 52kg. Cereals and pulses were consumed daily and green leafy vegetables consumed regularly. Consumption of fruits and milk were poor. Food intake was less than ICMR suggested RDA and nutrient intake was found to be inadequate in energy, protein, fat, iron, calcium, and vitamins.
Conclusion: Tribal adult women of Yercaud hills had poor knowledge on nutrition and health.

Keywords: Tribal women, anaemia, dietary practice

1. Introduction
A person is identified as a member of tribal (scheduled tribes) on the basis of the prescribed lists of scheduled tribes as per the scheduled tribes lists (Amendment) order 1976 issued by president of India. Several studies conducted on various tribal population living in different parts of India have reported them to be socially and economically disadvantaged groups and their diets to be nutritionally deficient [1] Nutritional anaemia is a major problem for women in India and more so in the rural and tribal belt [2]. Tamil Nadu has a large majority of Scheduled tribes in the hills; Salem has the highest proportion of tribes because of the existence of many mountainous regions which are suitable for their inhabitation [3]. Yercaud is a beautiful Hill station situated in the southern part of the Shevaroy ranges in the Eastern Ghats of Salem District. It is also called Ooty and princes of the poor [4].
In order to identify the problems faced by tribal women, it would be useful "to analyze the position of relative asymmetry in status of the tribal women *vis-à-vis* tribal men of a particular society and relative inequality between tribal and non-tribal women [5]." Tribal societies with different ways of life, culture and background give their women different status accordingly. Hence, in order to search out the problems of tribal women, we must study the socio-economic, religious and political structure of the tribal societies. In agricultural occupation and economy, women become the main workforce in family economy because they do agricultural work plus all kinds of household works [6]. Iron Deficiency is the most common and widespread nutritional disorder in the world and IDA is considered as an important contributing factor to the global burden of disease [7]. To address changing diets influenced by external culture, local food systems need to be reoriented to produce safe, nutritious food, promote dietary diversity, and ensure balanced diets, along with revival of local health traditions and health security [8]. Good nutrition is not only important to help improve performance but also promote healthy dietary practises in the long term [9].

2. Materials and Methods

2.1. Selection of area

The present study was conducted in Yercaud. It is one of Taluk located in Salem district. It was one of the major hill stations in India. It was also possible to make visits & to carry the teaching materials for educating the respondents on nutrition, dietary practices, personal hygiene & sanitation. According to censes 2011, the total literacy rate is of 61.48%. Male literacy rate is 62.47% & female literacy rate is 46.73%. Schedule tribe (ST) were 67.2% and schedule caste (SC) constitutes 13.1% (*censusindia.gov.in*).

2.2. Formation of interview schedule

Keeping in view of the objectives and the variables of the study, a comprehensive structured schedule was prepared. An interview schedule covering the information regarding age, religion, caste, type of family, monthly income, educational status, collection of data regarding 24 hour dietary recall method was used to assess the dietary intake of the subjects. Based on this, the mean food intake and the mean nutrient intake of the selected individuals were calculated using the table values and the nutrient adequacy was computed by comparing the nutrient intake with the recommended dietary allowances for Indians. The nutritional status of the subjects was assessed by using parameters like anthropometric measurements such as height, weight, Body Mass Index (BMI).

Programmes which are active in the tribal to improve the nutritional status of the community, exposure to audio visual aids, pamphlets, and slide show were very effective methods to provide nutrition education. The interview method of data collection was considered as the best as the respondents possessed low literacy level.

2.3. First stage of data collection

The respondents were personally contacted and the schedule was administered before exposure to the programme. Socio-economic status data were collected.

2.4. Planning and execution of nutrition education

The respondents were educated based on the nutrition knowledge and dietary practices through slide shows, audio visuals and pamphlets.

3. Results and Discussion

3.1. Socio-Demographic Profile of the Selected Respondents

The health status of the population depends on their socio-demographic background. The general information of the respondents like age, area, religion, educational status, occupational status, types of family, size of family, family monthly income were studied. Hence the information pertaining to the socio-demographic status were calculated.

Table 1: Socio-Demographic Profile of the Selected Respondents

Variables	Percent (n=100)	Variables	Percent (n=100)
Age		Educational qualification	
20-25	30	Degree	11
25-30	23	High school	8
30-35	25	Middle school	12
35-40	22	Primary school	31
Residence		Illiterate	38
Tribal	100	Occupation	
Religion		Employed	73
Hindu	59	House wife	27
Christian	33	Types of family	
Muslim	8	Nuclear family	67
Caste		Joint family	33
Schedule tribes	44	Family size	
Schedule caste	32	Small size (2-4m)	43
Most backward caste	12	Medium size (5-8m)	41
Backward caste	8	Large family (above 8m)	16
Other caste	4		

Apart from the table, out of 100 tribal women majority 28 percent belongs to 20-25 years of age groups; the area of residency showed that, all persons are stayed in the tribal area. It was founded that about 59 percent were about Hindu, from the table it was found that among the respondent's majority 44 percent were scheduled tribes. Based on the educational qualification, 38 percent were of illiterate, the majority of about 87 percent was married, in which 57 percent was married at 20-25years, and 13 percent unmarried; percent of non-consanguineous marriage. Around 67 percent of the respondents were of nuclear family, in which 36 percent has two earnings members Data from the table revealed that, the majority 54 percent are working in private sectors, The result showed that there were about 36 percent were having income of about 10000-15000, and 25 percent were of about 15000-20000, & 22 percent was about 5000-10000 income and 17 percent of more than 20000 which was based on Hudcco 2017**.** 81 percent have attain menarche around 12-14years, in which majority where using of napkins around 85 percent. In which 52 percent of three napkins per day were using. It was founded that about 89 percent of people were performing exercise, in which the majority is of 80 percent were walking, which is their major mode of transport.

Table 2: Statistical analysis of family income

Family Income	Observed N	Expected N	Mean ± SD	X^2	Df	P value
5000-10000	22	22.0	2.3700 ± 1.01160	9.995[a]	3	0.019
10000-15000	36	36.0				
15000-20000	25	25.0				
> 20000	17	17.0				

1% level of significance,

The observed P value is 0.019 which is lesser than 0.05 so we accept the alternative hypothesis and reject the null hypothesis, there is a significant difference between the family income and haemoglobin.

3.2. Nutritional Status of the Tribal Women

3.2.1. Anthropometric Measurement of the Selected Respondents

The anthropometric measurements such as height, weight were measured from the respondents. It is an effective indicator of health status. The height, weight of the respondents were measured. Height was measured with the help of inch tape marked by making the subject to lean on the wall. Weight was measured with the weighing balance. The data obtained are presented in the table 2.

Table 3: Mean Height and Weight of the Respondents

Variables	Values
Mean height	158cm
Mean weight	52kg

The above table showed that, the respondents mean height is 158cm and the mean weight is 52kg.

3. 2.1.1. Body Mass Index (BMI) of the respondents

The Body Mass Index (BMI) was calculated from height and weight of the respondents using standard formula.

Table 4: Body Mass Index (BMI) of the Respondents

Body Mass Index (BMI)	Percent (n=100)
Underweight <18.5	30
Normal 18.5 – 24.9	43
Overweight 25 – 29.9	18
Obesity 30-35	9

The table results denoted that the higher percentages of about 30 percent of the respondents were under weight, 43 percent were normal, 18 was overweight and 9 percent of the respondents was obese.

3.2.2. Biochemical Measurement of the Respondents

The most important and an effective indicator of health status viz. haemoglobin levels of the respondents were estimated.

Table 5: Haemoglobin level of the Respondents

Hemoglobin level	Percent(N=100)
Mild anemic (10.0 to 11.9 mg/dl)	22
Moderate anemic (7.0 to 9.9 mg/dl)	39
Severe anemic (< 7.0 mg/dl)	9
Normal (> 12.0 mg/dl)	30

The table denoted that the higher percentage of 39 percent were moderate anaemic, 30 percent were normal, 22 percent were of mild anaemic and 9 percent is of severe anaemic. The table conclude that the haemoglobin level was moderate in the tribal women.

3.2.3. Clinical Assessment of the Respondents

The clinical assessment was conducted to evaluate their general health status.

Table 6: General Clinical Assessment of the Selected Respondents

Variables	Percent (N=100)	Variables	Percent (N=100)
Face		**Skin**	
Paleness	41	Dry	47
Normal	59	Pale	21
Lips		Wrinkle	12
Crankiness	13	Normal	20
Dryness	42	Eyes	
Normal	45	Paleness	53
Teeth		Normal	47
Cavities	13	Neck	
Normal	87	Parotid enlargement	7
Mouth		Normal	93
Bleeding gums	10	Nails	
Glossitis	8	Spooning	20
Normal	82	Transverse lines	35
Hair		De-pigmentation	26
Thin	18	Normal	19
Easily plucked	23	Extremities	
Normal	59	Oedema	19

The above table results reveal that 41 percent of the selected respondents have paleness in the face. Dryness in the lips was found among 42 percent of sample and crankiness of lip was found among 13 percent of samples.13 percent have carries tooth. 10 percent has complaints of bleeding gums and 8 percent has glossitis. Easily plucked hair has 23 percent and 18 percent has thin hair. 47 percent & 21 percent has dry skin & paleness and 12 percent has wrinkle skin. 53 percent of the respondent's had lower eye lid is pale in colour. 7 percent respondent found of parotid enlargement; 35 percent, 26 percent & 20 percent have transverse line, de-pigmentation & spooning of nails. 57 percent has joint pain & 19 percent has oedema of lower extremities.

3.2.4. Dietary Survey of the Respondents

The diet should be provided with adequate amount of all

nutrients to maintain good health and physical efficiency. A single 24 hours dietary recall was done to calculate the daily nutrient intake of the selected respondents.

Table 7: Nutrient intake of the selected respondents

Nutrient	RDA	Actual intake	Deficit	% deficit
Energy(kcal)	2230	1915.9	314	14
Carbohydrate(g)	450	398	52	11.5
Protein (g)	55	49.2	5.8	10.5
Fat (g)	25	17	8	32
Iron (mg)	35	22	13	37.1
Vitamin c (mg)	40	37	3	7.5
Calcium (mg)	600	256.2	343.7	57.2

RD A-Recommended Dietary Allowances

It was observed that intake of energy was found 14 percent deficient, comparing the Recommended Dietary Allowances (RDA). 37.1 percent deficient of iron intake in their daily life similarly of calcium, vitamins, and proteins and fat were also found to be less than the RDA.

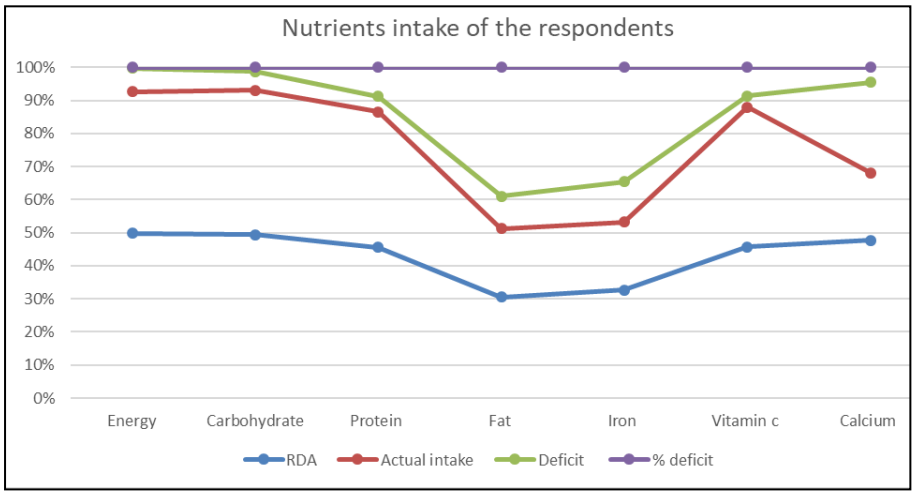

Table 8: Statistical Analysis of Nutrient Intake of the Respondents by the 24 hours Recall method

Nutrients	Mean	Standard deviation	df	t value	Sig.(2-tailed)
Energy (kcal)	8.93	135.29489	6	1.748	0.13
Carbohydrate(gm)					
Protein (gm)					
Fat (gm)					
Iron (mg)					
Vitamin C(mg)					
Calcium (mg)					

5% level of significance,

The observed P value is 0.13 which is greater than 0.05 so we accept the null hypothesis and reject the alternative hypothesis, there is no significant difference between the 24hours recall and haemoglobin.

4. Conclusion

This study throw a light on tribal anaemic women of Yercaud and it was clear that they have a poor knowledge about their nutrition and health. Thus a series of effort have been taken through various aids such as through pamphlets, slide show, and audio-visual, to improve their nutrition education about balanced diet and personal hygiene and its importance which has shown their drastic increase in their knowledge retention respectively. The tribal women are very enthusiastic and inquisitive in learning and acquiring knowledge on these unknown basic essential facts on health and nutrition which prompted to go for deeper studies in the future.

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