



## ORIGINAL ARTICLE

# Smoking behaviour among nursing students: attitudes toward smoking cessation

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## Keywords

Surveys and questionnaires • University students • Sicily • Students nursing • Smoke

## Summary

**Introduction.** The purpose of the study was to assess tobacco smoking habits among nursing students and how these are influenced by family members and cohabitants.

**Methods.** Cross-sectional study. An anonymous paper questionnaire was administered to nursing students of the three-year course of the University of Palermo. Adjusted Odds Ratio (aOR) are presented.

**Results.** 301 nursing students (63.12 % female) completed the questionnaire (response rate 61.17%). The average age of the sample is 21.88 years ( $SD \pm 2.80$ ). Considering as a dependent variable: “I currently smoke”, the statistically significant inde-

pendent variables associated are: “Male gender” (aOR 2.09), “Single” (aOR 2.06), “Second year of study of the degree course in nursing” (aOR 0.46), “Third year of study of the degree course in nursing” (aOR 0.43), “Don’t think that warnings and pictures on cigarette packs can help stop smoking” (aOR 6.38), “Mother smoked in the past” (aOR 2.25) and “Brother or sister smoked in the past” (aOR 5.50).

**Conclusions.** Students and graduate nurses need to be aware of current knowledge in the smoking cessation field and they have an influential role in modifying patient behavior in order to assist them to smoking cessation.

## Introduction

Nurses constitute the largest occupational group among health professionals and are employed in variety of settings such as schools, colleges, community and mental health settings, and others.

As shown by systematic reviews [1] the behaviors of nurses influence public perception of the profession, are a powerful vehicle for promoting health, and have been used to influence public health in the worldwide. When nurses engage in behaviors that are contradictory to health, they put the profession in a negative light. Nursing leadership has been aware of the negative image of the nurse as smoker for decades.

They are a potentially powerful resource for influencing the society smoking patterns and could play a key role in smoking cessation [2]. Recently published studies confirmed that smoking rates among nurses and nurse students are relatively high worldwide [3]. One of the main motivational reasons to become a health care worker is to assist people in achieving their full health potential, on the contrary, smoking is the most hazardous and avoidable health risk in our society. Tobacco smoking is a serious public health problem worldwide that the leading preventable causes of morbidity and mortality, leading to the death of more than 7 million people each year. More than 6 million of those deaths are the result of direct tobacco use while around 890,000 are the result of non-smokers being exposed to second-hand smoke [4]. Tobacco smoking, inclusive of secondhand smoke, is a leading risk factor attributable to 6% of global disability-

adjusted life years [5]. As healthcare costs continue to rise, much more attention is being focused on unhealthy behaviors that contribute to the increasing expenses. An estimated that more of 960 million smokers are living in 187 countries of world and this number is expected to increase with the growing population and worsening tobacco epidemic in developing countries [6]. Around 80% of the world’s 1.1 billion smokers live in low- and middle-income countries [4].

In Italy, the Ministry of Health provides free smoking cessation information and support through various websites and telephone services [7]. Furthermore, many healthcare organizations have designed and implemented smoking cessation initiatives at local and regional levels, such as territorial services for the cessation of tobacco smoke (Centri Antifumo - CAFs, in the Italian language). The Smoking, Alcohol and Drug Observatory of the Istituto Superiore di Sanità every year update the census of the CAFs active at the National Health Service, at the Italian League for the Fight against Cancer and at the private social sector. In 2017, 366 CAFs are active, of this 307 at the National Health Service, 56 at the Italian League for the Fight against Cancer and 3 at the private social sector [8].

The World Health Organization (WHO) developed the Global Health Professions Student Survey (GHPSS) to collect data on tobacco use among health professional students in all WHO member states. According to study GHPSS, prevalence of smoking was highest in eastern Mediterranean (10-23%) and European countries (7-13%). 41.5% of third year nursing students are current

smokers. 89.4% of the nursing students believed health professionals should teach their patients about smoking cessation and 96.7% believed they should be trained in smoking cessation, but only 22.6% actually received formal training [9].

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first treaty negotiated under the auspices of the World Health Organization. The WHO FCTC is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. WHO FCTC recommends that the global tobacco epidemic be monitored through population-based surveys conducted through the Global Tobacco Surveillance System. WHO FCTC underscores the importance of the role played by health workers in cessation and prevention of tobacco use by providing brief counseling or even simple advice [10]. Italy is one of the member states of the WHO FCTC.

According to data from a survey of the Istituto Superiore di Sanità in collaboration with the Mario Negri Institute for Pharmacological Research average age of the first cigarette in Italy is at 17.6 for man and at 18.8 for female. Moreover, the study reveals that 16.2% of young people between the ages of 15 and 24 smoke [11].

Nurse students in Italy are mostly part of this age class. The majority of the European Countries, including Italy, have adopted the pictures health warnings on tobacco product in 2016 [12]. Health warnings constituted an important policy to inform on the health impact of adult smokers and in may 2016 the Italian Minister of Health issued a decree for the introduction the pictures health warnings on tobacco product [13].

The aim of the study was to assess tobacco-smoking habits among nursing students and how these are influenced by family members and cohabitants. A further objective was to investigate about the power of tobacco package health warning messages to implement the attitudes for smoking cessation.

## Methods

The study employed a cross-sectional study design. In May 2018, an anonymous paper questionnaire was administered to nursing students attending the 3 year full-time course at the University of Palermo, Italy, in the academic years 2015/2016, 2016/2017 and 2017/2018, after giving informed consent. Data collection was self-completed, anonymously and voluntarily. The students were not coerced in any way into participating, and it was clearly explained that participating in the survey would not have any repercussions. The questionnaire was created by the authors for this study and consists in two sections. The first section of the survey consists of 18 questions and asked for personal data, information on the course of study undertaken, on the perception of the economic and health status and on voluptuary habits. In the second part of the questionnaire, the Fagerström Tolerance Questionnaire (FTQ) [14] test was administered, this questionnaire was used in similar studies [15-19].

The FTQ consists in 6 questions with answers to which are assigned a score ranging. Based on the score the subjects are assigned to one of the following categories: 0-2 low dependence, 3-5 medium dependence, 6-7 high dependence, 8-10 very high dependence. The FTQ consist in 6 questions with answers to which are assigned a score ranging (Tab. I).

The FTQ has a scoring range of 0-10 points, with a score of 0 assumed indicative of minimum nicotine dependence and a score of 10 indicative of maximum nicotine dependence. Based on the score the subjects are assigned to one of the following categories: 0-2 low dependence, 3-5 medium dependence, 6-7 high dependence, 8-10 very high dependence. The FTQ correlates with nicotine dependence but connection between FTQ scores and withdrawal symptoms is weak [14].

The 18 questions asked in the survey and the categorization of the results of the Fagerström test are shown in Table I. The variable "age" was dichotomized in in "Age class  $\geq 22$  years old and  $< 22$  years old" considering that the mean age was 23.41 years old. For the statistical analysis, continuous variables were expressed as means and standard deviations (SD). For all qualitative variables absolute and relative frequencies have been calculated; categorical variables were analyzed by Pearson's Chi-square test ( $\chi^2$ ). A multivariable logistic regression model was used. Adjusted Odds Ratio (aOR) are presented, each independent variable is adjusted for all the other independent variables. The Statistical significance was established with p-value less than 0.05. Returned completed questionnaires were coded numerically, and the results were analyzed using the STATA statistical software version 14 [19]. Results are expressed as adjusted Odds Ratio (aOR) with 95% Confidence Intervals

Tab. I. Fagerström Tolerance Questionnaire. The final score is obtained from the sum of the individual scores of each question.

<b>How soon after waking do you smoke your first cigarette?</b>	
Within 5 minutes	3 points
5-30 minutes	2 points
31-60 minutes	1 point
> 60 minutes	0 points
<b>Do you find it difficult to refrain from smoking in places where it is forbidden?</b>	
Yes	1 point
No	0 points
<b>Which cigarette would you hate to give up?</b>	
The first in the morning	1 point
Any other	0 points
<b>How many cigarettes a day you smoke?</b>	
10 or less	0 points
11-20	1 point
21-30	2 points
31 or more	3 points
<b>Do you smoke more frequently in the morning?</b>	
Yes	1 point
No	0 points
<b>Do you smoke even if you are sick in bed most of the day?</b>	
Yes	1 point
No	0 points

(95% CI). Ethical approval was not required because the data were provided and analyzed in anonymous and aggregated form.

## Results

Table II shows descriptive analysis of the sample. 301 nursing students agreed to the informed consent and completed the questionnaire (response rate of 61.17%). The average age of the sample is 21.88 years (SD  $\pm$  2.80), 63.12 % of the interviewees are female, 100.00% were

born in Italy, 45.51% are single, 41.20% were in-site students, 79.73 % report a low perceived economic status, 80.07% report a medium-high perceived health status. Regarding the smoking behavior: 32.89% currently smoke and only 35.05% of the whole sample think that warnings or pictures on cigarette packs can help to smoking cessation. The 63.12% of the sample live with their families and 59.46% currently live with smokers. At Fagerström test, the 67.68% of smokers have low dependence for nicotine, 25.25% have a medium dependence, 3.03% have a high dependence and 4.04% have a very high dependence.

Tab. II. Description of the sample (N = 301).

Variables		N (%)
Age class	$\geq$ 22 years old	146 (48.50)
	< 22 years old	155 (51.50)
Gender	Female	190 (63.12)
	Male	111 (36.88)
Country of birth	Italy	301 (100.00)
	Other	0 (0.00)
Perceived economic status	Medium-high	61 (20.27)
	Low	240 (79.73)
Perceived health status	Medium-high	241 (80.07)
	Low	60 (19.93)
Are you engaged or single?	Engaged	164 (54.49)
	Single	137 (45.51)
Year of study	First	89 (29.57)
	Second	98 (32.56)
	Third	114 (37.87)
Are you in-site, commuter or off-site student?	In-site	124 (41.20)
	Commuter	65 (21.59)
	Off-site	112 (37.21)
Who are you living with now?	With my family	190 (63.12)
	Not with my family	111 (36.88)
Do you currently smoke?	No	202 (67.11)
	Yes	99 (32.89)
Warnings and pictures on cigarette packs can help stop smoking?	Yes	102 (35.05)
	No	189 (64.95)
Do you currently live with smokers?	No	120 (40.54)
	Yes	176 (59.46)
Does your father currently smoke?	No	209 (69.44)
	Yes	92 (30.56)
Does your mother currently smoke?	No	242 (80.40)
	Yes	59 (19.60)
Does your brother/sister currently smoke?	No	253 (84.05)
	Yes	48 (15.95)
Does your father smoked in the past?	No	178 (59.14)
	Yes	123 (40.86)
Does your mother smoked in the past?	No	235 (78.07)
	Yes	66 (21.93)
Does your brother/sister smoked in the past?	No	268 (89.04)
	Yes	33 (10.96)
Fagerström Tolerance Questionnaire (FTQ)	Low dependence	67 (67.68)
	Medium dependence	25 (25.25)
	High dependence	3 (3.03)
	Very high dependence	4 (4.04)
Age		21.88 (SD $\pm$ 2.80)*

\*: mean Standard Deviation.

Table III shows the bivariate analysis. Only statistically significant results are reported in this section. 45.05% of male nursing students currently smoke compared to

25.79% of female students. 41.61% of students that are single currently smoke compared to 25.61% that are engaged in a relationship. To the question: "Warnings

**Tab. III.** Bivariate associations between the students currently smoke or not and the variables of the questionnaire. Used Pearson's Chi-square test. Statistically significant results are highlighted in bold.

	Do you currently smoke?					P-value
	No		Yes		Total	
	N	%	N	%	N	
<b>Age class</b>						
< 22 years old	108	69.68	47	30.32	155	0.329
≥ 22 years old	94	64.38	52	35.62	146	
<b>Gender</b>						
Female	141	74.21	49	25.79	190	0.001
Male	61	54.95	50	45.05	111	
<b>Perceived economic status</b>						
Medium-high	37	60.66	24	39.34	61	0.230
Low	165	68.75	75	31.25	240	
<b>Perceived health status</b>						
Medium-high	165	68.46	76	31.54	241	0.316
Low	37	61.67	23	38.33	60	
<b>Are you engaged or single?</b>						
Engaged	122	74.39	42	25.61	164	0.003
Single	80	58.39	57	41.61	137	
<b>Year of study</b>						
First	53	59.55	36	40.45	89	0.094
Second	73	74.49	25	25.51	98	
Third	76	66.67	38	33.33	114	
<b>Are you a in-site, commuter or off-site student?</b>						
In-site	84	67.74	40	32.26	124	0.663
Commuter	46	70.77	19	29.23	65	
Off-site	72	64.29	40	35.71	112	
<b>Who are you living with now?</b>						
With my family	134	70.53	56	29.47	190	0.099
Not with my family	68	61.26	43	38.74	111	
<b>Warnings and pictures on cigarette packs can help stop smoking?</b>						
Yes	89	87.25	13	12.75	102	< 0.001
No	104	55.03	85	44.97	189	
<b>Do you currently live with smokers?</b>						
No	83	69.17	37	30.83	120	0.558
Yes	116	65.91	60	34.09	176	
<b>Does your father currently smoke?</b>						
No	139	66.51	70	33.49	209	0.737
Yes	63	68.48	29	31.52	92	
<b>Does your mother currently smoke?</b>						
No	168	69.42	74	30.58	242	0.084
Yes	34	57.63	25	42.37	59	
<b>Does your brother/sister currently smoke?</b>						
No	176	69.57	77	30.43	253	0.037
Yes	26	54.17	22	45.83	48	
<b>Does your father smoked in the past?</b>						
No	123	69.10	55	30.90	178	0.376
Yes	79	64.23	44	35.77	123	
<b>Does your mother smoked in the past?</b>						
No	169	71.91	66	28.09	235	0.001
Yes	33	50.00	33	50.00	66	
<b>Does your brother/sister smoked in the past?</b>						
No	190	70.90	78	29.10	268	< 0.001
Yes	12	36.36	21	63.64	33	

and pictures on cigarette packs can help stop smoking?” 44.97 % of smokers think that warnings or pictures on cigarette packs cannot help to smoking cessation compared to 12.75% of smokers that think the opposite. Furthermore, 45.83% of smoker have a brother or sister that currently smoke compared to 30.43% of smoker that have a brother or sister non-smokers. 50.00% of smokers have a mother smoked in the past respect to 28.09 % of smokers who have a mother that has never smoked. Finally, 63.64% of smokers have a brother or sister that smoked in the past compared to 29.10% of smokers who have a brother or sister that have never smoked.

Table IV shows the adjusted Odds Ratio (aOR), considering as a dependent variable: “I currently smoke”, the statistically significant independent variables associated are: “Male gender” (aOR 2.09, 95% CI 1.13-3.87,  $p = 0.018$ ), “Single” (aOR 2.06, 95% CI 1.14-3.73,  $p = 0.016$ ), “Second year of study of the degree course in nursing” (aOR 0.46, 95% CI 0.21-0.99,  $p = 0.048$ ), “Third year of study of the degree course in nursing”

(aOR 0.43, 95% CI 0.18-0.99,  $p = 0.049$ ), “Don’t think that warnings and pictures on cigarette packs can help stop smoking” (aOR 6.38, 95% CI 2.99-13.61,  $p < 0.001$ ), “Mother smoked in the past” (aOR 2.25, 95% CI 1.12-4.59,  $p = 0.023$ ) and “Brother or sister smoked in the past” (aOR 5.50, 95% CI 2.09-14.50,  $p = 0.001$ ).

## Discussion

It is crucial, especially among youth, the quality of information, the modes of communication, the development of critical skills towards a participatory and non-imposed choice of lifestyles and healthy behaviors. Young university students represent a unique population on which the interest of public health researchers and policy is focused to promote healthy lifestyles, well-being and increase the level of knowledge. Young people utilize a diverse variety of resources to acquire health

**Tab. IV.** Multivariable logistic regression. Adjusted Odds Ratio (aOR) are presented. Each independent variable is adjusted for all the other independent variables. Based on 289 observations. Statistically significant results are highlighted in bold.

Independent variables		I currently smoke	
		aOR (95% CI)	P-value
Age class	≥ 22 years old	1	0.169
	< 22 years old	1.68 (0.80-3.51)	
Gender	Female	1	0.018
	Male	2.09 (1.13-3.87)	
Perceived economic status	Medium-high	1	0.906
	Low	1.04 (0.51-2.13)	
Perceived health status	Medium-high	1	0.971
	Low	1.01 (0.50-2.05)	
Are you engaged or single?	Engaged	1	0.016
	Single	2.06 (1.14-3.73)	
Year of study	First	1	0.048
	Second	0.46 (0.21-0.99)	
	Third	0.43 (0.18-0.99)	
Are you in-site, commuter or off-site student ?	In-site	1	0.360
	Commuter	0.69 (0.31-1.52)	
	Off-site	0.84 (0.29-2.47)	
Who are you living with now?	With my family	1	0.362
	Not with my family	1.65 (0.56-4.88)	
Warnings and pictures on cigarette packs can help stop smoking?	Yes	1	< 0.001
	No	6.38 (2.99-13.61)	
Do you currently live with smokers?	No	1	0.838
	Yes	0.93 (0.47-1.85)	
Does your father currently smoke?	No	1	0.546
	Yes	0.81 (0.40-1.638)	
Does your mother currently smoke?	No	1	0.380
	Yes	1.42 (0.65-3.08)	
Does your brother/sister currently smoke?	No	1	0.804
	Yes	1.11 (0.47-2.61)	
Does your father smoked in the past?	No	1	0.678
	Yes	1.14 (0.62-2.09)	
Does your mother smoked in the past?	No	1	0.023
	Yes	2.25 (1.12-4.59)	
Does your brother/sister smoked in the past?	No	1	0.001
	Yes	5.50 (2.09-14.50)	

information, including Internet, television, family doctor, books, magazines, friends and family.

Tobacco smoking is one of the most serious public health problems in the world. According to the WHO in the European region, people who die each year from smoking-related illnesses are 1.6 million, but in the absence of drastic control measure the figures are set to rise further [4]. This means, that Tobacco smoking is compared to a chronic disease manifesting its damage over a long period, given the latency between the beginning of habit and the onset of the disease caused.

This paper reports on a descriptive survey research design that examined nursing students' behaviour, knowledge and attitudes towards tobacco cessation among nursing students attending the 3 year full-time course at the University of Palermo.

In comparison to recent nursing students based studies, smoking prevalence in our sample was similar to other European population of healthcare students (45.05% and 25.79% of male and female nursing students are a smoker) [20].

Smokers compared to non-smokers believe that the damage caused by smoking is not immediate, moving the onset of both moderately severe and very serious diseases later, delaying their onset; this perception, which does not correspond to reality, called "Onset time delaying effect", highlights a lack of understanding of the negative consequences that smoking has on people's health and how quickly they can occur. The "Onset time delaying effect" has been defined as a new risk factor implicated both in the development of tobacco addiction and in the maintenance of such behavior, in fact it seems to be a possible risk factor in the development and maintenance of tobacco addiction [21].

WHO/Europe's new evidence brief reviews the effects of large pictorial warnings on the packaging of tobacco products on knowledge and behaviour. Studies have shown that combined written and graphic health messages on the packaging of tobacco products are more effective than text-only warnings for increase attempts to quit and decrease smoking uptake [22]. For example, in a survey conducted in Canada in 2001-2003, 44% of smokers reported that pictorial health warnings had increased their motivation to quit [23]. In Romania, combined text and pictorial warnings prompted 31% of smokers to try to quit [24]. In the United Kingdom, the Department of Health has estimated that the introduction of larger text-warnings prompted an additional 2,000-4,000 calls to the toll-free number for the National Health Service smoking helpline, which was provided on tobacco packaging before the introduction of pictorial health warnings [25]. However, in our study 44.97% of smokers affirm that warnings and pictures on cigarette packs cannot help stop smoking and they have a greater risk of thinking that cigarette package health warnings do not help to smoke cessation (aOR 6.38, 95% CI 2.99-13.61,  $p < 0.001$ ). The influence of family and friends on attitudes of the young to smoking it has been widely demonstrated in the literature [26] especially in the

evolutionary age. As shown in Table IV, our sample is strongly influenced by family members who smoke. The risk of becoming a smoker is higher among those with a mother that smoked (aOR 2.25, 95% CI 1.12-4.59,  $p = 0.023$ ) and a brother or sister that smoked in the past (aOR 5.50, 95% CI 2.09-14.50,  $p = 0.001$ ).

To underline the greater awareness acquired with university studies about the damages caused by smoking, it is possible to see that with the increase in the years of study there is a lowering of the risk of smoking. Second (aOR 0.46, 95% CI 0.21-0.99,  $p = 0.048$ ) and third (aOR 0.43, 95% CI 0.18-0.99,  $p = 0.049$ ) year of study of the degree course in nursing belong to lower reference classes to the risk of smoking compared to first year of study.

The study has some limits therefore please consider that the findings represented here in should be interpreted with a degree of caution. First, it is a cross-sectional study, several independent variables could not be evaluated for the cause and effect associations. Second, the questionnaire included only a limited number of questions and probably some factors that could be associated with smoking behavior, attitudes toward cessation and nicotine dependence were not taken into consideration. Moreover, being addressed to students of a single University campus, it does not allow to generalize the results to other Universities despite number of the sample being relevant compared to number of students of the three years of the degree course in nursing.

## Conclusions

Although tobacco use has declined markedly since 2000, according to a new WHO report, the reduction is insufficient to meet globally agreed targets aimed at protecting people from death and suffering from cardiovascular and other non-communicable diseases [27]. Tobacco kills over 7 million people each year, despite the steady reduction in tobacco use globally, as shown in WHO's new Global Report on Trends in the Prevalence of Tobacco Smoking 2000-2025 [28].

Health professionals' smoking habit may deter them from helping their patients, therefore cessation training for student health professionals may be a significant contribution towards tobacco use control. All of this could potentially have an impact on future professional practice by helping patients who smoke quit by either interviewing, simple advice or referrals to cessation clinics [29].

Our results show significant gender-related differences in smoking habits increased by having family members who smoke.

Our study results show relatively high smoking prevalence among nurse students who attending the University of Palermo. Our results show significant gender-related differences regarding smoking habits and strong influenced by family members and cohabitants, furthermore it is shown that for smokers the warnings and images on cigarette packets do not help to stop smoking (aOR 6.38, 95% CI 2.99-13.61,  $p < 0.001$ ). So far, unfortunately,

little public attention was paid to these potential and future health promoters. As a reaction to this situation, it is essential that programs and preventive interventions be increased also using new forms of communications. In this context, growth in health literacy should be the way to increase health and comprehension the risk for tobacco smoking as demonstrated in international studies. As reported by Sreedharan et al., nurses have a positive attitude in providing tobacco cessation care to their patients and they can utilize their unique knowledge and know-how to promote tobacco cessation and prevent the spread of this public health crisis [30]. The information and training campaigns aimed at promoting the correct lifestyles and risks linked to wrong habits are important for educating in order to reduce the costs of public health. Students and graduate nurses have an influential role in modifying patient behavior in order to assist them in smoking cessation. Students need to be aware of current knowledge in the smoking cessation field and students who smoke should know how to access the resources to assist them in smoking cessation.

Data from literature emphasize the importance of educational interventions and the efficacy of current smoking cessation methods and practices with a view to helping hospitalized patients to cease smoking. Nurses are clearly in a privileged position to assist hospitalized patients in establishing and implementing a personal plan to help them quit smoking [31].

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## Conflict of interest statement

None declared.

## Authors' contributions

AF, SP, OES and DG conceived, designed, coordinated and supervised the research project. AF, SP, OES and DG collected samples. AF, SP, OES performed the data quality control, optimized the informatics database, performed the statistical analyses and evaluated the results. AF, SP, OES and DG wrote the manuscript. All Authors revised the manuscript and gave their contribution to improve the paper. All authors read and approved the final manuscript.

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