

Dietary pattern of adolescent girls in relation to socio-economic factors; A comparison between North and South Tehran

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ABSTRACT

Comparing dietary pattern and related socio-economic factors among adolescent girls in the North and South of Tehran, the capital of Iran. This cross-sectional and analytical study 210 adolescent girls, aged 14-17 years, from high schools in the North district of Tehran (n=105; high socio-economic level) and the South district (n=105; low socio-economic level) were selected by the two-step, cluster random sampling method. Demographic data, including mothers' and fathers' educational levels and parents' occupation were gathered, using a validated self-administered questionnaire. Three questionnaires of food frequency, one-day 24-hour food recall and one-day 24-hour food record were used for assessing dietary pattern. The results showed that the frequency consumption of certain fatty foods, including dairy products and meat group, and fats in district 1 are higher than in district 19 adolescent girls; based on many differences such as life style and food accessibility. This indicated that there is a significant difference in the quality pattern of fat intake between the two districts. It is suggested to design and implement nutritional intervention programs for adolescent girls, particularly in the low socio-economic districts.

Key words: Adolescent girls; dietary pattern; socio-economic status

INTRODUCTION

In most countries, adolescents are a main portion of populations. According to the results of the census of 2006, 15-18 year old age group comprises 12.3% of Iran's population [1]. In such a young country, proper programming based on preventive health is too important. Health is affected by socio-economic status. In the analyses which education, occupation, income and employment are considered simultaneously, it is indicated that education and occupation are usually the strongest determinants of socio-economic status. In some studies, however, education and the parent's occupation have had more effects on food intake [2]. Some studies which have addressed the relations of socio-economic factors and the anthropometric indicators of adolescents, show effects of factors like education and occupation of parents and the

family size on food intake and anthropometric indicators of this age group. In spite of these findings, it is difficult to say how much of the seen differences is the result of each indicator [3,4,5]. In a report by Mohammadi et.al, the food consumption pattern of Iranians has been analyzed in terms of population and social factors. The results show that the two indicators of education and parents' occupation which comprise about 20% of the variance of socio-economic status, have a significant effect on the intake of foods and nutrients. Meanwhile, the study showed that with increase of education and occupation levels, intake of high calorie food groups decreases and intake of proteins, fruits and vegetable increases [6].

The studies on the food consumption pattern of the adolescents of different areas of the country

show that fats comprise 22-38% of the daily energy intake of this age group [7,8]. Meanwhile, the data of food frequency studies indicate increase in consuming fatty, sweet and salty foods, mainly as snacks [3,9,10]. Some studies also show the higher tendency of girls toward consuming fats at post-puberty stage, which can be a response to the changes of steroids level of the gonads [11]. Since lifestyle of adolescents, especially their food pattern, encounters dramatic changes, mainly due to their higher freedom in decision making, including in selecting and purchasing foods [12], assessment of food consumption pattern of this highly vulnerable age group is too important in enhancing health status of next generations. So, recognizing food consumption pattern and method of adolescents is one of the most important research priorities in designing appropriate programs and applying effective approaches toward improving the health status of future adults.

The goal of this study is to determine and compare dietary pattern patterns in related to socio-economic factors in adolescent girls of Northern and Southern districts of Tehran. The adolescents of districts 1 (in North of Tehran) and 19 (in South of Tehran) of Tehran city, are the representatives of high and low socio-economic populations respectively, based on the factors like geographical district of residence, parents' education and occupation, and family size, and will be compared together. It is hoped that the results of this study can be applied in designing and implementing appropriate programs for improving the health level of adolescents.

MATERIALS AND METHODS

This is a descriptive-analytical, cross-sectional research study in which the food consumption patterns of the adolescent girls of Northern and Southern districts of Tehran have been compared. Statistical samples of this study include student girls of grades one to three of public sector high-schools, from district 1 (with high socio-economic status) and district 19 (with low socio-economic status) of Tehran. The samples were selected through a two-step cluster sampling. The clusters were selected systematically, and in each cluster, the samples were selected randomly. Systematic sampling was considered for selecting the

clusters, regarding to the scores of high-schools and the number of students of each grade. For each district, 105, and totally 210 samples were considered for this study. Samples out of the pre-defined age range of this study (14-17 years) were excluded and new samples were randomly included instead. The students which were on weight-loss diet, were excluded too. All of the samples provided written consents for entering the study. At the beginning of study, the questionnaire of socio-economic information was completed for all of the samples. The socio-economic status of the samples was indirectly assessed, using variables of parents education level and parents occupation situation.

Data of dietary pattern

In this study, three questionnaires of food frequency, one-day 24-hour food recall and one-day 24-hour food record were used for assessing dietary pattern of the students. The average amounts of the consumed foods which were calculated from the information of food recall and food record questionnaires, were used for analysis. Dietary pattern is determined based on the amounts of the intake energy, total fat, saturated fat, mono-unsaturated fat and poly-unsaturated fat, as well as the portion of fat, in providing daily energy needs, and the number of times of consuming main food sources of fats [13,14]. Main food sources of fats are those foods that more than 20% of their calorie comes from fat [15].

Data Analysis

The qualitative variables of the two district were compared by Fischer and chi-square tests. T test was used for comparing the means, and one-way ANOVA was used for finding relationship between qualitative and quantitative variables. For determining the relationship between two quantitative variables, Pearson correlation coefficient was used. If it was not possible to do this test, spearman correlation coefficient was considered instead. $\alpha = 0.05$ was considered as significance cut-off point.

The data were statistically processed by SPSS software. Analysis of food consumption pattern, and determining nutritional value of the consumed foods (amount of energy and intake of macro-nutrients) were done by Food Processor II (FPII) software.

RESULTS

Findings of socio-economic status of the studied students, including their parents' education level and occupation, showed that in North and South districts of Tehran, fathers with B.Sc degree and higher(43.6%), and with pre-high school degree (35.2%), have the highest percentage, respectively. Also, in North, nearly 90% of fathers had a job, while in South, just about 80% of fathers had a job and almost 5.8% of them were jobless. The highest percentage of mothers, education group in North and South were high-school level(48.6%) and pre-high school level(33.3%), respectively. In North district, about 26% of mothers had a job, while in South, about 97% of mothers were housewives. According to

Fischer and chi-score tests, the high-school girls of North and South districts of Tehran were significantly different regarding their parents' education and occupation ($P<0.0001$). The results show that these indicators perfectly indicate the socio-economic conditions. Meanwhile, Man-Withney test showed that the adolescent girls of the two division had a significant statistical difference regarding family size and weekly pocket money ($P<0.0001$).

Table 1 shows the comparison of the means and standard deviations of the daily energy and fat intake. It was shown by t-test that there is a significant difference between the girls of Northern and Southern districts in the daily intake of cholesterol and mono- unsaturated fat.

Table 1. Means and Standard Deviations of the daily intake of energy and fats, among adolescent girls of two districts

Variables	North (n=105)	South (n=105)	Total (n=210)	P-value
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Energy (kcal)	1964.01 \pm 596.43	2288.58 \pm 796.43	2044.5 \pm 639.87	NS
Total fat (gr)	77.9 \pm 27.45	83.19 \pm 31.32	80.14 \pm 29.54	NS
Percent of energy from fat	34.15 \pm 6.08	34.42 \pm 6.62	34.29 \pm 6.34	NS
Saturated fats(gr)	24.98 \pm 9.69	25.37 \pm 10.82	25.18 \pm 10.24	NS
Mono-unsaturated fats(gr)	25.30 \pm 9.26	29.66 \pm 12.4	27.48 \pm 10.93	0.01
Poly-unsaturated fats(gr)	21.23 \pm 10.25	21.16 \pm 9.21	21.28 \pm 9.64	NS
Cholesterol(mg)	206.88 \pm 134.2	182.64 \pm 127.26	194.76 \pm 131.37	0.04
Ratio of unsaturated to saturated fats	0.87 \pm 0.30	0.95 \pm 0.68	0.91 \pm 0.53	NS

Figure 1, Comparison of means weekly frequency intakes in food groups of main sources of fat, among adolescent girls of two districts. Man- Withney test showed that there are significant differences between the girls from North and South of Tehran in terms of consuming

milk, chocolate milk and cheese from dairies group, poultry and shrimp from meats and eggs group, cream and non-cream cookies from sweets group, and sausages, pizza, hamburger, cheese burger, sambosheh and falafal from fast foods group.

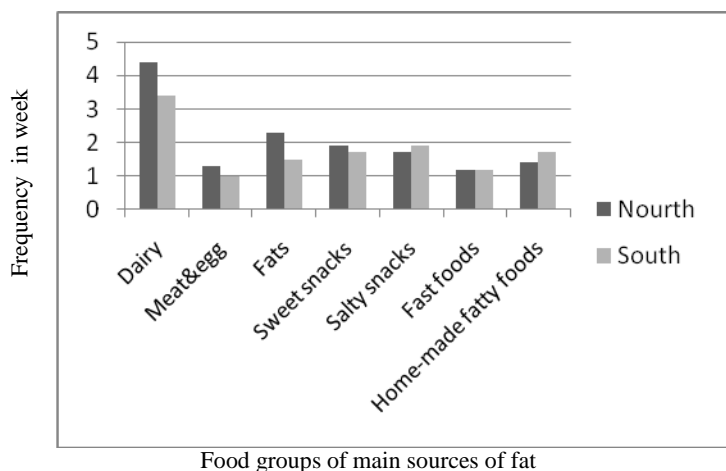


Figure 1: Comparison of means weekly frequency intakes in food groups of main sources of fat, among adolescent girls of two districts

Table 2. Correlation of family size and amount of pocket money, with weekly frequency intakes in food groups of main sources of fats and amounts of energy and fats intake, among adolescent girls of two districts

District	North (n=105)		South (n=105)	
	Amount of pocket money r	Family size r	Amount of pocket money r	Family size r
Dairy products	0.11	0.01	0.18	-0.006
Meat and egg	0.04	-0.03	0.17	-0.15
Fats	0.12	-0.09	0.19*	-0.19*
Sweet Snacks	0.015	0.09	0.18	-0.11
Salty snacks	0.22	0.16	0.19*	-0.05
Fast foods	0.19	-0.08	0.19*	-0.07
Home-made fatty foods	0.018	-0.01	0.04	0.16
Energy (kcal)	-0.03	0.09	0.04	-0.05
Total fat (gr)	0.12	0.04	0.10	-0.15
Saturated fats (gr)	0.13	0.008	0.11	-0.13
Mono-unsaturated fats(gr)	0.16	0.04	0.14	-0.15
Poly-unsaturated fats(gr)	0.06	0.04	0.12	-0.13
Cholesterol(mg)	-0.07	0.06	0.16	0.002
Percent of energy from fat	0.22*	-0.19	0.15	-0.16
Ratio of unsaturated to saturated fats	0.005	0.04	-0.003	0.01

*Significant Correlation $P < 0.05$

Table 2 shows the correlation of family size and pocket money, with weekly frequency intakes in food groups of main sources of fats and amounts of energy and fats intake, among adolescent girls of two districts. The Spearman correlation test showed that there isn't any correlation between amount of pocket money and frequency intakes in food sources of fats among Northern girls, while among Southern girls, there is a significant

positive correlation between amount of pocket money and frequency intakes in fats, salty snacks and fast foods. It means that the more the pocket money of south high-school girls, the more their purchase of salty snacks and fast foods. Also in south, there was a significant negative correlation between the family size and frequency intakes in fats per week. It means that there is less fat consumption in greater families.

DISCUSSION

The goal of this study was to compare the dietary pattern of the adolescent girls in relation to socio-economic factors of North and South districts of Tehran. According to the results, the high school girls of these two districts were significantly different in terms of socio-economic status, including their parents' education level and occupation. It can be resulted mostly from the low education level of the parents of the southern girls. The frequency consumption of food sources of fats such as dairy products, meats and different kinds of fats were less among the Northern girls, mostly due to their different life style. It indicates the significantly different qualitative pattern of fat consumption between the two groups of studied girls.

The mean intake of energy and total fat of Northern and Southern girls were 1964 kcal and 77g, and 2288kcal and 83g, respectively. The mean of daily energy intake at this study, resembles the reported amounts from the girls of divisions 3 and 16 of Tehran [3], Semnan [16], urban and rural areas of Astaneh-Ashrafiyeh [5], public and private high-schools of Babol [8], Urmiah and Shahindezh [7], and adolescent American [17] and Spanish [18] girls. In a study on British adolescent girls [19], the mean of daily energy intake was less than the reported amounts of this study. On the other hand, in a study on the adolescent girls of division 6 of Tehran [9], the mean of daily energy intake was more than the amounts of this study. According to the results of this study, there is no significant difference between the girls of two studied districts in terms of daily energy intake. This is similar to the findings of some other Tehran districts, as well as some other urban or rural areas of the country [3,4,5,7,10].

Regarding the mean of total fat intake, the girls of Lahijan were similar to our study samples [20], but the girls of district 6 of Tehran had higher amounts than our girls [9]. Also, girls from Bangladesh intake less fat than our studied girls [21]. It seems that the differences of studies are mostly due to using different methods for assessing food intakes, as well as using different nutritional software for analyzing food consumption information. Underestimation can also be a reason of this phenomenon [22]. In this

study, consumption of mono-unsaturated fats was more among the girls of south district of Tehran ($P<0.05$). But the mean of daily cholesterol intake was more among the girls of North district ($P<0.04$). Both of these differences were statistically significant and similar to the results of the studies in the other districts of Tehran [3,4]. It is probable that consuming more fast foods like sausages and potato chips which have a high content of cholesterol and saturated fats, has caused such a result. It should be noted that the mean of daily cholesterol intake of the both group of girls was less than the suggested amount (maximally 300mg per day), which shows a better food pattern of the studied girls, compared to the adolescent girls of the low-income American families [23]. There wasn't any significant statistical difference between the two groups of girls, regarding the ratio of unsaturated to saturated fats. Since there wasn't also any significant difference in the percent of energy from the fat, the quantitative pattern of fat consumption is similar in the two studied groups too. The results of this study shows that the mean of the percent of energy from fat among the girls of North and South districts of Tehran is 34.1 and 34.4, respectively. These figures are similar to the reported amounts from the adolescent girls of districts 3,6 and 13 of Tehran [3,9,24], over weight and obese girls of Semnan [16], over weight girls of Lahijan [20], private high-school girls of Babol [8], and adolescent girls of Portugal [25]. But the percent of energy from fat among our studied girls was higher than the adolescent girls from district 16 of Tehran with 26.4 [3], girls from the center district of Tehran with 28 [26]. Girls from urban and rural areas of Astanehashrafiyeh with 24.6 and 23.2 respectively [5], public high school girls from Babol with 29.5 [8], girls from high-income families of Urmiah with 28, and girls from low-income families of Shahindezh with 22 [7].

In the recent decade and during the nutrition transition process, fat intake of Iranian families has increased from 22% of daily energy to 25%. As the fat content of the foods of Tehran households has always been more than the other areas of country, it is expected that with increase in the mean of fat intake at national level, the percent of energy from fat increases among

Tehran households too [27]. The percent of energy from fat among the adolescent girls of district 6 of Tehran, has increased from 31.1 in 1995 [3], to 34.8 in 2002 [9]. This increase can also be seen in Tehran households that reaches to 28% [27].

Since fat should comprise less than 30% of daily energy intake in an appropriate food pattern [28], it can be seen that the studied girls consume more fat than the recommended amounts. This is mostly due to consumption of high-fat foods like sweets, salty snacks, fast foods, as well as some kinds of fats such as Mayonnaise and high-fat dairies like chocolate milk, ice cream and cream cheese [9]. A study in Moscow showed that the percent of energy from fat among adolescent girls is 29-32% which is less than the finding of our study [29]. The percent of energy from fat among the adolescent girls of high-income Greek household is about 43 [30]. This figure is 32-39% [17] and 39.8% [18], among adolescent girls from U.S and Spain, respectively, which is more than the result of our study.

The results of studies in the developed countries show that share of fat in providing energy has increased during 1996 to 2001. This is the case in our country too. Developed countries, however, do not have problems of underweight, wasting or inadequate micronutrients intake. They just face the increase in the prevalence of overweight and obesity. So, it is necessary to enhance the level of nutritional awareness and modify the lifestyle of adolescent girls as the future mothers.

Our study showed that the most consumed high-fat food resources (food with more than 20% fat) among the adolescent girls of North and South districts of Tehran include high-fat dairies, high-fat meats, oils, chocolates, biscuits, snacks, potato chips and seeds. The findings of the study of Dadkhah in district 6 of Tehran were similar to our findings in the two studied districts [9].

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Kelishadi et.al found that most of the adolescent girls from Isfahan consume high-fat and fast foods, more than 3 times per week [10]. According to the report of Cavadini et.al, consumption of fried potato and high-fat foods like pizza has increased among American adolescent girls [31], which is similar to the findings of our study. The results of studies on Afro-American adolescents show that consumption of fats, sweets and meats among this age group is more than the recommended amounts at the dietary guidelines [32]. Many studies have shown consumption of high amounts of snacks and junk foods among the adolescent girls of the different districts of Tehran, as well as other cities of the country [3,4,5, 9,10, 24, 33, 34]. These kinds of foods which have high energy and low nutritional density, can cause overweight and obesity on one hand, and prevent adequate intake of necessary nutrients, due to decreasing satiety for main meals and proper foods, on the other hand [28].

CONCLUSION

Since literacy level of mothers has a significant effect on the nutritional status of family size, improving nutritional knowledge of mothers and providing nutrition education for them is so effective in controlling and preventing obesity among adolescents. In this regard, considering adolescents and their specific condition in designing educational and interventional programs for improving nutrition and health status of community, is more necessary than the past.

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