

The Smoking Prevalence and the Determinants of Smoking Behaviour among Students in Cukurova University, Southern Turkey

E Akpınar¹, E Yoldascan², E Saatci¹

ABSTRACT

Objectives: To determine the smoking prevalence and its determinants in students at Cukurova University, Southern Turkey.

Design: The sample was selected from the first and final year students of all faculties in Cukurova University. The students who were present on the day of the survey were all included in the study. The students filled in an anonymous questionnaire detailing their sociodemographic characteristics and smoking behaviour. A random sample of 2200 students in Cukurova University was enrolled in the study representing a total of 8309 students for this random cross-sectional study. The response rate was 90.9% (n = 2131). A self-administered questionnaire was completed by all students. Outcome measures were smoking prevalence, family and peer smoking, grade, gender and place of living that may be related to smoking. Logistic regression was used to examine the determinants of smoking behaviour.

Results: Smoking increased between the ages of 13 and 17 years (26.6% and 43.7%, respectively). The smoking behaviour of best friends was the most powerful determinant of smoking, and this was consistent across the age groups. Best friends' attitudes towards smoking and family members' smoking behaviour were also important determinants of smoking.

Conclusions: Smoking prevalence among students in Cukurova University, in Southern Turkey, is high. Effective smoking prevention programmes should take into account the dominant influence of peers on the onset and maintenance of smoking behaviour. School-related items had a less important role in predicting smoking behaviour than expected.

La Prevalencia del Hábito de Fumar y las Determinantes de la Conducta de Fumador Entre los Estudiantes de Cukurova, al sur de Turquía

E Akpınar¹, E Yoldascan², E Saatci¹

RESUMEN

Objetivos. Determinar la prevalencia del hábito de fumar y sus determinantes en los estudiantes de la Universidad de Cukurova, al sur de Turquía.

Diseño. La muestra fue seleccionada de estudiantes de primer y último año de todas las facultades de la Universidad de Cukurova. Los estudiantes que estuvieron presentes el día de la encuesta, fueron todos incluidos en el estudio. Los estudiantes llenaron un cuestionario anónimo, en el que daban detalles sobre sus características sociodemográficas y su comportamiento como fumadores. Se tomó una muestra aleatoria de 2200 estudiantes de la Universidad de Cukurova, lo cual representa un total de 8309 estudiantes para este estudio transversal aleatorio. La tasa de respuesta alcanzó la cifra de 90.9% (n = 2131). Un cuestionario auto-administrado fue completado por todos los estudiantes. Las medidas de los resultados fueron la prevalencia del hábito de fumar, el fumar por parte de la familia y los iguales, el grado, el género, y el lugar de residencia que pudiera estar relacionado con el fumar. Se usó la regresión logística para examinar las determinantes del comportamiento de fumador.

Resultados. El hábito de fumar aumentó entre las edades de 13 y 17 años (26.6% vs 43.7%, respectivamente). El comportamiento de fumador de los mejores amigos fue el factor determinante más

From: Departments of Family Medicine¹ and Public Health², Faculty of Medicine, Cukurova University, Adana, Turkey.

Correspondence: Dr E Akpınar, Department of Family Medicine, Faculty of Medicine, Cukurova University, Balcali, 01330 Adana, Turkey. Fax: +90-322-338-65 72, e-mail: eakpinar@cu.edu.tr.

poderoso – factor que se presentó sistemáticamente en todos los grupos de edades. Las actitudes de los mejores amigos hacia el hábito de fumar y el comportamiento como fumadores exhibido por los miembros de la familia fueron también factores determinantes del hábito de fumar.

Conclusiones: *La prevalencia del hábito de fumar entre los estudiantes de la Universidad de Cukurova, al sur de Turquía, es alta. Los programas efectivos de prevención del hábito de fumar deben tener en cuenta la influencia dominante de los iguales en el comienzo y conservación del comportamiento de fumador. Los aspectos relacionados con la escuela tuvieron un papel menos importante de lo que se esperaba, en la predicción de la conducta de fumador.*

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INTRODUCTION

Tobacco use is a very important preventable risk factor for many diseases. It is suggested that high risk groups should be determined and specific risk approaches should be implemented in anti-smoking campaigns. Although the epidemic of disease and death related to smoking is played out in adulthood, it begins in childhood with premature death of children from smoking related diseases. Each day another 3000 young people become regular smokers (1).

It is estimated that 30–40% of the world adult population smoke; the situation is particularly alarming in adolescents. Each day, nearly 4800 adolescents smoke their first cigarette; of these, nearly 2000 will become regular smokers. It is estimated that at least 4.5 million adolescents in the United States of America (USA) are cigarette smokers. If current tobacco use patterns persist, an estimated 6.4 million children will die prematurely from a smoking-related disease. According to the 2001 national survey of the high school students in the USA, the overall prevalence of cigarette smoking was 28%. Over 20% of the twelfth graders, 14% of tenth graders, and 7.4% of eighth graders smoke cigarettes daily (2).

Several studies defined different factors which affected smoking behaviour: genetic predisposition, demographic and psychosocial factors, tobacco policy, accessibility of cigarettes, society values regarding tobacco smoking, role models and academic performance (3). Tobacco smoking is an important public health problem in Turkey (4). In 1988, a study comprising the whole Turkish population found that the prevalence of smoking was 44.5% in inhabitants over 15 years of age, with a much higher percentage of men among smokers (62.8% men vs 24.0% women) (5).

Cigarette-smoking rates have increased in recent years among university students. The epidemic of nicotine addiction in young people has grave consequences for public health. Between one-third and one-half of adolescents who try smoking with only few cigarettes, soon become regular smokers (6).

Starting in the late 1980s, when the evidence that adolescents have easy access to tobacco products was mounting, concern and action proliferated regarding broader environmental factors affecting the ability of youths to purchase or otherwise obtain cigarettes (7). The initiation and predictors of smoking by adolescents, although well-documented in the West, have been less well-studied in the

Asia-Pacific region (8). Nevertheless, smoking is still on the increase, especially in developing countries. The World Health Organization (WHO) estimates that about 50% of men and 8% of women in developing countries are smokers (9).

The initiation of smoking was between 11 and 13 years of age but, by the age of 16 years, many regretted their use of cigarettes because of health reasons and their inability to stop. Over half claimed they wanted to quit but had difficulty doing so (10).

Each year in the USA, more than 400 000 smokers die of smoking-related illnesses (11). Smoking kills more people than AIDS, car accidents, alcohol, homicides, illegal drugs, suicides and fires combined (11). A study in Japan among second grade students of a senior high school revealed that smoking behaviour proved to be the best predictor of smoking behaviour three and a half years later (12). Attitude towards men's smoking, gender and smokers in the family were also related to smoking behaviour. These three variables explained 35% of the variance in smoking behaviour.

This paper describes patterns of smoking in students of Cukurova University with particular emphasis on the determinants of smoking behaviour, and determinant variation in different age groups. Although age was recognized as an important variable in the onset and maintenance of smoking behaviour, only few studies have assessed how age affects the predictive models. It was hypothesized that the influence of peers and family members was not similar in all age groups of adolescents.

SUBJECTS AND METHODS

The sample size needed for the study was calculated from the total population of the first and the final year students ($n = 8309$) in eight faculties and three academies of Cukurova University, Adana, in 2003. Maximum acceptable difference was set as five per cent. Design effect was taken as two, with the total number of clusters being ten, estimated true rate at 25%, and confidence interval of 95%, the required sample size needed was 1981 students (11). Two thousand and two hundred students were in the sample group from the university. Out of the targeted 2200 students, 2131 accepted to participate in the study (96%). Of 2131 students, 1186 (55.7%) were male and 945 (44.3%) were female, 2007 (94.2%) were single, 1141 (53.5%) were in the first year and 990 (46.5%) were in the fourth (last) year. For the first year,

51.9% and for the last final year, 45% of students were reached. The mean age and Standard Deviation (SD) were 21.7 ± 2.4 years for male students, 20.8 ± 2.1 years for female, overall 19.8 ± 1.5 years for the first year and 23.0 ± 1.8 years for the final year students.

The questionnaires were administered by the study coordinator in a single session; students were asked to respond freely and truthfully to each question. Students completed questionnaires in their classrooms after being informed about the study. The assurance of confidentiality was provided and consent was obtained from the Ethics Committee of Cukurova University Faculty of Medicine.

Questionnaire

The questionnaire had 78 questions, some open ended and some with multiple choice answers, aimed at defining socio-demographic details and smoking behaviour. Student's age, gender, name of the faculty, place of living for the student and family, parents' occupation, parents' educational level, the age of onset for smoking, sources of cigarette, approval of smoking behaviour of the adolescent, and the effect of the social environment on smoking (attitudes of parents, siblings, friends, and teachers), student's, family's and the closest three friends' smoking behaviour and mean monthly income of student were ascertained. Students' smoking status was classified according to the WHO criteria (13): daily smoker – anyone who at the time of survey smokes some kind of tobacco product at least once a day; occasional smoker – anyone who smokes, but less than once a day; former smoker – anyone who smoked daily for at least six months, but who did not smoke at the time of survey; never-smoker – anyone who has never smoked.

Data were analyzed using the Statistical Package of the Social Science version 10.0 for Windows. Two series of logistic regression analyses were implemented for each age group to assess the contribution of several variables in the prediction of the binary dependent variable (smoking/not smoking). ANOVA, Pearson and Wald chi-square tests were used with significance set at $p < 0.05$.

RESULTS

The overall prevalence of smoking in the sample was 24.0% ($n = 529$). Among those, 195 (26.6%) began smoking regularly before the age of 13 years and 321 (43.7%) after the age of 17 years and the rate increased significantly as age increased after 17 years of age. Of 231 female students, 21.6% (50) declared that they tried their first cigarette before the age of 13 years. The rates were 25.1% and 53.2% for 14–16 years and ≥ 17 years respectively. Of 503 male students, 28.8% (145) tried their first cigarette before age 13 years and the rates were 31.8% and 39.4% for ages 14–16 years and ≥ 17 years, respectively. As the students' ages increased, the rate of smoking increased ($p = 0.002$).

Of 2131 students, 529 smoked daily (24.8%), 112 (5.3%) were occasional smokers, 212 (9.9%) were former smokers and 1278 (60.0%) were non-smokers. Among first year students ($n = 1141$), 21% were regular smokers, 4.6% smoked occasionally, 11.2% were former smokers and, 63.1% were non-smokers; and in the final year ($n = 990$), it was 29.2%, 6.0%, 8.5%, 56.4% respectively. Among males, ($n = 1186$) the frequencies were: 32%, 6.1%, 11.1%, 50.8% respectively; and females ($n = 945$): 15.8%, 4.2%, 8.5%, and 71.5% respectively. Half of the males were former or current smokers in comparison to less than a quarter of females. The status of "ever smoked" in the first year (421/1141) compared to final year students (432/900) had a prevalence ratio, (PR), 0.85 (95% CI 0.76, 0.94, ; $p = 0.0015$) and for male (584/1186) to female (266/945) was 1.74 (1.56, 1.97, $p = 0.006$).

Sources of first cigarette in the sample and in male vs female were: family member 7.7%, (male vs female; 9.6% vs 5.3%); friend 34%, (38.8% vs 27.9%); relative/neighbour 3.9%, (4.0% vs 3.7%); undeclared 34.6% (28.7% vs 42.1%); other sources 19.8% (18.9% vs 21.0%). Excluding undeclared, because female response was biased to 'no answer', the data showed significant difference, (chi-square = 25.91, $df = 4$, $p = 0.000033$).

Places from which subjects obtained their cigarettes: 9.0% at home (male 70.7%, $n = 41$; female 29.3%, $n = 17$); 39.8% in a tobacco shop (male 74.5%, $n = 173$; female 35.3%, $n = 82$); 17.8% from friends (male 66.7%, $n = 76$; female 33.3%, $n = 38$). Of the total students, 33.4% who reported 'having smoked' without identifying a source were much more likely to be occasional smokers than were the students who identified at least one source. These occasional smokers may not have responded to this question as they found it irrelevant for themselves. Therefore, the sources used by occasional smokers were underestimated. There appeared to be no significant difference by gender ($p < 0.05$).

Some subjects contemplated and others attempted to stop smoking. First graders, (64 of 178 males, 29 of 70 females attempted quitting); they had had a PR of attempting to stop smoking of 1.33 (95% CI, 1.14, 1.54, $p = 0.003$) higher than last final graders. Prevalence ratio showed that regular smokers were significantly less likely to live at home with family; in contrast, occasional and former smokers were significantly more likely to live at home with family. The family was probably most supportive of quitting or abstinence from smoking (Table 1).

In contrast to occasional and former smokers, regular smokers significantly hailed less from families with non-smokers. Out of the total sample of students ($n = 2131$); smoking students, $n = 259$, [31.7%, (151), $p = 0.001$], reported the presence of a smoking mother more frequently than smoking students, [24.0% (200), $p = 0.47$], who reported a smoking father (Table 2). The reasons reported for con-

Table 1: Place of living and prevalence ratio and 95% CI of students' smoking behaviour

Place of living	Regular Smoker PR	Occasional smoker PR	Former smoker PR	Non-smoker n	PR	Total n
Dormitory	0.99 (0.84, 1.16)	0.92 (0.68, 1.24)	0.35 (0.16, 0.74)	334	1	539
At home with family	0.66 (0.58, 0.76)	1.23 (1.05, 1.43)	1.37 (1.12, 1.67)	577	1	890
At home with friends	1.55 (1.34, 1.80)	0.69 (0.47, 1.02)	1.20 (0.72, 1.87)	284	1	533
Other	1.75 (1.27, 2.41)	0.81 (0.38, 1.72)	1.04 (0.39, 2.76)	74	1	149
Total n (%)	627 (29.7)	149 (7.1)	66 (3.1)	1269	(60.1)	2111 (100)

Table 2: Smoking behaviour of student and family members by prevalence ratios, PR and 95% CI

Smoking behaviour of family members	Regular smoker PR	Occasional smoker PR	Former smoker PR	Non-smoker n	PR	Total n
None of family members are smokers	1.08 (0.95, 1.23)	1.25 (1.01, 1.55)	1.49 (1.29, 1.72)	472	1	853
One family member is smoker	0.15 (0.10, 0.22)	0.12 (0.08, 0.19)	0.64 (0.48, 0.84)	416	1	507
More than one family member is smoker	1.80 (1.61, 2.02)	1.14 (0.87, 1.49)	1.49 (1.20, 1.86)	390	1	771
Total n (%)	529 (24.8)	112 (5.3)	212 (9.9)	1278	(60.0)	2131 (100)

tinuing smoking were: pleasure 12.8% (n = 273); relieves stress 10.4% (n = 222) and boost self-confidence 2.7% (n = 57).

DISCUSSION

A person who has not started smoking as a teenager is unlikely ever to become a smoker (14). The tobacco industry has argued that the decision to smoke and to continue smoking is a free choice made by an adult, but nicotine addiction is really a condition that takes hold in young people. Young people are aware of the dangers associated with smoking and nicotine addiction, but they do not believe that these dangers apply to them. Until they are in the grip of nicotine addiction, they greatly underestimate its power over them.

Many studies have examined predictors of smoking among adolescents. Environmental variables are often found to be the strongest predictors. In an overview by Reid *et al* (15) on smoking in young people in Western countries, it was 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.

The influence of parental smoking seemed less clear. The same overview stated that behavioural predictors of smoking include low academic performance, rebelliousness, alienation from school and lack of skills to refuse cigarettes. Personal risk factors include low self-esteem and the belief that smoking confers future advantages in social life. Cross-national data from the WHO survey on health behaviour in

school-aged children (HBSC) confirmed that the strongest statistical relationship was found with the smoking behaviour of best friends (16, 17). 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 do smoke, and having a positive attitude towards smoking were all factors predictive of smoking (8).

The mean age of our student population was 21.8 ± 2.32 years. Their beliefs, attitudes and smoking behaviour were similar to those of the subjects in other studies with similar populations (13, 19). Smoking behaviour was influenced by smoking behaviour of friends and family members, perceived level of stress, the need to "look cool" and "fit in". Most smokers stated that they wanted to quit smoking and attempted to quit but they did not have enough information about methods of successful quitting. Those who had attempted or succeeded quitting used "cold turkey" and "tapering" strategies. Few reported the use of nicotine replacement and other pharmaceutical aids. The most frequently cited reason for quitting was related to health concerns. Given the comparatively high level of addiction in the sample (24%) and the desire to quit smoking, opportunities need to be available for students to address their smoking cessation needs. There was a smoking cessation centre in the health clinic of Cukurova University, however, it is not clear if students would prefer to access such resources in the community. There were both similarities and differences between smoking and non-smoking students on

beliefs, attitudes and health promoting behaviours. Of particular note, was the congruence on items of the health risks related to smoking behaviour. Similar to previous studies, there were differences in students' beliefs and attitudes on factors influencing the quitting process. These include the role of internal motivation and external supports from professionals, family members and friends (20). Non-smokers considered these resources to be more important than did smokers. This finding may reflect the stage of behavioural change of the sample (21, 22). When these results were compared to re-sults of other studies conducted among university students, it was found that the rates in the present study were higher than those of British and American students (24.8% vs 2–20.3%) (23, 24) but lower than those of Iranian students (34.8%) (24). Results on smoking prevalence was consistent with the rates 30–60% given for the general population in Turkey (25, 26). It was stated that the low prevalence of smoking was indicative of a continued acknowledgement by medical pro-fessionals of the dangers of tobacco use (27). High smoking prevalence in Turkish university students was related to not only the lack of education on addiction, but also to tobacco advertisements in developing countries as well. Support for activities favourable to smoking restrictions tends to decrease with increased nicotine dependence (28). It should be stressed that restrictive prevention policies such as age restrictions and legislation on a tobacco-free environment have not been implemented properly in Turkey. Therefore, targeted and continuous education on smoking prevention should be mandatory for Turkish university students. The influence of peers and family members was not similar in all age groups of adolescents. This may be an important issue for developing anti-smoking campaigns for the young.

There were limitations to this study such as the veracity of the data collected by the questionnaire method. Although the study had a large sample with high response rate, several limitations should be acknowledged. In this investigation only a few sources for cigarettes were examined, and the data suggested that additional routes to tobacco products are important to consider. For example, almost 33.4% of the sample indicated that they had obtained cigarettes through a method other than peers, stores, vending machines, and theft. It may be, for example, that a substantial number of children receive cigarettes as gifts from adults. Thus, future investigations should explore other possible sources of tobacco products. Data are needed to determine how students' sources of tobacco products change as they age. By understanding the access routes for each age group, more effective legislative and educational programmes can be designed to prevent the onset of cigarette smoking in youth.

A third potential limitation of this study concerns the use of self-reports of smoking and the extent to which they are equally valid and reliable across students' groups. The smoking behaviour mentioned in the questionnaire may differ from actual smoking habits.

A further limitation is the potential bias resulting from students being absent on the day of the survey. Students who are absent from school have been shown to have rates of health-risk behaviours higher than students present at school. Absentee students are extremely difficult to access. Additionally, only the university students were included in the study making it impossible to generalize for the community. The sample in this study was mostly male and from urban area. Further studies are needed for the reliable assessment of all predictors of smoking behaviour.

CONCLUSION

Smoking prevalence among students in Cukurova University, in Southern of Turkey, is high. Effective smoking prevention programmes should take into account the dominant influence of peers in the onset and maintenance of smoking behaviour. School-related issues had less important role in predicting smoking behaviour than expected. The students may benefit from opportunities to examine their own beliefs and attitudes particularly in relation to tobacco use and other health-related behaviour. The young population has the potential to influence clients' behaviours and public policy concerning tobacco use.

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