

A comparative study on nutritional status of Bharno block and Gumla block adult tribal women in rural areas of Gumla district (Jharkhand)

SHEETH TOPPO

A comparative study was done to know the nutritional status of Bharno block and Gumla block adult tribal women of all income group of rural areas of Gumla district Jharkhand. Family monthly income, education, size, meal pattern, custom and traditions showed positive influence on nutritional status of people of all age groups in both tribal population. The subjects from Gumla block tribal group showed lower intake of protein and calorie as compared to Bharno block tribal group but both the groups showed lower intake of protein, fat, carbohydrate and calorie when compared with ICMR recommended allowance. The prevalence of nutritional deficiency diseases found among these people indicated that the food consumed by them have poor quality or inadequate to meet their growing needs. The study revealed that there is a direct correlation exists between the adequacy of diet and socio-economic status. Diet and nutrition are important factors in the promotion and maintenance of good health. Health and nutritional status of an individual depends on the food they eat. The components of the diet must be chosen judiciously to provide all the nutrients needed in adequate amounts and proportions. A normal balanced diet must include daily foods from the various food groups in sufficient amounts to meet the needs of an individual. Selection of foods from the different food groups also results in variety in the diet, which not only ensures nutritional adequacy but also increases food acceptability. Food habits are an important part of our diet which affects the amount and type of food consumed and thus the nutritional status of the women. The diets of both the group tribal women were mainly based on cereals and deficient in vegetables and fruits. The low intake of these protective foods resulted in nutritional disorders. The clinical signs of malnutrition, anaemia and vitamin B-complex deficiencies were observed. Promoting healthy diets and lifestyles to reduce the burden of malnutrition and non-communicable diseases requires a multisectorial approach. The health and nutritional status of rural women who form the vulnerable group of India's population is far from satisfactory. In the rural areas of Gumla district adult tribal women, they work as homemakers, farmers, food providers, fuel gatherers and animal feeders. Keeping this in mind, the present study has been undertaken. The over all result of this study is that the nutritional status of the womens of both the block area is not so good. It is moderate and some nutritional correction is required. Even having good income, tribal people used to practice their old eating habits and old cooking methods. Thus, they must be provided with proper nutrition education programme and educate them about proper health, hygiene and improved cooking practices so that they can develop themselves and maintain their health in good condition.

Key Words : Comparative, Nutritional status, Rural areas, Adult tribal women, RDA (Recommended dietary allowance)

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● AUTHOR FOR CORRESPONDENCE ●

SHEETH TOPPO, Department of Home Science, Ranchi University, RANCHI (JHARKHAND) INDIA

INTRODUCTION

As we know, good nutrition is the most important

factor affecting the health and well being of the people and we also know poor nutrition is responsible for high mortality rate, low birth weight babies, increased susceptibility to infection and nutritional deficiency diseases. Therefore, it is necessary to maintain good nutritional status of each individual as well as the community. In any attempt to improve the nutritional status of the population, it is essential to know the food habits, quality and quantity of food consumed by different segment, meal pattern, customs and beliefs about food in particular community. Such information will also be useful in correcting the dietary deficiencies with the observe symptoms of diseases in a given group of population. The aim of the present work was to observe the nutritional status of Bharno block and Gumla block adult tribal women. In this work various factors observed which influenced the nutritional status of these people were food habits, economic status, literacy level, traditional beliefs and customs, size of the family, food availability etc and it is done by knowing the actual quantity and type of food consumed by each member of the family and also by observing the sign and symptoms of deficiency diseases among them (Kiran *et al.*, 2006).

The tribal population is recognised as socially and economically valuable. Their life style and food habits are different from that of their rural neighbours. They depend on minor forest produce are employed is manual labour and may not have income. Their food consumption pattern is depended on the vagaries of nature and varies from extreme depration to high intakes (Dass, 2004).

Low dietary intake because of poverty and low purchasing power high prevalence of infection because of poor access to safe drinking water, sanitation and health care (Clay, 1997) poor utilisation of available facilities due to low literacy and lack of awareness. (Maxwell, 1996).

Nutritional status :

According to the report of WHO nutritional status is a positive health indicator. There are many ways to measure nutritional status. Nutritional status refers to the state of nutrition of an individual or a Specific group. The term may refer to specific nutrient (like zinc) or to a class of nutrients. (As in the assessment of protein energy malnutrition) and may apply to either deficiency or excess (Jelliffe, 1966). Nutritional status refers to the health of an individual as it is affected by the intake and utilization

of nutrients. According to Nelson (1975) the term nutritional status applied to all states of optimum, over and under nutrition, assessed in term of growth and development of the individual that is increase in size and maturation of function, such as physical, intellectual and emotional. Nutritional status was defined by Chirstakis (1973) as the “Health condition of an individual as influenced by his intake and utilization of nutrients, determined from the correlation of information obtained from physical, biochemical, clinical and dietary studies. (Robinson *et al.*, 1982).

Nutritional status assessment :

Williams (1988) quoted the term “assessment” comes from a Latin word “assessare” which means “to sit by” or “to watch over” nutritional assessment refers to the process of collecting all pertinent information about nutritional status of a person or a group of persons. According to Hooley (1980), nutritional assessment is a procedure by which several types of information (biochemical, anthropometric, clinical and dietary) are collected and compared to given standards representing normal nutriture. The principal aim of the nutritional assessment of a community is “to map out the magnitude and geographical distribution of malnutrition as public health problem, to discover and to analyze the ecological factors that are responsible and to plan and put into effect measures not only for the control and eradication of malnutrition but also subsequent maintenance of good nutrition” (Jelliffe, 1966). Assessment of nutritional status of community is one of the first steps in the formulation of any public health strategy to combat malnutrition. The principal aim of such an assessment is to determine the type, magnitude and distribution of malnutrition in different geographic areas, to identify at risk groups and to determine the contributory factors (Jelliffe, 1966). According to Mitchell (1997), nutrition assessment is a process or series of measurements that defines nutritional status. It is based not on a single determination but on a group or series of measurements and observations that provide an estimate of nutritional status. Nutritional assessment system utilizes a variety of methods to characterize each stage in the development of nutritional deficiency state. The methods are based on a series of dietary, laboratory, anthropometric and clinical measurements, used either alone or more effectively, in combination (Gibson, 1990) Wellman (1978)

accepted that a true assessment of nutritional status requires collection and correlation of four types of data *i.e.* anthropometry, biochemical, clinical and diet survey.

Classification of activists based on occupation	
Activity	Female
Sedentary	Teacher, tailor, executive, housewife, computer professional
Moderate	Servant maid, coolie, basketmaker, agricultural labour, beedi maker
Heavy	Stone cutter

Source : Modified. Gopalan *et al.* (1991)

Nutritional requirement for Adults			
Nutrients you need from food:-			
Sr. No.	What?	Why?	Which food?
1.	Carbohydrates	To provide energy	Pasta, bread, rice, potatoes
2.	Proteins	Growht and repair	Meat, fish, bears
3.	Fats	Energy insulation	Dairy foods, plant- oils, meat, fish
4.	Vitamins	To help cells work	Fruits, vegetables, eggs, meat, fish.
5.	Minerals	To help cell work	Dairy foods, meat, fish, nuts, bears
6.	Fibre	To help in intestines work	Fruit vegetables.
7.	Water	Essential for life	All food and drinks

Kim bryan *et al.* (2011)

Balanced diets (The quantities are given in grams)			
Food	Adult women		
	Sedentary work	Moderate work	Heavy work
Cereals	410	440	575
Pulses	40	45	50
Leafy vegetables	100	100	50
Other vegetables	40	40	100
Roots and tubers	500	50	60
Milk	100	150	200
Oil and fat	20	25	40
Sugar or jaggery	20	20	40

Park (2007)

Low cost balanced diet :

Diets of poor can be improved nutritionally by 1. replacing a single cereal with mixed cereals, one of them being a millet, 2. inclusion of at least 50 g. green leafy

Recommended dietary allowances for an adult woman			
Nutrient	Sedentary	Moderate	Heavy
Energy Kcal.	1875	2200	2925
Protein g	50	25	50
Calcium mg.	400	50	400
Iron mg	30	400	30
Vitamin A			
Retinol mcg	600	600	600
B carotene mcg	2400	2400	2400
Thiamin mg.	0.9	1.1	1.2
Riboflavin mg	1.1	1.3	1.5
Niacin mg	1.2	14	16
Niacin mg	2	2	2
Vitamin C mg	40	40	40
Folic acid mcg	100	100	100
Vitamin B ₁₂ mcg	1	1	1

Source : Sri Lakshmi (2007) Dietetics. New Age International (P) Limited Publishers. New Delhi (Pg. 16)

New nutritional guidelines		
Nutrient	1998	New consensus
Carbohydrates	60-70% of total calorie intake	50-60% of total calorie intake
Proteins	10-12% of total calorie intake	10-15% of total calorie intake
Fats	15-30 % of total calorie intake	Less than 30% of total calorie intake
Saturated fatty acids	Not specified	Less than 1% of total calorie intake
Essential polyunsaturated fatty acids	Not specified	5 to 8% of total calorie intake
Mono unsaturated fatty acids	Not specified	10-15 % of total calorie intake
Salt	Less than 8 g per day	Less than 5 g per day
Sugar	20-25% per day	Less than 10% of total calorie intake
Water	1 lit per day	1.5 lit per day
Food choices eating out	Not specified	Healthy snack options avoid high calorie drinks opt for butter milk, coconut water and fresh lime water
Meal portions	Not mentioned	Small, frequent meals
Alcohol	Not to be encouraged	Small quantities not to be discouraged

Source : National Institute of Nutrition, Hyderabad, 2011(Pg.25) Kurukshetra—August-2012. Vol.60. No10

vegetables to improve the intake of vitamin A, iron and calcium, 3. inclusion of inexpensive yellow fruits like papaya or mango and greens to increase vitamin A and C intake, 4. inclusion of at least 150 ml, of milk improves, intakes of riboflavin, calcium besides improving protein quality of the diet. 5. Another extra 10 g of oil increase

energy and essential fatty acid intake (Sri Lakshmi, 2005).

Aims and objectives :

- To find out the anthropometric measurements consisting of height weight and BMI.
- To determine and compare the nutrient in take with the Re commended dietary allowances (RDA).
- To examine the clinical signs and symptoms of nutritional deficiencies.

METHODOLOGY

Rural Gumla district area was selected purposively keeping in view that large concentration of rural tribal people. The reason for selecting this particular district was that no any systematic study on the food pattern of rural tribal women. A number of 300 women were selected for the study of age group 20 to 45 years. The study was conducted on rural areas of Gumla and Bharno block of Gumla district. The study was randomly selected from the all income group. The food consumption of the subjects was recorded by 24 hour recall method for 3 consecutive days. From the actual consumption of foods daily by the respondents the energy, protein, iron, calcium, β carotene and ascorbic acid content was calculated using food composition tables given by NIN. Body mass index was also called quetlet index.

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height}^2 \text{ (m)}}$$

Body mass index was calculated using the formula (Sri Lakshmi, 2007). The results were statically analyzed. The morbidity symptoms and the information regarding the illness suffered by the women since past 3 months were noted down. All the women were clinically examined using the ICMR schedule. The presence or absence of the clinically deficiency symptoms was recorded.

OBSERVATIONS AND ASSESSMENT

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Assessment and comparison of nutritional status of Gumla block women and Bharno block women (Normal women 300) :

To assess their nutritional status and diet pattern of

tribal women of both The block, a predesigned self-reported questionnaire was given to the respon dent the study purposes and the questions were explained to the respondents. The questionnaire was having questions related to personal and socio demographic characteristics of women, their daily life problems their diet pattern, preference unhealthy habit and about symptoms of deficiency diseases. As in my survey area large no of women are illiterate so I myself fill the questionnaire by asking them the questions related the problems. After filling the questionnaire anthropometric measurements of the respondent were taken, so that their nutritional status can be assessed properly. The results of the study are as following.

Comment :

From the study the mean height of Gumla block women was found to be 147.5 cm and the mean height Bharno block women was found to be 145.2 cm. The height of Gumla block was slightly higher than the Bharno block women. But both of the values are less then the average Indian height of the women. Generally it is observed that body built is determined by the nutritional uptake in childhood if some body is not taken proper diet its effect will reflected in later stages.

Comment :

The average weight of the both the block of tribal women was found to be lower than the average ICMR Recommended allowances. It is found that the women from both the groups were under weight. This is due to the inadequate consumption of nutrient in their diet (balanced diet) affected the total weight of the women from both the groups.

Comment :

The mean intake of BMI of Gumla block and Bharno block women was lower then the ICMR R.D.A. Generally it is observed that the body built is determine by the nutritional uptake in childhood. If some body is not taken proper diet its effect will be reflected in later stages.

Height and weight standard was taken from Nutrition and Dietetics Book, Joshi (2007). BMI standard was take from text book of Human Nutrition second Edition Bamji *et al.* (2003). The average weight of the oraon women ranged from (35 to 55 kg) where the range of height from (140-155cm). The results showed that the

rural women were of less height, weight and BMI than the normal value.

The data indicate that the mean energy intake by Bharno block women is slightly higher than the Gumla block women. From the dietary records is found that the calorie needs are met by sufficient intake of cereals in their diet. T test showed the difference between the two mean. The mean intake of Gumla block women was found to be 38.96 which is lower than the mean intake of Bharno block women. It is found that the average intake of protein from both the groups was much below the ICMR RDA. This is due to the dietary record of the tribal community, they consumed very little quantity of pulses, meat, fish, chicken etc. and the consumption of milk and milk products were found to be lacking in these communities. From the data, the mean fat intake by Gumla block women was 11.63 g which is little slightly higher than the Bharno block women *i.e.* 10.9 g (mean). But it is much below the RDA. Tribals mainly consume invisible fats But the consumption of visible fat was very low like meat fish, eggs etc. are found to be low. The fat it also gives energy to the body. During growth, pregnancy and lactation essential fatty acid requirement are relatively higher. To obtain this level visible fat intake should be 15-25g/day in terms of oils like ground nut. This amount of visible fat would not only provide the required amount of EFA, but also helps in absorption of fat soluble vitamins. The mean intake of calcium by Gumla block women was 305.5 which was slightly higher than the mean intake of calcium by Bharno block women was 288.76, are slightly differs but it is much below the RDA. The diet record showed the less consumption of pulses and legumes, milk, curd, skimmed milk, cheese as calcium is a major material element of the body. It's helps in the formation of bones and teeth, coagulation of blood, contraction of muscles, milk production. In short the calcium can controls many life processes ranging from muscle contraction to cell division deficiency leads to rickets in children and osteomalacia in adults. The data indicated that the mean iron intake by Gumla block women was 21.6 which is slightly higher than the Bharno block women *i.e.* 20.5. But it is much lower than the ICMR RDA. Because tribal women are taking more number of non haem iron, they are of vegetables origin. So they are taking very less number of haem iron. Good sources of haem iron are liver, meat, poultry and than non- haem iron. Iron deficiency leads to nutritional anaemia. It is

which is not a disease entity. It is a rather a syndrome caused by malnutrition.

The mean intake of B carotene of Gumla block women was 1850.33 which is slightly higher than the mean intake of Bharno block women is 1750. But it is much below the ICMR RDA. The results revealed the consumption of non-vegetarian foods are lower in tribal group. Foods rich in carotene are fat of dairy products and egg yolk and other important sources are liver, kidney and fish. Deficiency symptoms of carotene are increased susceptibility to microbial in, xerophthalmia and other eye disorders, loss of appetite, weight and sterility. The mean intake of ascorbic acid of Gumla block women was 27.5 which is slightly higher than the mean intake of Bharno block women *i.e.* 25.5. But it is lower than the ICMR RDA, from the dietary record of tribal women population it is seen that the intake of fruits such as oranges, pineapple lemon are lesser. Because tribal used to consume only seasonal fruits vitamin C can be easily oxidized, here the handling, preparation, cooking and processing of any food source should be considered in evaluating the nutritional constitution of of this unstable vitamins so they must be provided with proper nutrition education and improved cooking practice so that they can develop themselves and maintain the health in good condition. Because deficiency of ascorbic acid leads to shooting joint pains, anaemia, poor wound healing and scurvy.

Thus the diet of rural tribal women was monotonous and lacking in variety. They were more concerned about the quantity than quality of the diet. The common menu in morning breakfast was staple with gruel or vegetables. In lunch staple with gruel or vegetables and in dinner staple with vegetables some times they are taking staple with flesh food but these per cent is very less. In staple food they are mainly taking parboiled rice.

The adequacy of nutrients was below the RDA, s for all nutrients. The low intake was due to insufficient intake of balanced diet like sprouts, pulses, dairy products, meat, fish, egg, etc. Poverty and illiteracy plays an important role of not taking balanced diet which indicates poor nutritional status of Oraon tribal women.

Summary and conclusion :

A comparative study was done to observe the nutritional status of Bharno block and Gumla block adult tribal women of all income group. The assessment was

Table 1 : Anthropometric measurements (Shows the comparison of height of Gumla block women and Bharno block women)

Group	Range (in cm)	Mean (in cm)	Standard deviation	RDA in cm	Variation from RDA	T test	Result
Gumla block women	140-155	147.5	4.062	152	4.5	0.4239	P < 0.05
Bharno block women	140-151	145.2	3.249	152	6.8		

Comparison of weight of Gumla block and Bharno block women

Group	Range (in cm)	Mean (in cm)	Standard deviation	RDA in cm	Variation from RDA	T test	Result
Gumla block women	35-55	44.9	11.0758	48.5	3.6	0.9043	P<0.05
Bharno block women	35-50	42.1	3.8087	48.5	6.4		

Comparison of Gumla block and Bharno block. according (BMI) body mass index

Group	Range (in cm)	Mean (in cm)	Standard deviation	RDA in cm	Variation from RDA	T test	Result
Gumla block women	17-22	16.66	±4.69	22.5	5.84	0.14	P<0.05
Bharno block women	17-22	16.56	±2.23	22.5	5.94		

Comparison of Gumla block and Bharno block women according to their height, weight and BMI

Group of respondents	No.	Height (cm)	Weight	BMI (kg/m ²)
Gumla block women	150	147.5 (4.06)	44.9 (11.07)	6.66 (± 4.69)
Bharno block women	150	145.2 (3.24)	42.1 (3.80)	16.56 (± 8.66)

Sr. No.	Variables	T value	df	Level of significance
1.	Height	0.4239	298	P < 0.05
2.	Weight	0.9043	298	P < 0.05
3.	BMI	0.17	298	P < 0.05

done through anthropometrics, clinical and dietary indices as well as National standard laid down by ICMR. A total number of 300 samples were selected for the study, 150 from each group *i.e.*, Bharno block and Gumla block women 24 hrs recall questionnaire schedule was used by interviewing the head of the family or any other adult member of the family.

The questionnaire consisted of background information of the subject, meal pattern, the diet record, anthropometrics data the clinical record of the subject.

The background information was obtained regarding the occupation, age literacy, family size etc. the second part of the questionnaire included the meal pattern of the subject, food intake of the day and the typical menu of each meal taken. The third part deals with the amount of food consumed and this can be done by the using standard sized katori, cups or glass. Lastly the questionnaire consists of anthropometrics and clinical record. Average intake of energy, protein, fat, iron, calcium, β carotene and ascorbic acid of each individual

were calculated and the analysis of data consisted of range, mean, standard deviation, differences and 't' – test to find out the significance of differences between the two groups.

The study showed that malnutrition is still a leading problem and it is very much influenced by income of the family, education level, family size and certain beliefs and traditions of the society. Results showed that the both the group diet of rural oraoon adult tribal women was monotonous and lacking in variety. They were more concerned about the Quantity then quality of the diet. Calculation of nutrient showed that mean daily energy in take was slightly adequate as compared to the (RDA) but the mean daily intake of protein, fat, Calcium, iron, β carotene and ascorbic acid was grossly deficient in comparison to ICMR RDA. The low intake of these protective foods results in nutritional disorders. Thus the clinical Signs of malnutrition, anemia and vitamin B complex deficiency were observed. Promoting healthy life style and diets to reduce the burden of malnutrition

Table 2 : Mean intake nutrients by different group of respondents

Nutrients	Mean intake by Gumla block	Mean intake by Bharno block	Recommended level by (ICMR)
Calories (Kcal)	2179.6 (\pm 184.22)	2092.23 (\pm 34.14)	2225
Protein (g)	38.96 (\pm 4.09)	41.23 (\pm 4.03)	50
Fat (g)	11.63 (\pm 1.82)	10.2 (\pm 1.08)	20
Iron (mg)	21.6 (\pm 1.14)	20.5 (\pm 1.46)	30
Calcium (mg)	305.5 (\pm 3.26)	288.76 (\pm 7.12)	400
β carotene (mg)	1850.33 (\pm 81.85)	1750 (\pm 16.32)	2400
Ascorbic acid (mg)	27.5 (\pm 1.45)	25.5 (\pm 1.63)	40

Value Shows Mean and SD

Gumla block women vs Bharno block women

Variable	T value	DF	Level of significance
Calories	1.833	298	P < 0.05
Protein	4.836	298	P < 0.05
Fat	4.229	298	P < 0.05
Iron	6.875	298	P < 0.05
Calcium	26.197	298	P < 0.05
β carotene	14.72	298	P < 0.05
Ascorbic acid	11.76	298	P < 0.05

ICMR RDA (2007)

and non-communicable disease requires a multisectoral approach.

The over all result of this study is that the nutritional status of the tribals women of both the block area is not so good. It is moderate and some nutritional correction is required. Even having good income, tribal people used to practice their old eating habits and old cooking methods.

Thus they must be provided with proper nutrition education programme and educate them about proper health, hygiene and improved cooking practices so that they can develop themselves and maintain their health in good condition.

Suggestions and recommendations :

Tribal community is considered as one of the most backward section of the nation and is subjected to various levels of socio-economic exploitations. Owing to their economic backwardness and ignorance, they are said to suffer from various forms of nutritional and health related disorders due to inefficient knowledge about nutrition.

Study of the nutritional profile of these sections of society is of immense importance. In the above context it was proposed to carry out a comprehensive study on the knowledge, attitude, health care and dietary practices among the tribal women of Gumla district, one of the tribal dominated area. The study will be helpful for

government and private agencies to take appropriate measures to solve the health problem and also to know the changing food pattern + dietary pattern + nutritional knowledge. Because the nutritional status of an individual is often the result of many interrelated factors. It is influenced by the adequacy of food intake in terms of quantity and quality and also by the physical health of an individual.

The research into these aspects of tribal life is an essential pre-requisite for effective planning. Since very low level of information is available on food pattern of tribal women, the present study will help in determining the nutritional status in Jharkhand state and making the comparison with other states.

- A multisectoral approach to combat malnutrition is essential and efforts to increase female literacy.
- Women need to be educated on the basic health education, sanitation and personal hygiene with a aim to improve health hygiene and health status of the family.
- To launch movement against the belief in witchcraft and sorcery.
- There is lack of drainage system. So dirty water is not able to pass nicely and it is accumulated in one place. So in village, there should be a provision of good drainage system.
- Considering the poor quality of the diets cultivation and consumption of fruits and vegetables should be

encouraged.

– More in depth studies on the availability of food, nutrient analysis and preservation techniques are recommended to meet the food security need for the community.

– Repeated nutrition education programme should be conducted to bring about a permanent adoption of new concepts. Further proper aids for nutrition education should be provided in the anganwadis.

– Adult literacy centers should be opened in all the tribal hamlets without adhering to the norm of minimum size of the centers and by providing all minimum facilities required such teaching, learning materials, lighting, equipment etc.

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