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LETTER TO EDITOR

Influence of Food Intake on BMI of Indian and Nepalese Medico Sportsmen

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Introduction

Overweight and obesity have become a major public health problem in both developing and developed countries as they are causally related to a wide spectrum of chronic diseases including type II diabetes, cardiovascular diseases and cancer[1]. It is increasing rapidly in both developed and developing countries and has been recognised as one of the challenges for cardiovascular disease control and the new generations are at increased risk. A developing country like Nepal has both cardiovascular disease and obesity as major public health problems. Obesity is an epidemic across the globe and it is a multifaceted disease which requires multi pronged strategy to control it. Nutritional factors play a key role in the modification of energy intake and expenditure. Emerging scientific evidence over the past decade suggests that dairy foods may be beneficial when included in a moderate energy restricted diet and possibly for weight maintenance as well [2]. Body mass index (BMI) is one of the important parameters which is frequently used to assess obesity and nutritional status of an individual. Even a simple cross-sectional measure of BMI has a good predictive value for subsequent development of clinical disease [3]. The greater BMI in adolescence or early adulthood may be an important risk factor for ischemic heart disease (IHD) [4]. Several studies have shown that adequate consumption of fruit and vegetables is associated with a reduced risk of cancer and coronary heart disease (CHD) [5]. The aim of the present study is to find out the influence of food in the overweight of sportsmen among the medical students.

Materials And Methods

This cross sectional study was carried out at Manipal College of Medical Sciences, Pokhara, Nepal with ethical committee permission. Consented male medico participants of college sports competition were the subjects of this study. Assessments were made using self structured questionnaire which contains the details of anthropometry, food habits, and socio demographic details. The BMI (kg/m^2) was calculated by conventional methods as per WHO [6]. Z- Test and t-Test were used for the comparison of the two groups with the help of SPSS 16 and Microsoft Excel for Windows 2003.

Result

Of the 65 participants of this study, 25 (38.46%) were Indians and 40 were (61.54%) Nepalese. The ratio of Nepalese to Indian was 5:8. The comparisons of age, weight, height and BMI between Indian and Nepalese were done [Table/Fig 1] . Analysis of BMI showed that out of the 65 students 22 (mean 26.98; 95% CI 26.27-27.70) were over weight [Table/Fig 2] .

(Table/Fig 1) Comparison between Indians (n=25) and Nepalese (n=40)

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Variables	Nationality	Mean	Confidence Interval
Age	Indians	20.68	(20.21- 21.15)
	Nepalese	20.72	(20.30- 21.15)
	Total	20.71	(20.40- 21.02)
Weight	Indians	69.92	(66.44-73.40)
	Nepalese	65.15	(62.67-67.63)
	Total	66.98	(64.93-69.04)
Height	Indians	175.04	(167.12-182.97)
	Nepalese	165.63	(159.70-171.56)
	Total	169.52	(164.49-174.01)
BMI	Indians	23.11	(21.87-24.33)
	Nepalese	24.03	(23.14-24.94)
	Total	23.68	(22.96-24.39)

(Table/Fig 2) Comparison between normal (n=43) and overweight (n=22) students

Variables	Students #	Mean	P value	Confidence Interval
BMI	Normal	21.99	0.001*	(21.48-22.50)
	Over weight	26.98		(26.27-27.70)
Weight	Normal	71.07	0.001*	(69.36-72.78)
	Over weight	59.0		(55.96-62.04)
Height	Normal	180.16	0.001*	(176.41-183.91)
	Over weight	147.93		(143.32-152.54)

 # Total number of students participated (n=65); * statistically significant

Out of 22 overweight athletes 18 (81.82%) were non vegetarians and 4 (18.18%) were vegetarians [Table/Fig 3]. It is found that the over weight non-vegetarians are significantly (p < 0.05) more in number than vegetarians (Z-test). Among the non vegetarians 15 (83.33%) were Nepalese and 3 (16.67%) were Indians. It appears that Nepalese students are significantly (p<0.05) more overweight than Indians [Table/Fig 4] .

(Table/Fig 3) comparison between vegetarians (n=4) and non vegetarians (n=18)

Variables	Food Habit	Mean	P value	Confidence Interval
BMI	Vegetarian	27.22	0.7	(25.61-28.83)
	Non Vegetarian	26.93		(26.06-27.80)
Weight	Vegetarian	57	0.5	(53.56-60.44)
	Non Vegetarian	59.44		(55.72-63.17)
Height	Vegetarian	148.63	0.5	(143.06-154.20)
	Non Vegetarian	144.78		(136.05-153.51)

(Table/Fig 4) comparison between non vegetarian Nepalese (n=15) and Indians (n=3) overweight students

Variables	Nationality	Mean	P value	Confidence Interval
BMI	Indians	28.9531	0.06*	(25.64-32.26)
	Nepalese	26.5277		(25.67-27.39)
Weight	Indians	63.67	0.7	(15.48-111.86)
	Nepalese	58.6		(56.86-60.34)
Height	Indians	147.57	0.9	(85.67-209.46)
	Nepalese	148.84		(144.43-153.25)

***Statistically significant**

Discussion

There are more than 1 billion overweight people worldwide and at least 350 million who are estimated to be clinically obese.

According to the Nepal Demographic and Health Survey-2006, the prevalence of overweight in urban population is about 20.7 % [7]. Overweight and obesity poses a major risk for serious diet-related non-communicable diseases such as diabetes mellitus, hypertension and other cardiovascular disease, stroke, dislipidemia and some cancers [8]. Asian population have a higher percentage of body fat compared to Western populations for a given BMI or waist circumference [9],[10],[11],[12],[13] and exhibit greater prevalence of CHD risk factors at a low BMI and waist circumference values [14]. An earlier study in Nepal found that the prevalence of overweight and obesity is high in the males and 89.4% were non-vegetarian among 1000 study population [15]. The results of the present study even with its limited sample size also confirms this finding.

To avoid the risks of degenerative diseases during their adulthood, attention should be brought early to the nutritional status, food and physical activity habits of young children [16],[17]. The increased prevalence of overweight and obesity warrants for effective dietary strategies for weight management [18]. Western vegetarians, compared with non-vegetarians had a lower mean BMI a lower mean plasma total cholesterol concentration, and a lower mortality from ischemic heart disease [19]. A study on women population in Australia reports that vegetarians and semi vegetarians had lower BMI, than non-vegetarians [20]. Because fruits and vegetables are high in water and fibre, incorporating them in the diet can reduce energy density, promote satiety, and decrease energy intake [21]. Several studies have shown that adequate consumption of fruit and vegetables is associated with a reduced risk of cancer and CHD [22],[23]. Adolescent and young adult vegetarians may experience the health benefits associated with increased fruit and vegetable intake and young adults may experience the added benefit of decreased risk for overweight and obesity [24]. Intake of a low-fat, low-energy diet, over the course of one week in a stress-free environment, had positive impact on

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the risk factors of cardiovascular diseases [25],[26].

All must be encouraged and motivated to follow healthy eating behaviours so as to maintain ideal body weight by including more fruit, vegetables, nuts and whole grains in their diet and to reducing the intake of fatty (reduce saturated animal-based fats to be compensated with unsaturated vegetable-oils) and sugary foods. Effective weight management for individuals and groups at risk of developing obesity involves a range of long-term strategies. These include physical activity, weight maintenance, management of co-morbidities and weight reduction in overweight. They should be part of an approach, which includes environmental support for healthy diets and regular physical activity. Creating supportive environments through policies that promote the awareness, availability and accessibility of a variety of low-fat, high-fibre foods, and that provide opportunities for physical activity is essential.

Acknowledgement

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