



## **Educational Intervention on Health Related Lifestyle Changes Among Iranian Adolescents**

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### **Abstract**

**Background:** Healthy lifestyle habits during adolescence can prevent many of the diseases and disabilities in adulthood and later. The aim of the study was to examine the role of education in improving lifestyles among Iranian adolescents.

**Methods:** This group randomized controlled trial was conducted during October 2010 until January 2011 in Tehran. Participants for this study were selected through a random sampling method and divided into intervention and control groups. The intervention group received a six session course on healthy lifestyles and the control group received no intervention. The Adolescent Lifestyle Questionnaire (ALQ) was used for collecting data. Data were collected before the intervention, at a two week after participation time point, and a three month follow-up was conducted.

**Results:** Overall, 365 (male: 173, female: 192) adolescents participated in the study. There were significant differences between boys and girls in terms of physical activity and social support ( $P < 0.001$ ). The boys had higher levels of physical activity than girls. Girls received more social support than boys. There were significant differences in the lifestyle scores between the intervention and control groups at follow-up ( $P < 0.001$ ). The educational intervention indicated an improved total lifestyle score (from 123.7(SD.16.1) at baseline to 131.8 (SD.16.7) at two weeks and to 130.5(16.5) at 3 months after education) among the intervention group.

**Conclusions:** Adolescents` behaviors may be different in some dimensions among boys and girls. Unhealthy lifestyle habits are prevalent among adolescents. Therefore sex-specified lifestyle education can bring promising results. Further research in the field can reveal the importance of lifestyle intervention programs.

**Keywords:** Lifestyle, Adolescent, Health education, Iran

### **Introduction**

Lifestyle is the nature in which a person or group of people live, including where they live, what they own, type of employment, and activities they enjoy. One`s lifestyle can be healthy or unhealthy based on nutrition, physical activity levels, and overall personal behaviors. A positive lifestyle can

bring health and happiness, while a negative lifestyle can lead to illness and depression (1, 2).

A lifestyle has different components which includes: nutrition, physical participation, safety and health awareness, and these components contribute to an individual`s health (3). For example a

lifestyle that includes regular physical activity has been associated with numerous health benefits including a reduced risk of coronary heart disease, type 2 diabetes, obesity and associated health risks, cancer, arthritis, sexual dysfunction, depression, anxiety, mood disorders, and cognitive impairment (4, 5).

Health risk behaviors such as smoking, alcohol abuse, unhealthy dietary patterns, sedentary habits, and unsafe and aggressive behaviors have been found to have an important influence on morbidity and mortality (6-8). Health risk behaviors, which develop over time, can also contribute to an unhealthy lifestyle (9, 10).

An essential component in the prevention and management of diseases is the adoption of a healthy lifestyle that would include the promotion of non-smoking, eating a healthy balanced diet, and actively engaging in organized physical activities (11, 12).

Childhood and adolescence are critical periods for developing and forming healthy lifestyle habits and behaviors that can last a lifetime (3, 4, 9). However an unhealthy lifestyle is still a concern among adolescent populations. Some studies reported that more than 30% of the high school students watched TV and played video or computer games or used a computer  $\geq 3$  h/day on an average school day (13, 14). Also other studies have shown that more than 60% of students did not meet recommended levels of physical activity and engaged in sedentary behaviors (15, 16). These lifestyle behaviors may contribute to the prevalence of obesity and other chronic diseases in adulthood (17).

Despite an increased focus on nutrition and exercise for adolescents in the world over the last few decades, the dietary intake of adolescents remains a major cause of concern with an increasing number of youth consuming fast foods which are high in fat and sugar contents on a daily basis (18). The rapid rise in the prevalence of chronic diseases suggests lifestyle related factors are responsible. In other words, physical activity has declined, sedentary activities have increased, and there are widespread changes in dietary patterns. Perhaps all of these changes are rooted early in life during the

child and adolescent stage, therefore eating and exercise patterns established in adolescence may be more likely to be sustained into adulthood (19). Childhood healthy lifestyles can continue during adulthood if the behaviors are introduced early. The introduction of these behaviors may be based on environmental and social factors, such as sex, social class, and educational opportunities (20, 21). Studies that examined education, lifestyle habits, and functions among adolescents found they are not receiving adequate education and resources need to adopt a healthy lifestyle (22, 23). Adolescents will be better prepared to transition into adulthood if they have been provided the education, skills, decision-making power, and information to function as healthy adults in society.

The school setting is a perfect place for learning new attitudes and behaviors, thus adolescents may comply with targeted lifestyle interventions offered through schools more than with those offered in a health care setting (24).

Some studies have examined a range of factors from nutritional, behavioral, and sleeping habits as constructs of lifestyle in adolescents (8, 11, 13, 15, 16, 20); however only a few studies have considered lifestyle in general. Some studies have found sex is an origin of difference in terms of lifestyle behaviors among adolescents. For example self-reported studies of physical activity show that girls are less active than boys (25, 26), girls have different nutritional preferences than boys (25, 27), and girls using different stress management skills than boys (28, 29). So, recognizing lifestyle as a whole in two genders can help to understanding various lifestyle patterns in adolescents and identify the best method for behavior modification.

Therefore, the purpose of this study was to examine lifestyle factors through the implementation and evaluation of an intervention program for reducing unhealthy lifestyles among a sample of Iranian adolescents.

## Materials and Methods

### *Samples*

The study sample included 173 male and 192 female adolescents aged 14 to 18 years old recruited

from 8 high schools located in a southern area of Tehran. For sample size estimation we used Cohen's tables (ES=0.3, Power= 0.8 and  $\alpha= 0.05$  two tailed). In each school the study sample was recruited from students in the ninth and tenth grade. Inclusion criteria were voluntary participation in the study and signing the consent form by a parent or legal guardian. The adolescents that planned to leave the geographic area or had a friend or relative enrolled in the trial were excluded from participation. A clustered multistage sampling method was used to select students. Participant schools were obtained from a list of governmental high schools within four southern zones of Tehran. These zones were chosen due to their ease of accessibility and prior agreements made among school's officials that the intervention and data collection would be supported. Two high schools were selected (one for girls and another for boys) in each zone by simple random allocation (using a table of random numbers). To avoid diffusion effect four high schools were assigned to the intervention and the remaining schools were the assigned to the control group. The participants' flow diagram of the study is observable in Fig. 1.

To ensure safe and ethical practices among participants, the intervention was explained to the prior to the study and informed consent was provided by the parent or guardian. In addition, to avoid having a "no treatment group", the content of educational course has been given to the members of control group as a booklet after the end of the study. The study protocol was approved by the Review Committee Research the Tehran university medical sciences. Also the study has been registered in Australian New Zealand Clinical Trials Registry (ANZCTR) and its ID is ACTRN12612000612819.

### ***Data collection***

A culturally appropriate Adolescent Lifestyle Questionnaire (ALQ) was used in the study to collect data. The original scale was initially developed and tested by Gillis (30). To develop a culturally revised scale, its original version was translated into Persian by a bilingual researcher and then

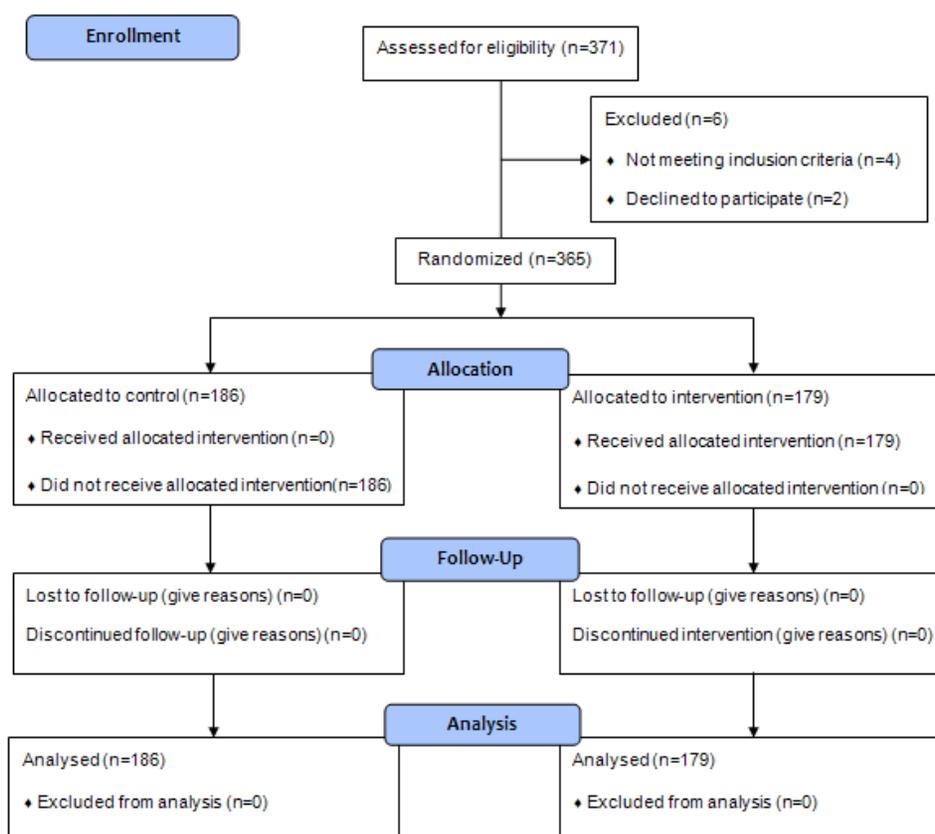
validated using a standard back translation technique by a native Persian researcher who was a specialist in health education and fluent in English. A native English speaker living in Iran backward translated the scale into English. Six bilingual Iranian experts of health education and instrument development were requested to assess the initial tool for quality and relevance of the items. The revised instrument was pilot tested with 62 students from 2 high schools that were selected randomly (28 girls and 34 boys; aged: 12 to 17 years old). Based on findings from the pilot study and recommendations from its participants, additional revisions were performed in the content of the items and it was completed in order to develop the final instrument.

The ALQ used in this study is a 43 item instrument that encompasses seven subscales: nutrition, physical participation, social support, stress management, identity awareness, general health practices awareness, and safety. The ALQ uses a 5 point Likert scale with responses ranging from 1 "never" to 5 "almost always". The preliminary testing of the instrument showed evidence of validity and reliability among adolescents. The internal consistency of the scale that measured by Cronbach's alpha was 0.82.

In addition to the instrument a one-page questionnaire was given to the participants to collect demographic information such as age, gender, grade, family household members, siblings, and socioeconomic status which included both education and economic status. Data were collected from October 2010 until January 2011.

### ***Educational intervention***

The classroom-based lecture method was adopted for imparting lifestyle education. This educational intervention consisted of six ninety minute sessions over a three week timeframe. The lectures were targeted to the group based on the baseline data. Lectures were conducted using age appropriate power-point presentations, which included pictorial graphics and educative statements. Each lecture was followed by interactive discussions, where the educator addressed all related queries from the participants.



**Fig. 1:** Participants` Flow chart

After each session an informative pamphlet was distributed to study at home to reinforce and attain the information gained through lectures and group discussions. Standard educational content about healthy lifestyles was provided by Iran's Ministry of Health and used for the education component of the intervention. Overall, the content included five axes (i.e. nutrition, physical activity, mental health, communication, and safety). Different educational materials such as charts and posters were developed and pre-tested for use as teaching aids by the lecturers. Charts and posters contained basic information related to healthy lifestyles. Two weeks and Three months after the intervention both groups were readministered the survey and data were compared to the baseline data.

### Data analysis

Data were analyzed with SPSS version 17.0 for Windows (SPSS Inc., Chicago, IL). Chi-squared test was used for categorical variables and dimen-

sions of ALQ between males and females were compared by t-test. Moreover the changes of lifestyle score in term of sex for intervention and control groups were tested by repeated measures ANOVA technique.

### Results

The mean age of the adolescents was 15.7 (SD=0.7) years old. Of the participants 91% were living with both parents. The majority of the fathers and mothers of the adolescents had secondary level education (67.6%, 73.9%, respectively). Past semester, grade point average of the participants was 17.17 from 20 (SD=2.25). Among the study participants 58% of the adolescents reported a moderate financial situation (at a 3 points scale: bad, moderate and good). Additional demographic characteristics of the adolescents are shown in Table 1.

**Table 1:** Demographic characteristics of intervention and control groups

	Intervention group (N=179) n (%)	Control group (N=186) n (%)	P-value*
<b>Age</b> (year; Mean, SD)	15.8 (0.6)	15.6 (0.8)	NS
<b>sex</b>			
Female	95(53)	97(52.1)	NS
Male	84(47)	89(47.9)	
<b>Family members</b>			
≤3	35(19.5)	34(18.2)	NS
4	93(52)	97(52.1)	
5≥	51(28.5)	55(29.7)	
<b>Living with...</b>			
Parents	161(89.9)	170(91.4)	NS
One parent	16(8.9)	14(7.6)	
Relatives	2(1.2)	2(1)	
<b>Father's job</b>			
Unemployed	9(5)	7(3.8)	NS
Officer	65(36.4)	68(36.6)	
Self employed	100(55.8)	108(58)	
Other	5(2.8)	3(1.6)	
<b>Mother's job</b>			
Housekeeper	155(86.6)	158(85)	NS
Officer	19(10.6)	20(10.7)	
Self employed	5(2.8)	8(4.3)	
<b>Father's education</b>			
Higher	29(16.3)	31(16.7)	NS
Secondary	123(68.7)	127(68.3)	
Primary	27(15)	28(15)	
<b>Mother's education</b>			
Higher	25(14)	22(11.8)	NS
Secondary	132(73.7)	139(74.7)	
Primary	22(12.3)	25(13.5)	
<b>Past semester grade point average</b> (0-20; Mean, SD)	17.23(2.35)	17.12(2.29)	NS
<b>Economic status</b>			
Bad	29(16.3)	34(18.3)	NS
Moderate	109(60.8)	103(55.4)	
Good	41(22.9)	49(26.3)	

\* All comparisons are non-significant at  $P < 0.05$

Table 2 shows the comparison of the ALQ mean scores between male and female students using the  $t$ -test. There were statistically significant differences in the dimensions of physical participation and social support between male and female students. The overall mean of physical participation was 3.11 (SD=0.84). There was a statistically significant difference ( $t = 6.31$ ,  $P < 0.001$ ) between the male and female adolescents. Male adolescents (mean = 3.40, SD=0.89) were more likely than their counterparts (mean = 2.82, SD=0.80) to participate in physical activities regularly three times per week

for at least 20–30 minutes. The overall mean of the social support dimension was 3.50 (SD=0.92). There was a statistically significant difference ( $t = 3.55$ ,  $P < 0.001$ ) in the social support dimension. More female adolescents (mean = 3.93, SD=1.09) than males (mean= 3.27, SD= 0.75) said they 'have someone to turn to with problems', are able to 'express concerns to others', 'discuss problems and concerns with people they are close to', 'enjoy spending time with friends', 'have good friendships with girls and guys of the same age' and 'have someone to turn to if help is needed'.

**Table 2:** Comparison of the seven dimensions of the ALQ between male and female High school students based on standardized scores\*

ALQ	All n = 365 Mean (SD)	Female n = 192 Mean (SD)	Male n = 173 Mean (SD)	t- value	P-value
Nutrition	3.10(0.77)	3.13(0.83)	3.07(0.74)	0.71	0.474
Physical participation	3.11(0.84)	2.82(0.80)	3.40(0.89)	6.31	<0.001
Social support	3.50(0.92)	3.73(1.09)	3.27(0.75)	3.55	<0.001
Stress management	3.26(0.79)	3.28(0.78)	3.25(0.81)	0.42	0.673
Identity awareness	4.01(0.62)	4.05(0.63)	3.97(0.59)	1.09	0.273
General health practices awareness	2.58(0.89)	2.59(0.95)	2.57(0.85)	0.20	0.839
Safety	3.39(1.04)	3.37(1.03)	3.42(1.05)	0.46	0.645
Total (Unstandardized)	123.87(19.3)	124.97(20.1)	122.77(18.28)	0.21	0.827

\* For standardization factors that consisting the scale, summed items` score of each factor has been divided on number of items in that factor

**Table 3:** Changes of lifestyle score in term of sex for intervention and control groups\*

	n	Baseline		Intervention group				Control group		Baseline		After 2 weeks		After 3 months		Within group effects		Interaction effects		Between group effects		
		Mean	SE	Mean	SE	Mean	SE	n	Mean	SE	Mean	SE	Mean	SE	Mean	SE	F	**P	F	P	F	P
Lifestyle scores																						
Male	84	122.3	17.6	130.6	16.1	128.7	15.9	89	123.2	18.9	123.9	16.9	122.8	16.1	7.92	-	7.86	<0.001	0.43	0.452		
Female	95	125.2	18.7	133.0	15.1	132.3	17.2	97	124.7	21.3	125.4	17.3	125.9	17.2	8.09	-	7.56	<0.001	0.49	0.433		
Total	179	123.7	18.3	131.8	16.7	130.5	16.5	186	123.9	20.1	124.6	17.2	124.3	16.7	7.98	-	7.65	<0.001	0.47	0.445		

\*F statistic was listed for repeated-measures ANOVA

\*\*P<0.001

There were no other significant differences between remaining dimensions. More detailed information on the lifestyle survey between the male and female adolescents can be found in Table 2.

Table 3 shows the changes in the lifestyle scores of the intervention and control groups in terms of sex. The score of the male students in the intervention group improved during the first two weeks and remained high until 3 months after the program (the mean scores were 122.3 at baseline, 130.6 two weeks after, and 128.7 three months after receiving education). In the control group, significant differences were not identified during the 3-months follow up (corresponding scores were 123.2, 123.9, and 122.8, respectively). The interaction between groups and time was significant ( $F=7.86$ ;  $P<0.001$ ), indicating the education program favorably affected male students lifestyle. The lifestyle scores of female adolescents in the intervention group improved during the first two weeks and remained high until 3 months after the program (the mean scores were 125.2 at baseline, 133.0 two weeks after, and 132.3 three months after receiving education), and there was a significant interaction between groups and time ( $F=7.56$ ;  $P<0.001$ ). Regarding total score, a statistically significant interaction was observed ( $F=7.65$   $P<0.001$ ). The total score of the participants in the intervention group improved during the two weeks after the education and slightly decreased during the three months follow up (123.7, 131.8, and 130.5). No considerable changes were observed in the total lifestyle score of the control group during the follow up period (123.9, 124.6, and 124.3, respectively).

## Discussion

In this study, boys reported more physical activity than girls. Moreover, the girls received more social support than boys. The educational intervention was found to be successful in order to change unhealthy lifestyles and replace them with healthy behaviors.

It was not a surprise to observe differences on lifestyle behaviors among the two sexes. Numerous studies have reported disparities among boys and girls in terms of lifestyle and related issues such as

overweight, psychological wellbeing, physical activity and games (3, 4, 13, 14). A study that also used the ALQ revealed that male students were found less likely than females to demonstrate 'health awareness' and 'social support' (3).

In Iranian culture everyone is encouraged to inform any health problem to a specialist or family member. So, this difference may be related to culture based dimensions.

In another study that used a Chinese version of the Adolescent Lifestyle Questionnaire to measure adolescents' lifestyle behaviors and psychosocial well-being in primary and secondary schools in Hong Kong and Guangzhou, found adolescents aged 10–19 years old in Guangzhou practiced healthier lifestyle behaviors and psychosocial well-being than adolescents in Hong Kong, with statistically significant differences in all the seven dimensions. From results of this study it was concluded that socio-economic disparities, family composition, and age group are the key factors associated with adolescents' healthy lifestyle behaviors (31).

The findings in this study are similar with other studies that found situational factors are one of the most important determinants of lifestyle among adolescents.

The different levels of physical activity among male and female adolescents is also consistent with the results of the study conducted among high school students that used the 2003 National Youth Risk Behavior Survey that found 40% of high school girls and 27% of high school boys had insufficient physical activity to meet these recommendations (32). Moreover, a study that was performed more recently among 9 and 15 years old adolescents also showed that only 5% of 9-year-old and 9% of 15 year-old students followed the recommended physical activity guidelines of at least 60 minutes a day of moderate-to-vigorous physical activity (MVPA) and MVPA was positively associated with sex (being a boy) (33). In the similar studies the authors found that the prevalence of physical inactivity among Iranian female adolescents significantly is higher than male adolescents (34, 35). In addition to the above mentioned study, different levels of receiving social support by male and female adolescents has been shown in other studies

(36, 37). The potential reason of this result may be related to differential emotions and feelings among female adolescents, and they prefer to express their concerns to others or enjoy spending time with their friends.

In this study, it was detected that students participating in lifestyle education programs adopt a healthy lifestyle. This finding shows that health education about lifestyle may have a positive impact on modification. This positive impact due to lifestyle education programs is consistent with some other related studies (11, 12, 38). As Amiri & et al. reported the lack of social support and inadequate education are some environmental barriers regard to having healthy lifestyles among Iranian adolescents (39). Such barriers could be well met by the educational interventions. These types of efforts have been shown to be effective even to reduce overweight among obese adolescents (40, 41).

It seems essential for teachers and health educators to monitor and educate students on healthy lifestyle behaviors in the high school setting with a school-based health program. If taught early healthy and positive lifestyle behaviors will be practiced and carried forward from childhood and adolescence into adult life. However, the long term and community based lifestyle intervention may conducive to promising results among developing countries like Iran which should receive a more consideration (42).

There were several limitations to our study. First, our study was conducted within southern area of Tehran, and therefore our study population was not sufficiently representative of all high school adolescents. However, the participation rate was very high and we had a high response rate to the questionnaire. Thus, we consider the internal validity of the current results to be reliable.

Second, individual self-reports were used for evaluating the effectiveness of the intervention to institute change in lifestyle behaviors, which may create a bias. A more sensitive index might be necessary in the future to better evaluate lifestyle behaviors, such as observations by researchers or more advanced assessment.

Finally, a three months follow-up alone cannot determine the educational effect. As our study may

have had an initial educational effect, a more stable effect, or the necessity for continuing or repeating education programs, should be assessed.

## Conclusions

This study indicated that male and female adolescents may be different in dimensions of lifestyle. Thus, educational programs for the adolescents must tailored and gender specific. In addition, school based lifestyle programs can be a positive effect on the modification of lifestyle behaviors among high school adolescents but the results of the study should be interpreted with caution.

Using an integrated approach with a long-term perspective will be required to support children and adolescents in ultimately meeting lifestyle challenges. Future studies with more sophisticated measures and early education in childhood could address this issue.

## Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

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