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ANTHROPOMETRY AND PREVALENCE OF OBESITY AMONG KOM TRIBAL FEMALE OF REPRODUCTIVE AGE GROUP

Ladiya Serto [1], Dr. Sumati Rajkumari [2]
[1] Ph.D. Scholar, Department of Home Science, Dhanamanjuri University, Manipur
[2] Assistant Professor, Department of Home Science, Dhanamanjuri University, Manipur
Corresponding author: ladiyakom@gmail.com

ABSTRACT

Background: Obesity among tribal women is a growing health concern influenced by lifestyle, limited healthcare access, and nutritional transition leading to higher calorie intake and lower physical activity. Obesity increases the risk of non-communicable diseases like Diabetes, Hypertension, Cardiovascular disease and certain type of Cancers

Objective: The study attempt to assess anthropometry and prevalence of obesity among kom tribal female of reproductive age group.

Methods: cross sectional study among 300 adult female were selected among 8 villages of two district of Manipur. Self- structure interview questionnaire pre-tested was adopted questionnaire consist of socio-demographic profile, anthropometry status and risk factors of obesity. Data analysis was done using SPSS.

Result: From the present study it is reported that majority 36.7% were in the age group 40-49 years, the mean height and weight of the female respondents were 150 cm and 59 kgs. The mean score of waist circumference was 83.2 cm and Waist Hip Ratio was .86cm additionally, the prevalence of overweight and obesity was 34.6% and 37.3% in the age group of 40-49 years. Eventually, to find the risk factor of obesity, there is significant association between activity pattern and obesity as the significant and *P* value is <0.005 and similarly, there is significant association between consuming junk food and obesity as P value is <0.005.

Conclusion: The study draw inference that majority were found to be overweight and obese among the Kom tribal female of rural areas of Manipur. To mitigate the rising rates of overweight and obesity, it is of utmost importance to encourage lifestyle adjustments and adopt wholesome diet.

Keywords: Anthropometry, Obesity, Reproductive, Overweight, Tribal females

INTRODUCTION

Obesity is a common health problem all over the world [1]. The World Health Organization (WHO) has officially labeled the global prevalence of overweight and obesity as an epidemic [2]. (39 %) of adults 39% of men and 39% of women were overweight and 13% (11% of men and 15% of women) were obese in 1016 worldwide [3]. According to the national Family Health Survey (NFHS-5), 24% of reproductive –aged women in India were overweight and obese 2019-21.[4] Globally, obesity is increasing rapidly and may cause many diseases and health problems,

including high blood pressure, diabetes and certain type of cancers [5] and obesity is one leading cause of cardiovascular diseases and even may leads to death [6] study on prevalence of overweight and obesity among tribal rural women of Manipur were found to be limited as rural tribal women are vulnerable in every aspect of health issues. Hence, an attempt was made to assess anthropometry and prevalence of obesity among kom female reproductive age women.

Material and Methods

The present study was descriptive cross-sectional household survey conducted over a period of three months from January 2025 to March, 2025. Among women of reproductive age group (20-49 years) those willing to participate were selected for the study from two hill district of Manipur state, Chandel and Kangpokpi district. Voluntary respondent women were selected from 8 villages respectively.

Sample size determination

The sample size was determined using the formula=z^2pq/d^2 where; n=the desired sample size z=95% confidence interval or 1.96 q=(1-p) or (100-p) and d=degree of precision set at 0.05%. calculation: 1.96×1.96×24×76÷0.5×0.5=276.2 A prevalence of 24% obesity/overweight among India reproductive aged women was used (Chakrabarti M. 2017) [4]. The minimum sample size was 280. Therefore 300 participants were selected for possible drop outs.

Data collection

All the women of reproductive age group (20-49years) were the target population of the study. The require samples those voluntary participant were selected randomly through door to door survey. A self-administered structured pre tested interview questionnaire method was used to obtain data on socio-demographic profile like age, marital status, socioeconomic status, Anthropometric status like height, weight, BMI, weight circumference and waist hip ratio were measure to find the prevalence of obesity and including other risk factors of obesity among the kom adult female.

Ethical clearance

Prior to data collection, ethical approval was obtained from institutional ethics committee and consent form was obtained from all the eligible participants and were explained about the purpose of the study.

Anthropometry measurements

Anthropometry is measurement of human body at different ages and levels of nutritional status [7]. Anthropometric measurement namely Height, Weight, Waist and Hip Circumference, will be measured for all the female respondent to compute Body Mass Index and Waist Hip Ratio.

Height: the height of the female respondents was measure using stadiometre measuring accurately to the nearest 0.01cm. The subject were made to remove their shoes and stand erect on the stadiometre stand with foot parallel with heals, shoulders and back of head in upright posture.

Weight: digital weighing machine OMRON was used for measuring the weight of the adult females to the nearest point of 0.1kg. After each recording, the scale was adjusted to zero point to ensure accuracy of the measurement taken.

Body Mass Index: the height and weight of the participants were used to calculate the body mass index. The subjects classified based on Body Mass Index for Asian.

BODY MASS INDEX FOR ASIAN INDIA's [8] (WHO, 2009)

BMI Classification	**Presumptive Diagnosis**
Below 18.5	Underweight
18.5-22.9	Normal
23-24.9	Overweight
Above 25	Obese

Waist Circumference: the waist circumference is measure at the level of midpoint between the inferior margin of the last rib and iliac crest. It was measure using a tape.

Hip Circumference: the hip circumference was measured with tape passing over maximum protuberance on buttocks.

Waist Hip Ratio: the ratio of waist to hip is an indicator of obesity. Waist hip ratio is calculated using the formula waist circumference divided by hip circumference in cm.

VALUES OF WAIST CIRCUMFERENCE AND WAIST HIP RATIO [9]

sex	**Waist Circumference**		**Waist Hip Ratio**	
	Normal	**At-risk**	**Normal**	**At-risk**
Women	<80 cm	≥80 cm	<0.81cm	≥0.81 cm

Data analysis

The present data were entered in Microsoft Excel and analysis of data using standard statistical package for social sciences (SPSS) trial version. Descriptive statistic (such as frequency, percentage, mean and standard deviation) were used.

RESULTS AND DISCUSSION

This study intent to discuss the Anthropometry and prevalence of obesity among Kom tribal female reproductive age group. Where, voluntary 300 adult females were selected from rural areas of Chandel and Kangpokpi district. The present study shows provocative outcomes, which are discussed below.

The socio demographic characteristic of the study sample are depicted in Table 1.

Regarding the age of women, majority 36.7% adult females had reported in 40-49 years, whereas less percentage 31.3% in the age group 20-29years. The mean age was 34.63±8.76 years. And majority 49% has found completing their intermediate and above with regard to employment status 49% were employed in different sectors and Socio economic status was classify according to modified BG Prasad classification 2024.[10] majority 35% respondent's family comes under lower middle class. Similar result (40.6 %) were supported by Jose MJ *et al.,* (2019) [11]. It is reported 53.3% were married and11% widow further, in present finding 65% and 35%belonged to nuclear and joint family whereas (96.62%) were found to be joint family in study by Gupta R.*et al.,*(2021) [12] and regarding the head of the family it is reported that 75.7% belonged to male whereas 24.3% belonged to female respectively.

Table 1. Socio-demographic characteristics of participants (*n*=300)

Characters	Category	No.	%	Mean
Age	20-29	94	31.3	
	30-39	96	32.0	34.63±8.76
	40-49	110	36.7	
Education	Intermediate and above	147	49.0	
	Secondary school	87	29.0	3.14±1.05
	Primary school	26	8.7	
	No education	40	13.3	
Occupation	Employed	147	49.0	1.51±0.50
	Unemployed	153	51.0	
socio economic status (Modified BG Prasad classification 2024)	Upper class (I)	15	5.0	
	Upper middle class (II)	31	10.3	
	Middle class (III)	90	30.0	3.54±1.07
	Lower middle class (IV)	105	35.0	
	Lower (V)	59	19.7	
Marital status	Married	160	53.3	
	Unmarried	106	35.3	1.69±.94
	Separated	1	.3	
	Widow	33	11.0	
Type of family	Joint	105	35.0	1.35±0.48
	Nuclear	195	65.0	
Head of the family	Female	73	24.3	1.76±0.43
	Male	227	75.7	

Table 2. Showed that majority 45% height is in the range of 140-150 cm and maximum height was 170 cm whereas, minimum height was 140 cm and mean height was 150 cm which is lower than ICMR standard height for women. **Table 3.** Present study showed that majority 61% reported to weight in the range of 40-60 kg whereas the mean weight was 59 which is found to be higher

than ICMR standard weight for female. The maximum weight was 94kg and minimum weight was 40 kg. Similar study by (Maruthesha AM.*et al.,* 2019) [13] reported that the mean anthropometric measurement was 153.8cm of height and 46.8kg of weight.

Table 2. Percent distribution of kom female according to Height

Height	**No**	**%**	**Mean±S.D**	**max**	**Min**
140-150	135	45.0	150.88±5.40	170	140
151-160	158	52.7			
161-170	7	2.3			
Total	**300**	**100**			
Mean height	**150**				
Standard for Female (ICMR, 2020)	**162.0**				

Table 3: Percent Distribution of Kom female according to Weight

Weight	**No**	**%**	**Mean±S.D**	**Max**	**Min**
40-60	183	61.0	59.24±9.04	94	40
61-80	113	37.7			
81-94	4	1.3			
Total	**300**	**100**			
Mean weight	**59**				
Standard for Female (ICMR, 2020)	**55.0**				

Table 4. Reported that majority 63.7% were found to be obese and 17% found to be overweight and normal and least (7)2.3% reported to be underweight. The mean BMI was 25.9. Similar study by (Biswas S.*et al*.,2022) [14] reported that the age group 35 and beyond has the highest prevalence of overweight and obesity and study supported by (Riamei G. *et al.,* 2019) [15] reported (15.93%) were found to be obese and (25.27%) were overweight.

Table4. Classification of Kom adult female based on BMI

BMI	**No.**	**%**	**Mean± S.D**	**max**	**Min**
Below 18.5 (underweight)	7	2.3	25.95±3.62	37.3	16.8
18.5-22.9 (normal)	51	17.0			
23-24.9 (overweight)	51	17.0			
Above 25 (obese)	191	63.7			

Table 5. It showed that more than fifty percent majority 61.3% were found to be their waist circumference at risk and less than fifty percent 38.7% were reported to have normal waist circumference whereas, for WHR majority of 82% were found to be at risk and 54 (18%) were

reported to be at normal. Similar studies by (Shivashankar M. *et al.,* 2022)[16] reported WHR mean was 0.76 which is lower than present study.

Table 5. Percent distribution among kom female according to waist circumference and waist hip ratio (WHO, 2004)

Variables	No.	%	mean±S.D	Max	min
Waist Circumference					
Normal (<80cm)	116	38.7	83.20±10.02	111	30
At risk (>80 cm)	184	61.3			
Waist Hip Ratio					
Normal (<0.81)	54	18.0	.8699±0.59	1.20	65
At risk (>0.81)	246	82.0			

It is shown that, the mean score of weight is higher and waist circumference 83.2 and waist hip ratio .86 is found to be higher than normal range. Similar study by (Shivashankar M.*et al.,* 2022) [16] reported the mean height of women was 157.36cm and mean weight was 53.86kgs.

Table 6. Mean score of kom adult female anthropometrical assessment

Anthropometrical assessment	Mean score
Height (in cm)	150.8 cm
Weight (in Kg)	59.2 kg
Body Mass Index (BMI)	25.9 kg/m^2
Waist Circumference (WC)	83.2 cm
Waist-Hip Ratio (WHR)	.86 cm

Table 7. Reported that the higher age group 40-49 age group is found to be obese 34.6% and 37.3% were reported overweight. The prevalence of obesity was 34.6% between the 40-49 age group among kom adult female of reproductive age group. The higher the age group the higher the obesity but p value is >0.005 There is no significant association between the two variables age and BMI. Similar study by (Rokade S.*et al.,*2020) [17] and (Sehgal RK.*et al.,*2024) [18]. The highest obesity was found in the age group of 35 and above (20.7%)

Table 7. Association between Age and BMI

Variable		Underweight	Normal	Overweight	Obese	*P* value
Age group	20-29	3 (42.9%)	12 (23.5%)	16 (31.4%)	63 (33.0%)	0.799
	30-39	1 (14.3%)	17 (33.3%)	16 (31.4%)	62 (32.5%)	
	40-49	3 (42.9%)	22 (43.1%)	19 (37.3%)	66 (34.6%)	
Total	100	7	51	51	191	

It showed in the Table **8**. That sedentary activity are to be more obese (78%) than moderate (18.3%) and heavy activity (3.7%) similarly, sedentary activity are found to be more overweight

70.6% than moderate 21.6% and normal 7.8% so, the *p* value is smaller than <0.005 it is highly significant and there is significant association between activity pattern and obesity.
Furthermore, those consuming junk food regularly are reported to me higher in obesity stage 70.2% and overweight 72.5% than those who consume junk food occasionally. So, the *p* value for is less than <0.005 it is highly significant and there is significant association between consumption of junk food regularly and obesity. Additionally, adult female's food preference those who prefer fast food more than traditional food were found to be greater chance of obesity 62.8% and overweight 58.8%. So, the *p* value is smaller than <0.05 it is highly significant and there is significant association between food preference and obesity.

Table 8. Association between other risk factors and obesity

Risk factors		**underweight**	**Normal**	**Overweight**	**Obese**	***P* value**
Activity pattern	Sedentary	3 (42.9%)	30 (58.8%)	36 (70.6%)	149 (78.0%)	0.000
	Moderate	4 (57.1%)	16 (31.4%)	11 (21.6%)	35 (18.3%)	
	Heavy	0 (0.0%)	5 (9.8%)	4 (7.8%)	7 (3.7%)	
Consuming of junk food	Yes (regular)	5 (71.4%)	36 (70.6%)	37 (72.5%)	134 (70.2%)	0.000
	No	2 (28.6%)	15 (29.4%)	14 (27.5%)	57 (29.8%)	
Food preference	Traditional	2 (28.6%)	17 (33.3%)	21 (41.2%)	71 (37.2%)	0.000
	Fast food	5 (71.4%)	34 (66.7%)	30 (58.8%)	120 (62.8%)	

(Statistical significant at ***P* <0.005**)

Conclusion: It may be mention that health elated studies among tribal populations is found to be limited. Several studies mainly focus on underweight among rural areas but limited studies in overweight and obesity health status. The present study draw inference that majority were found to be obese among the kom tribal female of rural areas of Manipur. To mitigate the rising rates of overweight and obesity, it is of utmost importance to encourage lifestyle adjustments and adopt wholesome diet. Nutritional education and nutritional intervention should be encourage among the schools and anganwadi centres nutritional education should be given both to children and women in bringing solution to health issues and challenges and for the betterment of health status among the rural tribal women.

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