Onset of Smoking Behaviors and Participation in Leisure Physical Activities of Turkish Adolescents Attending Vocational Health Schools

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Abstract

This cross-sectional study was conducted with the aim of examining the relationships between smoking behavior and leisure physical activity habits of adolescents (n=170, 85F & 85M, mean age= 15.42±0.58, age range=15-17 years) attending vocational health schools in Turkey. Participants were randomly selected from four provinces of the country and classified into two groups according to their participation in leisure physical activity. The logistic regression analysis of the data suggested there was a significant relationship between gender (being female) (OR=0.28), non-smoking (OR=0.39) and participating in leisure physical activities. Furthermore, being a female, age 16 years and over, and fathers' low education levels were also found to have a higher risk of smoking habits (OR=0.30, p=0.018; OR=0.33, p=0.023; OR= 3.92, p=0.004 respectively).

Key Words: *Physical Activity, Smoking Behavior, Adolescents*

Introduction

Adolescents represent around 20% of the world's total population.[1] In Turkey, the Demographic and Health Survey conducted by the Hacettepe Institute of Population Studies in 2003 indicated that adolescents (ages 13-18) make up approximately 22% of the total population. [2] Adolescence is defined as the period which occurs during the second decade of life, beginning with the onset of puberty, ending with the attainment of final adult height and characteristics [3]and characterized by rapid physical growth, significant physical and psychological changes and developing personal relationships.[4-6] In addition to the above mentioned changes occurring during adolescence, positive and negative habits regarding health are also acquired before adulthood.[7] Certain habits are initiated during adolescent years while some patterns of behavior, such as smoking and regular exercise, are established in earlier childhood.[8-11]

The rate of children and adolescents developing leisure physical activity habits has decreased over the last few years due to increased influence of television and other indoor sedentary activities.[5, 6, 12] Although the comprehensive survey regarding the percentage of Turkish population performing regular physical activity has not yet been completed, the last Turkish Demographic Health Survey revealed that the mean body mass index of women aged between 15 and 49 years was 26.5. This survey results indicated that three out of five women, aged 15 to 49 are categorized as overweight with a BMI above 25.0.[2] This might be an explanation for why a sedentary life style is such an important public health problem among the Turkish population, especially Turkish women.

In addition to a lack of participation in leisure physical activity, smoking is also an important health-related risk factor among adolescents.[13-15]The vast majority of adolescents who smoke will continue to smoke into adulthood.[8, 16-17]According to the Surgeon General of the United States, one in three adolescents who begin smoking will move on to regular use, and those who begin smoking earlier may be at greater risk of lung cancer as well as other diseases.[16] Among early adolescents, the intention to smoke was seen as the most powerful predictor in explaining the adolescent's future smoking behavior.[16, 18] It is well documented that tobacco consumption has increased in both developed and developing countries.[14, 15, 17, 19-20]A study conducted with school children in 24 western countries (western countries are those that are geographically west of Turkey) that included Northern Ireland, Israel, Poland, Lithuania, Estonia, Belgium, Finland, and Germany just to name a few, demonstrated that the prevalence of regular smoking in 13 year-olds varies from 3.5% to 12.5% and increases from 17% to 24.5% in 15 year-olds.[21]The rate of smoking among adolescents has also increased in Turkey. A recent study of 6012 adolescents found the smoking rate for 13 to 17 year-old boys and girls was 25.2% and 10.5 % respectively.[22]

Most of the available research on factors related to smoking behaviors and regular participation in leisure physical activity concerns adolescents in western countries. It is much less common for the literature to contain data regarding the prevalence and effects of smoking and frequency participation in leisure physical activity among adolescents from different social and cultural backgrounds. For health personnel specializing in prevention and health promotion, it is important that their own smoking and exercise behaviors conform to professional recommendation. Additionally, they can play an important role in the health education of individuals and groups and act as role models for lay people and the community.

No studies were found that examined health related behaviors, such as smoking and leisure physical activity, among students attending vocational health schools in Turkey. Therefore, adolescents attending vocational health schools were randomly selected as participants for this research study. The purpose of this study was to evaluate the relationship between selected socio-demographic characteristics, regular participation in leisure physical activities, and onset of smoking behavior for adolescents attending vocational health schools in four provinces in Turkey.

Methods

Participants

This cross-sectional study was conducted on 170 adolescents (85 F & 85 M, mean age= 15.42±0.58) attending vocational health schools in four provinces of Turkey (Istanbul, Ankara, Bursa and Erzurum) and took place during the 2000-2001 academic year. Approximately 40 students between 15-17 ages were included from each school. According to the Turkish National Education System, formal education includes primary and secondary education and higher education institutions (universities, faculties, higher education schools). Primary

education institutions are schools that provide eight years of uninterrupted education, while secondary education includes general secondary education and vocational or technical education (which includes technical education, trade, tourism and health) in Turkey. After graduation from vocational health schools, students generally prefer to continue study with higher level of educational institutions in health professions, such as nursing college, health education faculty, medical laboratory, and medical records.

Factors for inclusion in the study included interests and willingness to participate. Permission to conduct the study was granted by the school authorities. Participants and their parents also provided written informed consent before the study began. Participants in the study were asked whether they had chronic disease such as cardiovascular disease, diabetes, and pulmonary metabolic diseases. Participants taking prescription medication on a regular basis or on special diets and those with cardiovascular disease, diabetes, pulmonary or metabolic diseases that could affect physical activities were excluded from the study.

Data Collection

Data regarding regular participation in leisure physical activities was collected using face to face interviews. Participants in the study answered questionnaires via face-to-face interviews conducted by senior students from Marmara University's Faculty of Health Education who had all received training on interviewing techniques and methodologies, which minimized inter-observer variations.

The frequency (minutes per day) and duration of regular physical activity undertaken during the last three months (number of sessions per week, minutes per session) were collected. Participants were also asked how many hours they spent per session doing leisure physical activity. Response categories for this question were "less than 30 minutes in every session" and "30 minutes and over in every session". Participants taking part in leisure physical activity at least three times per week with at least 30 minutes spent on each session were classified as the "Leisure Physically Activity (LPA) Group"(n=76, F/M: 27/49, physical activity ≥ 3 times a week, each session ≥ 30 minutes during the last 3 months); the others (n=94, F/M: 36/58) were classified as the "Non Leisure Physical Activity (NLPA) Group" (physical activity < 3 times a week, each session < 30 minutes less than 3 months).

Data concerning the smoking behaviors of participants was collected using the following questions: "Do you smoke now?" "How many cigarettes a day do you smoke?" and "When did you start smoking?" Adolescents were also asked whether their mothers and fathers currently smoking and whether they smoke at home.

The same scale was used to measure body weight with each participant being weighed without shoes and in the minimum amount of clothing possible. A standing height measurement was taken with the participants shoulders in a relaxed position and the arms hanging freely at the sides. A measurement to the nearest 0.5 cm was recorded with the use of a commercial stadiometer. The body mass index (BMI, kg/m^2) of the participants was calculated using their weight and height measures without shoes and a body mass index of 25 kg/m^2 and higher was accepted as the measure for the participant being overweight.[23]

Data Analysis

The collected data was analyzed statistically using the SPSS 11.5 program. Chi-square, unpaired t-tests were used in group comparisons. Logistic regression analyses models were also constructed to determine regular participation in leisure physical activities and smoking behavior. The independent variables for regular participation in leisure physical activities and smoking behavior were gender (1 = boys; 0 = girls), age (median=15.00, 15 years old = 1, 16 years old and over = 0), body mass index (median=19.38 kg/m^2, 19.38≥1, 19.38<0), height (median = 157.00, 157cm≥1, 157cm <0), father's education level (1 = illiterate and primary school, 0 = secondary school and over), mothers' education level (1 = illiterate and primaryschool, 0 = secondary school and over), and smoking (1 = yes, 0 = no). In addition, having regular leisure physical activity (1 = yes, 0 = no) and parents' smoking behavior at home (1 = yes, 0 = no) were used as independent variables in the logistic regression analyses of smoking behavior. A p value equal or less than 0.05 was accepted as statistically significant.

Results

One hundred seventy adolescents (85F & 85M, mean age=15.42 ± 0.58 years) were included in this cross-sectional study; the physical characteristics of the participants are presented in Table 1. There were no statistically significant differences in age, height, weight, or body mass index in either gender. Among all participants, 4.7 % were found to be overweight with a BMI of 25.0 or above. The prevalence of regular leisure physical activity was found to be

44.7% (N = 76) in both genders. There were 64.5% (N = 49) of the males in the study that participated in some form of leisure physical activity. The distribution of the study group according to participation in leisure physical activity, smoking behavior and gender are presented in Table 2. The percentage of male participation in leisure physical activity was higher than that of female ($\lambda 2$ (1, n = 170) = 11.51, p = 0.01). The percentage of participation in leisure physical activity was also higher in non-smokers but the difference was not seen as statistically significant. The ratio of smokers was 15.9% (27/170) in both genders with 63.0 % (N = 17) of the current smokers were boys. The percentage of adolescent smokers whose parents smoked at home was higher but the difference was not statistically significant. Likewise, the results of the study also indicated that there were no gender differences between smokers and non-smokers ($p>0.05$) (See Table 3). Table 4 shows that the relationship between parents' smoking behavior at home and education levels of the parents were not statistical significance ($p>0.05$). In the logistic regression analyses, being female (OR=0.28, p = 0.000) and being a non-smoker (OR: 0.39, p = 0.014) were significant predictor factors for participation in leisure physical activities (Table 5). In addition, age (being 16 years and over, OR=0.33), being females, (OR=0.30) and fathers' low education levels (OR=3.92) were found to be statistically significant for smokers ($p \leq 0.05$) (See Table 5).

Discussion

Some of the most important findings of the study were the significant relationship for no smoking, being female, and participating in leisure physical activities (OR=0.28, p = 0.000; OR=0.39, p = 0.014 respectively). In this study, the frequency of participation in leisure physical activities (physical activity ≥ 3 times a week, each session ≥ 30 minutes during the last 3 months) was 44.7% for the whole group. It was shown in a previous study that 69% of 15 year-old boys in Denmark exercise two or more times a week, the figure being 90% in Northern Ireland.[13] When comparing the results of the present study to the one mentioned above, the frequency of regular participation in leisure physical activity of adolescents in Turkey is quite low.

There were 35.5% (N = 27) of the females in this study that participated in some form of leisure physical activity. Several studies reported similar results regarding gender difference.[10-12] Gender differences in leisure physical activity participation are consistent with previous studies, with males in each age group are more active than females.[13] The ratio of regular participation in leisure physical activity was found to be higher in participants who did not smoke than those who smoked (78.9% and 21.1% respectively). Some studies have found a similar inverse relationship between the prevalence of smoking and levels of regular participation in leisure physical activity. For example, the Amsterdam Longitudinal Growth and Health study found that physically active adolescents were much less likely to adopt a regular smoking behavior.[12] In addition, the results of the logistic regression model indicated that being a non-smoker and being female were statistically important factors contributing to regular participation in leisure physical activities for participants in this study. Similarly, the literature has shown that smoking correlated negatively with regular participation in leisure physical activities.[8, 12] However, it cannot claim with certainty that regular participation in leisure physical activity affects the onset of smoking behavior. Results of the present study indicate a negative relationship between smoking and participation in leisure physical activity. However, more research is needed to identify factors which trigger the onset of smoking behavior among adolescents. The authors strongly suggest that all adolescents attending vocational health schools should be encouraged to participate in regular leisure physical activity during school hours and at outdoor recreation facilities as much as possible.

The rate of male and female smokers of the group was found to be 20% and 12.8% respectively. Logistic regression analyses identified the significant factors leading to the onset of smoking behavior were older age (16 years old and over) (OR = 0.33, p = 0.023), being females (OR = 0.30, p = 0.018), and fathers' low education levels (OR = 3.92, p = 0.004). The rate at which the females smoked was less than that of the male group. For female participants, the logistic regression analysis indicated age (being 16 years old and over) and lower educational level of the fathers increases the risk for smoking behavior.

The link between smoking initiations and parental smoking has been shown in various studies with the focus being on the direct effects parental smoking has on adolescent's onset of smoking behavior.[17-18, 20, 24] Engels and others[19] found that parents' smoking behavior and adolescents' peer relationships affect the onset of adolescent smoking directly. The research conducted by Fagan and others[16] demonstrated that parents' education levels are partially mediated by the parent-adolescent relationship and also have a direct effect on adult offspring smoking. However, the association of

parental smoking with tobacco use was not statistically significant. It is suggested that parental socio-demographic status, such as education level, should be taken into consideration in creating and conducting future smoking prevention and intervention programs.

Results of this study indicate that the male participants can be seen to be more physically active in leisure physical activities than females and have a higher rate of smoking than females. However, results of the logistic regression analyses also indicated that being a female and being a non smoker are important factors for lack of regular participation in leisure physical activities. In addition, older females who participated in this study (16 year old and over) were more inclined to participate in smoking behaviors. The authors are therefore of the belief that females attending vocational health school should be the key target group for any program that aims to prevent smoking and promote regular participation in leisure physical activities.

Based on the results of this study it may be concluded that the students attending the vocational health schools do not appear to follow healthy practices with exercise and smoking. This may be caused by inadequate knowledge regarding the importance of regular participation in leisure physical activities and the health consequences associated with being a smoker. Therefore, an effort to improve student's knowledge base on these health concerns with revised curriculum interventions may be needed.

A limitation of the study is that the number of participants was small and therefore cannot be a representative sample of the overall Turkish population. Also, the results do not reveal a profile for the onset of smoking behavior and participation in leisure physical activity for all Turkish adolescents. Another limitation is that the study was designed to be cross-sectional and therefore further longitudinal studies are needed to investigate other factors affecting the onset of smoking behavior and lack of participation in leisure time physical activity of Turkish adolescents attending vocational health schools.

Lastly, it is important to understand that those students currently attending Turkey's vocational health schools with positive health-related behaviors including undertaking regular leisure physical activities and abstaining from tobacco use are the types of future health professionals that may provide much better counseling upon their graduation to the community in which they live and work.

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Table 1. Physical Characteristics of Participants Across Gender and Leisure Physical Activity

	Groups		
	[a] **Leisure Physical Activity Group** **Mean (SD)[d]**	[b] **Non-Leisure Physical Activity Group** **Mean (SD)**	**t p value**
Age (yr) Females	15.59 (0.69)	15.50 (0.56)	t=0.65 p= 0.51
Males	15.28 (0.57)	15.38 (0.49)	t=-0.86 p=0.39
Height (cm) Females	155.96 (5.33)	154.25 (7.01)	t=1.11 p=0.26
Males	160.26 (12.52)	160.05 (12.83)	t= 0.07 p=0.94
Weight (kg) Females	51.40 (8.45)	48.60 (9.26)	t= 1.33 p=0.18
Males	49.59 (12.78)	50.22 (14.09)	t= -0.21 p=0.83
[c]BMI (kg/m^2)Females	21.26 (3.20)	20.27 (2.74)	t= 1.46 p=0.14
Males	18.96 (2.59)	19.21 (2.60)	t= -0.42 p=0.39

a = Leisure physical activity group = physical activity ≥ 3 times a week, each session ≥ 30 minutes (during the last 3 months) (n=76)
b = Non-leisure physical activity group = physical activity < 3 times a week, each session < 30minutes (less than 3 months (n=94)
c = BMI = Body mass index (body weight (kg) /height (m) 2)
d = Standard Deviation

Table 2. Leisure Physical Activity by Gender and Tobacco Use

	[a] Leisure Physical Activity Group		[b]Non-Leisure Physical Activity Group		Total		λ^2 p value
	%	n	%	n	%	n	
Gender							λ^2(1, n=170)=11.51 p=0.01
Female	35.5	27	61.7	58	50	85	
Male	64.5	49	38.3	36	50	85	
Total	100	76	100	94	100	170	
Smoker	21.1	16	11.7	11	15.9	27	λ^2(1, n=170)=2.75 p=0.09
Non-Smoker	78.9	60	88.3	83	84.1	143	
Total	100	76	100	94	100	170	

a = Leisure physical activity group = physical activity ≥ 3 times a week, each session ≥ 30 minutes (during the last 3 months)
b = Non-leisure physical activity group = physical activity < 3 times a week, each session < 30minutes (less than 3 months).

Table 3. Smoking According to Parental Tobacco Consumption at Home (Study Group)

	Smoker **% (n)**	**Non-Smoker** **% (n)**	**Total** **% (n)**	**λ2 p value**
Gender				$\lambda^2(1, n=170)=2.15$ $p=0.14$
Female	37.0 (10)	52.4 (75)	50 (85)	
Male	63.0 (17)	47.6 (68)	50 (85)	
Total	100 (27)	100 (143)	100 (170)	
Parental Smoking				$\lambda^2(1, n=170)=1.68$ $p=0.19$
Yes	85.2 (23)	73.4 (105)	75.3 (128)	
No	14.8 (4)	26.6 (38)	24.7 (42)	
Total	100 (27)	100 (143)	100(170)	

Table 4. Association Between Parent's Smoking Behavior at Home and Education Levels

	Parent's Smoking Habit in the Home				**Total**		**λ2 p value**
	Yes		**No**				
	%	**(n)**	**%**	**(n)**	**%**	**(n)**	
Mother's Education Level							
Illiterate	28.9	37	22.9	11	28.2	48	
Primary School	52.3	67	50.0	21	51.8	88	$\lambda^2(3, n=170)=0.74$ $p=0.86$
Secondary School	10.9	14	11.9	5	11.2	19	
High School and Over	7.8	10	11.9	5	8.8	15	
Total	100	128	100	42	100	170	
Father's Education Level							
Illiterate	6.3	8	4.8	2	5.9	10	
Primary School	55.5	71	50.0	21	54.1	92	$\lambda^2(3, n=170)=0.68$ $p=0.87$
Secondary School	15.6	20	19.0	8	16.5	28	
High School and Over	22.7	29	26.2	11	23.5	40	
Total	100	128	100	42	100	170	

Table 5. Predictors of Leisure Physical Activity and Smoking Behavior Among the Study Group

Predictors	B	Odds Ratio	95 % CI for odds ratio	Wald F p value
Leisure Physical Activity of Study Group [1]				
Gender [a]	**-1.16**	**0.28**	**0.14-0.55**	**0.000**
Smoking Habits [b]	**-0.94**	**0.39**	**0.18-0.82**	**0.014**
Constant	**1.05**	**2.88**		**0.006**
Participants Smoking Behavior [2]				
Gender [c]	**-1.18**	**0.30**	**0.11-0.81**	**0.018**
Age [d]	**-1.09**	**0.33**	**0.13-0.85**	**0.023**
Father's EL [e]	**1.36**	**3.92**	**1.54-9.87**	**0.004**
Constant	**1.87**	**6.53**		**0.001**

1. N = 170, B = Coefficient, a. 1 - boys, 0 – girls; b. 1 - yes, 0 - no.
2. N = 170, B = Coefficient, c. 1 - boy, 0 – girl; d. age: median= 15 .00, 1= 15 years, 0 = ≥16 years;
e. EL = Education level, 1= illiterate and primary school, 0= secondary school and over.