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A study on dietary habits and Nutrient intake of tribal women in ITDA Paderu division of Visakhapatnam District, Andhra Pradesh

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Abstract

Introduction: India is a diversified country with a blend of people living in urban, rural and tribal areas. The dietary habits of tribals are distinct from rest of the people. Various research studies on tribal population revealed that their diets are nutritionally deficient.

Materials and Method: It is a population based Cross-sectional survey conducted in ITDA Paderu division of Visakhapatnam district among 225 tribal women in the age group of 15-49 years during the period from April to October 2014. Data was collected using two formats 1) food frequency questionnaire (FFQ) 2) 24-hour dietary recall questionnaire. MS Excel 2007, SPSS trail version-21 and Dietsoft software's were used for statistical analysis.

Results: Rice is the most common staple food and Ambali is the most common breakfast. Top five foods providing energy to the women were Rice, Ambali, Vegetables, Tea with Milk and Dal. The Mean Calorie intake of energy by tribal women was 1931 Kcal per day. Average consumption of Carbohydrates per each day was 367.14 gm and it accounts for 76.6% of total energy consumption. Protein intake was 49.83 gm and it was equal to 10.5% of total energy and fat consumption was 27.67 gm and it accounts for 12.9% of total energy.

Conclusions: One third of women were consuming less than 80% RDA of energy i.e., 1784 Kcal per day and two fifths of women were consuming protein less than 80% RDA i.e., 44 grams per day. It indicates the need of nutritional education to avoid taboos and improve health.

Keywords: Andhra Pradesh, Dietary Habits, Food frequency questionnaire, Nutritional status, Tribal women.

Introduction

India is a diversified country with a blend of people living in urban, rural and tribal areas. Anthropologically tribe is a system of social organisation which includes several local groups – villages, districts on lineage and normally includes a common culture, a common name, political system, simple economy, religion and belief, primitive law and education system.(1) They primarily live in various ecological and geo-climatic conditions ranging from plains, forests, hills and inaccessible areas. The traditional and cultural distinction of each tribal community has made them distinguishable from each other and also from people living in plain areas.(2) Their dietary habits too are distinct from rest of the community.

Various research studies on tribal population of India in the past two decades have revealed that their diets are nutritionally deficient.(3,4) These nutritionally deficient diets lead to chronic energy deficiency & related diseases, low capacity for work, increased susceptibility to various ill health conditions and thereby to deterioration in the health status of the individuals. Women being vulnerable section, the impact on their health is much higher. Based on this background this study was conducted in the tribal population of Integrated Tribal Development Agency (ITDA) Paderu division in Visakhapatnam district to study the dietary habits of tribal women and assess their nutrient intake.

Subjects and Method

It is a population based Cross-sectional survey conducted in ITDA Paderu division of Visakhapatnam district among tribal women in the age group of 15-49 years during the period from April to October 2014. Sample size was calculated with Epi-info software for population survey. Population of ITDA Paderu division according to Census 2011 was 604047. At 5% confidence limits and 30% expected frequency of deficient nutrient intake the sample size was calculated as 225. Simple random technique was used to select 9 PHCs out of total of 37 PHCs in ITDA Paderu division.

From each selected PHC, one village was selected for covering a sample of 225. A house to house survey was conducted to interview 25 women in reproductive age group from each randomly selected village. In case of less populated villages/ small hamlets where 25 women could not be covered, the subsequent hamlet / village was included for the study.

Written Permission was obtained from ITDA Additional District Medical& Health Officer (DM&HO) for conducting the study and taking help from the PHC staff. Help of Local Auxiliary Nurse Midwife (ANM) and Accredited Social Health Activist (ASHA) was taken for identification, initial contact and for translation of conversation where ever required. Tribal women in reproductive age group (15-49 years) available at home at the time of study and those who were willing to participate were included in the study. Pregnant and

lactating women, and those women with chronic diseases were excluded from study.

Data was collected using two formats. 1) Information regarding dietary habits was obtained using food frequency questionnaire (FFQ). As the dietary habits of tribal people are not fixed every day, frequency of consumption of various types of foods by the tribal women in the previous week was obtained using FFQ considering one week as one dietary cycle. Food consumed by the study participants were classified as different groups, such as Cereals, Millets, Oils, Pulses, Vegetables, Green Leafy vegetables, Milk & Milk products, Flesh food, Eggs, Fruits & Nuts, Homemade preserved foods, Packed foods, Alcohol. Homemade foods made up of fruits or meat such as pickles & dried meat were considered as preserved foods and ready to eat food items such as biscuits, packed snacks etc. purchased from the market were considered as packed foods. 2) Information on complete diet history of the study participants was obtained using a modified 24-hour dietary recall questionnaire for the previous day, developed by Public Health Foundation of India. Details of all the food items consumed at various intervals during the day were noted. The amount of food intake of each item was calculated with the help of standard measuring units- 5ml, 15 ml spoons, 50gms, 100gms, 150gms, 200gms, 250gms bowls. The measuring units were shown to the study participants and were asked to tell about dietary intake in terms of these vessels. The nutritive values of all consumed foods were added to calculate the total intake of energy and macro nutrients by the study participants using dietsoft software. As per Indian Council of Medical Research (ICMR) guidelines recommended daily allowance (RDA)for energy intake for an Indian reference women is 2230Kcal .Consumption of energy above 80% of RDA(>-2SD) was considered as normal, and consumption below 80% of RDA (<-2SD) was considered as deficient intake. MS Excel 2007, SPSS trailversion-21 and Dietsoft software's were used for statistical analysis.

Results

Women in the study belong to three Prime Tribe Group (PTG) tribes (Khonds, Gadabas & Porijas) & six non-PTG tribes. Table 1 shows that 11.1% of the study participants were in the age group of 15 to 20 yrs, 64% were in the age of 21–30 years and 19.6% in 31–40 years age. About 60% were illiterates. Around 12.9% were educated up to graduation or above. Twenty eight percent women were unemployed/ remained at home where as 72% were working. Out of the 225 women, 41.3% of women were below poverty line. Majority (78.7%) belong to Hindu religion remaining 21.3% belong to Christianity.

Table 2 and 3 depicts the frequency of food intake, dietary practices of Tribal women in ITDA Paderu division based on food frequency questionnaire and 24 hour Recall method. Rice is the most common staple food and Ambali is the most common breakfast. Top five foods providing energy to the women were Rice, Ambali, Vegetables, Tea with Milk and Dal. Table 2 shows that Majority of the women consumed rice (99.1%) and ragi (75.6%) every day. Consumption of wheat was almost negligible. Red gram is the commonly consumed dal among tribal women. Almost all the women (96.9%) were consuming red gram. Regarding the frequency, 46.2% women were consuming red gram at least three days in a week. Comparatively consumption of black gram was less. About two thirds of the women (76%) had not consumed black gram in the previous week. Only 24% of women were consuming black gram. Vegetables were consumed at least three times in a week by 83.5% of women & Green leafy vegetables by 66.2% of women. Consumption of saturated oils such a palm oil was observed among 63.9% as compared to other oils (36.1%).

Around two thirds (64.4%) of the women were consuming flesh food once in a week and two fifths (41.3%) were consuming eggs once in a week. Only 20% of the women were consuming more than thrice in a week. One third of the women (44.9%) not consumed milk. About half of the women (52.5%) were consuming fruits at least three times in a week. Around (63.1%) of the study population never consumed preserved foods and one tenth (11%) were consuming packed foods thrice in a week.

Regarding the practices of sharing the meal together, Majority (89%) of tribal women were eating food along with other family members where as 11% of women were eating food after other family members had finished. Alcohol consumption was observed in 13.3% of tribal women.

Regarding the nutrient intake it is observed that the Mean Calorie intake of energy by tribal women was 1931 Kcal per day. Fig. 1 shows that, in the present study, average consumption of Carbohydrates per each day was 367.14 gm and it accounts for 76.6% of total energy consumption. Protein intake was 49.83 gm and it was equal to 10.5% of total energy and fat consumption was 27.67 gm and it accounts for 12.9% of total energy.

Recommended daily allowance of energy for a moderate working women is 2230 Kcal and 80% of RDA is 1784 Kcal. Fig. 2 shows that, 37.8% of women were consuming less than 80% RDA of energy i.e., 1784 Kcal per day. Recommended daily intake for an Indian reference women of 55 kg weight is 55 grams per day and 80% RDA is 44 grams per day. Figure no.2 shows that, 40.9% of women were consuming protein less than 80% RDA i.e., 44 grams per day.

Table 1: Socio demographic and economic profile of tribal women

Age groups	Number (%) n=225
15-20 years	25 (11.1)
21-30 years	144 (64)
31-40 years	44 (19.6)
41-49 years	12 (5.3)
Education	Number (%) n=225
Illiterate	135 (60)
Up to High school	47 (20.9)
Intermediate / Post High school diploma	14 (6.2)
Graduate & above	29 (12.9)
Occupation	Number (%) n=225
Unemployed / Housewives	63 (28)
Working women	162 (72)
Economic status	Number (%) n=225
Above Poverty Line	132 (58.7)
Below Poverty Line	93 (41.3)
Religion	Number (%) n=225
Hinduism	177 (78.7)
Christianity	48 (21.3)

Table 2: Frequency of Consumption of various foods in one week duration

Type of food	Not Consumed (%)	Once (%)	Twice (%)	Thrice (%)	>Thrice (%)
Rice	0(0)	0(0)	0(0)	0(0)	100(100)
Ragi	0(0)	0(0)	0(0)	0(0)	100(100)
Red Gram	7 (3.1)	34(15.1)	80(35.6)	66(29.3)	38(16.9)
Black Gram	171 (76)	27(12)	16(7.1)	5(2.2)	6(2.7)
Vegetables	2 (1.0)	10(4.4)	25(11.1)	84(37.3)	104(46.2)
Green Leafy Vegetables	9 (4)	18(8)	49(21.8)	98(43.6)	51(22.6)
Flesh	29 (12.9)	145(64.4)	41(18.2)	10(4.5)	0(0)
Egg	48 (21.3)	93(41.3)	49(21.8)	29(12.9)	6(2.7)
Milk	101 (44.9)	22(9.8)	36(16)	21(9.3)	45(20)
Fruits	27 (12)	30(13.3)	50(22.2)	54(24)	64(28.5)
Preserved Foods	142 (63.1)	35(15.6)	9(4)	16(7.1)	23(10.2)
Packed foods	84 (37.3)	54(24)	45(20)	25(11.1)	17(7.6)
Oils (palm oil)	0(0)	0(0)	0(0)	0(0)	144(63.9)
Oils (other oils)	0(0)	0(0)	0(0)	0(0)	81(36.1))

Table 3: Dietary intake of Tribal women based on 24 hour Recall method

Items	Measuring Units	Total number of Servings	Energy in Kilo calories
Rice	250 gm	454	192950
Ambali	500 ml	264	116335
Vegetables	100 gm	204	34680
Green Leafy Vegetables	150 gm	58	5800
Dal	50 gm	165	16500
Chicken	150 gm	38	9120

Eggs	1 egg	17	1530
Curd	100 gm	29	3190
Fruits	100 gm	66	5940
Breakfast	3 Idlies	53	7950
Tea without milk	120 ml	136	5440
Tea with Milk	120 ml	66	21120
Snacks	3 Biscuits	57	11400
Pickles	30 gm	11	1320
Pea Nuts	100 gm	10	900
Lemon Juice	200 ml	5	300

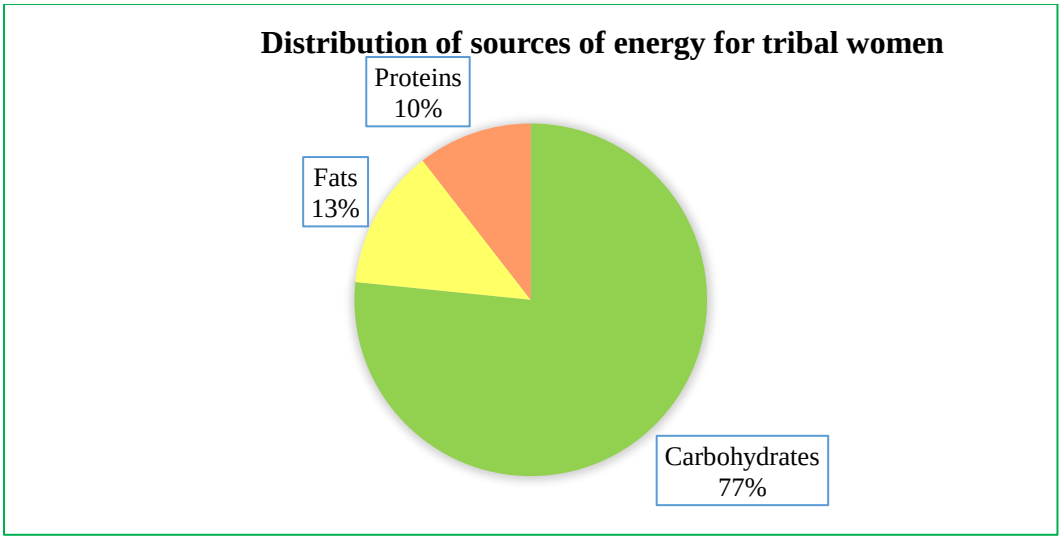

Fig. 1: Distribution of sources of energy for study women

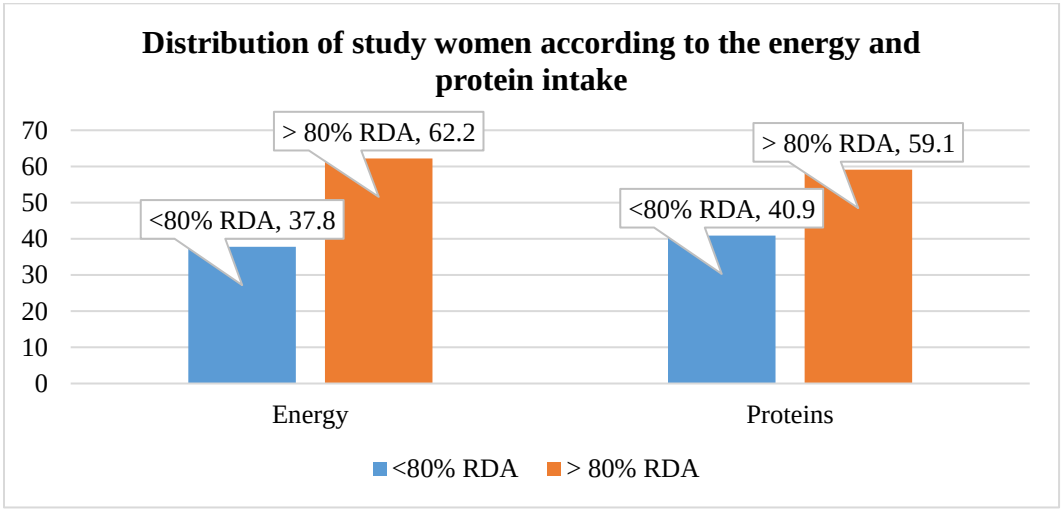

Fig. 2: Distribution of study women according to the energy and protein intake

Discussion

In this study, it was observed that rice and ragi were the major cereals consumed by tribal women. Both rice as well as ragi are cultivated by these tribals in their fields and that might be the reason for such consumption. This finding is consistent with the results of other studies conducted among tribal people.[5,6,7,8,9,10,11] Red gram and black gram were the preferred pulses. Black gram intake was comparatively less, only 32% of women were consuming Black gram. Almost all the women (96.9%) were consuming Red gram in the form of *dal* and *pappucharu*. However the frequency of consumption of pulses was only once or twice in a week. This finding is in concurrence with the results of some other studies.[7,8,9,12] The consumption of pulses is very low in both the seasons as reported by ITDA in 1993.[10] Consumption of saturated oils such as palm

oil was more among the women as compared to other refined oils may be because palmoline oil is marketed at a cheaper price in comparison to refined alternatives.

Some of the practices such as consumption of leafy and other vegetables was found to be good. Majority of the women (85.6%) were consuming vegetables including green leafy (66.7%) at least three times in a week. Regarding fruits, locally available seasonal fruits such as jack fruit and mangoes were consumed more as they were accessible to these tribal women. It was observed that, about half of the women (52.4%) were consuming fruits at least three times in a week. Similar results are reported by Ray SK et al., Agrahar - Murugkar D et al., Qamra S R et al., in their studies in different settings.[8,12,13]

Flesh foods such as red meat, poultry and eggs was less frequently consumed as compared to the vegetables. The frequency was once a week usually after the shandy days as the local shandies were the common purchasing points for these foods. Red meat was consumed by 64.4% of the women in a week where as 41.3% of women were consuming eggs once in a week. Consumption of fish/seafood was not common. In one of the villages called Gammeli, consumption of fish was a taboo as the villagers feel that the local deity protects these fishes.

Milking of cow is a taboo among tribal population and consumption of milk is comparatively less by these tribal women as compared with other food groups. In the present study it is observed that 44.9% of the women had never consumed milk. Similar findings have been reported by other studies.[6,7,8,9,12,13,14,15]

Tribals have a traditional practice of preserving foods such as meat and fruits for consumption at later days especially for rainy season when hunting and forest activities are not feasible. However in the recent times the traditional way of consuming such preserved foods is not so commonly seen among these tribal women. In our study, 58.2% of the women never consumed homemade preserved foods.

Alcohol consumption is common in tribal communities among both men and women. The alcohol consumed by them is usually locally prepared liquor called Toddy – 'Jeeluga Kallu'. Among the study population less number of women (13.3%) were consuming alcohol regularly which may be due to changing cultural patterns and influence of education. Rest of the women were consuming only during festival days. Kusuma YS et al., also reported women have reported to consume only on festive occasions.[14]

In our study the mean intake of calories by tribal women was found to be 1930 Kcal which is 86.5% of the recommended allowance with a mean deficiency of 13%. These findings are in concurrence with Kupputhai U et al., who reported a 20% deficiency.[16] Various studies on all age groups of tribal population including women revealed that the calorie deficiency ranged between 38 to 50.[6,9,17] Mean intake of carbohydrates in tribal women was 367 gm per day which provides 1468 K cal of energy. This was equal to 76% of total energy consumption which is as per the recommendation.

In our study mean consumption of protein by tribal women was 49.8 gm per day. The daily requirement of Protein is 1 gm per Kg body weight. It is recommended that the calorie contribution from protein should be at least 10% of total energy. If the total energy intake is 1930 K cal then a minimum of 193 k cal should be contributed by proteins. As one gm of protein provides 4 K cal of energy, for 193 K cal 48.25 gm protein consumption per day would meet the requirement. In our study it was observed that mean protein intake was 49.8gm per day which indicates that the protein intake satisfactory. An adequate intake of protein is also reported Agrahar-Murugkar D et al., and Laxmaiah et al., (2007).[6,18] However Kupputhai U et al., reported that there was 30-40% deficiency in protein intake.[16]

In our study fat consumption by tribal women was 27.6 gm, the main source being oil and flesh food, which provides 248 K cal. This was equal to 12.9% of total energy intake. As per recommendation Fats should contribute to 10-30% of total energy intake. In our study although the fat consumption is adequate it is in the lower end of the range. More over the fat consumed was more in the form of saturated oil compared to refined oil which may adversely affect the health of these women. However in contrast to this findings of Laxmaiah et al., (2007) who reported a 47% of total fat deficit in intake by tribal women in Khammam district.[6]

Conclusions

Dietary habits among tribal women were deficient of pulses and un-saturated oils. Presence of food taboos limiting their consumption of milk. One third of women were consuming less than 80% RDA of energy i.e., 1784 Kcal per day and two fifths of women were consuming protein less than 80% RDA i.e., 44 grams per day. It indicates the need of nutritional education to avoid taboos and improve health.

Recommendations

Education focussing on food taboos and misconceptions on various food groups among the women and families should be taken up by the Health Workers/ ASHAs.

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