Anthropometric characteristics and nutritional status based on body mass index of muslim females in Varanasi

■ SHAISTA PARVEEN, ARCHANA CHAKRAVARTY **and** N.K. AGRAWAL

■**ABSTRACT :** Under nutrition, overweight and obesity of individuals who differ by age and sex are matters of great concern having social and health implications for countries around the world. According to NFHS report (1998-99), based on weight for height index (body mass index), more than one-third (36%) of women in Uttar Pradesh are undernourished. Health status of women is of great concern in the contemporary world, because of the multiple roles play by women given rise to serious health and nutritional problems. Women are, thus, vulnerable to malnutrition for social and biological reasons. A cross-sectional study was undertaken to determine anthropometric profile and nutritional status based on body mass index (BMI) of muslim females in Varanasi. A total of 220 females (aged 15 - 45years) residing in urban area of Varanasi was studied. Anthropometric profile including height, weight, waist circumference as well as BMI and waist-hip ratio (WHR) were measured. The main aim of the study was to determine their anthropometric characteristics and nutritional status through the assessment of Body Mass Index (BMI) and Waist-Hip ratio. It was found that 35.5%, 36.8%, 14.1% and 13.6% were under weight, normal, pre-obese (overweight) and obese, respectively on the basis of Asian BMI categorization. On the account of waist-hip ratio, 42.7% respondents were at high health risk whereas 57.3% were at low health risk. This study will provide baseline data for further studies on Muslim women in India and will help to plan and implement a comprehensive package for the management of their nutritional status.

■ **KEY WORDS:** Nutritional status, Muslim females, Anthropometric characteristics

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The health of women depends on their emotional, social and physical well-being which is determined by different social, political and economical contexts of their lives. Under nutrition and malnutrition exist as part of the complex and of the population, problem of poverty and deprivation that affects millions of people in Asia. It is prevalent among all segments of the population; poor nutrition among women begins in infancy and continues throughout their lifetime (Chatterjee, 1990 and Desai, 1994). Because of prevailing culture and traditional practices in India, the nutritional status of women becoming worse effected. Nutritional status with respect to underweight, overweight and obesity in adults can be evaluated accurately using BMI, since it is the

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most appropriate method for extensive surveys in human population (Lohman *et al.,* 1988; Ferro-Luzzi *et al.,* 1992 and James *et al.,* 1994). The use of anthropometry is an efficient indicator of nutritional status of adults (World Health Organisation, 1995). There is paucity of information on the nutritional status of Muslim women and thus, in this connection the study is conducted.

■ RESEARCH METHODS

The study was conducted in two major wards of Varanasi *i.e.* Chowk and Chetganj .The study was carried out to determine the anthropometric characteristics and nutritional status of Muslim females. The survey represented information about 220 respondents and were selected by simple random technique. Females of reproductive age *i.e.* 15- 45 years were selected for this purpose. The study involved anthropometric measurement, nutritional status assessment, measurement of health risk on the basis of waist-hip ratio. To determine the anthropometric measurement *i.e.* height, weight, waist circumference and hip circumference standard technique was performed (Jelliffe, 1966). Questionnaire-cum-interview schedule was used for the collection of data.

Categorization of nutritional status was done on the basis of BMI for Asian countries (WHO Lancet, 2004) by using the formula:

BMI = Wt (kg)/ Ht² (m)
where, Wt = Weight in kg
Ht = Height in meters

Health risk assessment of respondents was done on the basis of waist-hip ratio (WHO Expert Consultation Report, 2008).The data was analyzed using descriptive statistics such as frequency, percentage, mean and standard deviation and pearson correlation co-efficient.

■ RESEARCH FINDINGS AND DISCUSSION

The present study revealed that mean weight, waist circumference, waist-hip ratio and BMI was increased with age as given in Table 1. This gain may be due to the cumulative effect of marriage and successive pregnancies or due to some hormonal changes that occur with increasing age. Table 2 shown relationship between anthropometric characteristics and it was found that there was significant correlation exist between each other except height.

On the basis of BMI categorization for Asian countries in Table 2, about 35.5%, 36.8%, 14.1% and 13.6% females were underweight, normal, overweight and obese, respectively.

WHO classification of health risk on the basis of waist-hip ratio (2008) of respondents in percentage was shown in Fig. 1. About 42.7% respondents were at high health risk whereas 57.3% were at low health risk. High health risk may be due to central obesity or overall obesity due to sedentary lifestyle, physical inactivity, heredity, sleeping less than 7 hours, skipping of meals which reduce BMR as well as faulty eating practices and low health risk may be because majority of the respondents belongs to early adulthood and have more physical activity.

| Table 1 : Mean (SD) value of Anthropometric characteristics and BMI on the basis of their age			(n=220)
Age (in years)	15-24 (n=141)	25-34 (n=49)	35-35 (n=30)
Height (cm)	153.29±5.81	154.12±5.10	152.99±5.94
Weight (kg)	44.75±8.27	55.25±10.44	65.65±12.72
BMI (kg/m²)	19.04±3.37	23.21±3.99	28.04±5.00
Waist circumference (cm)	67.34±8.34	77.96±8.71	88.03±10.68
Waist – hip ratio	0.78±.53	0.80±.53	0.82±.57

*BMI- Body Mass Index

Table 2: Correlation matrix showing relationship between anthropometric characteristics					
Anthropometric Characteristics	Height	Weight	BMI	Waist circumference	Waist-hip ratio
Height	1				
Weight	.260 ***	1			
BMI	.951***	-.045	1		
Waist circumference	.887***	.124	.880***	1	
Waist-hip ratio	.449***	.097	.432***	.676***	1

*** indicates significance of value at P< 0.001

Table 3 : Classification of nutritional status of respondents according to Asian BMI categorization

BMI classification	Number	Percentage
Underweight (<18.5 kg/m^2)	78	35.5
Normal (18.5-22.9 kg/m^2)	81	36.8
Overweight/Pre Obese (23-27.5 kg/m^2)	31	14.1
Obese (>27.5 kg/m^2)	30	13.6
Total	220	100.0
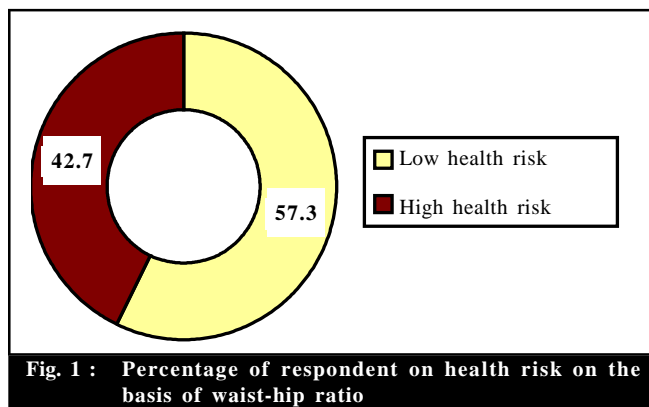
Fig. 1 : Percentage of respondent on health risk on the basis of waist-hip ratio

Conclusion :

The study concluded that anthropometric characteristics and BMI is associated with age. On the account of BMI categorization for Asian countries, about 35.5% respondents were underweight whereas 14.1% and 13.6% respondent were overweight and obese, respectively. 42.7% respondents were at high health risk whereas 57.3% were at low health risk on the basis of their waist-hip ratio.

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