Effect of Fast Food Consumption On Overweight/Obesity In College Youth

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Abstract
A cross-sectional study was conducted to scrutinize the association between fast food consumption and physical activity to the risk of developing overweight/obesity among youth. A total of 80 college students were selected. A significant difference in the mean values of weight was observed in both male and female subjects. 55% male and 45% female subjects had body weight higher when compared to the reference standards. A significant difference was observed in the mean values of waist circumference of both groups where 52% of males and 44% of females exhibited abdominal obesity. Significant difference was observed in frequency of eating out as well as physical activity. In the male subjects, waist hip ratio was found to be significantly and positively correlated with consumption of fast food whereas hip circumference was found to be significantly but negatively correlated with physical activity duration. In female subjects, waist circumference was positively and significantly correlated with fast food consumption. Eating out was positively correlated with fast food intake. In the present study, it was observed that frequent consumption of fast food was associated with an increase in weight, body mass index and waist hip ratio of the subjects.

Keywords — *Fast Food, Obesity, Overweight, Abdominal Obesity, Waist Hip Ratio, Eating Out, Physical Activity*

I. INTRODUCTION

Worldwide, overweight and obesity are at a rise both in developed as well as developing nations (Haidar and Cosmman, 2011). Overweight is observed as body mass index (BMI) of 25 kg/m^2 or more and obesity as BMI <30 kg/m^2. In developing nations since the past two decades, a threefold rise in obesity is observed because of the adoption of a more urbanised lifestyle combined with high calorie intake and a sedentary way of life (Popkin et al. 2012). A tremendous change in home and food environment has influenced the eating behaviours through numerous factors such as shift in the nature of food supply; more dependence on fast foods or foods consumed away from home; food advertisements and prices (French et al. 2001). Dietary behaviour is broadly considered a major modifiable factor to the obesity pandemic and numerous aspects of the diet could be generally related to obesity but amidst all the most prospective is the increased dependence on fast foods (Harnack and French, 2003). Drewnoski (2003) also reported that over the precedent two decades an increase in the portion size as well as the per capita availability of added fat and sugars is observed. The influence of Western dietary pattern on Asian diets is observed where consumers exhibit major preferences for highly processed convenience foods and drinks carrying a high content of fat and protein against the preferred traditional Asian diets emphasizing carbohydrates. Ever since, the dietary habits are attained at a young age these transformations are more evident with the young age groups who are acquiring lifelong habits (Parraga, 1990 and Mendez et al. 2004). Cohort studies conducted by both Niemeier et al. (2006) and Duffey et al. (2007) observed that consumption of fast food increased as age progressed.

Unwholesome consumption patterns predispose the youth at an increased risk for overweight and obesity (Bowman et al. 2004). A number of dietary factors are identified to be associated with the present rise in overweight and obesity among young adults comprising consumption of fried foods (Banwell et al. 2009), frequent snack intake (Hingorjo et al. 2009), increased number of meals consumed away from home (Jaworowska et al. 2013) and physical inactivity (So et al. 2012). Driskell et al. (2005) revealed that college students consume meals at fast food outlets quite frequently i.e. 6-8 times in a week. Numerous factors contribute to this over-consumption comprising easy accessibility, variety and large portion sizes of energy-dense foods (Nielsen et al. 2002; Nielson & Popkin, 2003). Foods available at these outlets are found to be high in fat, sodium and low in micronutrients (Hearst et al. 2013 and Bauer et al. 2012). Lin et al. (1999) revealed that 26% of total meals and snacks consumed as foods away from home contributed a total of 32% of the total daily energy and these foods are found to be high in saturated fat, sodium and low in iron, fibre and calcium when compared to traditional home cooked foods. According to Asgary et al. (2011) fast foods are concentrated sources of saturated as well as trans-fatty acids. Consumption of fast foods can have deleterious health effects including hyperinsulinemia, insulin resistance, cardiovascular complications and

obesity. Such behaviours are of great concern for the health professionals as the dietary and nutrition knowledge as well as beliefs may transcend into adulthood thus influencing the future health status (Dinger et al. 1997).

II. MATERIALS AND METHODS

Selection of Subjects:

A total of 80 college students were selected from a college in Jalandhar city (Punjab). The subjects belonged to the same age group of 18-22 years who were further segregated into groups based on gender. Out of the total subjects, 33 were males and 47 females.

Data Collection:

The anthropometric measurements i.e. height, weight, waist and hip circumferences were obtained using standard procedures. Body mass index and waist hip ratio were derived. The reference cut off value of <23kg/m^2 for BMI (WHO, 2004) and >0.8 (Ghafoorunissa and Krishnaswamy, 1994) for waist hip ratio were considered for the assessment of overweight/obesity. A written consent of the subjects to participate in the study was obtained. An interview schedule cum questionnaire was developed to collect the information regarding fast food consumption frequency and preferences as well as physical activity level of the subjects.

Statistical analysis:

Mean and standard deviations for the various parameters were computed. Analysis of Variance was employed using Microsoft Excel (2003) Statistical Analysis tool pack. Coefficients of correlation (r) were also derived to determine the relationship of anthropometry with snacking preferences as well as physical activity in college students.

III. RESULTS AND DISCUSSIONS

The anthropometric measurements of the subjects are given in Table 1. A significant difference in the mean values of weight was observed in both male and female subjects. 55% subjects in the male group and 45% of subjects in the female group had body weights higher when compared to the reference standard i.e. 60 kg for man and 55 kg for women, respectively. A significant difference was also noticed in the mean values of waist circumference of the male as well as the female subjects. There was no significant difference in the mean values of BMI in both the groups but 52% of males and 44% of females were found to be overweight and obese when compared to the reference cut off value of <23kg/m^2 for BMI (WHO, 2004). No significant difference was observed in the waist hip ratio of the subjects but 48% males and 26% females had waist hip ratio higher when compared to the cut off value of >0.8 (Ghafoorunissa and Krishnaswamy, 1994) indicating abdominal obesity. Abdominal obesity is majorly associated with the risk of developing metabolic diseases (Singh et al. 2017). Waist hip ratio and waist circumference act as predictors in risk of development of cardiovascular disease, type-II diabetes, hypertension, premature death and certain cancers (Rexrode et al. 2001; Lakka et al. 2002). Significant difference was found in frequency of eating out in both males and females.

In the male subjects, waist hip ratio (r=0.22) was found to be significantly ($p \leq 0.05$) and positively correlated with consumption of fast food whereas hip circumference (r= -0.25) was found to be significantly ($p \leq 0.01$) but negatively correlated with physical activity duration (Table 2). French et al. (2001) reported that frequent consumption of fast food was linked to a rise in total energy intake and weight gain. Singh et al. (2017) revealed that eating out is frequently observed in younger age groups in comparison to older groups. Physical activity parameters both as days/week (r= -0.22) and duration/day (r= -0.21) were significantly ($p \leq 0.05$) but negatively correlated with consumption of fast foods, thus depicting increased concern with outlook lead to a decreased preference for unwholesome food choices.

In female subjects, waist hip ratio (r=0.26) and waist circumference (r=0.19) were positively and significantly ($p \leq 0.10$) correlated with preference for bakery items as fast food. Ebbeling et al. (2004) reported in a feeding trial that despite of body type fast food intake lead to an increased calorie intake. Waist circumference (r= -0.02) was significantly ($p \leq 0.10$) but negatively correlated with the duration/day of physical activity. Consumption of fast foods (r=0.19) was positively correlated with increased frequency of eating out. Pereira et al. (2005) revealed that individuals who frequently consumed fast foods were observed to add 4.5 kg extra body weights over a 15 year follow up study. BMI (r=0.23) was also positively and significantly ($p \leq 0.05$) correlated with waist hip ratio. In a study conducted by Singh et al. (2018) a lesser concern with body shape in female is observed to be positively and significantly correlated with BMI, body weight, body fat and waist circumference. Rouhani et al. (2012) revealed associations between increased body mass index, waist circumference and fast food consumption were significant. Highest energy density was chiefly related to highest quartile of fast food intake in the subjects.

IV. CONCLUSION

In the present study, it was observed that frequent consumption of fast food was associated with an increase in weight, body mass index and waist hip

ratio of the subjects. Physical activity was found to be related to a decreased waist and hip circumference as well as a decreased preference for fast foods. Fast foods tend to be energy and fat dense as well as low in micronutrients and fibre which may consequently lead to a poor general health status. So, approaches to reduce fast food intake are indispensable to correct diet quality and energy balance in individuals. Strategies must be planned to encourage the fast food outlets to enhance the nutritional quality of foods being offered.

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Table 1 Anthropometric Profile of the subjects

Parameter	Males (n=33)		Females (n=47)		Overall (n=80)		CD at 5%
	Range	Mean±SD	Range	Mean±SD	Range	Mean±SD	
Basic							
Height (cm)	153-188	167.6±8.69	146-171	158.88±4.97	146-188	162.39±7.93	4.03
Weight (kg)	46.6-86.9	65.16±10.45	39.2-71.6	55.07±8.25	39.2-86.9	59.16±10.41	5.52
Waist Circumference (cm)	25.5-39.0	31.52±3.54	24.0-36.0	29.54±2.96	24.0-39.0	30.34±3.34	1.92
Hip Circumference (cm)	32.5-44.0	39.0±3.09	28.0-44.0	37.9±3.14	28.0-44.0	38.4±3.14	NS
Derived							
BMI (kg/m^2)	15.6-30.8	23.20±15.57	15.9-29.2	21.9±3.32	15.6-30.8	22.4±3.39	NS
Waist Hip Ratio	0.72-0.92	0.81±0.05	0.08-0.85	0.75±0.11	0.68-0.95	0.75±0.09	NS

Values are Mean ± SD
NS: Non significant

Table 2 Correlation coefficients derived among anthropometric parameters, fast food consumption and physical activity of the subjects

PARAMETER	CORRELATION COEFFICIENTS (r)	
	Positive	Negative
OVERALL		
BMI	Waist Circumference (r=0.81**) Hip Circumference (r=0.77**) Waist Hip Ratio (r=0.32**) Weight (r=0.81**)	- - - -
Hip Circumference	Weight (r=0.69**) Waist Circumference (r=0.74**)	- -
Waist Circumference	Weight (r=0.74**)	-
Waist Hip Ratio	Weight (r=0.29**) Eating Out (r=0.24*)	- -
Eating Out	Fast Food (Fried) (r=0.37**)	-
MALES		
Fast Food Consumption	Waist Hip Ratio (r=0.22*)	-
Physical Activity Duration/hr	-	Fast Food (r= -0.21*)
Physical Activity Days/Week	- -	Fast Food (r= -0.22*) Hip Circumference (r= -0.25**)
FEMALES		
Waist Hip Ratio	BMI (r=0.23*)	-
Eating Out	Waist Hip Ratio (r=0.26**) Fast Foods (r=0.19***)	- -
Physical Activity Duration/hr	-	Waist Circumference (r= -0.02***)
Fast Food	Waist Circumference (r=0.19***) Waist Hip ratio (r=0.26**)	- -

* Significant at 10%
** Significant at 5%
*** Significant at 1%