

The Education by Peers Cautioning Against Deleterious Impact of Junk Foods on Knowledge, Attitude and Body Mass Index of School Students in Shiraz, Iran, 2012-13

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Background: The peers play an important role in choosing the foods and shaping the dietary habits. Obesity and many other diseases result from consumption of unhealthy foods by children and adolescents.

Objectives: The aim of this study was to determine the deleterious effect of junk foods on knowledge, attitude and body mass index (BMI) of school students in Shiraz, southern Iran.

Patients and Methods: This study was conducted in two stages and comprised 480 (240 boys and 240 girls) of fifth grade in primary schools from four education and culture districts of Shiraz. The students were selected randomly and divided into two groups of intervention (120 girls and 120 boys in case group) and (120 girls and 120 boys in control group). In the first stage, both case and control groups completed the questionnaire on their knowledge, and attitude, in addition to calculating and recording their BMI. Initially, 3-4 active candidate students were selected from each class and after educating them about disadvantages of junk foods, commissioned them to educate their classmates daily about deleterious impact of such diets. The second stage started after three months when the same questionnaires were recompleted by both case and control groups, while their BMI re-calculated and recorded. The collected data were statistically analyzed using SPSS 15, chi square, paired t test, ANOVA and Post hoc test.

Results: The results showed that, before intervention, out of 480 girls and boys, 13.0% were thin, 38.2% had normal weight, and 11.9% were overweight of whom 36.9% were obese. By comparing the average weight and height for girls and boys (case and control group), only in the region-1, there was a statistically significant difference in the mean weight ($P = 0.002$) and height ($P = 0.015$) of the girls in control and in the case group. Case groups from all four regions were overweight but without any statistically significant difference ($P = 0.381$). However, after intervention, a significant difference in overweight was found between case and control groups ($P = 0.041$). There was a significant relationship ($P < 0.05$) in comparing the score mean difference of attitude of students' girls and boys (case-control) in four regions before intervention. The attitude score of girls was better than the boys. There was no significant correlation ($P > 0.05$) between average knowledge scores of girls and boys (case and control) before and after intervention and attitude after intervention.

Conclusions: Children spend a long time at schools which are ideal places for education. The peers chosen for this study proved to be highly successful in educating their classmates in cautioning them against unhealthy diets, an approach of potential educational Value.

Keywords: Peers; Knowledge; Attitude; BMI; Students

1. Background

Educational progress of students is impressed by the quality of securing their psycho-social needs and enjoying good health. One of these requirements is nourishment (1) which if fulfilled properly would have beneficial and positive impact on children's education for which school is a suitable place, since children spend more than 90.0% of their daytime at schools (2). The patterns of diet have changed during recent decades and replaced by junk foods which are deficient in vitamins, minerals, energy and protein contents (3, 4). Paeratakul et al. (2003) reported that consumption of fast foods by adults and children were 42.0% and 37.0% respectively, but gave no convincing estimates in regard to vitamin A and B intakes (5). Dietary behaviors and patterns develop from infancy,

affect the health of individuals and prepare the ground for chronic diseases like Obesity, Cardio-vascular diseases, Diabetes, some types of Cancer and Osteoporosis in adulthood (6, 7). Regarding the overweight and obesity resulting from lack of proper nourishment at infancy periods, World Health Organization (WHO) (2005-2006) reported that, in some countries, the prevalence of obesity and overweight among adolescents aging 11-13 years is between 5.0% to more than 25.0% (8). According to the report of WHO in 1998, Iran is also included in seven countries with high prevalence of obesity among adolescents (9). This is confirmed by the Food Research Institute (2004) report that indicated the prevalence of obesity and overweight among girls and boys of Tehran as

31.0% and 26.0% respectively (10). Moghadasi et al, (2009) showed increasing trend in the prevalence of obesity and overweight in children from Shiraz which was higher than other regions of Iran (11). The role of education in solving this problem was explicitly demonstrated by the results of the study conducted by Azadi et al. (2009) who by introducing the health promotion planning at school, observed the difference in the average use of dairy products, drinks, etc., before and after intervention among case group (12). The results of a study by Abdolahi et al. (2006) also found a significant difference between the knowledge of both groups after educational intervention, where the results among girl students were more satisfactory than in boy students (13). In many studies, education has been carried out by researchers and teachers with lesser attention paid to education by peers which could be one of the most powerful educational methods for adolescents in relation to health promotion of youngsters (12). The reason for engaging peers in teaching is that stronger students influence the weaker pupils who, in this way, become converted into superior learners (14).

2. Objectives

The present study was conducted to evaluate the effect of education provided by peers on the rate of knowledge and attitude of students and calculating their BMI, in connection with the disadvantages of using junk foods before and after intervention. The advantages of this method from the viewpoint of expenses, accessibility, homogeneity of groups etc., are of great importance, and hopefully the results obtained will provide a positive step toward promoting the health of young students.

3. Patients and Methods

This experimental study was planned for two stages and 480 students of fifth class selected randomly from schools of four regions of education culture of Shiraz. For the first stage, girls and boys from the selected schools were divided into two case and control groups (from both groups of girls and boys, 120 case and 120 control were selected) and after briefing them about. The aim of the study, they were asked to fill in the knowledge and attitude questionnaire. Their weight and height were then measured and their BMI were calculated and recorded. The validity of the questionnaire was confirmed using content validity method. The reliability of the questionnaire was determined previously by distributing it randomly among some of the students, and the information therein was extracted along with making the necessary corrections. Initially, 3-4 active candidate students were selected from each class and after educating them about disadvantages of junk foods, commissioned them to educate their classmates daily about deleterious impact of such diets. The progress of education was monitored weekly through telephone by peers for three months. In the schools of control group, only the questionnaire of

knowledge and attitude was presented to the students for answering, followed by calculating and recording their BMI and measuring their weight and height. At the second stage, we visited the schools after three months, and the same questionnaire about knowledge and attitude were presented to both of case and control groups, followed again by calculating and recording their BMI and measuring their weight and height. A fixed weight and height meter was used for the research and the weight of the students was measured while wearing light clothes. Finally, the data collected were statistically analyzed using SPSS 15, chi square and paired t tests, as well as ANOVA and post hoc tests.

4. Results

The results showed that, the mean and standard deviation of the age of students (girls and boys) was 10.3 ± 2.7 and their BMI according to the centers for disease control and prevention (15) indicated that 13.0% were weak persons, 38.2% had normal weight, 11.9% were overweight and 36.9% were obese. Before intervention, the mean weight and height of girls were 38.91 ± 10.35 kg and 142.21 ± 17.7 cm, respectively, and the respective mean weight and height of boys were 36.7 ± 10.6 kg and 140.52 ± 19.73 cm. In regard to the mean weight and height of girls and boys in case and control groups, a significant difference was only found between the mean weight ($P = 0.002$) and height ($P = 0.015$) of girls of control group of region one and the girls of case group in the same region; weight and height of control group was more than that of case group. Before intervention, the mean score of BMI for girls and boys were 18.70 ± 3.5 and 18.23 ± 3.48 respectively, and the respective values for girls and boys after intervention were 18.77 ± 3.5 and 18.23 ± 3.49 . The study of BMI of girls and boys in case and control groups before and after intervention showed that the prevalence of obesity was higher in girls than boys in the case and control groups (Table 1). Using ANOVA test, the comparison of BMI in case group in four regions showed a statistically significant difference in score difference between girls and boys in region 2 ($P < 0.001$). Considering the foregoing results and using post hoc test, the mean score of BMI of case group in region 2 and control group of region 1 was compared with other regions and the results are in table 2. This indicated that regarding mean score, the students in case group from region 2 significantly differed from other regions. The post hoc test was also carried out for the control group and comparing the region-one with region 2 ($P < 0.05$), region 1 with 3 ($P < 0.001$) and region 1 with 4 ($P = 0.008$), indicate the mean score of BMI of control group in region 1 differed from other regions. The comparison of the mean score of knowledge and attitude between the girls in case and control groups showed no significant relationship before and after intervention ($P > 0.05$). The comparison between the mean score of knowledge before and after intervention between boys in case and control groups showed no statistically significant differ-

ence ($P > 0.05$), but with respect to attitude the difference was significant ($P = 0.049$). On the other hand, comparison between the mean score of knowledge and attitude of girls in both case and control groups from four regions did not show any statistically significant difference ($P > 0.05$). However, statistically significant difference was found between the mean score of attitude of boys in case and control groups after intervention ($P = 0.049$, mean difference 1.21 ± 0.61). The comparison of the mean score of knowledge and attitude of the girls and boys in case group was also carried out and the results showed statistically significant difference between the mean score of attitude before intervention (36.2 ± 64 for girls and 32.7 ± 52 for boys, $P < 0.001$). However, no significant difference was observed between the mean score of knowledge before and after intervention and attitude after intervention ($P > 0.05$, Table 3). Comparing the mean score of at-

titude in the control group also showed that a significant difference between girls and boys (36.1 ± 62 for the girls and 32.3 ± 47 for the boys) existed before intervention ($P < 0.001$), but no difference was observed in the mean score of knowledge before and after intervention and attitude after intervention ($P > 0.05$). The changes in the score of knowledge and attitude of girls and boys in the case and control groups were determined by the differences between these scores before and after intervention, so that significant changes in the score of knowledge were found between regions 2, 3 and also between regions 3 and 4, but no significant changes were observed in the score of attitude ($P = 0.138$). Also significant differences in knowledge ($P < 0.005$) and attitude ($P < 0.001$) of the girls and boys in the control group were observed between regions 2 and 3 as well as between regions 3, and 4. In this context, girls exhibited better performance than boys.

Table 1. The Calculation of BMI of Students, Following Separation of Genders, in Case and Control Groups Before and after Educational Intervention ^a

Intervention	Before Intervention			After Intervention		
	Obese	Normal	Weak and Overweight	Obese	Normal	Weak and Overweight
Gender						
Girl	93 (38.75)	91 (37.9)	50 (20.85)	94 (39.2)	82 (34.2)	52 (21.7)
Boy	77 (32.1)	91 (37.9)	63 (28.4)	74 (30.8)	92 (38.3)	62 (25.5)
Total						
Girls	234 (97.05), 6 cases or 2.5 missed			228 (95.01), 12 cases or 24.9 missed		
Boy	233 (98.4) 7 cases or 1.6 missed			232 (94.06), 8 cases or 5.4 missed		

^a Data are Presented as No. (%)

Table 2 . The Results of Post Hoc Test for Comparison Between Case Group in Region 2 and Control Group in Region 1 with Other Regions

Comparison	Difference Mean \pm SD	P Value
The Case Group of Region 2 With Region.1	-1.05 \pm 0.	< 0.001
The Case Group Of Region 2 With Region 3	0.69 \pm 0.	< 0.001
The Case Group Of Region 2 With Region.4	0.77 \pm 0.2	< 0.001
The Control Group Of Region.1 With Region 2	0.98 \pm 0.22	< 0.001
The Control Group Of Region 1 With Region 3	1.11 \pm 0.4	< 0.001
The Control Group Of Region 1 With Region 4	0.63 \pm 0.23	0.008

Table 3. The Comparison Between the Mean Score of Knowledge and Attitude of Girls and Boys in the Case Group Before and After Intervention ^a

variables	P Value	Value ^a
Mean score of knowledge before intervention	0.949 ^a	-0.04 \pm 0.67
Mean score of knowledge after intervention	0.476	-0.39 \pm 0.47
Mean score of attitude before intervention	< 0.001	3.41 \pm 0.69
mean score of attitude after intervention	0.056	-1.2 \pm 0.62

^a Values are presented Mean \pm SD

5. Discussion

With respect to BMI, the results showed obesity and overweight among students where obesity was more prominent among girls (47.5%) than boys (31.7%) and overweight was more frequent among boys (11.5%) than girls (10.4%) before and after educational intervention. Comparison of the mean height and weight of girls and boys before and after intervention also revealed statistically significant difference in weight ($P = 0.002$) and height ($P = 0.015$) among case and control groups of girls from region 1, but the control group had a higher mean score. Several studies have been conducted on the prevalence of obesity among girls and boys. In this regard WHO (1988) considered Iran among seven specified countries with high prevalence of obesity among children (9). In this connection, the Food Research Institute of Iran (2004) reported the prevalence of obesity and overweight among girls and boys from Tehran as 31.0% and 26.0% respectively (10). Other studies also reported the increasing prevalence of obesity among children. For example, a study conducted by Aziz S. et al. (2009) on 398 children aged from 6 to 17 years, reported obesity in 6.0% of children (16). Also, Olivares S. et al. (2004) indicated that before using the dietary curriculum at the school, the prevalence of obesity and overweight were 15.4% and 19.6% respectively (17). The results of a study conducted by Wickramasingh VP et al. (2004) also showed higher prevalence of obesity among boys (4.3%) than in girls (3.1%) (18). Another study reported higher obesity rate (5.5%) and overweight (5.0%) among boys compared with girls of whom 2.0% were obese and 3.5% overweight (19). Goyal RK (2010) in India studied obesity and overweight among 12-18 year-old children, and found higher prevalence of obesity (14.3%) and overweight (2.9%) among boys than girls with respective rates of 9.2% 1.5% (20). As observed, the results of some investigation are consistent with, or contrary to the results of present study, but the important and obvious fact in these studies is the increasing prevalence of obesity among children. In connection with the effect of education on the rate of knowledge and attitude of students, results showed that the education had no effect on the mean score of knowledge and attitude of girls in case and control groups before and after intervention ($P > 0.05$). Moreover, regarding boys, there was no difference between the mean score of knowledge before and after intervention, but with respect to knowledge the mean score was higher than before intervention ($P = 0.49$). Statistically significant difference was observed between the mean score of knowledge and attitude of students before and after intervention in girls and boys of the case and control groups in four regions, ($P < 0.001$). A study by Angorani et al. (2007) on the influence of dietary education booklet on the knowledge of students showed significant increase in mean score of knowledge in the case and control groups before and after intervention ($P < 0.000$) (21). Azadi et al. (2008) investigated the effect of applying

health promotion program on the students. The results of this study showed that, the BMI score of case and control groups was not changed after intervention ($P > 0.05$), but the mean score of knowledge of case group became significant after intervention compared with control group ($P < 0.0015$) (12). Abdolahi et al. (2005) also did not observe any significant difference between the mean score of knowledge and function of case and control groups before intervention, but the result became significant after intervention ($P < 0.005$) (13). The results of the study by Fahlman MM (2008) and Olivares S (2004) demonstrated the relationship and impact of education by teachers on improving the knowledge of students using curriculum and CD (17, 22). Our findings regarding the effect of education on knowledge and attitude of students were consistent with the results of aforementioned studies.

The schools are appropriate places for education, wherein children spend most of their times. Educational method, qualified teachers, relevant topics, etc. could influence the quality of education. Seeking the help of peers for education of the classmates in the present proposal did not result in weight reduction and incidence of obesity of students. However, the result was successful in regard to changing their knowledge and attitude. Anyway, it seems that using peers for teaching is not per se sufficient. Nevertheless, it could become an efficient and potential method of health promotion of adolescents if based on continuous planning, effective policies, the need of the society, cooperation of organizations, families, and financial resources, etc.

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References

1. World Health Organization. *Teaching for all*. Parsenia S, Hekmat S editors. Tehran: Chehr Publication; 1997.
2. Amoozesh 3 group. *[Learning a few basic learning opportunities for all]*. 2009. Available from: <http://amozsh3.blogfa.com>.
3. Taghipoor RS, Kalantari N. *Determinethe relationship between dietary habits and BMI District 2District 8girls'schoolsin Tehran*. Tabriz: Abstracts of Iranian Congress of Nutrition; 2006.
4. Naghib ZM, Mozafari KH. Consumption of snacks In the academic year 83-84students in Yazd, Iran. . Tabriz: Abstracts of Iranian Congress of Nutrition; 2005. p. 321.
5. Paeratakul S, Ferdinand DP, Champagne CM, Ryan DH, Bray GA. Fast-food consumption among US adults and children: dietary and nutrient intake profile. *J Am Diet Assoc*. 2003;**103**(10):1332-8.
6. Freedman DS. Clustering of coronary heart disease risk factors among obese children. *J Pediatr Endocrinol Metab*. 2002;**15**(8):1099-108.
7. Alexy U, Sichert-Hellert W, Kersting M, Schultze-Pawlitschko V. Pattern of long-term fat intake and BMI during childhood and adolescence—results of the DONALD Study. *Int J Obes Relat Metab Disord*. 2004;**28**(10):1203-9.
8. Haug E, Rasmussen M, Samdal O, Iannotti R, Kelly C, Borraccino A, et al. Overweight in school-aged children and its relationship

- with demographic and lifestyle factors: results from the WHO-Collaborative Health Behaviour in School-aged Children (HBSC) study. *Int J Public Health*. 2009;**54** Suppl 2:167-79.
9. Dehghan M, Akhtar-Danesh N, Merchant AT. Childhood obesity, prevalence and prevention. *Nutr J*. 2005;**4**:24.
 10. Mohamadpoor AB, Kalantari N, Karandish M, Rashidi A. The prevalence of obesity in boys' and girls' high school in Tehran with Some associated factors. . Tehran: Institute of Food Nutrition and resources; 2001.
 11. Moghadasi M, Naser K, Ghanbarzadeh M, Shakerian S, Razavi A. Prevalence of Overweight, Obesity and Physical Fitness in Shiraz Adolescents. *Ir J Endocrinol Metab*. 2011;**12**(5):476-82.
 12. Azadi A, Anoshe M, Alhani F, Hagizade A. The effect of Implementation of health promotion programs in schools to control risk factors related with obesity. . Bushehr: Bushehr Quarterly medicine south-Institute for Biotechnology-Medical; 2008. pp.162-53.
 13. Abdolahi P, Razeghe M, Razaveye S, Maghami J, Fathi A. The effect of nutrition education on knowledge about elementary school students practice taking snacks. *Zanjan Medic Sc J*. 2005; **51**(13):13-20.
 14. *Periodical Modern contraception*.Peer to Language Learning: Research Publications Research Studies Department of Health, Office of Education; 2010.
 15. *Centers for Disease Control and Prevention*. 2010. Available from: <http://www.cdc.gov/growthcharts>.
 16. Aziz S, Noorulain W, Zaidi UE, Hossain K, Siddiqui IA. Prevalence of overweight and obesity among children and adolescents of affluent schools in Karachi. *J Pak Med Assoc*. 2009;**59**(1):35-8.
 17. Olivares S, Moron C, Kain J, Zacarias I, Andrade M, Lera L, et al. [A methodological proposal to include nutrition education in primary schools. Experience in Chile]. *Arch Latinoam Nutr*. 2004;**54**(2 Suppl 1):33-9.
 18. Wickramasinghe VP, Lamabadusuriya SP, Atapattu N, Sathya-das G, Kuruparanantha S, Karunarathne P. Nutritional status of schoolchildren in an urban area of Sri Lanka. *Ceylon Med J*. 2004;**49**(4):114-8.
 19. Akhvan KS, Falah R, Golestan M, Saber BM. Frequency and predisposing factors of obesity and overweight in Yazd preschool children. *Yazd U Medic Sc J*. 2009;**16**(5):13-8.
 20. Goyal RK, Shah VN, Saboo BD, Phatak SR, Shah NN, Gohel MC, et al. Prevalence of overweight and obesity in Indian adolescent school going children: its relationship with socioeconomic status and associated lifestyle factors. *J Assoc Physicians India*. 2010;**58**:151-8.
 21. Angorani P, Keshavarz A, Sadrzadeh YH, Rahimi A. The effect of nutrition education booklet at Breakfast on knowledge of students in fourth grade six region girls school education in Tehran. *J Med Tehran U Medic Sc*. 2007;**65**:49-53.
 22. Fahlman MM, Dake JA, McCaughtry N, Martin J. A Pilot Study to Examine the Effects of a Nutrition Intervention on Nutrition Knowledge, Behaviors, and Efficacy Expectations in Middle School Children. *J School Health*. 2008;**78**(4):216-22.