Smoking Prevalence, Associated Attitudes and Comparison of Negative Automatic Thoughts among High School Students in Turkey

Türkiyede Lise Öğrencileri Arasında Sigara İçme Prevalansı, İlişkili Tutumlar ve Olumsuz Otomatik Düşüncelerin Karşılaştırılması

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ABSTRACT

Introduction: Research indicates that social stressors, negative affect, anxiety or depression are associated with an increased prevalence of smoking in adolescents.

Objective: The aim of this study was to determine the smoking prevalence and to find out whether spending more time on the internet or psychological characteristics like negative automatic thoughts and thoughts of failure at school affect smoking among adolescents.

Material and Methods: A self-administered anonymous sociodemographic questionnaire and the automatic thoughts questionnaire (ATQ) were administered using a sample of students in grades 9 through 12 at eight different public senior high schools in Karabuk, Turkey.

A descriptive analysis was made, and the Chi-square and Mann-Whitney U tests were used to compare the groups.

Results: From the 463 participating students aged 14-19 years (43.9% female, 56.1% male), 40 (8.7%) had tried smoking or were former smokers and 48 (10.4%) were occasionally or daily smokers. Students with male gender (p<0.001), older age (Z=-5.356; p<0.001), those who had used alcohol before (p<0.001), scored higher on the ATQ (Z=-2.065; p=0.039), spent more time on the internet (Z=-3.021; p=0.003), and felt like failing at school (Z=-3.730; p<0.001), and those who had a smoking mother (p<0.001), father (p=0.005), sibling (p=0.018), or close friend (p<0.001), had a higher frequency of smoking.

Conclusion: In order to increase our understanding, future research on smoking in adolescents could target the psychological basis of smoking behavior.

Key Words: Smoking behavior, Negative automatic thoughts, Cessation

ÖZ

Giriş: Araştırmalar, sosyal stres faktörlerinin, olumsuz duygulanımın, anksiyete ya da depresyonun ergenlerde sigara içme prevalansı ile ilişkili olduğunu göstermektedir.

Amaç: Çalışmanın amacı, sigara içme prevalansını belirlemek ve internette daha fazla zaman harcamanın, olumsuz otomatik düşünceler gibi ruhsal özelliklerin olup olmadığını, okuldaki başarısızlığın ergenlerde sigara içimini etkileyip etkilemediğini tespit etmektir.

Gereç ve Yöntemler: Kendi kendine uygulanan anonim sosyodemografik soru formu ve otomatik düşünceler anketi (ATQ), Karabük'teki sekiz farklı lisede uygulanmıştır.

Deskriptif analiz yapılmış ve grupları karşılaştırmak için Ki-kare ve Mann-Whitney U testi kullanılmıştır.

Bulgular: Araştırmaya katılan 463 katılımcıdan 14-19 yaş arası (% 43,9 kadın,% 56.1 erkek), 40 (% 8,7) kişi denemiş ya da daha önce sigara içen ve 48 (% 10,4) sıklıkla veya günlük sigara içiyordu. Erkek cinsiyet (p <0,001), daha büyük yaş (Z = -5,356; p <0,001), daha önce alkol kullananlar (p <0,001),

ATQ puanları daha yüksek (Z = -2,065; p = 0,039), internette daha fazla zaman harcayanlar (Z = -3,021; p = 0,003), okulda kendini başarısız hissedenler (Z = -3,730; p <0,001), sigara içen anne (p <0,001), baba (p = 0,005) kardeş (p = 0,018), ya da yakın arkadaşı olanlarda (p <0,001), sigara içmenin sıklığı daha fazlaydı.

Sonuç: Sonuçların daha iyi anlaşılması için, ergenlerde sigara ile ilgili gelecekteki araştırmalarda, sigara içme davranışının psikolojik temeli hedeflenebilir.

Anahtar Sözcükler: Sigara içme davranışı, Olumsuz otomatik düşünceler, Sigara bırakma

INTRODUCTION

Tobacco use is a global leading cause of preventable death, especially in developing countries. Most of the burden of disease attributable to smoking occurs among adults. However, the problem starts in the teenage years when the majority of smokers have their first experience with cigarettes. Recent studies indicate that 88% of adult smokers start smoking before the age of 18 (1). Globally, the smoking prevalence among the young varies and the WHO reports a prevalence between 8–21 % among boys and 2–17 % among girls (2). In Turkey, the prevalence of smoking has been reported to vary between 4.1% and 37.5% among adolescents (3). In the global youth tobacco survey, 29.3% of 15957 children in primary school year 7-8 and high school year 1 had a history of smoking at least once (21.5% for girls and 34.9% for boys) and 9.1% (5% for females and 11.9% for males) of them were current users (4).

Early initiation of cigarette smoking has been associated with a greater potential for problems, including greater consumption, longer duration of smoking, and increased nicotine dependence (5). Studies have also shown that adolescents who smoke are more receptive to additional risky behaviors (alcohol, cannabis and other illicit drugs) (6). These findings showed that targeting smoking prevention interventions to younger adolescents is critical. The most common reasons cited for children to start smoking are peer pressure, parental tobacco habits and pocket money given to children (7). Ah DV. et al. also suggested that individual personality factors, cognitive factors, and coping resources may play a key role in determining which adolescents will have a propensity to initiate and continue to smoke (8). Beliefs of personal failure, loss, and hopelessness are associated with depression, thoughts of physical or psychological threat are associated with anxiety, and thoughts of being wronged are associated with anger in adolescents (4). A number of questionnaires have been developed to examine negative beliefs, including the Cognitions Checklist (9), the Automatic Thoughts Questionnaire (ATQ) (9), and the Anxious Self-Statements Questionnaire (ASSQ) (10). Obtaining relevant data to guide youth regarding smoking can help to understand effective psychological mechanisms in the formation of cigarette addiction.

The aims of the study were to determine the smoking prevalence in high schools from Karabuk district, and to find out whether spending more time on the internet or psychological characteristics like negative thoughts and the thought of failure at school affect smoking among adolescents.

MATERIAL and METHODS

There were 18 high schools and a total of 6989 students in Karabuk during the 2013-2014 school year. A power analysis was conducted to determine the required study sample size. The minimum sample size required for a two-sided binomial test to detect a difference (P1-P0) of 0.0500 and the target sample size calculated was 307, keeping in mind the smallest prevalence of tobacco use as 15.0 per cent, a relative precision of 10 per cent, and a confidence interval of 90 percent. The schools were selected randomly from each area. The classes were randomly selected and all students of every alternate section were included from each selected class. The study was approved by the ethics and review committee of Abant Izzet Baysal University. (Decision No):2014/55-135 (Date):06/08/2014. The principals of the schools were informed in writing about the importance of the survey. Students were asked to participate in the study voluntarily and informed consent was obtained from the students and school authorities. Children were informed on how to complete the questionnaire. They were assured that all information would be kept confidential. No changes were made in the automatic thoughts questionnaire. The questionnaire was provided in Turkish. The translated version was validated before the survey.

Data were collected on the socio-demographic profile, occupation and literacy status of their parents. Data were also collected on the use of tobacco, age at initiation, smoking habits of parents and siblings, household income, insurance type, opinion on his/her success, time spent on the internet, *etc*. 'Ever smoker' was defined as the use of cigarette even once including current cigarette use (11).

Automatic Thoughts Questionnaire

Hollon and Kendall's (9) Automatic Thoughts Questionnaire (ATQ-30) was designed to identify and measure the frequency of occurrence of automatic negative thoughts associated with depression. This 30-item self-statement

inventory was constructed and cross-validated using male and female undergraduates as subjects, and significantly discriminated subclinically depressed from nondepressed criterion groups. (12).

Statistical Analyses

Analyses of data were performed using the computer software STATA (StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP). Quantitative data were expressed as mean + standard deviation. Qualitative data were expressed as frequency and percentage. The Mann-Whitney U test was used to compare numeric parameters between smoking and non-smoking teenagers. The Chi-square test or Fisher's exact test was used to compare qualitative variables in smoking and non-smoking students. A p-value of less than 0.05 was considered to show statistical significance.

RESULTS

A total of 600 school students were invited to participate in the study, of which 75% filled the questionnaire. Those who refused or failed to fill out the questionnaires were removed and 451 students remained. The mean and median age for the students was 16.11±0.90 and there was no difference in the mean age of the gender groups (boys: 16.11 ± 1.6 and girls: 16.81 ± 13.5 yrs.). 62 percent of the fathers had completed secondary education (>8 yrs.) and fathers of 37% of the students had completed primary education (<=8 yrs.). In contrast, the majority of the mothers (64%) had completed primary education (<=8 yrs.) and 33% of the mothers had completed secondary education (>8 yrs.). About 82.7 percent of the responders resided in urban areas while 17.3 percent resided in rural settings. High school students comprised only 9.5 per cent of the subjects, while 52% of them were in lower grade schools. From the 451 participating students, aged 14-19 years (43.9% female, 56.1% male), 40 (8.7%) had tried smoking or were former smokers and 48 (10,4%) were occasional or daily smokers. Sociodemographic data by smoking status are described in Table I.

Students with male gender (p<0.001), older age (Z=-5.356; p<0.001), those who had used alcohol before (p<0.001), and had a smoking mother (p<0.001), father (p=0.005), sibling (p=0.018), or close friend (p<0.001) (Table I); had high scores on the ATQ (Z=-2.065; p=0.044), or spent more time on the internet (Z=-3.021; p=0.005), (Table II, Figure 1) had a higher rate of smoking. Also, students who felt they were failing at school tended to smoke at a more than 7 times higher rate in logistic regression analysis.

DISCUSSION

The main findings of our study were as follows; from the 451 participating students, 8.7% were former smokers and

10.4% were daily smokers. Additionally, students who spent more time on the internet and had high ATQ score had a higher rate of smoking. Furthermore, we found a correlation between smoking and negative automatic thoughts and also thoughts of failing at school in adolescents.

Pierce et al. reported that at least a million young children start smoking in the United States each year (13). The previous study reported that 1.4 million or 28% of young adults in Canada currently smoke and approximately one-fifth of smokers have tried their first cigarette after the age of 18 years. The prevalence of daily smoking rose from 8% among youth to 22% among young adults (14). In particular, the Global Youth Tobacco Survey (KGTA) was conducted in Turkey in 2003, 2008 and 2009. According to KGTA 2003 results, the smoking rate is 6.9% among young people, 9.4% in males and 3.5% in females. According to KGTA 2009 results, the rate of smoking is 8.4% in young people, 10.2% in males and 5.3% in females. Both genders showed an increase over the years (15, 16). Similarly, in our study we found that 8.7% of 451 participating students were former smokers and 10.4% were daily smokers.

The seminal research findings suggested that virtually all smokers begin smoking before the age of 18 and smoking behavior is largely fixed by the age of 18 (17). A study from Turkey reported that smoking rates increased between the ages of 13 and 17 years (18). Also, 50% of smokers who start smoking in adolescence continue to smoke for 15-20 years. Therefore, we should have more data on smoking status and causes of smoking in the young population. The most obvious way to reduce smoking rates is to prevent smoking initiation and to clarify the factors that contribute to continued use. Smoking behavior is influenced by various individual and social factors in general. The rates of smoking differ among the genders in the young population. Previous research among adolescents has
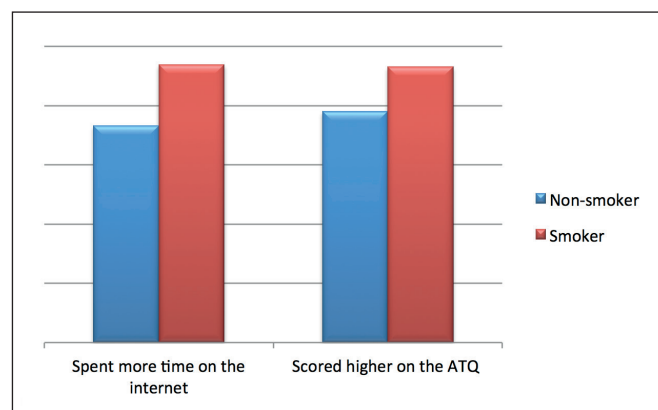
Figure 1: The correlation graphs by smoking status
p=0.005, p=0,044
ATQ: Automatic Thoughts Questionnaire.

Table I: Sociodemographics by smoking status.

N=451	Teenager Smoking status		Total	Significance
	Yes	**No**		
Age Mean±SD	16.13±0.91	16.82±0.874	16.11±0.90	>0.05
Gender(%)				
Male	42(16.60)	211(83.40)	253(56.10)	<0.0001
Female	5(2.53)	193(97.47)	198(43.90)	
District				
Urban	36(9.65)	337(90.35)	373(82.70)	0.242
Rural	11(14.10)	67(85.90)	78(17.30)	
School grade				
High	2(4.65)	41(95.35)	43(9.50)	
Intermediate	32(18.60)	140(81.40)	172(38.24)	<0.0001
Low	13(5.51)	223(94.49)	236(52.26)	
Insurance type				
Full cover	42(10.19)	370(89.81)	412(89.04)	0.412*
Self paid	7(14.29)	42(85.71)	49(10.96)	
Household income	2385±1242	2472±1522	2463±1494	>0.05
Parental marital status				
Married	45(10.59)	380(89.59)	425(94.24)	0.748
Single	3(11.54)	23(88.46)	26(5.76)	
Father's education level				
Primary (<=8 yrs)	18(10.53)	153(89.47)	171(37.92)	0.749
Secondary (>8 yrs)	27(9.64)	253(90.36)	280(62.08)	
Mother's education level				
Primary (<=8 yrs)	29(9.73)	269(90.27)	298(64.08)	0.489
Secondary (>8 yrs)	18(11.76)	135(88.24)	153(33.92)	
Father smoking status				
Ever smoker	10(5.43)	174(94.57)	184(40.80)	0.004*
Never smoker	37(13.86)	230(86.14)	267(59.20)	
Mother smoking status				
Ever smoker	21(20.59)	81(79.41)	102(22.62)	<0.0001*
Never smoker	26 (7.47)	322(92.53)	348(77.38)	
Opinion about his/her success				
Successful	79(37.62)	131(62.38)	210(46.56)	<0.0001
Unsuccessful	19(7.88)	222(92.12)	241(53.44)	

Table II: Continuous Variables By Smoking Status.

	Smoking status		Total	Significance
	Yes	**No**		
Time spent on the internet	3.22±2.63	4.95±3.82	3.39±2.81	0.005
ATQ	57.42±29.47	48.70±25.32	49.66±25.92	0.044

shown that smokers tend to be male and the frequency of smoking in males is reported to be higher than in females (18). In our study, smoking rates were found to be higher in males. Reid et al. concluded that factors such as easy access to cigarettes, the perception that tobacco use is the norm, peers' and siblings' positive attitudes, and lack of parental support were associated with adolescent smoking (19). The study confirmed that the strongest statistical relationship was found with the smoking behavior of best friends (20). Similarly Akpinar et al. reported that the smoking behavior of best friends was the most powerful determinant of smoking (18). Prevention programs and policies that target this population should therefore focus on the role of peers. Many studies have observed that family members' smoking is associated with initiating smoking in the adolescent. A study among 11-year old school children in Hong Kong showed that believing that their parents will not interfere with their smoking, living with family members who smoke, and having a positive attitude towards smoking were all factors predictive of smoking (20).Previous studies suggested that young adults who report consuming alcohol are more likely to initiate smoking as well, and past illegal drug use is associated with a greater likelihood of initiating smoking among young adults (21). Studies investigating other addictions in adolescents have found that those who spend long periods on the computer such as for surfing the internet show high rates. Yalaki et al. found that 70.3% spent 2 hours on a computer (22). Similar to these studies, we found students with a male gender, those who used alcohol previously, had a smoking mother, father, sibling, or close friend, and spent more time on the internet had a higher frequency of smoking.

Most studies show an association between psychiatric disorders and smoking in adolescents. However, there is not enough data on the psychological basis of smoking behavior.

Some studies found a positive relationship between negative affect and smoking and concluded that negative affect is associated with smoking behavior (23, 24). Negative affect (NA) and stress figure prominently in several theories of cigarette use (23), but studies that examined these correlates in youths are limited. Naquin and Gilbert (24) found that college students who were current smokers reported higher levels of perceived stress compared to students who did not smoke. Piasecki et al. (25) reported that daily compared to nondaily smokers were more likely to cite coping with negative affect as a reason for smoking. Furthermore, low self-efficacy and the lack of conscientiousness were found to be determinants of smoking initiation while only low self-efficacy was a determinant of increased smoking frequency and quantity. The findings of this study also suggest that strategies for smoking prevention and cessation intervention programs may need to be focused on increasing self-efficacy and conscientiousness to improve their success. In this context, we similarly found students with high scores on the ATQ and felt like they were failing at school had a higher rate of smoking.

In summary, the prevalence of cigarette smoking continues to increase in adolescents. In our study, the rate of former smokers was 8.7% and the rate of daily smokers was 10.4%. Besides known factors such as parental smoking, peers, siblings, alcohol consumption and time spent on the computer, we found that negative automatic thoughts and thoughts of failing at school were also associated with smoking in adolescents. In order to understand the issue better, longitudinal studies are required and future research on smoking in adolescence could target the psychological basis of smoking behavior in more detail.

Transparency Declarations

Competing interest: none to declare.

REFERENCES

1. Global Youth Tobacco Survey Collaborative Group. Preventing tobacco use among youth and young adults: a report of the surgeon general. [cited 2016 April 8]; Available from: http://www.cdc.gov/tobacco/data_statistics/sgr/2012. Accessed 8 April 2016.

2. World Health Organization. Tobacco Free Initiative (TFI) Global youth survey (GYTS).2008.http://www.cdc.gov/tobacco/global/gtss/tobacco_atlas/pdfs/tobacco_atlas.pdf. Accessed 15 July 2015.

3. Kara B, Hatun Ş, Aydoğan M, Babaoğlu K, Gökalp AS. Assessment of risky behaviors in terms of health for high school students in Kocaeli province. Çocuk Sağlığı ve Hastalıkları Dergisi 2003;46(1):30-7.

4. T. C. Ministry of Foreign Affairs, Ministry of Health, Ministry of Interior, Ministry of Justice, Ministry of National Education, UNODC. Health services in Turkey, Prevention of substance use by education and community initiative National evaluation study on substance use 2003 (Results from six major cities), Ankara: 2003.

5. Breslau N, Fenn N, Peterson EL. Early smoking initiation and nicotine dependence in a cohort of young adults. Drug Alcohol Depend 1991;33(2):129e37.

6. Kandel DB. The parental and peer contexts of adolescent deviance. An algebra of interpersonal influences. J Drug Issues. 1996;26:289–315.

7. Mohan S, Sankara-Sarma P, Thankappan KR. Access to pocket money and low educational performance predict tobacco use among adolescent boys in Kerala, India. Prev Med 2005;41: 685-92.

8. Ah DV, Ebert S, Ngamvitroj A, Park A, Kang D. Factors related to cigarette smoking initiation and use among college students. Tobacco Induced Dıseases 2005;(3)1:27-40.

9. Hollon SD, Kendall PC. Cognitive self-statements in depression: Development of an automatic thoughts questionnaire. Cognitive Therapy and Research 1980;4:383-95.

10. Kendall PC, Hollon SD. Anxious self-talk: Development of the anxious self-statements questionnaire (ASSQ). Cognitive Therapy and Research 1989;13:81-93.

11. Marshall L, Schooley M, Ryan H, Cox P, Easton A, Healton C, Jackson K, Davis KC, Homsi G. Youth tobacco surveillance-United States, 2001-2002. MMWR Surveill Summ 2006;55:1-56.

12. Harrell TH, Ryon NB. Cognitive-behavioral assessment of depression: Clinical validation of the automatic thoughts questionnaire. J Consult Clin Psychol 1983;51(5):721-5.

13. Pierce JP, Fiore MC, Novotny TE, Hatziandreu EJ, Davis RM. Trends in cigarette smoking in the United States. Educational differences are increasing. JAMA 1989;261(1):56-60.

14. Hammond D. Smoking behaviour among young adults: Beyond youth prevention. Tobacco Control 2005;14:181-5.

15. Bilgic N, Gunay T. A Method for supporting smoking cessation in adolescents: Peer Education. Turk Toraks Derg 2014;15:102-5.

16. Can G. Frequency of Tabacco Product Usage. In Ertem M, Inaldi T, Can G, Ergor A, Sasmaz T, Ayoglu F, Kaya M, eds. Turkish public health report by Public Health Association, Ankara, Turkey, Hasuder 2012:202-5.

17. Backinger CL, Fagan P, Mathews E, Grana R. Adolescent and young adult tobacco prevention and cessation: Current status and future directions. Tobacco Control 2003;12(suppl):46-53.

18. Akpinar E, Yoldascan E, Saatci E. The smoking prevalence and the determinants of smoking behaviour among students in Cukurova University, Southern Turkey. West Indian Med J 2006;55(6):414.

19. Reid DJ, McNeil AD, Glynn TJ. Reducing the prevalence of smoking in youth in Western countries: An international overview. Tobacco Control 1995;4:266-77.

20. Peters J, Hedley JJ, Lam TH, Liu J, Wong CM, Ong SG. Factors influencing smoking behaviour in Hong Kong primary school children: Targets for prevention. Asia-Pacific J Public Health 1995;8:102-8.

21. Reed MB, Wang R, Shillington AM, Clapp JD, Lange JE. The relationship between alcohol use and cigarette smoking in a sample of undergraduate college students. Addict Behav 2007;32(3):449-64.

22. Yalaki Z, Cetin F, Dallar B. Bir eğitim ve araştırma hastanesine başvuran adelosanlardaki riskli davranışların değerlendirilmesi. Ege Journal of Medicine 2015;54(3):127-33.

23. Kassel JD, Stroud LR, Paronis CA. Smoking, stress, and negative affect: Associations and mechanisms across stages of smoking. Psychological Bulletin 2003;129:270-304.

24. Naquin MR, Gilbert GG. College students' smoking behavior, perceived stress, and coping styles. Journal of Drug Education 1996;26:367-76.

25. Piasecki T M, Richardson AE, Smith SM. Self-monitored motives for smoking among college students. Psychology of Addictive Behaviors 2007;21:328-37.