

Assessment of Nutritional Status among the Lodha Woman in village of Paschim Medinipur: An empirical statistical analysis

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Abstract

Tribes constitute about 10% of the total Indian population. They are found in most parts of the country and are generally economically deprived. Tribe is a social group speaking a distinctive language or dialect and possessing a distinctive culture, mainly living in hilly areas and forest areas. The Lodhas are treated as one of the denitrified communities by the Central Government and now treated as a Particularly Vulnerable Tribal Groups in West Bengal. In West Bengal, Lodhas are mainly concentrated in the districts of Paschim (West) Medinipur and Jhargram. In the pre-Independence period they were treated as a Criminal Tribe till the revocation of the Criminal Tribes Act in 1952. Nutrition is the science that deals with the digestion, absorption and metabolism of food, i.e. the utilization of food in the body. It may be defined as the science that interprets the relationship of foods to the functioning of living organism. It includes the intake of food, liberation of energy, elimination of wastes and all the processes of synthesis essential for maintenance,

growth and reproduction. Anthropometric measurement helps in the assessment of nutritional status and physical growth. Health and nutrition, particularly in the tribal societies, is intimately connected with forest. It has been reported in various studies that the tribals who are living in remote areas have a better health status and more balanced food than those living in less remote and depleted forest areas. The purpose of this study was to evaluate the nutritional status of Lodha women. This study design was a questionnaire-based cross-sectional study. The study revealed that dietary intake of tribal women is poor than those of their adult male counterpart. The study conducted 71 Lodha woman in a remote village of Paschim Medinipur. According to Kuppur's swami Scale the socio-economic status is Upper Lower (IV) class. The prevalence of thinness among the study women was 1.41% severe thinness, 8.45% moderate thinness, 43.66% mild thinness. The study conclude that The Lodhas are more back warded tribal populations than other tribal group and they are also socio-economically back warded compared to other population groups. The

average intake of all nutrients was lower than the ICMR standards. So, in connection with anthropometric variable of tribal women also found lower than the ICMR standards.

Keywords: Lodhas. ICMR standards, health, nutrition

Introduction

In Greek 'Tribe meant their geographical division.' Tribe is a social group speaking a distinctive language or dialect and possessing a distinctive culture, mainly living in hilly areas and forest areas. In the remote past, they were hunter and food gatherers. 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. A member of a ST can profess any religion.

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 (Singh and Rajyalakshmi, 1993; Mishra et al., 2002; Taneja and Saxena, 1998; Murugesan and Ananthalakshmi, 1991). Tribal living style differs place to place and also differs from the general population and further they live in dense forests and near to nature. It is obvious that food problems and habits of different tribes are bound to be different from those living in urban areas.

The tribes of India comprise about 8% of the total population of the country having probably the largest number of tribal communities in the world (Topal and Samal, 2001). Bhils constitute the third

largest tribal group of India, next to Gonds and Santhals. They are also one of the largest scheduled tribes of Rajasthan and constitute 44.50% of the total tribal population of Rajasthan (Bhasin et al. 2007). Limited data are available on anthropometric and body composition characteristics and nutritional status of tribal population of India.¹

Biologically, an adult is a human being that has attained reproductive age. In human context, the term adult has additional meanings associated with social and legal concepts; a legal concept for a person who has attained the age of maturity and is therefore regarded as independent, self-sufficient and responsible. Major characteristics of adulthood are the "settling-down age", reproductive age, problematic age, period of emotional tension, period of social isolation, time of value change, time of adjustment to new life style, creative age and time of commitment.

LODHAS

The Lodhas are now treated as one of the denitrified communities by the Central Government. In West Bengal, Lodhas are mainly concentrated in the districts of Paschim (West) Medinipur and Purba (East) Medinipur. In the pre-Independence period they were treated as a Criminal Tribe till the revocation of the Criminal Tribes Act in 1952. In the first Census of India after Independence, the Lodhas were recorded as a scheduled caste and their total population was

¹ Bisai, S., Bose, K., Gangula, S., Mumtaz, H., Mukhopadhyay, A. and Bhadra, M. Sexual dimorphism and age variations in anthropometry body composition and nutritional status among Kora Mudi tribals of Bankura district, West Bengal, India. *Stud. Tribes and Tribals* 2: 103-109, 2008.

returned to be 8,346 only in West Bengal. According to the Census of 1951 the Lodhas were found to be distributed in the districts of Burdwan, Birbhum, Bankura, Midnapore, Hooghly, Howrah, 24 Parganas, Calcutta, Murshidabad and Jalpaiguri. In 1951, they were not found in the North Bengal districts like Nadia, Maldah, West Dinajpur, Darjeeling and Cooch Behar. In the same Census the total number of Lodhas in erstwhile Midnapore was 7040, that is 84.35 percent of the then total population of Lodhas in West Bengal. The Lodhas of Midnapore are said to be identical with Savaras and Sahars but in Orissa they are different. They marry young but they do not practice widow remarriage or divorce. Their traditional occupation is collection of jungle produce, but in Midnapore they also work as agricultural labourers and firewood collectors and sellers. The Census of 1981 shows that the total population of the Lodhas including the Kharias and the Kherias of West Bengal was 53,718. The Lodhas were concentrated in erstwhile Midnapore District and their total number according to the Census of 1981 was 16,534. Besides West Bengal, they are also found in the Mayurbhanj and Baleswar districts of Orissa, Originally, they inhabited hilly rugged terrains covered with jungle. Their mother tongue is Lodha, which is close to Savara, an Austro-Asiatic language. They are fluent in Bengali. Traditionally, they were forest dwellers but now they have started cultivation either as owners of land or as agricultural labourers and are also engaged in hunting and fishing. More than 80 percent of them follow Hinduism with traditional belief in spirits and nature. At present the Lodhas do not live

exclusively in the forest covered areas, but have spread out in other deforested regions where they are found to be working as agricultural and non-agricultural labourers. But their main economy is still based on collection of minor forest products, such as leaves for preparing leaf-plates for sale. According to Bhowmick, the Lodhas were found to collect edible roots and fruits for household consumption and sell the surplus in the local markets. They are also found to be engaged in the collection of tussore cocoons and sell them in the market for cash. Lodhas also catch snakes and lizards and sell their hides and consume the flesh of these animals. They also catch fish and tortoises from the water bodies for domestic consumption as well as for sale. Women among less privileged communities in India.

Dietary energy intake is not adequate to compensate their heavy physical work load. The National Nutrition Policy (1993) advocates a comprehensive intersect oral strategy for alleviating all the multi-faceted problems of malnutrition and its related deficiencies and diseases. While malnutrition is prevalent among all segments of the population, but women are highly affected by malnutrition because their nutrients intake level is low, beside this they have several duties to be performed such as childbearing, child rearing and other domestic duties etc.

In tribal area especially, tribal women are sufferer in all type of condition. Because they have lack of knowledge, lack of availability, poor economic condition and their geographical condition are responsible for their poor nutritional status.

Thereafter when they go through the period of pregnancy and lactation their nutritional status become more poor because of the increased requirement of nutrients specially iron, calcium, energy, protein and vitamin A etc. during these period. Women with poor health and nutrition are more likely to give birth to low weight infants. They are also likely to be unable to provide adequate food and proper care for their children.

²Food, which provides our body all the nutrients such as carbohydrates, fat, protein, vitamins, minerals and water, does influence our health status.

Nutrition is the science that deals with the digestion, absorption and metabolism of food, i.e. the utilization of food in the body. It may be defined as the science that interprets the relationship of foods to the functioning of living organism. It includes the intake of food, liberation of energy, elimination of wastes and all the processes of synthesis essential for maintenance, growth and reproduction. The fundamental activities are characteristics of all living organism from the simplest to the most complex plant and animals.

Body requires different nutrients in a varying proportion so as to maintain proper body functions. By the time we reach adulthood, particularly in terms of height and body stature, stops to a certain extent. Is to thus that there is not much of apparent growth but the, the breakdown

² Chatterjee, M. Indian Women: Their health and economic productivity. World bank discussion papers. 109, Washington, D.C; World Bank, 1990

and repair of body tissues go on continuously even among adults. Therefore, adequate amounts of all the essential nutrients need to be provided to adults through their diets for maintaining both physical and mental health.

The consumption of a wide variety of nutritious food is important for women's health. Adequate amounts of protein, fats, carbohydrate, vitamins and minerals are required for balanced diet. Meat, fish, eggs and milk as well as pulses and nuts, are rich in protein. Green leafy vegetables are rich in a source of iron, folic acid, vitamin C, β -carotene, riboflavin and calcium. Many fruits like amla and guava are good sources of vitamin C. Bananas are rich in carbohydrates, papayas, mangoes, and other yellow fruits contain β -carotene, which is converted to vitamin A. Vitamin A is also present in milk and milk products, as well as egg yolks. ³

Malnutrition has been defined as a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients, this state being clinically manifested or detected only by biochemical, anthropometric or physiological tests.⁴ Malnutrition increases the risk of mortality and morbidity. Nutritional profile of tribal's is low as compared to the national average. Few studies have revealed the pathetic situations with regard to chronic energy and micro nutrient deficiencies among tribal communities.

³ Gopalan, C., Ramasatri, B.V. and Balasubramanian, S.C. Indian Council of Medical Research, National Institute of Nutrition, Hyderabad, 1996

⁴ Jelliffe, B.D. The assessment of the nutritional status of the community. Monograph Series No. 53, world health organization, Geneva: 63-78, 1996.

In a country like India, women face serious health problems due to socio-economic ,environmental conditions, nutrition and gender discrimination. Diet and health are synonymous with the well being of an individual. In absence of proper and adequate nutrition, a person can develop several developmental malformations. Many research studies have documented that malnutrition affects body growth and development. Nutrition is an important complement of physical fitness program.⁵ Good nutrition is not only important to help improve performance but also promote healthy dietary practices in the long term.⁶

The physical well being and maintenance of normal health of an individual is closely related to the status of nutrition. Proper nutrition keeps man healthy and fit where as inadequate or improper nutrition reduces fitness and causes susceptibility to disease. Nutritional status refers to the intake of nutrients and their utilization.⁷ The need for assessment of the nutritional status is to identify individuals or the community at risk due to malnutrition and to provide nutritional aid. Food is a pre requisitenot only for attaining good health but also for maintaining adequate growth and body equilibrium. The choice of food is deeply related to life style of an individual and the conditions, in which she is living. However the food habits are greatly influenced by thoughts,

beliefs, notions, traditions and taboos of the society. Apart from these socio-cultural barriers, the religion, education and economic factorsare the determinates of the food pattern of an individuals in a given society. That iswhy the food patterns are bound to vary from a one society to other, one area to otherand so on. Life cannot be sustained without adequate nourishment. Man needs adequate food for growth, development and healthy life.

Dietary habits of populations in different regions of the world have been determined mainly by the availability of foods locally grown and which are in practice in this particular area. Man has involved his habitual dietary pattern to maintain good health, perhaps after a good deal of trial and error. Satisfaction of hunger is usually the primary criteria for adequate food intake for sustaining healthy and active life. Butdiets should be planned on sound nutritional principles.

Man needs a wide range of nutrients to perform various functions in the body and to lead a healthy life. The nutrients include proteins, fat, carbohydrate, vitamins and minerals. These nutrients are chemical substances which are consumed daily are classified as cereals, legumes, nuts and oil seeds, vegetables, fruits, milk and milk products and flesh foods (fish, meat and poultry). Most of the foods contain almost all the nutrients in various proportions, some foods being rich in certain nutrients. Depending on the relative concentration of these nutrients, foods are classified as protein rich foods, carbohydrates rich foods and fat rich foods etc. some foods provide only a single nutrient as in the case of sugars

⁵ Babitha, B. Nutritional status of adolescent girls and impact of short term food supplementation with special reference to vitamin A and hemoglobin. *J. Commun. Guidan. Resear.* **20**: 121-131, 2003.

⁶ Jonnalagadda, S.S., Rosenbloom, C.A. and Skinner, R. Dietary practices, attitudesand physiological status of collegiate freshman football players. *J. Strength Cond.Resear.* **15**: 507-513, 2001.

⁷ Bera, S. Food and nutrition of the Tibetan women in India. *Anthropolo.* **6**: 175-180, 2004.

which are source of only carbohydrates while oils, ghee etc. provide only fat.

Nutrition is responsible for the nutritional status of an individual person. Good nutrition and malnutrition are directly linked to the nutritional status of a person.

Nutritional status must take into account the state of the body before and after experiments, as well as the chemical composition of the whole diet and of all material excreted and eliminated from the body. Nutritional status can be measured in four ways: Anthropometric measurement, dietary intake, biochemical and chemical examination.

Anthropometry refers to the measurement of the human individual. As an early tool of physical anthropology, it has been used for identification, for the purposes of understanding human physical variation, in pale anthropology and in the various attempts to correlate physical with racial and psychological traits. Anthropometric measurements are frequently used to diagnose malnutrition in clinical settings. The standard values given by national centre for health statistics will be used for to calculate anthropometric measurements. Anthropometric measurement helps in the assessment of nutritional status and physical growth. The anthropometric measurement is influenced by different factors like religion, social, cultural background, customs, and dietary habits, biological and genetic influences. Adult growth associated with poor intake of all nutrients due to improper dietary habits, make as women at high risk for anaemia and nutritional deficiency status.

Anthropometry offers a reliable method to assess the nutritional status of the women. It is the single most universally applicable, inexpensive and non invasive method available to assess the size, proportion and composition of human body. The physical well being and maintenance of normal health of an individual is related closely to his status of nutrition. Life cannot be sustained without adequate nourishment. Man needs adequate food for normal growth and development and maintenance of body tissues.

Nutrition is the science that deals with the digestion, absorption and metabolism of food, i.e. the utilization of food in the body. Proper nutrition keeps man healthy and fit whereas inadequate or improper nutrition reduce fitness and causes susceptibility to diseases.⁸ Therefore, nutrition is responsible for the nutritional status of an individual person. Good nutrition and malnutrition are directly linked to the nutritional status of a person. The anthropometric measurements influenced by different factors like religion, social, cultural background, customs, dietary habits, biological and genetics influences.

Anthropometric and nutritional characteristics are related to genetics, environmental, socio-cultural conditions and to lifestyle, health and functional status. This makes it difficult to give standard interpretation of their values. Anthropometry is an essential tool in geriatric nutritional assessment to evaluate underweight and obesity conditions,

⁸ Bhardwaj, S. and Kapoor, S. Nutritional anthropometry and health status: A study among Dhanka Tribals of Rajasthan. *Anthropolo.* **9(3)**: 211-214, 2007.

which are both important risk factors for severe diseases.⁹

The BMI shows the relation between a person height and weight and can be used to indicate whether the person has a normal weight or if she is underweight or overweight. BMI can also be called the Quetelet index. It is important to note that BMI is not actually a measurement for the percentage of body fat, and is not applicable to everybody (e.g. persons with a large muscle mass or body builders). The BMI table that is being used for adult is not applicable to children and teenagers.

BMI is simple index of weight for height that is commonly used to classify underweight, overweight and obesity in adults. It is define as the weight in kg divided by square of the height in meters (kg/m²). For example, an adult whose weight is 70 kg and height is 1.75 m will have a BMI of 22.9. BMI values are age independent and the same for both sexes. However, BMI may not correspond to the same degree of fatness in different populations due, in part, to different body proportions. The health risks associated with increasing BMI are continuous and the interpretation of BMI grading in relation to risk may differ for different populations. BMI is an important index in evaluating the state of health of the population. BMI was recommended as the basis for anthropometric indicators of thinness and

overweight.¹⁰ The term ‘underweight’ in adult assessment has been applied to individuals of low body weight relating to height, generally expressed in terms of BMI. BMI was found useful for the assessment of the current or short duration malnutrition among adults.¹¹ It is used as a measure of underweight and Chronic Energy Deficiency (CED).¹² Vary low BMI reflects low fat and fat free mass, which is typical of CED. The condition of low BMI in adults (also terms as ‘thinness’), which results in CED, can be graded on the basis of BMI into mild thinness (BMI < 18.49 > 17.0), moderate thinness (BMI < 16.99 > 16.0) and Severe thinness (BMI < 16.0). BMI in the range of 18.5 to 24.99 is considered as normal and individuals above a BMI of 25 are categorized as overweight. Although adults nutritional status can be evaluated in many ways the body mass index (BMI) is most widely used because it’s use is inexpensive, non-invasive and suitable for surveys.¹³

Forest, Health and Nutrition:

Health and nutrition, particularly in the tribal societies, is intimately connected with forest. It has been reported in various studies that the tribals who are living in remote areas have a better health status and more balanced food than those living in

¹⁰ Rolland- Cachera, M.F. Body composition during adolescence: methods, limitations and determinants. *Hormone Resear.* **39** (suppl.): 25-40, 1993.

¹¹ Reddy, P.Y.B. and Rao, A.P. Body mass index among the sugalis, a tribal population of Cuddapah district, Andhra Pradesh. *J. Hum. Ecol.* **11**(5): 409-410, 2000.

¹² Ferro-Luzzi, A., Sette, S., Franklin, M. and James W.P.T. A simplified approach of assessing adult chronic energy deficiency. *Eur. J. Clin. Nutr.* **46**: 173-186, 1992

¹³ Ulijaszek, S.J. and Kerr, D.A. Anthropometric measurement error and the assessment of nutritional status. *Br. J. Nutr.* **82**: 165-177, 2007.

⁹ Jensen, G.L. and Rogers, J. Obesity in older persons. *J. Am. Dietetic. Assoc.* **98**:1308-1311, 1998.

less remote and depleted forest areas. In the Report of the Roy Burman Committee on Forest and Tribals, it has been noted that, “ It has been possible for the tribal community to subsist for generations with a reasonable standard of health because forest provided their food such as fruits, tubers, leafy vegetables, shoots, honey, flowers, juices, grass, game, fish, etc. “Medicinal herbs and plants which they have been using for treatment of diseases and maintaining health are today the source of modern medicine. In two recently completed studies related to tribal health, it has been noted the various roots and tubers available in the forest or small animals they can hunt supply a more balanced nutritional status of the tribals, but due to deforestation as most of the roots and tubers are not available in many areas, the health and nutrition have been affected. Again, in many cases, it has been noted that certain diseases may be common in certain areas but remained controlled due to certain food habits based on vegetation available locally. Forest helps to maintain a balanced ecosystem in nature and supplies sufficient food to the people who depend on it. So any type of degradation in the forest environment is likely to affect the balance and thereby adversely affecting the concerned population.

Relation between anthropometry and nutritional status

The relative merits of anthropometric measurements commonly used in nutrition surveys and the interrelationship between the various measurements were assessed using data obtained on 71 adult women surveyed in some tribal areas.

Anthropometry and nutrition are interrelated and include genetic and environmental characteristics, socio-cultural conditions, functional status and health. The evaluation of anthropometry is an essential part of nutritional assessment to determine the level of malnutrition, overweight and obesity. It also denotes the loss of muscle mass, gain of fat mass and redistribution of adipose tissue. These anthropometric indicators have been used to evaluate the prognosis of both acute and chronic disease in adults and assist to guide, medical intervention in the elderly.

It has been demonstrated that anthropometric measurements are highly reliable in determining nutritional status in comparison with other, more sophisticated methods (hydrodensitometry, dilution techniques and electronic bioimpedance), the use of which is restricted by their complexity and cost.

Why Anthropometry Is Important To Study Of Nutritional Status

Anthropometry (the use of body measurements to assess nutritional status) is a practical and immediately applicable technique for assessing nutritional status of populations as an expression of the magnitude and distribution of under-nutrition. Anthropometric indicators are less accurate than clinical and biochemical techniques when it comes to assessing individual nutritional status. In many field situations where resources are severely limited, however, anthropometry can be used as a screening device to identify individuals at risk of under-nutrition, followed by a more elaborate investigation using other techniques.

Dietary intake is necessary to compare dietary data with established standard like the allowances recommended by the Indian Council of Medical Research (ICMR) nutrient expert group (2010) and it provides general impression regarding the nutritional adequacy of the diet since the Recommended Dietary Allowances (RDA) includes margin of safety a person not consuming 100 percent of all the nutrients and should not be considered malnourished without the support of biochemical, clinical and anthropometric data.

Dietary intake of women is poor than those of their adult male counterpart. Chronic malnutrition continues to exist extensively, especially among women of different age groups, because they are caught in the sequence of ignorance, poverty, inadequate nutritious food intake and diseases. Finally, a woman's health affects the household economic well being and a woman with poor health will be less productive in the labour force (Rao, 2010).

Literature Review

A national level study has been done by Das & Bose in 2012, at different state of India on Nutritional deprivation among Indian tribal: A cause for concern,their study revealed that Since nutritional status is intricately linked with dietary habits as well as the ecology of the population, further research should be undertaken to investigate, in details, these factors. Each tribal population has its unique food habits.¹⁴ Moreover, there are distinct inter-tribal differences in the

¹⁴ Mandal, H., Mukherjee, S., Dutta. *India-An Illustrated Atlas of World Kolkata: Anthropological Survey of India* (2001).

environment in which they reside, i.e. the ecology of the population. The studies reviewed here did not deal with these factors as they were beyond the scope of study. It is, therefore, imperative that future studies on tribal populations include these parameters when investigating their nutritional status. Similar studies should also be undertaken among other tribal populations in India, since they constitute a sizeable portion of India's population. Moreover, since under-nutrition has several underlying causes, future investigations should aim at identifying the likely cause(s) of high rates of under-nutrition among Indian tribal populations. To overcome this problem, there is an immediate requirement for appropriate steps to be taken to improve the nutritional status of these groups on the basis of severity of the burden they are facing.

The nutrition and health problems faced by Kannikar tribal women of Trivandrum district, Kerala in normal physiological conditions like pregnancy and lactation were studied. pulses, milk and milk products and other animal foods which were the sources of protein were lacking on their diets. Average calorie consumption as found to be below the recommended level for the normal, pregnant as well as lactating women. Consumption of calcium (in the form of tapioca and fish) was noticed to be highest in normal women where as it was poorest in the lactating women. Similar deficits of calcium in the diets of pregnant and lactating tribal women of Western and central India was reported.¹⁵ The intake of

¹⁵ Das, S., Bose, K. (2010). Body Mass Index and Chronic Energy Deficiency among Adult Santal of Purullia District,

iron and vitamin. A were found to be low. Detailed clinical examination Kannikar tribal women showed that anaemia (90%), vit-A deficiency (30%) and niacin deficiency(10%) were prevalent among them. The morbidity status of the tribal women revealed the prevalence of pyrexia, respiratory complaints, gastrointestinal diseases and rheumatic diseases. Among the adult women gynaecological complaints and deficiency diseases were common.

Abortion and child death rates were also found to be high among the tribal population studied. Poor maternal nutritional could be one of reasons for this high rate. However, it was not possible to identify whether poor maternal nutritional status was contributing to high abortion rate of our simple size was small. Knowledge of tribal women reported as having not consumed iron and folic acid tablets during their previous pregnancy. This was the case with the rest of the county where low consumption of iron and folic acid tablets was reported by multi centric study. Tribal women of this study did not have the warring slipper when they go out .This may increase the chance of getting hookworm infestation thereby causing anaemia. Thus majority of tribal women in Bihar are at risk of delivering low birth weight babies and have pregnancy complications. Some of the reasons for under nutrition among tribal women could be poor diet intake, income , early marriage, and high morbidity due to unhygienic practice and surroundings. Under nutrition of mothers may be may be carried over to their children.

West Bengal, India. International Journal of Human Sciences.

The study revealed that mean BMI and levels of CED of santal females of Purulliya and various tribal population (among females) of West Bengal. From this table it can be inferred that, in general, the mean BMI of santal females of Purullia were low (18.1 kg/m²) and CED rate indicated a critical situation. In the state of West Bengal, among tribal females, mean BMI was in the range 17.7 kg/m² to 19.7kg/m². Moreover, the rates of CED varied between 31.7% and 67.9%. These rates were in the category high (20-39%) to very high (>40%). These result clearly indicated that, santal females of Purulliya ware in very critical nutritional stress. The relationship between mean BMI and CED among santal females and other female tribals in various states of India is presented in Figure 1. From this table it can be inferred that, in general, the mean BMI of Purulliya was 63.4%. The tribal females of various states of India were in the range 18.2-23.0kg/m². Moreover, the rates of CED varied between 4.8% (Sikkim) and 64.2%(W.B). These rates were in the category good (<5%) and very high (40%). These results clearly indicated that, tribal females of West Bengal were under critical nutritional stress.

The findings are the study of the tribal women of Singbhum direct reveal that highly undernourished. The present study reported 23.9% tribal women as having height <145 cm and 95.9% having weight <45kg. If <38kg is taken 3 cut-off for weight than 36.0% of these women can be termed as low weight. This is quite high when compared to studies reported from other parts of India In their study in rural Tamil Nadu Samuel

and Rao (1992) had found 14.1% as having g height <145 cm and 37.3% as having weight <40 kg. Similarly Anderson (1989) reported 56.0% of women in Gujarat and 63.05% of women in Maharashtra as having weight <40kg and 31.3% mothers were found to have height <145cm. The percentage of malnutrition among tribal women of the present study is high when compared to developed countries. Only 1% US women were found to have weight <40kg.

An earlier study the intake of cereals was higher than the recommended level. Similar observations were also reported by other authors among tribes of Maharashtra and Bihar. This is because most of the tribal diet is a cereal-based diet. Most of the nutrients (calories, protein, Iron etc.) except calcium mean intake were inadequate as compared to RDA. Hanumantha Rao et al. (1993) also reported lower intake of such nutrients in Jenu Kurubas, a primitive tribe of Karnataka. The low value of Carotene and Riboflavin could be due to low intake of green vegetable and negligible amount of milk in their diet. The high calcium value was mainly due to frequent consumption of fetid cassia leaves (Cassia-Tora) by this tribe. From the above discussion, it can be attributed that the poor growth pattern of the Bumia may be due to the poor socio-economic condition. Most of the Bhumia populations of Madhya Pradesh live without modern health care and transport facilities. Hence, the Bhumia the study area face many health and nutritional hazards due to poverty, illiteracy and ignorance. The health and nutrition status of the Bhumia tribes requires an immediate attention in the implementation of short-term supplementary feeding programmes,

general medical, and awareness and health care facilities, improvement of food security are needed to overcome the nutrient deficits.

Aims and Objectives

Objective is the root of any scientific research. To completion the project work objective formulation is the main part of the study.

- i) To evaluate the nutritional status of tribal women.
- ii) To assess the nutritional status through anthropometric measurement of tribal women.
- iii) To explore the dietary intake of tribal women.
- iv) Finally, some recommendation would be made for better livelihood.

Materials and Method

Study area: The survey was carried out at Kharikashuli Village of Chandra Grampanchayat under the jurisdiction of Medinipur sadar Block in Paschim Medinipur District among the adult women. This study has been conducted for the period of Feb, 2019 to April, 2019.

Selection of Subjects: The data has been collected through intensive field presented here were obtained from a cross-sectional anthropometry measurement and dietary survey carried out in an adult population (females). I have applied simple random sampling in availability of

the population during survey. In brief, a random sample of 71 female's are from different Lodha household.

Survey Method: Anthropometric measurements were performed as a survey method. It is very useful method for assessing nutritional status as it provides rapid and quantitative means of nutritional assessment. So for this purpose following parameters were taken: weight, height, MUAC, waist, hip **Apparatus:**

The apparatus used for anthropometric measurements are as follows-

1. Anthropometer- for measuring height.
2. Weighing machine- for measuring weight.
3. Steel tape- for measuring different circumference of body.

Procedure

a) Weight measurement: For weight measurement I have used human weighing machine. Subject stands the platform of the machine with minimum clothes and exerting equal pressure on both feet. I have taken the weight reading from the scale with an accuracy of 0.5 kg.

b) Height measurement: The measurement of body height in nutritional assessment is well recognised as it is a useful indication for long - term nutritional adequacy and fundamentally

important in anthropometric measurements. For height measurement I have used anthropometric rod. Subject should stand on a flat floor keeping his feet parallel with the heels. His back of head touched the upright portion to touch the hair and make contact with the top of the head. At last I have take the reading from the scale.

c) Body Mass Index (BMI):Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m²). For example, an adult who weighs 70kg and whose height is 1.75m will have a BMI of 22.9. $BMI = 70 \text{ kg} / (1.75 \text{ m}^2) = 70 / 3.06 = 22.9$

BMI=Weight in Kg/Height in meter square.

BMI Classification according to WHO (1995)

Nutritional Status	BMI(kg/m ²)
Underweight	<18.50
Severe thinness	<16.00
Moderate thinness	16.00 - 16.99
Mild thinness	17.00 - 18.49
Normal range	18.50 - 24.99
Overweight	≥25.00
Pre-obese	25.00 - 29.99
Obese	≥30.00

Obese class I	30.00 - 34.99
Obese class II	35.00 - 39.99
Obese class III	≥40.00

Measurement of Mid Upper Arm Circumference (MUAC):

MUAC is recognized to indicate the status of muscle development. It is measured on the left hand, the mid-point between the acromion of the scapula and tip of the olecranon of the fore-arm bone, ulna is located with the arm flexed at the elbow and marked with a marker pen. Flexible tape is used and the reading is taken to the nearest millimeter.

Measurement of Waist circumference:

The waist circumference is measured in standing position with arm at sides, done with minimal clothing with measuring tape to the nearest 0.1 cm in a perpendicular to the long axis immediately superior to iliac crest.

Measurement of Hip circumference:

Hip circumference measured in a standing position with minimal clothing by measuring tape to the nearest 0.1 cm at the level of maximum posterior extension of the buttocks.

Waist-hip ratio:

WHR is the ratio of the circumference of the waist to that of the hips.

This is calculated as waist measurement divided by hip measurement ($W \div H$).

Dietary Assessment:

Diet survey constitutes an essential part of any complete study of nutritional status of individual or groups.

Here, I followed the interview method for the purpose of dietary assessment. Some of the interview techniques are diet recall, diet history, food frequency questionnaire etc. Here I followed the diet recall (3-5 day) method.

Statistical Analysis of data:

Statistics is the science of the methodology for scientific collection, systematic, presentations, mathematical; analysis of interpretation of the data and for drawing inferences about the explored property of phenomenon in the relevant population, in this respect, statistics has the following basic applications. The calculated data was analysed by Microsoft excel.

Mean:

Mean is the arithmetic average of asset of scores. The mean of a sample (statistical mean) and that of a population (Parametric mean) are represented by the symbols \bar{x} and μ , respectively where X (or X_i) represents each individual score of a sample, $\sum X$ (or $\sum X_i$) is the sum of all its scores, n is the sample size or the total frequency of cases in the sample.

$$\bar{X} = \frac{\sum X}{n}$$

Standard deviation:

Standard deviation (SD) is the positive square root of the mean of squared deviations of all the scores from the mean. It is an absolute measure of deviation and is expressed in the

same unit as the original scores. Standard deviation of a

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

sample is denote by

Standard Error:

Standard error (SE) of a statistics is a measure of the deviation of that statistics from the corresponding parameter and consequently serves as an index of the sampling error of that statistics. It is the standard deviation of the sampling distribution of the relevant statistics.

FINDINGS OF THE STUDY

This study had a total of 71 adult female who participated in the present study.

Table 1: Statistical value of Anthropometric and dietary intake in relation with ICMR Reference Value

PARAMETERS	TRIBAL WOMEN MEAN±SE	ICMR REFERENC E VALUE
Weight(kg)	42.20±0.78	55
Height(cm)	147.52±0.70	161
MUAC(cm)	21.69±0.21	22
W/H ratio (cm)	0.83±0.004	0.85
Energy (kcal)	2099.55±18.46	2850
Protein(gm)	47.86±0.71	55
Calcium (mg)	333.09±15.69	600
Iron (mg)	12.44±0.55	21
Beta-carotene (ug)	1438.12±225.65	4800
Thiamine (mg)	1.40±0.02	1.4
Riboflavin (mg)	0.56±0.02	1.7
Niacin (mg)	19.96±0.15	16
Vitamin C (mg)	76.36±7.65	40

Table 2: Mean nutrient intake of the selected subjects.

Sl .No	Nutri ents	ICMR standa rds	M ea n	S D	% of nutrient intake	% Excess or deficit
1	Energy(Kcal)	2850	2099.55	15.51	73.67	-26.33
2	Protein(gm)	55	47.86	5.98	87.02	12.98
3	Calcium(mg)	600	333.09	13.23	55.52	-44.49
4	Iron(mg)	21	12.44	4.65	59.24	-40.76
5	B-Carotene(ug)	4800	1438.12	19.01	29.96	-70.04
6	Thiamine(mg)	1.4	1.4	0.18	100	0
7	Riboflavin(mg)	1.7	0.56	0.18	32.94	-67.06
8	Niacin(mg)	16	19.96	1.28	124.75	24.75
9	Vitamin C(mg)	40	76.36	64.7	190.9	90.9

Table 3: Mean dietary intake of the selected subjects.

Sl. No	Food Stuffs	ICM R stand ards	M ea n	S D	% of the present study	% Excess or Deficit
1	Cereals	480	432.04	36.4	90.01	-9.99
2	Pulses	90	24.72	1.98	27.47	-72.53
3	Milk& milk	300	45.0	5.0	15.02	-84.98

	products		7	1		
4	Roots & tubers	200	205.28	46.08	102.64	2.64
5	Green leafy vegetables	100	58.45	53.44	58.45	-41.55
6	Other vegetables	200	148.59	56.83	74.3	-25.71
7	Fish/meat/egg	50	19.2	24.61	39.44	-60.56
8	Frutis	100	19.72	40.7	19.72	-80.28
9	Sugar	45	19.32	1.82	42.73	-57.27
10	Fat	30	19.58	1.48	65.27	-34.73

Table 5: According to Kuppur's swami scale Socio-Economic Status of the studied Lodha Women

Score	Socioeconomic Class	Frequency	Percentage
26to29	Upper(I)	0	0
16to25	Upper Middle(II)	0	0
11to15	Lower Middle(III)	3	4.23
5to10	Upper Lower(IV)	68	95.77
<5	Lower (V)	0	0
	Total	71	100

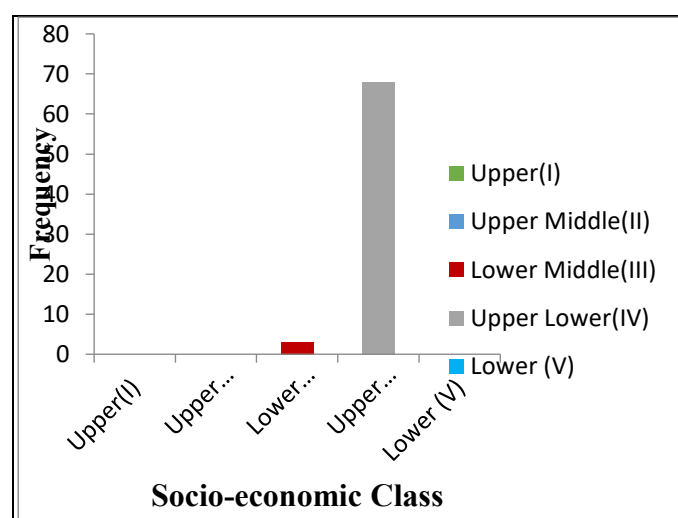


Table 4: Socio demographic profile of tribal women.

Age group	Number (%) n=71
18-	71 (100)
Education	Number (%) n=71
Illiterate	50 (70.42)
Literates	21 (29.58)
Occupations	Number (%) n=71
Labour	48 (67.61)
FPC	23 (32.39)
Type Of Family	Number (%) n=71
Nuclear Family	54 (76.06)
Joint Family	17 (23.94)
Number of children	Number (%) n=71
<2 children	49 (69.01)
>2 children	22 (30.99)
Economic Status	Number (%) n=71
Above Poverty Line	31 (43.66)
Below poverty Line	40 (56.34)

Table 5: Comparison of body weight (kg) of tribal women (n=71) with ICMR standard

	Tribal Women	Reference value
Mean(kg)±SE	42.20±0.78	55

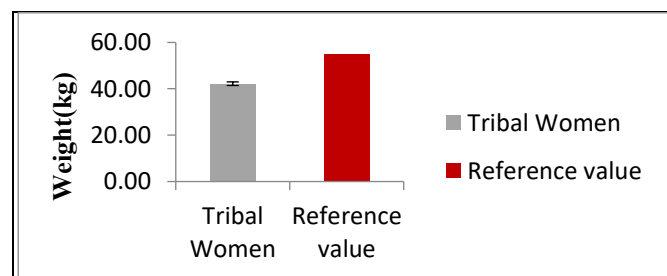


Figure : Body weight of tribal women.

Table 6: Comparison of body height (cm) of tribal women (n=71) with ICMR standard.

	Tribal Women	Reference value
Mean(cm) \pm SE	147.52 \pm 0.70	161

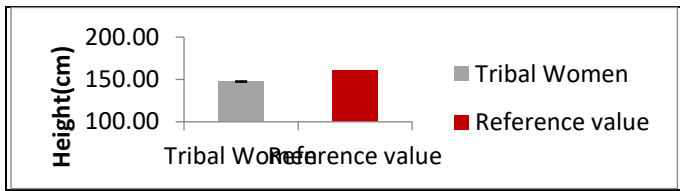


Figure: Body height (cm) of tribal women.

Table 7: Comparison of MUAC (cm) of tribal women (n=71) with ICMR standard.

	Tribal Women	Reference value
Mean(cm) \pm SE	21.69 \pm 0.21	22

Table 8: Comparison of W/H Ratio of tribal women (n=71) with ICMR standard.

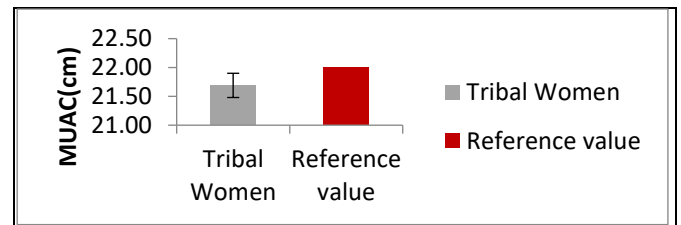


Figure: Mid Upper Arm Circumference (cm) of tribal women.

	Tribal Women	Reference value
Mean \pm SE	0.83 \pm 0.004	0.85

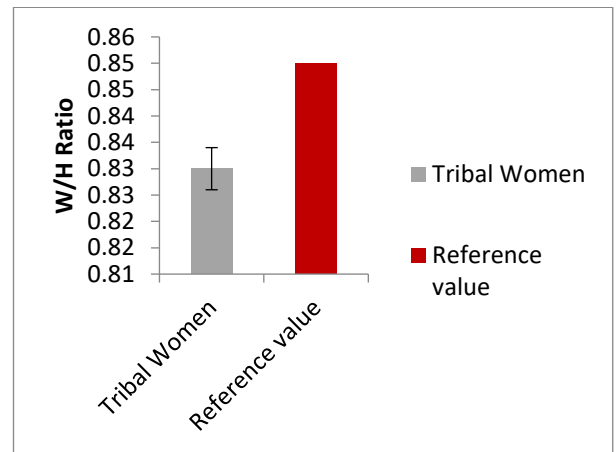


Figure : W/H Ratio of tribal women.

Table 9: Body mass index of tribal women (N=71) according to WHO standard in different categories.

Sl. No	Nutrients	ICMR standard	Mean	SD	% of nutrient intake
1	Energy(Kcal)	2850	2099.5	155.5	73.67
2	Protein(gm)	55	47.86	5.98	87.02
3	Calcium(mg)	600	333.09	132.2	55.52
4	Iron(mg)	21	12.44	4.65	59.24
5	B-Carotene(ug)	4800	1438.1	190.1	29.96
6	Thiamine(mg)	1.4	1.4	0.18	100
7	Riboflavin(mg)	1.7	0.56	0.18	32.94
8	Niacin(mg)	16	19.96	1.28	124.75
9	Vitamin C(mg)	40	76.36	64.47	190.9

Grading of BMI	Frequency	Percent
Severe thinness	1	1.41
Moderate thinness	6	8.45
Mild thinness	31	43.66
Normal	28	39.44
Overweight	5	7.04
Total	71	100.00

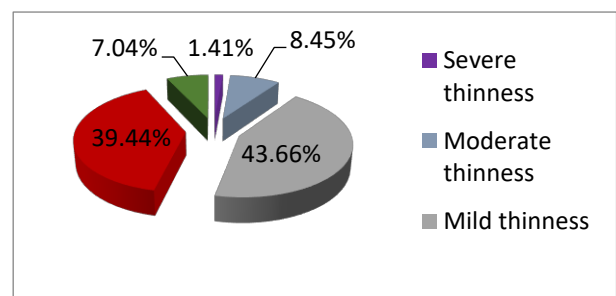


Figure: Body Mass Index of tribal women.

Table 10: Comparison of nutrient intake of tribal women (n=71) with ICMR standard.

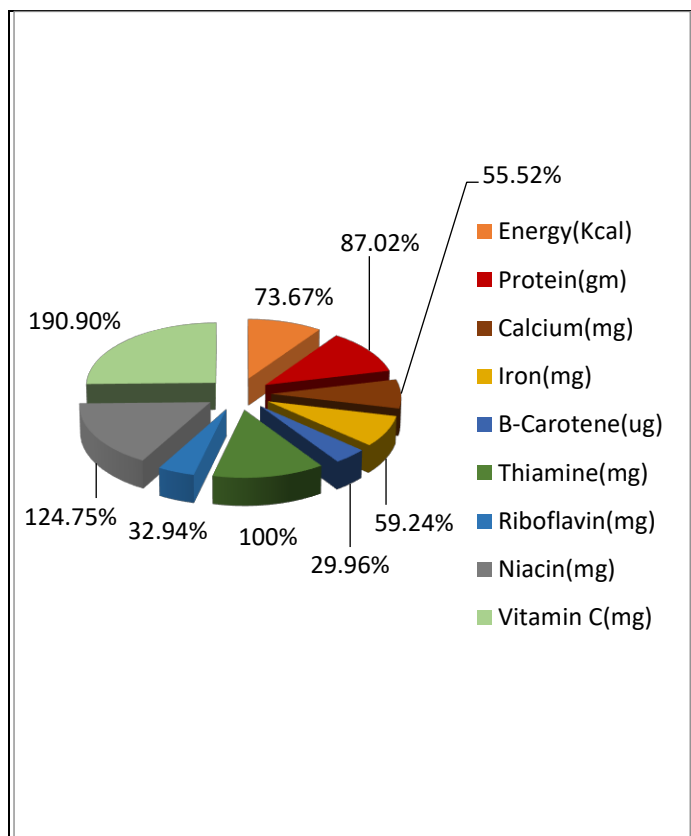


Figure :- Nutrient intake of tribal women.

Table 11: Comparison of dietary intake of tribal women (n=71) with ICMR standard.

Sl. No	Food Stuffs	ICMR standards	Mean(gm or ml)	SD	% dietary intake
1	Cereals	480	432.04	36.4	90.01
2	Pulses	90	24.72	11.98	27.47
3	Milk & milk products	300	45.07	50.1	15.02
4	Roots & tubers	200	205.28	46.08	102.64
5	Green leafy vegetables	100	58.45	53.4	58.45
6	Other vegetables	200	148.59	56.83	74.3
7	Fish/meat/egg	50	19.72	24.6	39.44

				1	
				40	
8	Fruits	100	19.72	7	19.72
9	Sugar	45	19.23	1.82	42.73
10	Fat	30	19.58	1.4	65.27

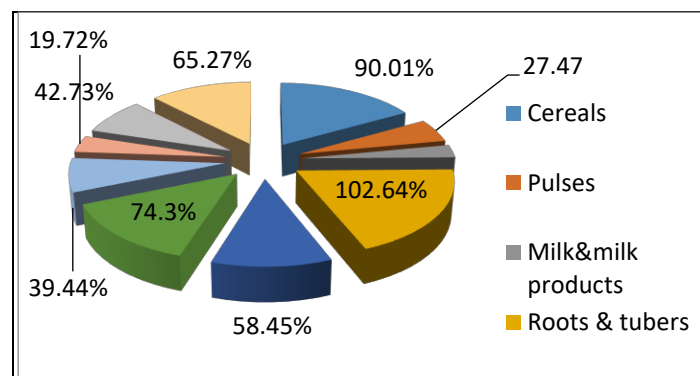


Figure: Dietary intake of tribal women.

DISCUSSION

The present study examines the nutritional status of women in an effort to estimate the prevalence of malnutrition. It is a cross sectional study conducted in Kharikashuli Village of Chandra Grampanchayat under the jurisdiction of Medinipur sadar Block in Paschim Medinipur District among 71 randomly selected tribal women. Simple random sampling technique was applied to collect data.

The anthropometric measurements of the tribal women in this study revealed that there is deficit in both weight and height as compared to the standards. The Indian Council of Medical Research (ICMR) has set a standard of 161 cm as average height for Indian women and 55 kg as average body weight for Indian reference women. In the study mean weight of tribal women was 42.20±0.78 kg and mean height was 147.52 ± 0.70

cm. prevalence of thinness among the study women was 1.41% severe thinness, 8.45% moderate thinness, 43.66% mild thinness.

Nutrient intake of the selected tribal adult women in the present study was found to be inadequate when compared with RDA of ICMR (2010) except thiamine, niacin and vitamin-C. calorie deficiency was 26.33% where as protein deficiency was about 12.98%. The extent of deficit was highest with respect to calcium (44.498%), iron (40.76%), followed by beta-carotene (70.04%), riboflavin (67.06%).

In this study earnings status of the household was very low. In this study it is shown that about 4.23% respondents belonging to lower middle (III) category and the rest 95.77% were belonging to upper lower (IV) class. Studies have shown that majority of the respondents (70.42%) were illiterate and the remaining were (29.58%) were literate but have attend only up to primary school. Most of them of the subject are day labour (67.61%) and rests are forests produce collection (32.34%) by which it is expressed that they have low economical status.

CONCLUSION

The purpose of this study was to evaluate the nutritional status of Lodha women. This study design was a questionnaire-based cross-sectional study. For the assessment of nutritional status different parameters like weight, height, MUAC, waist and hip circumference, Socio-economic status and dietary intake pattern was taken.

The Lodhas are more back warded tribal populations than other tribal group and they are also socio-economically back warded compared to other population groups. [10] This study

concluded that the average intake of all nutrients was lower than the ICMR standards. So, in connection with anthropometric variable of tribal women also found lower than the ICMR standards.

In my study it was revealed that the nutritional status of Lodha women was generally poor. During my survey I have found that the most Lodha women belonging in upper lower (IV) socio-economic class.

So the observation of dietary assessment could explain the above under nutrition. Most probably above under nutrition may be due to the dilatory intake in tribal adult women. (WHO, 1984)

RECOMMENDATION

Food is the source of nutrients which are required for maintenance, repair, growth and development of body. Low intake of nutrients is a major cause of poor nutritional status. Regular and proper quality intake of nutritious diet is the need of the day in tribal areas. When anthropometric measurements of tribal women were compared with ICMR reference values found to be less than reference values. A comparison of the intake of various nutrients with ICMR recommendations for heavy worker women indicated that their intakes of nutrients were less than RDA.

- ❖ Increase literacy rate and awareness about importance of health hygiene and sanitation.
- ❖ Knowledge about food and nutrition necessary for women.
- ❖ They need to include all food groups in their diet.

- ❖ Intake of seasonal fruits and vegetables when they are not so costly can be increased.
- ❖ To improve nutritional status of the Lodha women health education, awareness and nutritional counseling are necessary.
- ❖ Most importantly, immediate nutritional intervention programs are needed for better implementation for the Lodhas

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