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Socioeconomic Status, Youth's Eating Patterns and Meals Consumed away from Home

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Abstract: This study was design to determine whether there is a difference in the number of meals consumed away from home (restaurant or fast food) between low socioeconomic status (SES) and high SES adolescents. Additionally, this study sought to determine if the nutrients and food group chosen differs among children who consume meals away from home versus those who do not. Eighty four adolescences (51 boys and 33 girls) ages 12-16 years and their parents from Shiraz, Iran completed the three 24 h diet recalls (one weekend and two week days). The demographics questionnaire was also completed from each participant. Data analyzed using SPSS and hypothesis tested using one way ANOVA. There was no significant difference in the number of meals consumed away from home in low SES adolescents compared to high SES ($p = 0.464$). However, those who consumed meals away from home reported a higher percentage of calories from fat ($p = 0.007$) and serving of fried vegetables ($p = 0.010$) compared to those who consumed no meals away from home. These findings suggest that intervention for adolescents eating patterns should provide information on choosing healthy meals away from home.

Key words: SES, adolescent, meals, eating pattern

INTRODUCTION

Rapid increase in obesity across different age groups coupled by the reduction in the age when obesity occurs, force us to focus on the dietary habits of children and youth. Dietary habits that result in suboptimal nutrient intake increase the probability of developing chronic diseases such as coronary heart disease, type 2 diabetes, or hypertension (Nicklas *et al.*, 2003; Steffen *et al.*, 2005). On the other hand, dietary habits during adolescence that result in the consumption of a well-balanced diet may decrease the risk of obesity and other related diseases during adulthood and increase the quality of life (Nicklas *et al.*, 2003).

The increasing prevalence of overweight children and adolescents is attributed to many dietary factors including the increase in consumption of soft drink, fast food and energy-dense foods coupled with non-healthy foods consumed away from home and decreased physical activity (Nicklas *et al.*, 2003; Nielsen *et al.*, 2002; Kant and Graubard, 2004; Austin *et al.*, 2005; Morland *et al.*, 2002).

In a 2004 study, researchers concluded that children who consumed fast-food, in comparison with children that did not, consumed more energy, total fat, total carbohydrate, added sugar, sugar beverages and less milk, fruit and non-starchy vegetables (Bowman *et al.*, 2004).

Recent studies have suggested that families in the area of lower socioeconomic status don't eat as healthy as families of higher socioeconomic status, partly due to

decreased availability of healthy foods (Morland *et al.*, 2002). Apart from lack of availability of good quality foods in lower socioeconomic status area, lack of education has been positively associated with caloric dense and nutrient deficient diet (Stang, 2004).

The purpose of this study was to determine whether there are differences in the number of meals consumed away from home between low and high socioeconomic status adolescence and to determine if nutrient and food group contents differs among children who consumed foods away from home versus those who do not.

MATERIALS AND METHODS

Eighty four adolescents (51 boys and 33 girls) ages 12-16 years with their parents from eight junior high schools at eight different locations in Shiraz were recruited to participate in this study in November 2007. Each participant met the following criteria (a) age 12-16 years, (b) able to self-report data and © able to answer the questionnaire. Exclusionary criteria included the presence of any illness or medical problem that includes special dietary or drug treatment.

Procedure: A trained dietitian asked to explain the study to adolescents and their parents at school visit and obtained parental consent and child assent from each who agreed to participate in the study. Then, each participant asked to complete a demographic questionnaire.

Education levels are commonly used as a surrogate for income; therefore, parents' education level was used as a surrogate for socioeconomic status in this study, with a high school degree or less classified as low socioeconomic status and more than a high school degree classified as high socioeconomic status.

The number of meals eaten away from home was divided by the total number of meals eaten in each day to obtain the percentage of meals eaten away from home. The average meals eaten away from home were determined for three day to estimate the percentage of meals consumed away from home. The frequency or percentages of meals consumed away from home between adolescents from high socioeconomic status versus low socioeconomic status were compared.

The total nutrient and food group content for adolescents who consumed meals away from home was compared to that of adolescents who didn't consume meals away from home.

Nutrients/food groups of adolescents who consumed meals away from home and adolescents that didn't consume meals away from home were compared.

Questionnaire: Three 24 h diets recalls (one weekend and two week days) were administered to participants and their parents in the study. Adolescents were asked to recall the total dietary intake of the last 24 h.

Portion size aids were used to obtain accurate serving sizes. Meals eaten away from home were classified according to location and included restaurants and fast food.

Dietary analysis: Analyzed of dietary intakes were assessed using Nutrition Data Systems (NDS-R software, Taken from the NDS-R manual (2005) from FAQ-How do I cite NDS-R). The following nutrients were assessed: energy, total fat (percent of energy, kcal), saturated fat (percent of energy, kcal) and fiber (g). The following food groups were also assessed: fruits (servings, kcal), vegetables (servings, kcal), fried vegetables (servings, kcal), soft drink (mL), milk (mL), water (mL) and whole grains (serving, kcal). Serving sizes were based on food guide pyramid (Stang, 2004).

Statistical analysis: Descriptive statistics were used to describe the demographics of study. Meals away from home and socioeconomic status were tested by using one-way ANOVA (percentage of meals eaten away home by socioeconomic status) and the level of significance was set at 0.05. The data were analyzed using SPSS, Version 13.

RESULTS

Among eighty four adolescents (51 boys and 33 girls) included in the study, majority of participants (94.04%) were classified as at risk for overweight or were overweight according to the 2000 center for disease control revised sex specific Body Mass Index (BMI) for age growth charts (Lucas, 2004). Parents' socioeconomic status according to educational level was evenly distributed, with approximately one-half attaining more than a high school degree and the other half having a high school degree or less. Approximately 40% of participants consumed at least one meal away from home during the three days analysis (Table 1).

Soft drink consumption was high among study participants with an average of 360 mL day⁻¹. Consumption of fat (37% of energy, 566 kcal with 12% saturated fat; 183 kcal) were high as compare with the recommended 20-35% of calories (306-535 kcal) from fat and less than 10% of calories (153 kcal) from saturated fat. Fruit and vegetable intakes were low (1.82 serving per day, 109.2 kcal and 1.45 serving per day, 36.25 kcal respectively); 5-9 servings of fruits and vegetables per day is recommended according to the United States Department of Agriculture food guide pyramid (USDA, 2006). Furthermore, the youth consumed 1 serving of whole grains (30 g), 11.6 g fiber and 180 mL milk day⁻¹ (Table 2).

Table 1: Demographics of study population (n = 84)

Variables	Frequency	Percent
BMI		
Less than 75th	5	5.95
75th to 85th	0	0.00
85th or greater	79	94.04
Gender		
Boy	51	38.70
Girl	33	61.30
Total	84	100.00
Parent SES		
High school or less	43	51.20
More than high school	41	48.80
Restaurant meals (%)		
None	50	59.50
At least one	34	40.47

Table 2: Estimated nutrient and food intake of study population

Variables	Mean	SD
Age (year)	14.20	0.20
Energy (kcal)	1531.00	479.00
Total fat (%)	37.00	0.07
Saturated fat (%)	12.00	0.02
Fruit (serving)	1.82	1.96
Vegetable (serving)	1.45	1.54
Fried-fat vegetable (serving)	0.32	0.73
Whole grains (serving)	1.00	1.10
Total dietary fiber (g)	11.60	5.00
Soft drink (mL)	360.00	44.00
Water (mL)	540.00	60.00
Milk (mL)	180.00	17.00

Table 3: Analysis of variance between restaurant meals and nutrient intake

Variables	Restaurant meals			p-value
		Mean	SD	
Energy (kcal)	0	1472.70	461.20	0.20
	≥1	1618.40	499.30	
Total fat (%)	0	0.35	0.07	0.007*
	≥1	0.40	0.05	
Saturated fat (%)	0	0.12	0.03	0.33
	≥1	0.13	0.02	
Fruit (serving)	0	0.95	1.08	0.16
	≥1	0.63	0.72	
Vegetable (serving)	0	0.50	0.63	0.33
	≥1	0.38	0.35	
Fried-fat vegetable (serving)	0	0.14	0.31	0.01**
	≥1	0.58	1.06	
Whole grains (serving)	0	1.05	0.97	0.93
	≥1	1.03	1.17	
Total dietary fiber (g)	0	11.89	5.19	0.52
	≥1	11.13	4.66	
Soft drink (mL)	0	303.00	50.00	0.36
	≥1	398.59	31.51	
Water (mL)	0	526.16	58.56	0.88
	≥1	548.84	65.18	
Milk (mL)	0	193.34	16.90	0.38
	≥1	157.62	17.38	

*p≤0.01, **p≤0.05

No significant difference in the number of meals eaten away from home between adolescents from a low socioeconomic status versus a high socioeconomic status (p = 0.464) were found.

Significant differences were found between the two groups for the percentage of calories from fat and servings of fried fat vegetables (p = 0.007 and p = 0.01, respectively). Adolescents who ate at least one meal away from home consumed more fat and more fried vegetables (Table 3).

DISCUSSION

At a time of increased concern about obesity and its link to hypertension, heart disease, diabetes and cancer few studies have focused on the trends in adolescents total energy intake and its sources (Melnik *et al.*, 1998; Hassapidou *et al.*, 2006; Nkungula and Harris, 2005). Adolescents worldwide have increased their energy consumption over the past 20 years; the most significant trend is the shift of energy intake from home to away from home sources (Kant and Graubard, 2004). In the present study, number of meals consumed away from home and socioeconomic status were used to establish the association between youth eating patterns and overweight status in adolescences. The finding of this study showed not only the prevalence of overweight among adolescents, but several eating patterns were also positively related to overweight, such as high consumption of soft drinks, fatty food, fried vegetables and low intake of fruit and vegetables.

The finding of this study support the Bogalusa heart study which shows an association between the consumption of sweated beverages and total gram of low quality foods with obesity (Nicklas *et al.*, 2003). Other studies also suggested an association between high fat food (Basiotis *et al.*, 1998), soft drinks (Ludwig *et al.*, 2001; Dennison *et al.*, 1997; Teresia *et al.*, 2006) and overweight status.

Present result showed that consumption of fat accounted for 37% of total energy, while the average soft drink intake was 360 mL day⁻¹ that it was high too. Nielson *et al.* (2002) have also showed dietary shift from healthy eating to large increase in total fat consumption and soft drinks in recent years.

A particular interesting finding was the lack of significant differences in the number of meals eaten away from home between low and high socioeconomic status adolescents, which to our knowledge; no other study has determined such association. The study showed that adolescents who ate meals away from home consumed more fat than those who didn't. Mccrory *et al.* (1999) also reported a positive link between body fatness and frequency of consuming fast food meals. Such findings are also in consistent with other reports of Hassapidou *et al.* (2006) and Hulshof *et al.* (2003) who showed that consuming a fast food or eating in a restaurant is associated with higher energy intake.

In conclusion, it is apparent that people of all ages in general and adolescents in specific are making unhealthy choices when they eat out. This should be the focus of public health policies and intervention.

REFERENCES

- Austin, S.B., S.J. Melly, B.N. Sanchez, A. Patel, S. Buka and S.L. Gortmaker, 2005. Clustering of fast-food restaurants around schools: A novel application of spatial statistics to the study of food environments. *Am. J. Public Health*, 95: 1575-1581.
- Basiotis, P.P., M. Lino and R.S. Anand, 1998. Report card on the diet quality of African Americans. *Fam. Econ. Nutr. Rev.*, 11: 61-63.
- Bowman, S.A., S.L. Gortmaker, M.A. Pereira and D.S. Ludwig, 2004. Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics*, 113: 112-118.
- Dennison, B.A., H.L. Rockwell and S.L. Baker, 1997. Excess fruit juice consumption by preschool-aged children is associated with short stature and obesity. *Pediatrics*, 99: 15-22.
- Hassapidou, M., E. Fotiadou, E. Maglara and S.K. Papadopoulou, 2006. Energy intake, diet composition, energy expenditure and body fatness of adolescents in Northern Greece. *Obesity*, 14: 855-862.

- Hulshof, K.F.A.M., J.H. Brussaard, A.G. Kruizinga, J. Telman and M.R.H. Löwik, 2003. Socio-economic status, dietary intake and 10 y trends: The dutch national food consumption survey. *Eur. J. Clin. Nutr.*, 57: 128-137.
- Kant, A.K. and B.I. Graubard, 2004. Eating out in America, 1987-2000: Trends and nutritional correlates. *Prev. Med.*, 38: 243-249.
- Lucas, B.L., 2004. Nutrition in Childhood. In: Krause's Food, Nutrition and Diet Therapy, Mahan, L.K. and S. Escott-Stump (Eds.). 12th Edn., W.B. Saunders Company, Philadelphia, ISBN: 978-0-8089-2378-7, pp: 260-264.
- Ludwig, D.S., K.E. Peterson and S.L. Gortmaker, 2001. Relation between consumption of sugar-sweetened drinks and childhood obesity: A prospective, observational analysis. *Lancet*, 357: 505-508.
- Mccrory, M.A., P.J. Fuss, N.P. Hays, A.G. Vinken, A.S. Greenberg and S.B. Roberts, 1999. Overeating in America: Association between restaurant food consumption and body fatness in healthy adult men and women ages 19-80. *Obest. Res.*, 7: 564-571.
- Melnik, T.A., S.J. Rhoades and T.A. Melnik, 1998. Food consumption patterns of elementary school children in New York City. *J. Am. Diet. Assoc.*, 98: 159-164.
- Morland, K., S. Wing and A.D. Roux, 2002. The contextual effect of the local food environment on residents' diets: The atherosclerosis risk in communities study. *Am. J. Public Health*, 92: 1761-1767.
- Nicklas, A., T. Baranowski, S. Yang, I. Zakeri and G. Berenson, 2003. Eating patterns and obesity in children, the Bogalusa heart study. *Am. J. Prev. Med.*, 25: 9-16.
- Nielsen, S.J., A.M. Siega-Riz and B.M. Popkin, 2002. Trends in energy intake in US between 1977 and 1996: Similar shifts seen across age groups. *Obesity Res.*, 10: 370-378.
- Nkungula, A. and E. Harris, 2005. Foods frequently eaten by high school students in a density area in Zimbabwe. *Ecol. Food Nutr.*, 44: 1-11.
- Stang, J., 2004. Nutrition in Adolescence. In: Krause's Food Nutrition and Diet Therapy, Mahan, L.K. and S. Escott-Stump (Eds.). 12th Edn., W.B. Saunders Company, Philadelphia, ISBN: 978-0-8089-2378-7, pp: 284-299.
- Steffen, L., C.H. Kroenke, X. Yu, M.A. Pereira and M.L. Slattery *et al.*, 2005. Associations of plant food, dairy product and meat intakes with 15 y incidence of elevated blood pressure in young black and white adults: The coronary artery risk development in young adults (CARDIA) study. *Am. J. Clin. Nutr.*, 82: 1169-1177.
- Teresia, M., S.J. Yang and A. Theresa, 2006. Beverage intake among preschool children and its effect on weight status. *Pediatrics*, 118: e1010-e1018.