



RESEARCH ARTICLE

PREVALENCE OF OBESITY IN RELATION TO FOOD INTAKE AND PHYSICAL WORK IN
MALE INDIVIDUALS OF BANNU DISTRICT

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ABSTRACT

There is a strong association of obesity with food intake and physical work. The study was conducted in one city and three villages of district Bannu, in such a way, that it covered all aspects of life. Hundred households were randomly selected from each location and a male individual of 20-60 years of each household was interviewed. A total of 600 individuals were interviewed. Anthropometric, activity level and dietary information of three alternate days of the week were collected through a standard questionnaire. Prevalence of obesity, overweight & underweight was 14, 35 & 10% in cities and 7, 30 & 15% in villages respectively. Over all prevalence of obesity, overweight and underweight was 10, 34 & 12% respectively in the district Bannu. The highest prevalence of Obesity and overweight was noted in the age group of 25-50 years (7 & 16 %), followed by >50 years (2 & 10%) and lowest prevalence of obesity and overweight was noted in the age group of 19-24 years (1 & 6%). The average energy intake was 2503±456 Kcal/day. The energy intake was positively correlated with body mass index (BMI) (0.360). Physical activity was negatively correlated with BMI (-0.371). Obesity and excessive central body fat were the highly prevalent health problems in the studied population. For the people of district Bannu, multi-component strategy including a low energy diet, increased physical activity and behavior therapy are strongly recommended, as it seems more efficient than treatment programs using just one or two of these modalities.

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INTRODUCTION

Obesity is a medical condition, characterized by storage of excess body fat. Fat is critical for good health because it is a concentrated source of energy when the body lacks, the energy necessary to sustain life processes and it provides insulation and protection for internal organs, whereas the accumulation of too much fat in the body is associated with a variety of health problems. Studies show that individuals who are overweight or obese run a greater risk of developing diabetes mellitus, hypertension, coronary heart disease, stroke, arthritis, some forms of cancer and other life-threatening diseases (Robert and Richard, 2005; Mahan & Escott-Stump, 2000).

Public health officials are concerned that obesity is reaching epidemic proportions. According to the National Institute of Diabetes, Digestive and Kidney Diseases, almost 70 percent of heart disease cases in the United States are linked to excess body fat, and obese people are more than twice as likely to develop hypertension. The risk of medical complications,

particularly heart disease, increases when body fat is distributed around the waist especially in the abdomen. Excess body fat around the abdomen (often termed 'apple shaped') carries a higher risk than excess body fat around the hips, thighs and buttocks (often termed 'pear shaped'). Adults with central or android obesity defined by an increased waist circumference (i.e. >102 cm for men or >88 cm for women), are at increased risk for obesity related diseases independent of the BMI. This type of upper body fat distribution is more common in men than in women (John, 2005 and WHO, 1997).

When the calories from food intake equal the calories of energy the body uses, weight remains constant. But when a person consumes more calories than the body needs, the body stores those additional calories as fat, causing subsequent weight gain. Consuming about 3,500 calories more than what the body need result in weight gain of 0.45 kg of fat. Obesity can become a chronic lifelong condition caused by overeating, physical inactivity, basal metabolic rate, hormonal and even genetic makeup. No matter what the cause, obesity can be prevented or

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managed with a combination of diet, exercise, behavior modification, and in severe cases, weight-loss medications and surgery. Weight reduction is lifesaving, so it is necessary to reduce weight (Weinsier, 2001 and Shilton et al, 2001). Caloric restriction and regular exercise is the single best predictor for achieving long-term weight control, which also improve some of the medical conditions associated with obesity, Five to ten percent reduction in body weights sufficient to significantly improve medical conditions, such as elevated cholesterol levels, diabetes mellitus, and hypertension. These health improvements occur even though patients may still be overweight (Gary, 2005).

Changing lifestyles over the last century, including increased calorie consumption and reduced physical activity have increased the chances of becoming obese. The lack of physical activity has reduced the overall amount of energy expended in the course of a day, has played a key role in the prevalence of obesity seen today. The prevalence of obesity, energy intake and lifestyle are not known in Pakistan in general and in KhyberPakhtunkhwa (KPK) in particular. Due to lack of scientific data, no precautionary measures have been adopted to reduce the prevalence of obesity, make changes in dietary pattern and lifestyle. This study was designed to know the prevalence of obesity and its relation with food intake and physical activity of male individual in District Bannu K.P Pakistan.

MATERIAL AND METHODS

Study design and location

A cross-sectional study was conducted in District Bannu, KhyberPakhtunkhwa, Pakistan.

Sample size and selection criteria

Six hundred households were randomly selected from Bannu district (one city and three villages). Healthy male individuals aged 20-60 years who were willingly participated in the study were included in the study. The individuals were interviewed through standard questionnaire.

Demographic and Socio-economic Characteristics

Socio-demographic variables were determined by interviewing the subjects about their age, family type, education, socio-economic condition, profession, family monthly income and their responses were recorded in the questionnaire.

Anthropometric Measurements

Weight, height, waist and hip circumferences and BMI of all the subjects were measured by WHO recommended procedure. Subjects were categorized into underweight, normal, overweight and obese by using WHO classification.

Dietary Assessment

Every individual of the sample was interviewed through food frequency questionnaire. The part of the questionnaire on the visiting day was filled from that individual. To fill the parts of the questionnaire for the remaining two alternate days, the questionnaire was left with that individual and was practically trained for it. That questionnaire was collected from him after three days. The serving size of the different area was

determined. The volume of the bowl, glass and cup was measured with the help of graduated cylinder and the weight of the curry plate, rice plate and bread was determined with the help of digital balance.

Determination of Macronutrients

The protein, fat and carbohydrate intake was calculated from the consumed foods using the food composition tables (Understanding Nutrition, 1984). The required energy was determined by using the formula (Ideal body weight*10) + (Ideal bodyweight*factor of activity level) (ADA, 1984).

Determination of Activity Level

Activity level of individual was determined from his profession according to Krause and Mahan (1984). The individual, involved in exercise in addition to the job, was added to his activity level.

Statistical Analysis

All the data was entered into the statistical package for social sciences (SPSS) for inspecting error and statistical analysis. Mean and standard deviation of BMI, protein, fats, carbohydrates, energy and the percent prevalence of obesity, overweight, underweight and percent contribution of macronutrients to energy was analyzed. An independent t-test and chi-square test were used for association of obesity with energy (food intake) and physical work with the help of SPSS, 2007.

RESULTS

Overall Prevalence of Obesity in the District Bannu (n=600)

On the basis of combine data of city and villages the prevalence of obesity and other weight profiles in the district Bannu is given in (Table-1). Ten percent individuals were obese with a mean BMI of 33 ± 2.9 , 33% individuals were overweight with a mean BMI of 26 ± 1.3 . 12% individuals were underweight with a mean BMI of 17 ± 1.0 . The remaining 43% individuals were of normal weight with a mean BMI of 22 ± 1.7 .

Table- 1 Overall Prevalence of Obesity in the District Bannu (n=600)

Nutritional Status	N (%)	Mean±SD (BMI)
Obese	65 (10)	33±2.9
Overweight	199 (33)	26±1.3
Normal Weight	259 (44)	22±1.7
Underweight	77 (12)	17±1.0

Physical Activity Level of Individuals in City and Villages of District Bannu

Forty one percent individual was in sedentary, 32% was moderate, 23% was vigorous and 4 % was having strenuous activity level in city, while 29 percent sedentary, 29 % moderate, 34 % vigorous and 8 % was in strenuous activity level in villages of district Bannu.

Table 2 Physical activity level of individuals in city and villages of District Bannu

	Category	N	%age
City	Sedentary	120	41
	Moderate	96	32
	Vigorous	69	23
	Strenuous	12	4
Villages	Sedentary	88	29
	Moderate	88	29
	Vigorous	33	34
	Strenuous	24	8

Macronutrient intake and their energy content in city and villages of District Bannu

The energy in take in city of District Bannu was 2440±442, 2542±492 and 2557±469 kcal/day/person in Lakki gate, Railway road and Paratayqassaban respectively. The energy in take in villages was 2432±489, 2552±440 and 2497±445 kcal/day/ person in Kakki, Kammerkala and Domel respectively. The percent increase over required energy was higher (19%) in city than (15%) in villages. It presents that energy intake was more in cities than villages. These differences were perhaps due to the difference in the socioeconomic status of people residing in the cities, and villages. Also people leaving in city have easy access to fast foods, bakery and confectioneries, which provide sufficient amount of energy.

Table- 3 Mean Macronutrient intake and their energy content in city and villages of District Bannu

Location	Ptn	Fat	CHO	Mean±SD			Ptn	Fat	CHO	
				E. Intake	Required Energy	(+) or (-) over R.E				
City	Lakki Gate	90	53	400	2440±442	2115±228	16	15	19	66
	Railway road	91	58	414	2542±492	2147±237	19	14	20	65
	P. qassaban	92	63	406	2557±469	2126±227	21	15	22	64
Villages	Kakki	88	57	391	2432±489	2199±273	11	15	21	64
	Kammarkala	92	63	404	2552±440	2134±291	20	15	22	64
	Domel	90	53	415	2497±407	2206±234	14	14	19	67

DISCUSSION

High prevalence of obesity was noted in city of district Bannu which is mainly because of high-energy in take and sedentary lifestyle. In addition, many of the labor saving devices of the modern lifestyle, such as cars, elevators, personal computers, and remote controls promote a sedentary lifestyle. In cities people get high-calorie food choices and larger portions have become the basis of the typical diet, resulting in excessive calorie intake and increasing the prevalence of obesity. The current study results are in contrast with a study in which obesity and overweight was 22.2% and 26.8% respectively reported in urban black South Africans Umtata (Erasmus et al. 2001). Abbas and Khan (2003) reported a prevalence of 10% obesity and 41% overweight in cities of district Mardan Pakistan. Afridi and Khan (2002) reported a prevalence of 9% and 34% overweight in cities of district Swabi, while the prevalence of obesity and overweight was 8% and 30% respectively in the employees of University campus Peshawar. Obesity was found in 6.6% men and 33.3% women, in an urban area of South Africa (Walker et al. 2002). According to the Centers for Disease Control and Prevention (CDC), in the United States nearly 31 percent of the population was obese, up from 13 percent in 1960. From 1980 to 2000 obesity among American adults doubled, and the number of obese children and teenagers nearly tripled (Gary, 2005). Studies conducted in the United States in the 1990s

showed that more than 97 million Americans were overweight and risked health problems, such as heart disease, diabetes mellitus and arthritis, commonly associated with obesity (NIH, 1998). The prevalence of childhood obesity in France is 10-14% and is doubled between 1980 and 1996 (Rolland et al. 2001). Another study reported 45% of men and 66% of women were obese in New Zealand (Bell et al. 2001). In Rio de Janeiro City, Brazil, 1455 males and 1906 females (>20 years of age) has 44.9% overweight with 39.2% excessive central body fat distribution, having intake of 31%, 42% and 47%, fat, saturated fat and cholesterol respectively (Marins et al. 2001). Both imbalance diet in terms of energy and sedentary lifestyle increase the incidence of obesity and overweight. The data in (Table 3) showed that in the city, about 26% of people were consuming 26-50% more than the required energy. The data in (Table 2) showed that almost 41% of people were living a sedentary life. Thus it is evident that increased energy consumption and decreased physical work in city has caused such a high prevalence of obesity.

Comparatively to city the prevalence of obesity is less prevalent in villages because, the people living in villages, involve themselves to some extent in vigorous activities. The data in (Table 2) shows that almost 34% of people were involved in vigorous physical activities.

While underweight is highly prevalent in villages than city, as there are low health facilities and no access to nutritional education. Abbas and Khan (2003) has reported 7% obesity, 34% overweight and 37% underweight in villages of district Mardan and Afridi and Khan (2002) has reported 2% obesity, 16% overweight and 12% underweight in villages of district Sawabi. The underweight is highly prevalent (34%) in district Mardan and (12%) in District Sawabi. While prevalence of underweight (15%) in district Bannu was higher from Swabi and shows less prevalence than Mardan.

The prevalence of obesity is increasing rapidly in all age groups in most EU countries and is one of the fastest growing epidemics, now affecting 10-40% of the adult population (Astrup, 2001). Out of 1787 males and 2288 females aged 6-16 years, in United Arab Emirates, 16.5% and 16.9% of males and females, respectively, are classified as overweight. The rate of morbid obesity is approximately twice that expected in reference data (Al-Haddad et al. 2000). When high carbohydrate diet is consumed, and in particular, when the carbohydrate is simple sugars, lipogenesis from carbohydrate does occur and convert it into fatty acid. Therefore, recommendations to simply reduce dietary fat for controlling obesity are inappropriate. The type of carbohydrate recommended and total calories are critical variables. Similarly excess dietary proteins are also converted to fatty acids in the liver by means of lipogenesis. So strong evidence suggests that

longevity is affected by energy intake, not necessarily just fat calories (Mahan and Escott-Stump, 2000).

CONCLUSION

The results of the study showed that malnutrition problems namely obesity, overweight and underweight were present among population of district Bannu. Obesity and excessive central body fat were highly prevalent health problems in the studied population. The highest prevalence of Obesity and overweight was noted in the age group of 25-50 years, followed by >50 years and lowest prevalence of obesity and overweight was in the age group of 19-24 years. The overall prevalence of obesity was higher than the reported prevalence of obesity in the district Mardan and district Sawabi Pakistan and less prevalent compared to the other parts of the world. Consumption of imbalance diet particularly excessive caloric intake, lack of nutrition education and sedentary lifestyle when coupled with the modern leisure facilities are the major factors responsible for the occurrence of obesity and overweight. The identified risk factors should be urgently addressed through health nutrition education and physical activity program.

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