

PREVALENCE OF OVER WEIGHT AND OBESITY IN FIRST YEAR MEDICAL STUDENTS OF A SOUTH INDIAN MEDICAL SCHOOLRachakonda Parvathi¹, Gandhi Bhaskar Pathrudu²**HOW TO CITE THIS ARTICLE:**

Rachakonda Parvathi, Gandhi Bhaskar Pathrudu. "Prevalence of Over Weight and Obesity in First Year Medical Students of a South Indian Medical School". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 19, May 12; Page: 5250-5254, DOI: 10.14260/jemds/2014/2583

ABSTRACT: Overweight and obese people are increasing even in developing countries like India. Obesity is increasing even in educated people due to sedentary life style & other reasons. **METHODOLOGY:** The present study is undertaken with the aim to assess the obesity profile of medical students using WHR & BMI as parameters, to assess their probable cause in terms of caloric intake and caloric expenditure. **RESULT:** The study showed that even among medical students almost one fourth (23.2%) are in the overweight and obese category, with one fifth (19.1%) of the students in the overweight group and 4.2% in the obese category. Furthermore, 4.2% are in the underweight category. Regarding WHR, more women are with increased WHR than men (women 30.3; men 5.3%; $p < 0.0001$) indicating an increased incidence of visceral adiposity among female students. Questionnaire data assessing the total caloric intake and expenditure didn't show much difference between the two in almost all the students, indicating that the probable cause of the excess weight may be related to genetic or other unknown factors. **CONCLUSION:** These data show that there is every necessity to create awareness among students about overweight & obesity and their consequences and strategies for maintenance of weight.

KEYWORDS: Obesity, medical students, BMI, WHR, Caloric intake.

INTRODUCTION: Obesity is one of the most common nutritional problems of children and adolescents in the developed and developing world today. Studies have shown that the highest prevalence of obesity is seen in people of Pacific and Indian Ocean islands.^{1,2} Previously common in affluent countries, now it is a growing problem in many developing countries.³ In developing countries like India, where once under nutrition was a major problem, obesity and overweight has now become coexistent in a parallel fashion with under nutrition.⁴ Overweight and obesity are on the rise in the past decade in India. However, in some urban and high economic groups a relatively high level has been already reached⁵. Overweight and obesity is growing in incidence in a health care professional's also.⁶

The objectives of the present study were to measure the Body Mass Index (BMI), Waist Hip Ratio (WHR) as indicators of obesity in Medical Students and to compare the observed findings with obesity data from India and the world in general. To interpret difference or similarities if any, and to establish probable causes of Obesity, like Diet, Life Style, Exercise, Stress etc. & also to inculcate awareness of Calorie intake and Output in the Medical Students.

METHODOLOGY: The present study is a Cross-sectional study conducted on 142 first year medical students of Andhra Medical College, Visakhapatnam. They were chosen for their ready accessibility. This study was done after four months of their admission into the MBBS Course. The consent of each student was taken individually before the study. There were 76 males and 66 females in this Study in

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the age group of 18 to 20yrs. BMI & WHR were calculated from standardized measurements of height, weight, waist and hip circumference. A Chi Square test for independence was performed based on number of males & females in particular BMI & WHR categories. A questionnaire was prepared regarding the Total Energy Input (in the form of the quantity of food taken per day) and the Total Energy Output (from the Life Style followed). List of common physical activities performed by students during their leisure time was provided as a questionnaire to each student for marking. The activities were namely jogging, running, playing outdoor games (involve running), yoga, physical exercise and others like swimming, dancing etc. MET (metabolic equivalents) value of each of the activity was known.⁷

RESULTS:

a) Caloric intake and output: Most of the students have come out with identical calorie intake like four idly and a glass of milk for breakfast with a slight variation. Even for lunch and dinner their menu remains normal for their age & sex. The caloric intake of the students matched with the normal caloric requirement for the age group 16-19 yrs. which is around 2800 K. Cal. in males & around 2000 K. cal in females. The Calorie Output was also identical and balanced the normal caloric intake of the students as per their age & gender (data not shown)

b) BMI: WHO classification is used for analysis of the BMI of students.^{8,9} In this Study the percentage of Students with gross obesity, with a BMI of >30 was 4.2 %. Among these, 2.6% were males and 2.8% were females. The percentage of Students in the Overweight group (BMI >25) were 19.1 % with 15.7% amongst males and 22.7% amongst females. The majority of the Students i.e. 72.5% is in the normal range of BMI (18.5 to 24.9) with 75 amongst males and 69.7 % amongst females. 4.22% of students are in the underweight category of <18.5 BMI with 3.52% males and 7 % amongst females [Table 1].

c) WHR: Taking a WHR of < 0.9 for men, < 0.8 for women as normal and >0.9 for men, >0.8 for women as increased WHR, 83.1% of the total students are in the normal range of WHR, while 16.9% are with increased WHR. More men (94.7% are in the normal range of WHR than women (69.7%). Women (30.3%) are in the increased range of WHR than men (5.3%).

BMI Category	Total N%	Male N%	Female N%	P value*	WHR Category	Total N%	Male N%	Female N%	P value*
BMI					WHR				
<18.5	6 (4.2%)	5 (6.5%)	1 (1.5%)	0.2158	< 0.9 (M) < 0.8 (F)	118 (83.1%)	72 (94.7%)	46 (69.7%)	<0.0001
18.5-24.9	103 (72.5%)	57 (76%)	46 (69.7%)	0.5724					
25.0-29.9	27 (19.1%)	12 (15.7%)	15 (22.7%)	0.3915	>0.9 (M) >0.8 (F)	24 (16.9%)	4 (5.3%)	20 (30.3%)	<0.0001
>30	6 (4.2%)	2 (2.6%)	4 (6%)	0.4166					

Table 1: Distribution of BMI & WHR categories, among first year medical students

*P value from chi square test of independence based on number of males & females in particular BMI & WHR categories.

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DISCUSSION: In the present study 19.7% amongst males and 28.8% amongst females belong to overweight and obese category. This correlates with the study of Mendez et al who found a relatively more prevalence of overweight than underweight in young women residing at urban and rural areas in economically developed countries.^{10,11} BMI in our study coincides with a study conducted in Pune in 2004 which documented the prevalence of 5.7% gross obesity and 19.9% overweight amongst school children similar to our figure of 4.22 % of Gross Obesity and 19.01% of Overweight.¹² In a study conducted on subjects in a medical school in Malaysia.¹³ 68.8% were in the normal range of BMI and 16.1% were in the over-weight and obese category.

In the present study the normal weight category of 72.5% closely matches. But for the overweight and obese categories there is a marked contrast (23.3% in the present study compared to 16.1% in the Malaysian study). The mean BMI of 21.94 and standard deviation of 2.86 also matches with that of the Malaysian study where the mean BMI is 21.8 and standard deviation is 3.4.

Also the present study indicates that more men are in the normal range of WHR than women. Also more women are with increased WHR than men, indicating that women are more prone to visceral adiposity than men.

Overweight and obesity are associated with hypertension,¹⁴ cardiovascular problems¹⁵ and other chronic diseases.^{16,17} The economic costs of treatment of obesity-related diseases necessitates a surveillance program and preventive measures to curtail the problem. The results show that physical inactivity and sedentary lifestyle are some of the strong factors for the cause of obesity in adolescents.¹⁸ Physical activity is the only behavior associated with a lower risk of overweight or obesity.¹⁹

One of the predisposing factors for obesity and associated diseases is malnutrition during fetal development and early childhood. Hence obesity and related diseases are likely to pose major health problems in the future. In countries where nutritional deficiencies and malnutrition are highly prevalent in children, overweight is adding extra problems.² Findings of our study prove the evidence that the growing incidence of obesity and overweight is due to physical inactivity rather than excess caloric or dietary intake.¹⁰

CONCLUSION: In the present study there is a balance between the calorie input and output. As such Diet as primary cause of overweight and obesity could not be taken into account. However there is a possibility of the students not coming out with the exact details. BMI is a controversial statistical measurement which does not take into account many factors such as Frame Size & Muscularity. The Genetic Predisposition should be considered, as Indians are genetically susceptible to weight accumulation especially around the waist. Therefore, medical education should focus not only on knowledge of caloric consumption and expenditure for maintenance of a balanced body weight but also stress on healthy attitudes and behaviors for better living.²⁰

Physical activity is a good method in obesity prevention and reduction programmes.²¹ One of the ways of preventing Obesity and treating overweight is to focus on strategies which increase physical activity and decrease television viewing amongst youngsters.¹⁰ Keeping in view the high prevalence of Obesity and the resultant economic cost involved on the health care services, a simple solution lies in the prevention of obesity through prophylactic efforts.¹⁶

REFERENCES:

1. WHO consultation on obesity. Special issues in the management of obesity in childhood and adolescence. In: obesity preventing and managing the global epidemic Geneva: WHO, 1998; pp 231-47.
2. Delpeuch F, Maire B. Obesity and developing countries of the south. *Med Trop (Mars)*. 1997; 57 (4): 380-8.
3. WHO (World Health Organisation), International Association for the Study of Obesity (IASO) and International Obesity task Force (IOTF). 2000. The Asia-Pacific Perspective: Redefining Obesity and its treatment. Geneva: World Health Organisation.
4. Popkin BM., Horton D, Kim S, Mahal A, Shuigao J. Trends in diet nutritional status and diet related non communicable diseases in China and India: The economic costs of the nutritional transition. *Nutr Rev*. 2001; 59: 379-90.
5. Subramanian SV, Smith GD. Patterns, distribution, and determinants of under- and over nutrition: a population-based study of women in India. *Am J Clin Nutr*. 2006; 84(3): 633-40.
6. Abbate C, Giorgianni C, Munao F, Beninato G, D'Arrigo G, D'Arrigo P, et al. Evaluation of obesity in healthcare workers. *Med Lav*. 2006; 97(1): 13-9.
7. Anura VK, Sumathi S, Swarnarekha B. IAP National Task Force for Childhood Prevention of Adult Diseases: The effect of childhood physical activity on prevention of adult diseases. *Indian Pediatrics*. 2004; 41: 37-62.
8. WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series 854. Geneva: World Health Organization, 1995.
9. WHO. Obesity: preventing and managing the global epidemic. Report of a WHO Consultation. WHO Technical Report Series 894. Geneva: World Health Organization, 2000.
10. Janssen I, Katzmarzyk PT, Boyce WF, Vereecken C, Mulvihill C, Roberts C, et al. Comparison of overweight and obesity prevalence in school-aged youth from 34 countries and their relationships with physical activity and dietary patterns. *Obes Rev*. 2005; 6 (2): 123-32.
11. Mendez MA, Monteiro CA, Popkin BM. Overweight exceeds underweight among women in most developing countries. *Am J Clin Nutr*. 2005 Mar; 81(3): 714-21
12. Khadilkar VV, Khadilkar AV. Prevalence of obesity in affluent school boys in Pune. *Indian Pediatr*. 2004; 41(8): 857-8.
13. Boo NY, Chia GJ, Wong LC, Chew RM, Chong W, Loo RC. The prevalence of obesity among clinical students in a Malaysian medical school. *Singapore Med J*. 2010; 51 (2): 126-32.
14. Neser WB, Thomas J, Semanya K, Thomas DJ, Gillum RF. Obesity and hypertension in a longitudinal study of black physicians: the Meharry Cohort Study. *J Chronic Dis*. 1986; 39(2): 105-13.
15. Bertsiyas G, Mammias I, Linardakis M, Kafatos A. Overweight and obesity in relation to cardiovascular disease risk factors among medical students in Crete, Greece. *BMC Public Health*. 2003; 8(3): 3.
16. E CP Jr., Caan B, Jacobson A. Obesity, health services use, and health care costs among members of a health maintenance organization. *Arch Intern Med*. 1998; 158 (5): 466-72.
17. Ohe K, Hachiya Y, Takahashi Y, Oda S, Takahara K. The significance of obesity in UOEH medical students--multiple regression analysis of the annual physical check-up data in 1991. *J UOEH*. 1992 Dec 1; 14 (4): 279-88.

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18. Janssen I, Katzmarzyk PT, Boyce WF, King MA, Pickett W. Overweight and obesity in Canadian adolescents and their associations with dietary habits and physical activity patterns. *J Adolesc Health*. 2004; 35 (5): 360-7.
19. Smith BJ, Phongsavan P, Havea D, Halavatau V, Chey T. Body mass index, physical activity and dietary behaviours among adolescents in the Kingdom of Tonga. *Public Health Nutr*. 2007; 10(2): 137-44.
20. Ekpanyaskul C, Sithisarankul P, Wattanasirichaigoon S. Overweight/Obesity and Related Factors among Thai Medical Students. *Asia Pac J Public Health*. 2011 Dec 23.
21. Flynn MA, McNeil DA, Maloff B, Mutasingwa D, Wu M, Ford C, et al. Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with 'best practice' recommendations. *Obes Rev*. 2006; 7 (Suppl 1):7-66.

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Date of Submission: 01/04/2014.
Date of Peer Review: 02/04/2014.
Date of Acceptance: 29/04/2014.
Date of Publishing: 10/05/2014.