



Anthropometric Profile of Mao Tribe - Manipur, North-East India

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ABSTRACT

A community based study was carried out with members from 100 households of the Mao tribe of Manipur. This study was conducted assessing nutritional status based on anthropometric measurement of the Mao tribe. data were collected for Height, weight, and Waist & Hip Circumference. A cross tabulation of BMI inference and WHR inference was conducted. The study found with females under moderate to high risks whereas the males have low to moderate risks. As per the BMI tabulation, the majority of the Mao tribe were found to be under normal category with lesser underweight and overweight. Though there is room for development to fight the prevailing undernutrition, they should continue with their present food habit and adopt only the necessary changes needed. Their healthy features can be attributed to their diets. Hence, there is still need for nutritional intervention programs and encouraged eating balance diet to the Mao tribe of Manipur.

KEY WORDS: Mao tribe, nutritional status, BMI, WHR, MUAC, overweight, underweight.

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INTRODUCTION

The tribal population is found in almost all the parts of the world. In India, the tribal communities mainly consist of forest dwellers, who have accumulated a rich knowledge on the uses of various forests and forest products over the centuries. India has the largest concentration of tribal population possessing a total of 427 tribal communities, of these more than 130 major tribal communities live in North East India.[1]. One among the many tribe is *Mao* tribe of Manipur. This tribe are scattered in Senapati district which is in the northern part of Manipur. The region is bordered by the Nagaland state on the north, Thoubal and Bisnupur districts on the south, Ukhrul District on the east and Tamenlong district on the west. The dietary habits of *Mao* tribe is mainly depend on the local sources of food product such as various vegetables and meat etc, although it also depend for other seasonal wild vegetables, fruits and animals from their forest[2]. This paper discussed about the documentation of food habits and nutritional status of Mao tribe.

The *Mao* are the major tribes constituting the Nagas, a group of tribes spread over the eastern most part of India and the western border region of Myanmar. Tribal population of *Mao* tribe in Manipur with reference to census 2011, the total population is 97,195. The ethnic tribal people of North-East India, particularly Manipur have been living in the forest ecosystem and follow their own socio-cultural pattern, tradition and typical food habits. The traditional foods of tribe people are very simple and they used in festivals and rituals [3].

Nutritional status of the population were mainly depend on the consumption pattern of food in relation to their needs and their purchasing power [1]. Knowledge of the nutritional status of a community or a region is necessary to have a comprehensive idea about it development process, as undernutrition is one of the major health problems in developing countries[4].

Geographical location and climatic condition play an important role in the growing harvesting and availability of food products influencing the food habits of the ethnic population. Food habits are symbolical to a particular culture. The methods of food preparation were diverse and are related to the types of available food. Food is represented as part of the cultural traits of an ethnic community. The cultural background determines what shall be eaten as well as when and how it shall be eaten. Food culture in this part of the country is invariably different from rest of India because of the traditional food habits of the ethnic tribal population [5]. Dietary diversity, that is, consumption of a wide variety of foods, has been identified as one of the food-based interventions to ameliorate the many-faceted burden of malnutrition. In fact, it has been included as one of the indicators apart from wasting, stunting,

micronutrient deficiencies, and obesity rates for tracking the trends of this triple burden of malnutrition [6].

Few researcher has been conducted regarding, although need for nutritional status and food habits of the *Mao* tribe population is required. On the other hand information from this study will be useful to find out their current health status and socio-economic demographic profile.

MATERIAL AND METHODS

The study was based on the primary data collected from *Mao* tribe of Tadubi village and Kalinamei village of Senapati district, Manipur state.

A sample size of 100 (n=100) household were selected by random sampling from the two village *i.e* Tadubi and Kalinamei village of Senapati District. The participants were adults of ages between 19 and 59. Anthropometric evaluation is an essential feature of geriatric nutritional evaluation for determining malnutrition, being overweight, obesity, muscular mass loss, fat mass gain and adipose tissue redistribution [7]. The study was assessed by using anthropometric measurement such as anthropometric rod for measuring of height, portable weighing machine for measuring weight, measuring tap for measuring mid-upper arm circumference and waist-hip ratio and BMI (body mass index) were computed evaluated using standard equation *i.e*,

WHR = waist circumference (cm)/ hip circumference (cm)

BMI (kg/m²) = weight (kg)/ height (m²)

Using World Health Organization (WHO), nutritional status was assessed under the BMI classification given below:

Underweight: BMI < 18.5

Normal: BMI ≥ 18.5 – 25.0

Overweight: BMI ≤ 25.0

For both male and female subjects, means and standard deviations of all anthropometric variables and indices were computed. To compute the differences in nutritional status Chi-square test (Fischer's exact test) was used.

RESULTS

This study evaluated the nutritional status of *Mao* tribe, Manipur India. The data on age and anthropometric measurement of the study subjects set out in table 1. The total mean of ages for both male and female were observed as 36 and 31.9 respectively. The study resulted with mean height of the men was 161.96 cm and weight was 52.8 kg. In case of women mean height and weight were 155.07 cm and 52.8 kg respectively. Mean minimum waist circumference of the male subject was 25.0 cm and for female was 29 cm. The male subjects had mean maximum hip circumference of 105 cm and for female it was 105.4cm which was almost the same. The mean BMI of both the subjected men and female were 22.1 kg/m² and 21.7 kg/m². The calculated WHR for male and female were 0.95 and 0.94 respectively.

Table 2 depicts the nutritional status based on BMI among *Mao* adult. It was found that majority of the subject male were normal (69.2%) followed by overweight (22.3%) and very few underweight (6.1%). However, the subjected women found with majority of them were under normal (67.3%) category, 30.60% of them were overweight and only 2% of them were underweight.

The Waist to Hip Ratio inference among *Mao* adult given in table 3 showed that majority of both male (68.4%) and female (67.3%) were under moderate risk obesity. The female subjects were higher (26.9%) than male (31.9%) under higher risk obesity. At lower risk obesity very few percentage of females (0.6%) were found than male (4.6%) followed by of female subject. Thus, the study resulted with female population of *Mao* tribe were at higher risk of obesity compared to male.

DISCUSSION

Nutritional status was classified as overnutrition and undernutrition which together known as malnutrition. World Health Organization defines malnutrition as a term used to refer to a number of diseases, each with a specific cause related to one or more nutrients and each characterized by cellular imbalance between the supply of nutrients and energy on the one hand, and the body's demand for them to ensure growth, specific function and maintenance [8]. The results of nutritional status of *Mao* tribe, Manipur shown the various aspects of the members of the *Mao* tribe such as height, weight, waist, hip, BMI WHR ratio etc. were analyzed. Anthropometric indicator such as BMI may be suitable in a country like India which have diverse ethnic group [9].

Also cross tabulation of BMI inference and WHR inference for adult population of age group between 19-59 years was conducted. The study resulted with tribal females were at risk of obesity than male. Physical activity guideline should be motivated among the normal and obese women to avoid the risk of

overweight and unhealthy status [10]. Whereas other studies on tribal population showed high prevalence of undernutrition [11-13].

From the age group and WHR inference cross tabulation of *Mao* tribe adult, it was found that females irrespective of their age group have moderate to high risks whereas the males have low to moderate risks. Similarly, Gosh [14] revealed that most of the adult were normal category but some few of them were found to be underweight as well as overweight. As per the BMI tabulation, the people of the *Mao* tribe were found to be under normal category though few percent were found underweight and overweight. Similarly, Bam & Malagi [15] found that the prevalence of overweight and undernutrition were less while the majority of the adults falls in normal category [15]. Further research should be undertaken to investigate the links among nutritional status, dietary habits, ecology of the population and other factors.

**Table 1: Age and Anthropometric Characteristics of *Mao* Adult
N= 277**

Variable	Men (130)	Women (147)
Age	36.03 (7.83)	31.9 (7.35)
Height (cm)	161.96 (13.70)	155.07 (12.65)
Weight (kg)	58.61 (12.89)	52.8 (7.92)
Circumference (cm)		
Minimum waist	25.0 (11.54)	29.5 (10.56)
Maximum hip	105.0 (9.02)	105.4 (12.26)
Mid upper arm	25.60 (3.40)	27.5 (16.79)
BMI (kg/m ²)	22.1 (3.82)	21.7 (3.94)
WHR	0.95 (0.07)	0.94 (0.11)

Standard deviation were presented in parentheses

Table 2: Nutritional Status Based on BMI among *Mao* Adult [N= 277]

Gender	BMI			Modified X ²
	Undernutrition	Normal	Overweight	
Male	8 (6.15)	90 (69.23)	29 (22.30)	4.85*
Female	3 (2.04)	99 (67.34)	45 (30.61)	
Total	11 (3.97)	189 (68.23)	74 (26.71)	

Percentage are shown in parentheses

Table 3: Nutritional Status Based on WHR among *Mao* Adult [N= 277]

Gender	WHR			Modified X ²
	Low risk	Moderate risk	High risk	
Male	6 (4.61)	89 (68.4)	35 (26.9)	4.81*
Female	1 (0.68)	99 (67.3)	47 (31.9)	
Total	7 (2.52)	188 (67.8)	82 (29.6)	

Percentage are shown in parentheses

CONCLUSION

From this study, it is known that according to WHO classification the adult *Mao* tribe of Manipur was under normal category showing very less prevalence of undernutrition and few overweight. This may be attributed to the food habits and lifestyles of the population where the diets are mostly bland with usage of available local herbs. Further nutritional survey and intervention programmes should be undertaken to educate and encourage the eating of balance diet to the *Mao* tribe of Manipur.

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