

Nutritional Transition: A Cause of Concern for Obesity Among Students of Bukiriyah City, Saudi Arabia

Ravi Kiran Pal, *Mahmoud Fathi Jaber, *Sohail Akhtar

Department of Community Medicine, ESIC Medical College and Hospital, Faridabad, Haryana, *College of Public Health Informatics, Qassim University, Al Bukiriyah, Qassim, Saudi Arabia.

ABSTRACT

The prevalence of overweight (21.8-23%) and obesity (7015.7%) among male students is reportedly high in Saudi Arabia. Hence, there is felt need to assess percentage of overweight students also in Qassim region prior to intervention. A cross sectional study was carried out during October 2014 to September 2015 to find out prevalence of obesity among students of public health and to understand their dietary habits associated with obesity. All 202 students studying in college of Public Health & Health Informatics at Bukiriyah, in Qassim province of Saudi Arabia were interviewed using a structured and pretested questionnaire. The normal weight, overweight and underweight students were 47.03%, 45.05% and 7.92% respectively. Eighty percent were overweight among those aged above 23 years. This is approximately double of percentage of overweight students in the other two age groups. Consumption of fruits and fruit juice was higher in normal weight and overweight students, but lower in underweight students. A low vegetable and fruit intake along with higher intake of coke, tea, coffee, pizza and burger were noted as common eating habits of the students. There is urgent need to reduce the prevalence of overweight and obesity among college students, and to promote healthy eating habits and physical activities.

KEY WORDS: food habits, obesity, public health, saudi arabia

INTRODUCTION:

The MONICA Project, sponsored by the World Health Organization, discovered that 30% of the population in the Arab World is overweight or obese, including adolescents and adults^[1]. This percentage is smaller for North African countries than oil-producing countries, but is still a prevalent trend^[2]. The adoption of western lifestyle is one of the leading causes. The intake of attractive energy dense food with undesirable composition, increased consumption of animal fats and sugars and reduced consumption of dietary fibre, along with a lack of sufficient physical activity is high. Specifically in the Arabian Peninsula the physical activity of the population has significantly diminished with the availability of housemaids, private cars, television, and sophisticated household appliances. In addition, the types of food and fat intake have changed^[3]. Other common factors, besides a sedentary lifestyle and unhealthy food choices, across the Arab world include

urbanization, technology,^[4] and a cultural appreciation of plumpness^[5].

The rate of childhood obesity is increasing in developing countries, but this rate is highest in the Middle East^[6]. In the last few decades, the Kingdom of Saudi Arabia (KSA) has experienced rapid socio-cultural changes caused by the dramatic rise in the economy of the Arabian Gulf region. Such transformation associated with major changes in food choices and eating habits has made the youth westernized. This nutritional transition has been implicated as a cause of rising trends of overweight and obesity recently observed in the Saudi population^[7]. In Saudi Arabia, the overall prevalence of overweight, obesity, and severe obesity in otherwise healthy children and adolescents aged 5 to 18 years is 23.1%, 9.3% and 2%, respectively^[8].

All the factors associated with obesity may not be amenable to modification such as urbanization and availability of increased disposable income, but factors like dietary habits may be modified with continued health education, sharing evidence and increasing availability & consumption of healthy foods by appropriate policy changes.

In view of the above, this study was carried out with objectives to assess the prevalence of obesity in students of public health, to understand the dietary

Corresponding Author:

Dr R K Pal

Associate Professor,
College of Public Health,
Qasim University, Al Bukiriyah,
Saudi Arabia

Phone No.: 9891077651

E-mail: rkpal.nhsr@gmail.com



habits associated with obesity and for suggesting solutions for improving the present status.

MATERIAL & METHODS:

All 202 students, studying in college of Public Health & Health Informatics at Al Bukayriyah, in Qassim province of Saudi Arabia were interviewed. As this college is only for males, all students interviewed were males. The age of these students ranged from 18 years to 29 years. All the regular students attending the college in the period of October 2014 to September 2015, were included in the study. The students already in occupation and attending selected courses for 3 to 4 months under the “bridge course” were excluded. Calculating Body Mass Index was used as the standard method for assessment of obesity. The weighing machine received from UNICEF of make SECA fitted with height measuring rod was used for recording the weight & height of students. The weight was recorded to nearest 100 grams and height was measured up to nearest 0.5 centimetres as available in calibrations of the weighing machine. The height and weight of students was recorded using above stated standard equipment available in the college.

All students were interviewed using a predesigned questionnaire about their dietary intake of different type of food items and frequency of their weekly consumption. The selected students were trained by faculty members in recording height and weight and using the interview questionnaire and these students recorded the observations under supervision of faculty. After reviewing the questionnaire used in studies mentioned in references at serial nos. 13 & 16 to 18 from Arab countries, the food items for questionnaire of present study were selected. The variables selected for food items were frequent weekly consumption (4 to 7 days per week) of fruits, vegetables, junk food (pizza / burger), coke, tea / coffee & fruit juice.

The data collected were organized in tables and graphs using excel sheets. The results were analyzed comparing food habits of underweight, normal weight and overweight students. The Chi Square test was applied to find whether the difference in consumption of different food items between normal and overweight students is statistically significant. The data entry and tabulation was done by the faculty members themselves.

RESULTS:

The age wise distribution of students between the age group of 21 to 23 years was found to be 52%,

followed by 32.67% in age group 18 to 20 years and 15.35% in age group above 23 years (Table 1). Distribution of students by both Age & Obesity status shows that 62 % of normal weight and 43 % over weight students were in age group 21 to 23 years. It is evident that 30 % of all overweight students (28 out of 93) were already present in age group of 18 to 20 years and their number increased by another 43 % in age group 21 to 23 years. Therefore interventions for prevention and control of obesity must start in the school, before they enter the college, and also as soon as they get entry to the college.

The distribution of students by Age, normal weight & overweight status, shows that in students of age group 23 & above, 80 % were overweight (Table 2). This is approximately double of percentage of overweight students in the other two age groups. Hence it is evident from this observation that students in age group 23 years and above are high risk group. It may be advisable to check blood pressure, blood sugar & HbA_{1c} also in this age group to maximise use and benefit of available diagnostic and preventive resources.

The consumption of fruits and fruit juice was higher in normal weight and lower in underweight students. In underweight students intake of vegetables was also low than other two groups, but Consumption of Pizza or burger & drinking coke was higher (Table 3). Consumption of tea / coffee and drinking fruit juice was comparatively higher in over weight students. In under weight, normal and overweight, all the 3 categories of students, frequency of drinking coke, tea and coffee was found high, while intake of fruits and fruit juices was found comparatively low.

The Chi Square test was applied to find whether the difference in consumption of different food items between normal and overweight students is statistically significant. The difference was found significantly higher in overweight students (value of p was less than 0.02), only regarding consumption of tea and coffee. The significant difference is also expected logically between normal and overweight students regarding intake of fruits, vegetables, pizza and burger, but probably a larger sample size is required to capture this observation.

DISCUSSION:

The studies in Saudi Arabia and other countries as well also have stated high prevalence of overweight & obesity. In study by Fadia Y. Abdel-

Table 1: Distribution of students by Age & Obesity status.

Obesity Status	Number of students of age 18-20 Years No. (%)	21-23 Years No. (%)	More than 23 Years No. (%)	Total No. (%)
Under weight	9(56.25)	7(43.75)	0	16 (7.92)
Normal weight	29(31.18)	58(62.37)	6(6.45)	93 (46.04)
Over weight	28(30.11)	40(43.01)	25(26.88)	93 (46.04)
Total	66 (32.67)	105 (51.98)	31 (15.35)	202 (100.0)

Table 2: Proportion of Normal & over weight students by Age Groups – The High Risk Groups.

Obesity Status	students of age 18-20 Years No. (%)	21-23 Years No. (%)	More than 23 Years No. (%)	Total No. (%)
Total Number	66 (32.67)	105 (51.98)	31 (15.35)	202
Normal weight	29 (43.94)	58 (55.24)	6 (19.35)	93 (46.04)
Over weight	28 (42.42)	40 (38.09)	25 (80.64)	93 (46.04)

Table 3: Frequency of weekly consumption of food items in normal, under and overweight students.

Eating Habit (Eating 4-7 days)	Under Weight No. (%)	Normal Weight No. (%)	Over Weight No. (%)
Any Fruit	1 (2.27)	19 (7.69)	12 (4.76)
Vegetables	7 (15.91)	46 (18.62)	47 (18.65)
Pizza Or Burger	10 (22.73)	36 (14.57)	33 (13.10)
Coke	12 (27.27)	64 (25.91)	61 (24.21)
Tea/ Coffee	11 (25.00)	64 (25.91)	78 (30.95)
Fruit Juice	3 (6.82)	18 (7.29)	21 (8.33)
Total	44 (100.00)	247 (100.00)	252 (100.00)

Megeid et al^[9], the prevalence of overweight was found 23% and obese 7% in male students. These results are in agreement with several studies^[10-11]. In KSA, Al-Rethaiaa et al^[12] reported that the prevalence rate of overweight and obesity of male Health Sciences College students were 21.8% and 15.7%. The students were eating 2 meals per day including breakfast, together with frequent snacks and fried food, whereas, vegetables and fruits were not frequently consumed by most students. Most males are exposed to outdoor eating, which usually contains excess fat and carbohydrates, and less fibre^[13].

Musaiger et al^[14] reported that the prevalence

rate of obesity was 35.7% in males in the United Arab Emirates. In contrast, in Iranian male college students, only 7.9% of them were found above the normal body weight^[15]. In our present study overweight students were 45.05%.

Most students followed unhealthy eating habits, they often eat snacks daily, and this may be due to their palatability, availability, and convenience. The present study revealed that most students had a lower frequency regarding intake of fruits, fruit juice and vegetables but higher frequency of consuming coke, tea/ coffee, pizza and burger. These present findings were in accordance with several authors^[16-18] who stated that obesity was associated with an unhealthy diet, high intake of fast foods and other foods high in

fat, and a low intake of fruits and vegetables.

The studies conducted with medical students in different parts of India reveal that 44% were overweight & 8 to 10 % were obese. Relation with increased frequency of meals ($p = 0.007$), increased sleep duration ($p = 0.003$) and regular exercise ($p = 0.047$) were found to be significant. The students having daily breakfast were found to be 42.9% to 68%. However, only 10% participants said that they had a fruit daily. Most of the male (53.9%) and female (47.6%) students were habituated to consume snacks in fast food centre. Fried snacks were the most popular with 39% students, followed by various bakery items. Only 7% students preferred salads and soups for snacking^[19,20,21]. Jayaraj et al^[21] & Gillman et al^[23], reported that regular participation in physical activity with eating a healthy diet strongly influences health status and reduces the risk of obesity and overweight.

CONCLUSION:

Poor nutritional behaviour is associated with many risks that endanger health not only during later life but also during early adulthood. Despite high level of education of university students, they still have poor nutritional habits, more so than the general population.⁽²²⁾ A low vegetable and fruit intake along with higher coke, tea, coffee, pizza and burger were found the most common eating habits of the students. Lifestyle modification is important, especially in young age groups, to improve healthy habits earlier in life.

Our observations and review of studies in Arab countries and India as well suggest that the students along with their parents and teachers seem to be the most appropriate target group for health education about life style including nutritional education and exercise. Coordinated efforts and strategies are required at all levels including family, university, community and Government to reduce the tendency of overweight and obesity among college students, and to promote healthy eating habits and physical activity.

ACKNOWLEDGMENTS:

We gratefully acknowledge support received from our college administration and students who participated in the study.

REFERENCES:

1. Kelishadi, Roya, Obesity and Associated Modifiable

- Environmental Factors in Iranian Adolescents: Isfahan Healthy Heart Program - Heart Health Promotion from Childhood, *J Pediatrics International*, 2003; 45(4): 439.
2. Barry M, Popkin, The Obesity Epidemic is a Worldwide Phenomenon, *J Nutri Revie*. 1998; 56 (4):109.
3. Al-Mahroos F, Al-Roomi K, Overweight and Obesity in the Arabian Peninsula: An Overview. *J R Soc Promot Health*, 1999; 119 (4): 251-3.
4. Godwin SM. Globalization, Education, and Emiratisation: A Study of the United Arab Emirates. *EJISDC*. 2006; 27(1):1-14.
5. Galal OM. The Nutrition Transition in Egypt: Obesity, Under nutrition, and the Food Consumption Context. *Pub Health Nutri*. 2002, p. 147.
6. James PT. Obesity: The worldwide epidemic. *Clin Dermatolo*. 2004;22(4):276-80.
7. Al-Rethaiaa AS, Fahmy Alaa-Eldin A, Al-Shwaiyat NM, Obesity and eating habits among college students in Saudi Arabia: A cross sectional study. *Nutr J*, 2010;9:39.
8. El Mouzan MI, Foster PJ, Al Herbish AS, Al Salloum AA, Al Omer AA, Qurachi MM, *et al*. Prevalence of overweight and obesity in Saudi children and adolescents, *J Ann Saudi Med* 2010;30:203-8.
9. Fadia Y, Abdel-Megeid, Hala M, Abdelkarem, Aisha M. El-Fetouh, Unhealthy nutritional habits in university students are risk factor for cardiovascular diseases, *Saudi Med J*, 2011; 32 (6): 621-627.
10. Yahia N, Achkar A, Abdullah A, Rizk S, Eating habits and obesity among Lebanese University students. *Nutr J* 2008; 7: 32.
11. Irazusta A, Hoyos I, Irazusta J, Ruiz F, Diaz E, Gil J. Increased cardio vascular risk associated with poor nutritional habits in first year university students. *Nutr Res* 2007; 27: 387-394.
12. Al-Rethaiaa AS, Fahmy AA, Al-Shwaiyat NM, Obesity and eating habits among college students in Saudi Arabia: a cross sectional study. *Nutr J* 2010; 9: 39.
13. Sakamaki R, Amamoto R, Mochida Y, Shinfuku N, Toyama K, A comparative study of food habits and body shape perception of university students in Japan and Korea, *Nutr J*, 2005; 4: 31.
14. Musaiger AO, Lloyd OL, Al-Neyadi SM, Bener AB, Lifestyle factors associated with obesity among male university students in the United Arab Emirates. *Nutrition & Food Science*, 2003; 33: 145-147.
15. Sakamaki R, Toyama K, Amamoto R, Liu CJ, Shinfuku N, Nutritional knowledge, food habits and health attitude of Chinese university students--a cross sectional study, *Nutr J*. 2005; 4: 4.
16. King KA, Mohl K, Bernard AL, Vidourek RA. Does Involvement in Healthy Eating among University students differ based on Exercise status and reasons for exercise? *CJHP*. 2007; 5: 106-119.
17. Beydoun MA, Powell LM, Chen X, Wang Y, Food

- prices are associated with dietary quality, fast food consumption, and body mass index among U.S. children and adolescents, *J Nutr* 2011; 141: 304-311.
18. Knol LL, Haughton B, Fitzhugh EC, Food group adherence scores assess food patterns compared to US Department of Agriculture Food Guide, *J Am Diet Assoc* 2006; 106: 1201-1208.
 19. Nupura A. Vibhute, Rajendra Baad, Uzma Belgaumi et al, Dietary habits amongst medical students: An institution-based study, *J Family Med Prim Care*. 2018;7(6): 1464–1466.
 20. Biswa Bhusan Mohanty, Karmajeet Rath, Sunil Kumar Jena et al, Dietary habit of medical students- a study among the students of a health university in eastern India, *JEMDS*. 2018;7(22):2698-2701.
 21. Jayaraj, Nair PP, Napoleon R, Stephen J, Nishant K, Suresh D. Prevalence of Overweight and Obesity Among Students of a Medical College in South India: A Pilot Study. *IJCP*. 2014;25(4):333-37.
 22. Laska MN, Pasch KE, Lust K, Story M, Ehlinger E, Latent class analysis of lifestyle characteristics and health risk behaviors among college youth, *J Prevention Science* 2009; 10: 376-386.
 23. Gillman MW, Pinto BM, Tennstedt S, Glanz K, Marcus B, Friedman RH, Relationships of physical activity with dietary behaviors among adults, *J Prev Med* 2001; 32: 295-301.

Cite this article as: Pal RK, Jaber MF, Akhtar S. Nutritional Transition: A Cause of Concern for Obesity among Students of Bukiriyah City, Saudi Arabia. *PJSR* ;2019;12(2):1-5.
Source of Support : Nil, Conflict of Interest: None declared.