



Attitudes and Smoking Prevalence Among Undergraduate Students in Central Greece

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Abstract

Tobacco smoking is a major public health problem globally. The vast majority of smokers start smoking early. The hazards of smoking depend on a plethora of factors such as the age one starts to smoke, number of cigarettes smoked per day, nicotine, and filter

type of the cigarette among other factors. According to the World Health Organization, most tobacco-related deaths occur in low- and middle-income countries. Undergraduate students are an important part of the general population, and their life conditions, smoking rates, and the knowledge, attitudes, and exposure to smoking (including secondhand smoke) are an interesting topic for investigation. The aim of the present study is to investigate undergraduate university students' smoking attitudes as well as the prevalence of smoking and their exposure to secondary smoke. A cross-sectional study was conducted in 600 undergraduate students in Central Greece. Anonymous self-report-adjusted questionnaires were distributed in students of the Technological Educational Institute of Thessaly. The total prevalence of tobacco smoking was 35%, while the majority of the smokers were females (65%). Fifty-three of the participants reported daily exposure to secondary smoke inside their houses, and 45% of them reported daily exposure to secondary smoke in their work.

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Keywords

Smoking · Undergraduate students ·
Secondhand smoke · Greece

1 Introduction

Cigarette smoking is one of the most important lifestyle risk factors for chronic and degenerative diseases including degenerative aortic valve disease, degeneration of the intervertebral disc, cardiovascular disease, diabetes, and inflammatory diseases which are responsible for a high number of deaths worldwide [1, 2]. Tobacco smoking has been classified by the International Agency for Research on Cancer (IARC) as causing a Group I carcinogenic effect in humans while at least 70 carcinogens have been identified in tobacco smoke [3]. World Health Organization (WHO) has estimated that tobacco use (active or second-hand smoking and smokeless products) is currently responsible for the death of about six million people across the world each year with many of these deaths occurring prematurely [4]. Smoking is usually initiated during puberty and young adulthood making tobacco use a global epidemic phenomenon [5]. Prevalence of any tobacco use is defined as the proportion of the population of interest who exclusively uses smoked tobacco products and/or exclusively uses smokeless tobacco products. Most policy programs by health authorities dedicated to the prevention of smoking in adolescents address smoking beliefs [6], because smoking belief is associated with smoking status [7]. The economic impact of smoking is another important factor for the public health authorities, and many studies showed parameters such as smoking-attributable health, care expenditures, and productivity losses associated with smoking-caused mortality or morbidity [8–10]. Just over 40% of deaths in Greece can be attributed to behavioral risk factors (which is above of the EU average of 39%), with smoking being the leading contributor. More than one in four adults smoke daily in Greece, thus ranking second highest among EU countries. In 2014, 32% of Greek men in the poorest income quintile smoked daily while EU average was 24%. In the same context, 25% of Greeks belonging to the highest incomes smoked while the average in EU was estimated at 16% [11].

2 Methods and Materials

This cross-sectional study was conducted in Larissa, Greece. A convenient sample of 30% from a total of 2500 students from undergraduate schools (including Medical Laboratories School, Logistics Department, Financial School/Business Administration Department, and Faculty of Nursing) were contacted in order to participate in this study. Anonymous self-report-adjusted questionnaire was distributed in 800 students of the Technological Educational Institute of Thessaly, and 600 questionnaires were completed and returned to researchers (response rate 75%). Sociodemographic characteristics including gender, age, type of educational school attended, as well as smoking habits (past and present), age of first smoking experience, and the knowledge about the smoking-ban laws in public places and finally the weekly cost for tobacco smoking were recorded. During administration of the questionnaire, researchers were available to explain the questions if needed. Data were entered into an Excel database and were tabulated. Absolute (N) and relative (%) frequencies were used for the description of qualitative variables. In addition, 95% Confidence Intervals were calculated for proportions by the use of OpenEpi. Data collection was self-completed, anonymously and voluntarily. The study period was from October 2018 to February 2019. The study was approved by the ethical committee of Medical Laboratories School of the Technological Institute of Thessaly (number 26/14-12-2017).

3 Results

The study population consisted of 220 male students and 308 were females. In the distribution of the schools, the Medical Laboratories School participated with 168 students, the Faculty of Nursing with 152 students, followed by Logistics Department with 142 students, and finally the Financial Department with 138 participants. The total prevalence of tobacco smoking was esti-

mated at 35% with the majority of the smokers being females (65%) while 35% were males. When assessing the prevalence of smoking by School, the Financial Department showed the highest percentage of smoking (37.5%), followed by the Logistics Department with 37%, the Medical Laboratories with 34%, and finally the Faculty of Nursing with the lowest percentage (31.5%) (Table 1). In the question “when was the first time to smoke,” half of participants reported the age group of 11–17 years, 9% reported “10 years and less,” and finally 204 (34%) students reported that they had never tried to smoke in their life. The majority of the students (90%) reported that they knew about the ban law in indoor areas, and on behalf, 70% blamed the country culture for the failure to implement the law. Fifty-three of the participants reported that they were daily exposed to secondhand smoke

inside their houses, 20% reported working at the study period, while 45% of them were exposed to smoke in their workplace in indoor areas during the last 30 days. Half of the students had tried to quit smoking at least once in the past 12 months, 61% had visited a physician for an unrelated reason, and 50.8% has received advices to quit smoking by the physicians during that visit. About the noticing warnings for health in cigarette packs, the vast majority (84%) reported awareness for the current health warnings. On behalf of anti-cigarette information, 53% of the participants reported they received warnings from newspapers or magazines and 58% from television. Finally, about the weekly cost for cigarettes, 68% from the smokers reported that they spend 3–10 € per week, 24.5% spend 10–20 € per week, and 7.5% spend up to 20 € per week (Table 2).

Table 1 Prevalence of smoking in undergraduate students

Demographics	<i>n</i>	%	CI 95%
Sex			
Male	220/600	36.5	(32.91–40.6)
Female	380/600	63.5	(59.4–67.09)
Mean age	20 years		
Age range	18–23		
<i>School of participants</i>			
Medical laboratories	168/600	28	(24.56–31.72)
Nursing	152 /600	25.5	(22.02–28.96)
Logistics	142/600	23.5	(20.44–27.23)
Financial school/business administration	138/600	23	(19.81–26.53)
<i>Current prevalence smoking among schools</i>			
Total prevalence	211/600	35	(31.45–39.07)
Male prevalence	74/211	35	(28.95–41.72)
Female prevalence	137/211	65	(58.28–71.05)
Financial school/business administration	52/138	37.5	(30–46)
Logistics	53/142	37	(29.8–45.51)
Medical laboratories	58/168	34	(27.75–41.99)
Nursing	48/152	31.5	(24.72–39.34)

Table 2 Knowledge attitudes and practices for tobacco smoking

Questionnaire		<i>n</i>	%	CI 95%
Q3. How old are you when you first started smoking?	Never smoke	204/600	34	(30.3–37.88)
	Ten years and less	54/600	9	(6.9–11.56)
	11–15 years	162/600	27	(23.6–30.69)
	16–17 years	120/600	20	(16.99–23.39)
	18–19 years	54/600	9	(6.96–11.56)
	20–24 years	6/600	1	(0.4591–2.164)
	24>		0	
Q4. Do you know about the ban law for smoke in indoor areas like restaurants or coffee areas?	Yes	540/600	90	(87.34–92.15)
	No	50/600	8	(6.37–10.82)
	Uncertain	10/600	2	(0.90–3.04)
Q5. The country culture is important reason for not applying the ban law?	Yes	420/600	70	(66.22–73.53)
	No	66/600	11	(8.74–13.76)
	Uncertain	114/600	19	(16.06–22.33)
Q6. How often does anyone smoke inside your home?	Daily	320/600	53.3	(49.33–57.29)
	Weekly	16/600	2.6	(1.64–4.28)
	Monthly	52/600	8.6	(6.67–11.19)
	Less from month	68/600	11.3	(9.039–14.12)
	Never	144/600	24	(20.76–27.58)
Q7. Current status of working	Yes	120/600	20	(16.99–23.39)
	No	480/600	80	(76.61–83.01)
Q8. Secondhand exposure in past 30 days in indoor areas at work	Yes	54/120	45	(36.39–53.92)
	No	48/120	40	(31.68–48.94)
	Uncertain	18/120	15	(9.70–22.47)
Q9. Try to quit the smoking in past 12 months?	Yes	99/211	47	(36.17–49.4)
	No	112/211	53	(40.3–53.65)
Q10. For the last 12 months have you ever visited a physician?	Yes	366/600	61	(57.04–64.82)
	No	234/600	39	(35.18–42.96)
Q11. Receiving advices to quit the smoking from the physician	Yes	186/366	50.8	(45.72–55.91)
	No	180/366	49.2	(44.09–54.28)
Q12. Noticing anti-cigarette information in newspapers or magazines?	Yes	318/600	53	(49–56.9)
	No	228/600	38	(34.2–41.95)
	No answer	54/600	9	(6.96–11.56)
Q13. Noticing anti-cigarette information on television	Yes	348/600	58	(54.01–61.89)
	No	204/600	34	(30.32–37.88)
	Uncertain	48/600	8	(6.08–10.45)
Q14. Noticing health warnings on cigarette packs	Yes	504/600	84	(80.85–86.72)
	No	60/600	10	(7.84–12.66)
	I never see cigarette packs	34/600	5.6	(4.08–7.81)
Q15. Thinking about quitting because of health warnings	Yes	90/211	42.6	(36.17–49.4)
	No	99/211	47	(40.3–53.65)
	Uncertain	22/211	10.4	(6.98–15.28)
Q16. Weekly cost for cigarettes?	3–10 €	143/211	67.8	(61.2–73.71)
	10–20 €	52/211	24.6	(19.32–30.88)
	Up to 20 €	16/211	7.6	(4.72–11.96)

4 Discussion

According to the WHO report 2015, the prevalence of tobacco smoking among Greek persons aged 15 years and over was high (estimate prevalence 41.5%) in both genders [12]. In the current study, we recorded a total prevalence of 35% in both sexes with remarkable difference between female and male participants. From the report on the trends of daily tobacco smoking WHO estimate, the crude adjusted prevalence for Greek active smokers aged 15 years and over for both sexes will be active 36.2% [13]. The prevalence estimated from the present study displays similar results with other Greek researches studying undergraduate and postgraduate students. In a study that investigated smoking habits and alcohol consumption within first-year students, 32.4% of the sample were active smokers [14]. Diomidous et al. demonstrated that 36.8% of the students smoked systematically [15]. Saridi et al. reported 32% prevalence of active smokers in a sample with undergraduate and postgraduate students from Greece [16].

Furthermore, in 2000 the WHO was reported that one in six women (16.7%) aged 15 years and older were current users of some form of tobacco. By 2015, the proportion of women using tobacco had declined to under one in ten (9.5%), while in the present study smoking prevalence of female participants was estimated at 19.5%. Other studies from European countries report that smoking rates among girls surpass those among boys [17]. The exposure of undergraduate students to secondhand smoking in the present study indicated high levels for both home (53%) and enclosed workplaces (45%). Pacheco et al. reported that only 40% of college students were not exposed to secondhand smoke in the past 7 days, displaying similar results with our study [18].

For many years, one of the most important problems related to smoking in Greece was the failure to implement smoking-ban law, particularly in public places such as restaurants and cafeterias. The findings of the present study underlined this issue, and the majority of participants reported that they knew the smoking-ban law, while the country's traditions were reported

as an important reason for not implementing the law. In the same context, Satterlund et al. reported that in California bars, indoor smoking was significantly related to patron ethnicity. Specifically, the research staff consistently observed smoking in bars serving primarily Irish and Asian patrons [19].

In the present study, the majority of smokers started to smoke while younger than 17 years old, and this percentage reduces to the students 18 years of age and up. A study conducted by the University of Montreal School of Public Health suggests that for people between 18 and 24 years, the three strongest risk factors for starting smoking are being impulsive, using alcohol regularly, and getting poor grades in school. Forty-four percent of the teens started smoking before entering high school, 43% started during high school, and 14% started sometime in the 6 years post-high school [20]. In a study conducted in the United Kingdom, 53% of adolescents reported having smoked at least one whole cigarette by the age of 16 years [21]. Another study from Panatto et al. in Italian students reported that 59.5% of students had tried smoking, while 35.6% defined themselves as current smokers while the mean age of initiation was 13.5 years for males and 13.9 years for females, reporting similar results with our findings [22].

Media, telecommunications, and other interventions (such as TV, radio, newspapers, telephone, the Internet, social media) usually have positive effects in reducing smoking prevalence especially when delivering smoking cessation messages and counseling support. In the present study, 45% of the smokers had tried to quit smoking in the past 12 months and 53% had received anti-cigarette information from newspapers or magazines, while 58% had watched anti-cigarette information on television. Meantime, 43% of the smoking participants had thought to quit smoking because of health warnings and anti-cigarette information. A study conducted in Australia by Borland et al. demonstrated that those living in regions exposed to the antismoke campaign were more advanced in thoughts about quitting. Of the responders, 33% progressed toward cessation and 21% regressed [23]. Gibson et al. indicated

that the campaign in the United States significantly predicted four behaviors, i.e., using help, seeking advice from a doctor, using medication, and making a quit attempt. After adjusting for prior use of help (3 months “before the campaign period”) and other confounders, each additional campaign exposure per week was associated with an 8% increase of smoking cessation [24].

The last decade some European countries, and especially Greece, suffered a huge financial crisis with many social problems. In comparison with some European countries, the majority of Greek students cover the financial cost for the student period from their family budget. A plethora of studies indicated that the financial crisis can lead to high unemployment rates, which can also correlate to higher smoking prevalence [25, 26]. Another important result of the present research is the impact and the financial cost per week of each smoker student. Sixty-eight percent of the smokers were spending 3–10 € per week and 24.5% spend 10–20 € per week followed by a minority (7.5%) that were spending up to 20 € per week. Saridi et al. from another Greek study in students showed that the financial crisis did not lead the students to change their smoking habits [14]. Siahpush et al. in a study from Australia demonstrated that on average a smoker who quits smoking is expected to have a 25% reduction in the odds of financial stress [27].

5 Conclusions

This study has several potential program and policy implications. Smoking prevention programs tailored specifically to undergraduate students may be needed. In particular, education about the dangers of smoking may be effective when undergraduate students are starting new life at universities. Educating undergraduate students, young adults, and parents about the dangers of secondhand smoke may not only benefit students but may also prompt cessation. Finally, there is an emergent need to continue to promote smoke-free environments in places where undergraduate students work and play, at work, campuses, in restaurants, bars and nightclubs, or at home.

Furthermore, the supporting and the implementation of ban law for smoking must be continued. These results need to be interpreted with caution and the associations observed need to be investigated further.

5.1 Limitations

Our study has several limitations. The local sample of the participants is an important limitation, while the distribution of the sample (with the majority being females) is another limitation. Another limitation of this analysis includes that self-reported data may be subject to recall bias, and finally, the use of a convenience sample may limit the generalizability of the findings.

References

1. Yamaura Y et al (2019) Impact of cumulative smoking exposure on subclinical degenerative aortic valve disease in apparently healthy male workers. *Circ Cardiovasc Imaging* 12(8):e008901
2. Elmasry S et al (2015) Effects of tobacco smoking on the degeneration of the intervertebral disc: a finite element study. *PLoS One* 10(8):e0136137
3. International Agency for Research on Cancer (IARC) (2004) Tobacco smoke and involuntary smoking, IARC monographs on the evaluation of carcinogenic risks to humans, vol 83. WHO Press, Lyon
4. World Health Organization (2012) WHO global report: mortality attributable to tobacco. WHO, Geneva. Available: http://www.who.int/tobacco/publications/surveillance/rep_mortality_attributable/en/
5. US Department of Health and Human Services (2012) Preventing tobacco use among youth and young adults: a report of the surgeon general. US Department of Health and Human Services, Public Health Service, Office of the Surgeon General, Rockville
6. Thomas RE, McLellan J, Perera R (2015) Effectiveness of school-based smoking prevention curricula: systematic review and meta-analysis. *BMJ Open* 5(3):e006976
7. Parkinson CM et al (2009) Smoking beliefs and behavior among youth in Malaysia and Thailand. *Am J Health Behav* 33(4):366–375
8. Max W et al (2011) The cost of smoking for California’s Hispanic community. *Nicotine Tob Res* 13(4):248–254
9. Wegner C et al (2004) Smoking-attributable productivity loss in Germany—a partial sickness cost study based on the human capital potential method. *Gesundheitswesen* 66(7):423–432

10. Max W et al (2004) The economic burden of smoking in California. *Tob Control* 13(3):264–267
11. State of Health in the EU, G.C.H.P. Available: https://www.oecd-ilibrary.org/social-issues-migration-health/greece-country-health-profile-2019_d87da56a-en
12. World Health Organization (2015) WHO global report on trends in prevalence of tobacco smoking 2015. WHO. Available: <https://apps.who.int/iris/handle/10665/156262>
13. World Health Organization (2019) WHO global report on trends in prevalence of tobacco use 2000–2025, third edition. WHO. Available: <https://www.who.int/publications-detail/who-global-report-on-trends-in-prevalence-of-tobacco-use-2000-2025-third-edition>
14. Konstantinidis T, Skandalaki N, Kritsotakis G (2014) Smoking and alcohol consumption among undergraduate nursing students. *Nosileftiki* 53:42–47
15. Diomidous M, Galanis P, Mpakoula X et al (2007) Evaluation of students' attitudes towards smoking and alcohol consumption. *Nosileftiki* 46:523–528
16. Saridi M et al (2017) Smoking habits among Greek university students after the financial crisis. *Asian Pac J Cancer Prev* 18(5):1329–1335
17. Inchley J, Currie D, Young T et al (2016) Growing up unequal: gender and socioeconomic differences in young people's health and well-being. *Health Behaviour in School-aged Children (HBSC) study: international report from the 2013/2014 survey*. World Health Organization, Copenhagen
18. Pacheco CM et al (2018) Clearing the air: American Indian tribal college students' exposure to second hand smoke & attitudes towards smoke free campus policies. *J Am Coll Heal* 66(2):133–140
19. Satterlund TD, Antin TMJ, Lee JP, Moore RS (2009) Cultural factors related to smoking in San Francisco's Irish bars. *J Drug Educ* 39(2):181–193
20. O'Loughlin LJ, Dugas NE, O'Loughlin KE, Karp I, Sylvestre MP (2014) Incidence and determinants of cigarette smoking initiation in young adults. *J Adolesc Health* 54(1):26–32
21. Heron J et al (2011) Characterizing patterns of smoking initiation in adolescence: comparison of methods for dealing with missing data. *Nicotine Tob Res* 13(12):1266–1275
22. Panatto D et al (2013) Tobacco smoking among students in an urban area in Northern Italy. *J Prev Med Hyg* 54(2):97–103
23. Borland R, Balmford J (2003) Understanding how mass media campaigns impact on smokers. *Tob Control* 12(Suppl 2):ii45–ii52
24. Gibson LA et al (2014) Evaluation of a mass media campaign promoting using help to quit smoking. *Am J Prev Med* 46(5):487–495
25. Kourakos M, Kafkia T, Saridi M (2016) *Greece: economic crises and management*. Nova Science Publishers, Hauppauge, pp 45–55
26. Patelarou A, Manidaki A, Mpalolakis A et al (2011) The economical crisis and consequences to health suggestions. *Hellenic J Cardiol* 4:53–61
27. Siahpush M, Spittal M, Singh GK (2007) Association of smoking cessation with financial stress and material well-being: results from a prospective study of a population-based national survey. *Am J Public Health* 97(12):2281–2287