Comportement tabagique chez les étudiants en sciences de santé de l'université de Monastir (Tunisie)

Smoking behavior among students of health sciences at the university of Monastir (Tunisia)

Hajer Nouira[1], Asma Ben Abdelaziz[1], Sana Rouis[1], Meriem Mili[1], Mouna Safer[1], Helmi Ben Saad[2], Ahmed Ben Abdelaziz[1].

1. UR12SP36 "Mesure de la Performance Hospitalière ». Sahloul University Hospital, Unit of information management, Sousse, Tunisia
2. Laboratory of Physiology. Faculty of Medicine of Sousse, Tunisia

RÉSUMÉ

Objectif : Mesurer la prévalence du tabagisme chez les étudiants en sciences de santé à Monastir (Tunisie) et identifier ses facteurs déterminants.
Méthodes : Il s'agit d'une étude transversale basée sur un questionnaire auto administré, conduite auprès des étudiants de 2ème, 4ème et 6ème année aux facultés de Médecine et de Pharmacie de Monastir, en 2013. L'étudiant a été jugé « fumeur » lorsqu'au moment de l'étude, il fumait au moins une cigarette par jour. La difficulté académique a été retenue en cas de passage d'une session de contrôle et/ou revalidation d'un stage et/ou du redoublement. Une étude multi variée par régression logistique a été effectuée pour identifier les facteurs indépendamment associés au tabagisme.
Résultats : Le nombre des participants a été de 634 (285 en médecine et 349 en pharmacie) dont 170 étudiants et 464 étudiantes. La prévalence globale du tabagisme a été de 15%; IC95% [12,1-17,7]. Elle a été cinq fois plus importante chez les étudiants que chez les étudiantes (35,3%; IC 95% [28,1-42,5]) versus 7,5%; IC95% [5,10-9,90]); Elle a été aussi plus élevée en Pharmacie qu'en Médecine (18,9%; IC 95% [14,8-23,0]) versus 10,2%; IC 95% [6,7-13,7]). L'étude multi variée a permis d'identifier trois facteurs associés au tabagisme: la faculté de Pharmacie (ORa=3,081; IC 95% [1,7-05,7]), le sexe masculin (ORa=6,929; IC 95% [3,9-12,0]) et la difficulté académique (ORa=1,854; IC 95% [1,0-03,4]).
Conclusion : Le taux de prévalence du tabagisme chez les étudiants en médecine et en pharmacie a été élevé, ce qui aurait un impact négatif sur leur rôle modèle. , la création des cellules de soutien psychologique et d'accompagnement académique serait nécessaire pour le contrôle de l'épidémie tabagique chez les étudiants en sciences de la santé.

Mots-clés
Tabagisme - Style de vie – Etudiants – Etudiant Médecine – Etudiant Pharmacie - Prévalence - Facteurs de risque - Questionnaires - Tunisie.

SUMMARY

Objective: Measure the prevalence of smoking among students of health sciences Faculties in Monastir (Tunisia) and identify factors associated with smoking behavior.
Methods: A cross-sectional study based on a self-administered questionnaire conducted among students registered in their second, fourth and sixth year at the Faculties of Medicine and Pharmacy in Monastir, in 2013. Smoker was the subject who, at the time of the survey, smoked at least one cigarette per day. Academic difficulties were used to denote any of the following incidents that a student may experience: passing exams at the retake session, revalidating an internship or repeating a school year. A logistic regression analysis was used to identify factors associated with smoking.
Results: The number of participants was 634 (285 Medical students and 349 Pharmacy students); they were 170 males and 464 females. The prevalence of smoking was 15%; 95% IC [12.1-17.7]. It was nearly five times higher among male compared to female students (35.3%; 95% IC [28.1-42.5]) vs 7.5%; 95% IC [5.1-9.9]); It was also higher among Pharmacy students than among Medical students (18.9%; 95% IC [14.8-23.0]) vs 10.2%; 95% IC [6.7-13.7]). In the multivariate analysis, the Faculty of Pharmacy (ORa=3.081; 95% IC=[1.7-5.7]), the male sex (ORa=6.929; 95% IC [3.9-12.0]) and the academic difficulties (ORa=1.854; 95% IC [1.02-3.38]) were found to be significantly associated with smoking.
Conclusion The level of tobacco use found among Medical and Pharmacy students is alarming. This serious problem has a negative impact on their behavior and can hinder their role model as future health professionals. Greater efforts are needed to develop anti-smoking programs, to educate students and to offer psychological support to deal with school difficulties.

Key-words
Smoking - Lifestyle - Students - Students, Medical - Students, Pharmacy -Prevalence - Risk Factors - Questionnaires - Tunisia

سلوك التدخين بين طلاب العلوم الصحية بجامعة المنستير (تونس)

هاجر نويرة ، أسماء بن عبد العزيز ، سناء رويس ، مريم ميلي ، منى سافر ، حلمي بن سعد ، أحمد بن عبد العزيز.

الهدف: قياس معدل انتشار التدخين بين الطلاب في العلوم الصحية بالمنستير)تونس(و تحديد العوامل المرتبطة بهذا السلوك.
الطرق: دراسة مقطعية اعتمدت على استبيان ذاتي لدى الطلاب المسجلين بالسنوات الثانية والرابعة و السادسة في كليتي الطب والصيدلة بالمنستير عام 2013. المدخن هو الذي يدخن سيجارة واحدة على الأقل في اليوم الواحد . تم تعريف الصعوبة الأكاديمية عندما يكون الطالب قد اجتاز امتحان دورة التدارك او اعاد فترة تدريب في المستشفى أو رسب. تم استخدام التحليل اللوجستي لتحديد العوامل المرتبطة بالتدخين بشكل مستقل.
النتائج: كان عدد المشاركين 634: 285 من كلية الطب و 349 من كلية الصيدلة. 170 من الذكور و 464 من الإناث كان معدل انتشار التدخين بنسبة 15 % [17,7-12,1]' خمس مرات اعلى بين الرجال مقارنة بالنساء (35.3% [28,1-42,5] مقابل 7,5% [5,1-9,9]) وكان أيضا أعلى بين طلاب الصيدلة مقارنة بطلاب الطب (18.9% [14,8-23,0] مقابل 0.2 % [6,7-13,7]). بينت الدراسة ثلاثة عوامل مرتبطة بالتدخين : الانتماء الى كلية الصيدلة (نسبة الارجحية = 3.081 [1,6-5,6]) و الانتماء الى جنس الذكور(نسبة الارجحية= 6,929] 3,9-12,0]) و الصعوبة الاكادمية (نسبة الارجحية = 1,854 [1,02-3,38])
الاستنتاج: كان معدل انتشار التدخين بين طلاب الطب والصيدلة عاليا (15 ٪) مما يؤثر سلبيا على دور المهنيين الصحيين في المستقبل كمثال يحتذى به في المجتمع. فمن الضروري توفير خلايا للمساعدة النفسية و الأكاديمية للحد من انتشار التدخين في الوسط الجامعي.

الكلمات الرئيسية: التدخين والصحة - معدل الانتشار- العوامل المرتبطة – استبيان- تونس.

Auteur correspondant :
Ahmed Ben Abdelaziz
Unit of information management, Sahloul University Hospital, Sahloul
4011, Sousse, Tunisia.
Phone: +216 97 448 060
E-mail: ahmedbenabdelaziz.prp2s@gamial.com

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Disclosure
The authors report no potential, perceived, or real conflicts of interest in this work that could inappropriately bias conduct or findings of this study.

Authors' contribution
Hajer Nouira wrote the manuscript and conducted the analysis. Asma Ben Abdelaziz,, Rouis Sana, Meriem Mili and Mouna safer conceived the study and collected data. Pr. Helmi Ben Saad helped to draft the manuscript. Pr. Ahmed Ben Abdelaziz conceived the study, helped to analysis and to draft the manuscript.

INTRODUCTION

In recent years, tobacco smoking has become a major public health problem[1, 2]. It is a growing epidemic which receives an important attention around the world[3]. Six million people worldwide die every year due to tobacco smoking[4]. The prognosis is that in 2030 about eight million people will die because of smoking, and 80% of these deaths will take place in low and middle income countries[4]. This epidemic accounts for high economic burden worldwide[5-7]. These facts highlight the need to help smokers quit and to discourage non-smokers from ever starting. Smoking prevention programs have been given high priority in World Health Organization policies[8]. During these last years, smoking prevalence has decreased in some developed nations. For example, In U.S the prevalence of current smoking among adults was 15.5% in 2016, which was a significant decline from 2005 (20.9%)[9]. In contrast, important increases in tobacco use have been registered in developing countries[10].

In Tunisia, the prevalence of smoking has reached 46% of men and 1% of women[11]. These increasing trends in tobacco consumption, especially among teenagers and women[12, 13] reveal that the situation is alarming. The implementation of recommended interventions is still in its rudimentary stages[14]. In fact, understanding the social determinants of smoking cessation is essential for smoking reduction at the population level[15]. Smoking among physicians is an important concern since they are expected to promote smoking cessation and to be an example for people to follow[12]. Physicians and healthcare professionals in general must play an active role in Tobacco smoking reduction strategies[16]. In developing countries, healthcare professionals represent an important asset in the fight against smoking, owing to their importance in the society[17]. Therefore, physicians are expected to represent a role model for patients by having a healthy lifestyle[18]. According to a study carried on health professionals from the Sahel area, Tunisia, the rate of smoking among them was found to be as high as that of the general population (50%)[19]. In fact, future health professionals are confronted with a risky environment such as stress related to their studies[20]. Face to the seriousness of this problem, students in health sciences should be a crucial target of tobacco prevention programs, a target that has been underestimated until now in many countries like Tunisia[21]. There is a definite paucity of information available from Tunisia regarding this issue. Indeed, querying the data base Medline, until the first quarter of 2014, allowed to find only five articles[2, 21-24]. Therefore, the present study focuses on the epidemiological status of smoking among health sciences students. Such information provides crucial support for efforts aimed at developing a healthy lifestyle, strengthening control programs and improving the planning of tobacco prevention among university students. The objective of this study was to determine the prevalence of smoking among students at the faculties of health sciences at the University of Monastir (Tunisia) and to identify the factors associated with smoking behavior.

METHODS

Study design: A cross-sectional approach was applied to collect data by means of a self-administered anonymous questionnaire. This study was carried out within the training framework of a health survey focused on students called 'ESE2S': (Etat de Santé des Etudiants en Sciences de la Santé) health of students in health sciences, and conducted by the 'GRASSE2S 'group:' (Groupe de Recherche Action Sur la Santé des Etudiants en Sciences de la Santé) research group for the health of students on health sciences. This group involved professors and students of Medicine, Dental medicine and Pharmacy. The purpose of this group is to promote students' health, particularly with regard to the components of lifestyle. Thus, this initiative is meant to improve the positive role of our participants who are, in fact, the future health authority of society.

Study Setting: This study was conducted in Monastir, a governorate on the central coast of Tunisia, in the Sahel area. The general population in 2013 was estimated at 542 100[25]. Founded in 2004, the University of Monastir comprises 10 establishments of higher education with 26 058 students registered in 2 012[26]. The faculties of health sciences are as follows: Faculty of Medicine, Faculty of Pharmacy, Faculty of Dentistry, and The Higher Institute of Health Sciences. This study focused on students belonging to the faculties of Medicine and Pharmacy. These students should go through a long and stressful training.

Study population: An exhaustive study was carried out among students registered in the second, fourth and sixth years at the Faculties of Medicine and Pharmacy. Concerning the first cycle, we focused on second year students as first year ones are still in a stage of adjustment to university life. Regarding to the second cycle, we have chosen the fourth year because it represents an intermediate year. As for the third cycle, we opted for the sixth year students due to the unavailability of the seventh year students as they are busy preparing for the Residency National Exam.

Data collection: In January 2013, the voluntary group GRASS2S consisting of professors, interns and students was formed and a workshop was carried out to ensure their training. Members of this group developed a structured

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questionnaire after a detailed review of literature and an informal discussion about the topic. It was written in French and derived from 'ELSE' study (Etude Longitudinale sur la Santé des Etudiants), longitudinal study on students' health[27]. The questionnaire was modified to be appropriate for our participants. Additionally, its understanding was tested with a small convenience sample of sixteen students in Medicine and Pharmacy. Then, appropriate revisions were incorporated to ensure content validity. Finally, the questionnaire was printed and distributed for data collection. The majority of questions were closed. The survey items were as follows: socio-demographic characteristics, smoking, alcohol consumption, drug use, diet, physical exercise, stress, internet use, sleep status, wellness and university health service. The smoking status was divided into two parts. The first part contained question referring to tobacco smoking. The student was asked if he was a smoker or a non-smoker (ex-smoker/ never-smoker). Smokers were asked about their first smoking attempt, tobacco consumption (number of cigarettes/day), the place where they smoke and their willingness to participate in tobacco cessation activities. Ex-smokers were asked about their age of onset, age of cessation and their reason for withdrawal. The second part included questions about narghile. Between April and June 2013, the questionnaire was distributed by the collaborators at the two Faculties (Medicine, Pharmacy), at 'Fattouma Bourguiba Hospital, the maternity Hospital in Monastir and' Taher Sfar 'Hospital in Mahdia. The study was approved by the Deans of the two Faculties. The students were briefed about the purpose of the research and were invited to participate in, free of charge. Assurance was given about anonymity and confidentiality of the information to be provided. In addition the referents of 'GRASSE2S' group have installed stands and posters at the faculties of Medicine and Pharmacy in order to motivate students to take part in the survey. Moreover, they created many pages on 'Facebook'[28] so that they can spread the information.

Definition of variables: Smoking status was defined as follows: Smokers were subjects who, at the time of the survey, smoked regularly one or more cigarettes per day. Never smokers are subjects who never smoked at all. Ex-smokers are subjects who were smokers prior to the onset of the study. Non-smokers are subject who, at the time of the study, did not smoke. In fact, non-smokers comprised ex-smokers and never smokers. Perceived Stress Scale[29] was used to evaluate the stress among students. Fourteen items were designed to evaluate how unpredictable, uncontrollable, and overloaded respondents find their lives. A replacement-of-missing-value operation was undertaken for the students whose data showed deficits in one item, without affecting the data distribution or mean values. Students whose data showed deficits in more than one item were excluded. The category 'Distress' was defined when the score was equal or more than 50. Body Mass Index (BMI in kg/m^2) was calculated as follow: BMI= (Weight/Hight^2). If BMI was equal or more than 30 kg/m^2, the participant was considered obese[30]. Academic difficulties were used to denote any of the following incidents that a student may experience: passing exams at the retake session, revalidating an internship or repeating a school year. The use of psychotropic drug was defined as the student's declaration of having taken, at least once, anxiolytic drugs or antidepressants for non therapeutic reasons.

Statistical analysis: Statistical Package for Social Science (SPSS) version 17 was used to analyse the data at the Management Information System, Hospital Sahloul, Sousse. We ran frequencies to check any inconsistencies in data entry. Concerning the descriptive study, prevalence with the 95% Confidence Intervals (95% CI), including cross-tabulation, were used for data summarization. Moreover, statistics of central tendency (means and median) and dispersion (standard deviation) were calculated for quantitative variables. In order to identify factors associated with smoking behaviour, we used an univariate analysis as well as a multivariate one. Initially, we performed, separately, a univariate analysis using Chi Square test to compare differences in proportions, with significance level set at $p<0.05$. When the assumptions of the Chi Square test were not fulfilled, we used the Fisher exact test. Crude Odds Ratios (ORc) and their 95% CI were calculated. Finally, we entered the variables showing association in the univariate analysis at $p<0.2$ level, in a multivariate logistic regression model and thus, we ascertained the factors by controlling the effect of potential confounding variables. Then, we calculated adjusted Odds Ratios (ORa) with their 95% CI

RESULTS

We invited 1 556 students (748 Medical students and 808 Pharmacy students) to take part in the study. The number of participants was 634 (285 Medical students and 349 Pharmacy students) corresponding to a response rate of 41%: 38.1% in Medicine and 43.2% in Pharmacy. The majority of participants were female (73.2%) and the sex ratio was 0.36 (0.44 in Medicine and 0.30 in Pharmacy). Ages ranged from 19 to 30 years with a mean of 22.4±2.09 years and a median of 22 years (Figure 1). Characteristics of the study population are displayed in Table 1.

Figure 1: Box Plot of the Age of the 634 students on health sciences at the University of Monastir (Tunisia) in 2013.
*The points in the Box Plot represent the outliers

We found that students often getting financial problems were more in Medicine (17.5%) than in pharmacy (9.7%). Students were distributed as follow: 43.5% in the second year, 30.3% in the fourth year and 26.2% in the sixth year which shows the decrease of the response rate from the first cycle to the second. Most of the students had a personal choice of their faculty (77%), a choice taken essentially for humanitarian reasons (39%) and social status (30.4%). Concerning academic difficulties, 17% of students repeated a school year, 5.5% revalidated an internship and 55.8% passed the retake session.

Table 2 shows that the overall prevalence of smoking was 15%; 95% CI [12.1-17.7]. The prevalence of smoking was nearly five times higher among males compared to females (35.3%; 95% CI [28.1-42.5]) *vs*. 7.5%; 95% CI [5.1-9.9]); It was also higher among Pharmacy students than among Medical students (18.9%; 95% CI [14.8-23.0] vs. (10.2%; 95% CI [6.7-13.7]). Females among Pharmacy students smoked nearly five times more (11.2%) than females among Medical students (2.5%).The 95 smokers smoked for a mean of 4.7±2.5 years and 13±7.6 cigarettes per day. Characteristics of smokers are displayed in table 3. The majority smoked 10 to 20Cigarettes per day (53.7%). They smoked mainly at the faculty (67.4%) and at home (53.7%). The need to smoke was most commonly justified by the desire to cope with stress (32.6%) and to enjoy life (29.5%). The prevalence of students thinking of quitting smoking was 62.1% (66.7% are males), 72.4% in Medicine and 57.6% in Pharmacy.

The prevalence of alcohol consumption was 46.3%; 55% among males and 31.4% among females. In addition, it was twice as high among Pharmacy students (56.1%) as among Medical students (24.1%). Regarding the consumption of cannabis, it concerned 21.1% of smokers, (5.7% are females and 30% are males). The use of psychotropic drug among smokers was 5.3%; 4.5% among Pharmacy students and 6.9% among Medical students.

The results of the univariate analysis are shown in Table 4. Factors found significantly associated with smoking were: establishment of Faculty of Pharmacy, male sex, age ≥25 years, career choice for a non humanitarian reason, academic difficulties and a parent having health occupation.

A multivariate logistic regression model (Table 5) showed three independently factors associated significantly with smoking: *Faculty of Pharmacy* ($p<10^{-3}$, ORa=3.081, 95% IC [1.7-5.7]), *male sex* ($p<10^{-3}$, ORa=6.929, 95% IC [3.9-12.0]) and *academic difficulties* (p=0.043, ORa=1.854, 95% IC [1.02-3.38]).

DISCUSSION

Smoking among health sciences students is an important problem since they are expected to fight the tobacco menace[31]. In this context, our study focused on health-profession students in order to obtain an assessment of smoking prevalence, and behaviors as a first step to improve this role model.

The present study had both advantages and limitations. As a cross-sectional design, it cannot establish trends and causality between smoking and risk factors. Nevertheless,

Table 1: Characteristics of the 634 students on health sciences at the university of Monastir (Tunisia) in 2013 (n,%).

	Medicine						Pharmacy						Total					
	Male		Female		Total		Male		Female		Total		Male		Female		Total	
	(n=88)		(n=197)		(N=285)		(n=82)		(n=267)		(N=349)		(n=170)		(n=464)		(N=634)	
Demographic and educational characteristics																		
Year of study																		
Second year	23	***(26.1)***	87	***(44.2)***	110	***(38.6)***	34	***(41.5)***	132	***(49.4)***	166	***(47.6)***	57	***(33.5)***	219	***(47.2)***	276	***(43.5)***
Fourth year	35	***(39.8)***	54	***(27.4)***	89	***(31.2)***	26	***(31.7)***	77	***(28.8)***	103	***(29.5)***	61	***(35.9)***	131	***(28.2)***	192	***(30.3)***
Sixth year	30	***(34.1)***	56	***(28.4)***	86	***(30.2)***	22	***(26.8)***	58	***(21.7)***	80	***(22.9)***	52	***(30.6)***	114	***(24.6)***	166	***(26.2)***
Reason of choice																		
Humanity	30	***(34.1)***	113	***(57.4)***	143	***(50.2)***	16	***(19.5)***	88	***(33.0)***	104	***(29.8)***	46	***(27.1)***	201	***(43.3)***	247	***(39.0)***
Social status	25	***(28.4)***	43	***(21.8)***	68	***(23.9)***	23	***(28.0)***	102	***(38.2)***	125	***(35.8)***	48	***(28.2)***	145	***(31.3)***	193	***(30.4)***
Wealth	17	***(19.3)***	9	***(4.6)***	26	***(9.1)***	24	***(29.3)***	21	***(7.9)***	45	***(12.9)***	41	***(24.1)***	30	***(6.5)***	71	***(11.2)***
Other	14	(***15.9)***	27	***(13.7)***	41	***(14.4)***	18	***(22.0)***	46	***(17.2)***	64	***(18.3)***	32	***(18.8)***	73	***(15.7)***	105	***(16.6)***
NP	2	***(2.3)***	5	***(2.5)***	7	***(2.5)***	1	***(1.2)***	10	***(3.7)***	11	***(3.2)***	3	***(1.8)***	15	***(3.2)***	18	***(2.9)***
Academic difficulties																		
Retake session	45	***(51.1)***	88	***(44.7)***	133	***(46.7)***	53	***(64.6)***	168	***(62.9)***	221	***(63.3)***	98	***(57.6)***	256	***(55.2)***	354	***(55.8)***
Internship revalidation	14	***(15.9)***	12	***(6.1)***	26	***(9.1)***	8	***(9.8)***	1	***(0.4)***	9	***(2.6)***	22	***(12.9)***	13	***(2.8)***	35	***(5.5)***
Repeating a year	14	***(15.9)***	35	***(17.8)***	49	***(17.2)***	19	***(23.2)***	40	***(15.0)***	59	***(16.9)***	33	***(19.4)***	75	***(16.2)***	108	***(17.0)***
Socioeconomic characteristics																		
Current housing																		
Leasing	44	***(50.0)***	75	***(38.1)***	119	***(41.8)***	67	***(81.7)***	168	***(62.9)***	235	***(67.3)***	111	***(65.3)***	243	***(52.4)***	354	***(55.8)***
With parents	39	***(44.3)***	83	***(42.1)***	122	***(42.8)***	11	***(13.4)***	52	***(19.5)***	63	***(18.1)***	50	***(29.4)***	135	***(29.1)***	185	***(29.2)***
Residence hall	2	***(2.3)***	27	***(13.7)***	29	***(10.2)***	0	-	40	***(15.0)***	40	***(11.5)***	2	***(1.2)***	67	***(14.4)***	69	***(10.9)***
NP	3	***(3.4)***	12	***(6.1)***	15	***(5.3)***	4	***(4.9)***	7	***(2.6)***	11	***(3.2)***	7	***(4.1)***	19	***(4.1)***	26	***(4.1)***
Financial problems																		
Always	4	***(4.5)***	12	***(6.1)***	16	***(5.6)***	15	***(18.3)***	9	***(3.4)***	24	***(6.9)***	19	***(11.2)***	21	***(4.5)***	40	***(6.3)***
Often	13	***(14.8)***	37	***(18.8)***	50	***(17.5)***	11	***(13.4)***	23	***(8.6)***	34	***(9.7)***	24	***(14.1)***	60	***(12.9)***	84	***(13.2)***
Sometimes	48	***(54.5)***	94	***(47.7)***	142	***(49.8)***	42	***(51.2)***	120	***(44.9)***	162	***(46.4)***	90	***(52.9)***	214	***(46.1)***	304	***(47.9)***
Never	21	***(23.9)***	53	***(26.9)***	74	***(26.0)***	14	***(17.1)***	114	***(42.7)***	128	***(36.7)***	35	***(20.6)***	167	***(36.0)***	202	***(31.9)***
NP	2	***(2.3)***	1	***(0.5)***	3	***(1.1)***	0	-	1	***(0.4)***	1	***(0.3)***	2	***(1.2)***	2	***(0.4)***	4	***(6.0)***
Community life																		
Club	25	***(28.4)***	23	***(11.7)***	48	***(16.8)***	16	***(19.5)***	49	***(18.4)***	65	***(18.6)***	41	***(24.1)***	72	***(15.5)***	113	***(17.8)***
RSSF*	6	***(6.8)***	10	***(5.1)***	16	***(5.6)***	19	***(23.2)***	41	***(15.4)***	60	***(17.2)***	25	***(14.7)***	5	***(11.0)***	76	***(12.0)***
NGO†	13	***(14.8)***	18	***(9.1)***	31	***(10.9)***	12	***(14.6)***	33	***(12.4)***	45	***(12.9)***	25	***(14.7)***	51	***(11.0)***	76	***(12.0)***
Political party	4	***(4.5)***	3	***(1.5)***	7	***(2.5)***	10	***(12.2)***	8	***(3.0)***	18	***(5.2)***	14	***(8.2)***	11	***(2.4)***	25	***(3.9)***
Parent have health carrier	29	***(33.0)***	32	***(16.5)***	61	***(21.6)***	31	***(37.8)***	74	***(27.7)***	105	***(30.1)***	60	***(35.3)***	106	***(23.0)***	166	***(26.3)***

*RSSF: Representative Structure for Students at the Faculty †NGO: Non Governmental Organisation, NP: Not Precised

Table 2: Prevalence of smoking among the 634 students on health sciences registered at the university of Monastir (Tunisia) in 2013 (n,%).

	Medicine						Pharmacy						Total					
	Male (n=88)		Female (n=197)		Total (N=285)		Male (n=82)		Female (n=267)		Total (N=349)		Male (n=170)		Female (n=464)		Total (N=634)	
Smokers																		
Second year	8	*(34.8)*	2	*(02.3)*	10	*(09.1)*	15	*(44.1)*	9	*(06.8)*	24	*(14.5)*	23	*(40.4)*	11	*(05.0)*	34	*(12.3)*
Fourth year	10	*(28.6)*	0	-	10	*(11.2)*	7	*(02.9)*	12	*(15.6)*	19	*(18.4)*	17	*(27.9)*	12	*(09.2)*	29	*(15.1)*
Sixth year	6	*(20.0)*	3	*(05.4)*	9	*(10.5)*	14	*(63.6)*	9	*(15.5)*	23	*(28.8)*	20	*(38.5)*	12	*(10.5)*	32	*(19.3)*
Total	24	*(27.3)*	5	*(02.5)*	29	*(10.2)*	36	*(43.9)*	30	*(11.2)*	66	*(18.9)*	60	*(35.3)*	35	*(07.5)*	95	*(15.0)*
Ex- smokers																		
Second year	2	*(08.7)*	1	*(01.1)*	3	*(02.7)*	0	-	0	-	0	-	2	*(03.5)*	1	*(0.5)*	3	*(1.1)*
Fourth year	4	*(11.4)*	1	*(01.9)*	5	*(05.6)*	3	*(11.5)*	1	*(01.3)*	4	*(03.9)*	7	*(11.5)*	2	*(1.5)*	9	*(4.7)*
Sixth year	5	*(16.7)*	0	-	5	*(05.8)*	1	*(04.5)*	1	*(01.7)*	2	*(02.5)*	6	*(11.5)*	1	*(0.9)*	7	*(4.2)*
Total	11	*(12.5)*	2	*(01.1)*	13	*(04.6)*	4	*(04.9)*	2	*(0.7)*	6	*(01.7)*	15	*(08.8)*	4	*(0.9)*	19	*(3.0)*
Never- smokers																		
Second year	13	*(56.5)*	84	*(96.6)*	97	*(88.2)*	18	*(52.9)*	122	*(92.4)*	140	*(84.3)*	31	*(54.4)*	206	*(94.1)*	237	*(85.9)*
Fourth year	21	*(60.0)*	53	*(98.1)*	74	*(83.1)*	16	*(61.5)*	62	*(80.5)*	78	*(75.7)*	37	*(60.7)*	115	*(87.8)*	152	*(79.2)*
Sixth year	19	*(63.3)*	53	*(94.6)*	72	*(83.7)*	7	*(31.8)*	48	*(82.8)*	55	*(68.8)*	26	*(50.0)*	101	*(88.6)*	127	*(76.5)*
Total	53	*(60.2)*	190	*(96.4)*	243	*(85.3)*	41	*(50.0)*	232	*(86.9)*	273	*(78.2)*	94	*(55.3)*	422	*(90.9)*	516	*(81.4)*
NP	0	-	0	-	0	-	1	*(01.2)*	3	*(1.2)*	4	*(1.2)*	1	*(0.6)*	3	*(0.65)*	4	*(0.6)*

*Percentages are calculated by dividing the number of student participants on the total number of students enrolled in the Faculty of the same sex and academic level. NP: Not Precised

Table 3: Characteristics of smoking Habits of the 95 smokers among the 634 students at the University of Monastir (Tunisia) in 2013 (n,%).

	Medicine						Pharmacy						Total					
	Male (n=24)		Female (n=5)		Total (N=29)		Male (n=36)		Female (n=30)		Total (N=66)		Male (n=60)		Female (n=35)		Total (N=95)	
Duration of smoking habit (years)																		
< 4	15	*(62.5)*	2	*(40.0)*	17	*(58.6)*	15	*(41.7)*	11	*(36.7)*	26	*(39.4)*	30	*(50.0)*	13	*(37.1)*	43	*(45.3)*
≥ 4	8	*(33.3)*	3	*(60.0)*	11	*(38.0)*	18	*(50.0)*	6	*(20.0)*	24	*(36.4)*	26	*(43.3)*	9	*(25.8)*	35	*(36.8)*
NP	1	*(4.2)*	0	-	1	*(3.4)*	3	*(8.3)*	13	*(43.3)*	16	*(24.2)*	4	*(6.7)*	13	*(37.1)*	17	*(17.9)*
Frequency of smoking (cigarettes/day)																		
< 10	9	*(37.5)*	2	*(40.0)*	11	*(37.9)*	4	*(11.1)*	6	*(20.0)*	10	*(15.2)*	13	*(21.7)*	8	*(22.9)*	21	*(22.1)*
10-20	11	*(45.8)*	3	*(60.0)*	14	*(48.3)*	25	*(69.4)*	12	*(40.0)*	37	*(56.1)*	36	*(60.0)*	15	*(42.9)*	51	*(53.7)*
> 20	2	*(8.3)*	0	-	2	*(6.9)*	5	*(13.9)*	0	-	5	*(7.6)*	7	*(11.7)*	0	-	7	*(7.4)*
NP	2	*(8.3)*	0	-	2	*(6.9)*	2	*(5.6)*	12	*(40.0)*	14	*(21.2)*	4	*(6.7)*	12	*(34.3)*	16	*(16.8)*
Reasons for smoking																		
To cope with stress	10	*(41.7)*	1	*(20.0)*	11	*(37. 9)*	14	*(38.9)*	6	*(20.0)*	20	*(30.3)*	24	*(40.0)*	7	*(20.0)*	31	*(32.6)*
Enjoyment	6	*(25.0)*	1	*(20.0)*	7	*(24. 1)*	13	*(36.1)*	8	*(26.7)*	21	*(31.8)*	19	*(31.7)*	9	*(25.7)*	28	*(29.5)*
Lifestyle	3	*(12. 5)*	1	*(20.0)*	4	*(13. 8)*	1	*(02. 8)*	0	-	1	*(1. 5)*	4	*(6.7)*	1	*(2.9)*	5	*(5.3)*
Academic performance	2	*(8.3)*	1	*(20.0)*	3	*(10. 3)*	1	*(02. 8)*	1	*(03.3)*	2	*(3.0)*	3	*(5.0)*	2	*(5.7)*	5	*(5.3)*
Fear of gaining weight	0	-	1	*(20.0)*	1	*(3. 4)*	0	-	1	*(03.3)*	1	*(1. 5)*	0	-	2	*(5.7)*	2	*(2.1)*
Other reasons	1	*(4. 2)*	0	-	1	*(3.4)*	4	*(11.1)*	1	*(03.3)*	5	*(7.6)*	5	*(8.3)*	1	*(2.9)*	6	*(6.3)*
Place of smoking																		
Faculty	17	*(70.8)*	5	*(100.0)*	22	*(75.9)*	30	*(83.3)*	12	*(40.0)*	42	*(63.6)*	47	*(78.3)*	17	*(48.6)*	64	*(67.4)*
Home	10	*(41.7)*	5	*(100.0)*	15	*(51.7)*	22	*(61.1)*	14	*(46.7)*	36	*(54.5)*	32	*(53.3)*	19	*(54.3)*	51	*(53.7)*
Hospital	9	*(37.5)*	4	*(80.0)*	13	*(44.8)*	8	*(22.2)*	0	-	8	*(12.1)*	17	*(28.3)*	4	*(11.4)*	21	*(22.1)*
Thinking to quit smoking	18	*(75.0)*	3	*(60.0)*	21	*(72.4)*	22	*(61.1)*	16	*(53.3)*	38	*(57.6)*	40	*(66.7)*	19	*(54.3)*	59	*(62.1)*

NP: Not Precise

Table 4: Factors associated with smoking behavior among the 634 students on health sciences at the University of Monastir (Tunisia) in 2013 (univariate analysis)a) Demographic and educational factors:
a) Demographic and educational factors:

	N	Smokers n	Smokers %	P	ORc‡	95% CI§
Demographic factors						
Establishment						
Medicine	285	29	***(10.2)***	0.002	1	
Pharmacy	349	66	***(19.1)***		2.088	[1.307-3.336]
Sex						
Female	464	35	***(7.6)***	$<10^{-3}$	1	
Male	170	60	***(35.5)***		6.699	[4.200-10.686]
Age (years)						
< 25	523	70	***(13.5)***	0.016	1	
≥ 25	111	25	***(22.5)***		1.865	[1.118-3.110]
Marital status						
Married	28	3	***(10.7)***	0.784	1	
Single	561	83	***(14.9)***		1.459	[0.431-4.943]
Having children						
No	627	93	***(14.9)***	0.285	1	
Yes	7	2	***(28.6)***		2.280	[0.436-11.924]
Educational factors						
Cycle of study						
Extern	468	63	***(13.6)***	0.078	1	
Intern	166	32	***(19.3)***		1.520	[0.952-2.428]
Choice of career						
Other*	144	20	***(14.7)***	0.928	1	
Personal	490	73	***(15.0)***		1.025	[0.600-1.752]
Reason of choice						
Humanitarian	247	24	***(9.8)***	0.002	1	
Other reason†	387	70	***(19.1)***		2.187	[1.333-3.589]
Control session						
No	269	27	***(10.1)***	0.003	1	
Yes	354	66	***(18.8)***		2.067	[1.280-3.339]
Revalidation of internship						
No	565	81	***(14.4)***	0.070	1	
Yes	35	9	***(25.7)***		2.056	[0.929-4.546]
Repeating a year						
No	498	66	***(13.3)***	0.009	1	
Yes	108	25	***(23.4)***		1.982	[1.181-3.325]
Academic difficulties						
No	254	23	***(9.1)***	0.001	1	
Yes	367	69	***(19 .0)***		2.339	[1.415-3.866]

*Familial choice or suggestion of friends †Social status or wealth or other ‡Crude Odds Ratio §: Confidence Interval

b) **Health and socioeconomic factors**

	N	Smokers		p	ORc††	95% IC‡‡
		n	%			
Health factors						
Having a chronic disease						
No	599	89	***(15.0)***	0.670	1	
Yes	34	6	***(17.6)***		1.218	[0.490-3.027]
Having a sick parent						
Yes	255	33	***(13.0)***	0.187	1	
No	362	61	***(16.9)***		1.360	[0.860-2.150]
Sport practice						
No	440	46	***(10.5)***	$<10^{-3}$	1	
Yes	179	42	***(23.7)***		2.671	[1.671-4.207]
Stress						
Distress	194	26	***(12.1)***	0.412	1	
Eustress	313	51	***(14.5)***		1.236	[0.745-2.050]
Socioeconomic factors						
Current housing						
With parents	185	22	***(11.9)***	0.168	1	
Other*	449	68	***(16.2)***		1.435	[0.857-2.403]
Having a source of income†						
Yes	180	24	***(13.4)***	0.496	1	
No	439	68	***(15.6)***		1.190	[0.721-1.966]
Financial problems						
No	202	16	***(8.0)***	0.001	1	
Yes‡	428	78	***(18.3)***		2.578	[1.462-4.543]
Community life						
No	415	54	***(13.1)***	0.121	1	
Yes§	197	35	***(17.9)***		1.441	[0.906-2.293]
A parent having health carrier						
Yes	166	38	***(22.9)***	0.001	1	
No	453	56	***(59.6)***		2.083	[1.318-3.293]
Social status of parents						
Together	559	84	***(15.1)***	0.786	1	
Separated**	63	10	***(16.4)***		1.104	[0.539-2.260]

*: Leasing or residence hall
†: Scholarship or lean or job
‡: Always or often or sometimes
§: Club or Representative Structure for Students or Non Governmental Organization or Political party
**: Divorced or immigrant or passed away
††: crude Odds Ratio
‡‡: Confidence Interval

Table 5: Factors associated with smoking behavior among the 634 students on health sciences at the university of Monastir (Tunisia) in 2013 (multivariate analysis).

			Univariate analysis			Multivariate analysis		
	Risk factor	**Reference**	**p**	**Crude OR***	**95% CI†**	**p**	**Adjusted OR***	**95% CI†**
Establishment	Pharmacy	Medicine	0.002	2.088	[1.307-03.336]	**$<10^{-3}$**	**3.081**	**[1.674-05.671]**
Sex	Male	Female	$<10^{-3}$	6.699	[4.200-10.686]	**$<10^{-3}$**	**6.929**	**[3.995-12.017]**
Age (years)	≥ 25	< 25	0.016	1.865	[1.118-03.110]	0.269	1.604	[0.694-03.709]
Cycle of study	Intern	Extern	0.078	1.520	[0.952-02.428]	0.590	1.238	[0.569-02.694]
Reason of choice	Non humanitarian	Humanitarian	0.002	2.187	[1.333-03.589]	0.165	1.516	[0.843-02.728]
Academic difficulties	Yes	No	0.001	2.339	[1.415-03.866]	**0.043**	**1.854**	**[1.019-03.376]**
Current housing	Without parents	With parents	0.168	1.435	[0.857-02.403]	0.983	0.993	[0.529-01.866]
Financial problem	Yes	No	0.001	2.578	[1.462-04.543]	0.133	1.646	[0.859-03.152]
Community life	Yes	No	0.121	1.441	[0.906-02.293]	0.903	0.966	[0.556-01.678]
Parent having health career	No	Yes	0.001	2.083	[1.318-03.293]	0.690	0.959	[0.782-01.177]

*: Odds Ratio †: Confidence Interval

the majority of studies about this topic have been cross-sectionals and they are widely reported to calculate the prevalence and identify risk factors[32, 33]. In addition, as smoking behavior among students was self-reported, there could have been reporting information bias. However, since the questionnaire was completed anonymously and the topic wasn't a taboo, it was anticipated that this situation would be minimized. To avoid selection bias, we included not only Medical school but also Pharmacy. In the beginning, this study was planned to be carried out at the Faculties of Medicine, Pharmacy and Dentistry. Unfortunately, operational difficulties have been noted in the faculty of Dentistry, despite the support of the dean. We had chosen three academic years (a tracer year from each cycle) and we have diversified the places and the circumstances of collecting data (during course, internship, in the library, in the hospital…). Despite the recent emergence of the narghile use in Tunisia and other Arab countries and its associated claims of reduced harm[34, 35], this study focused only on cigarettes. Indeed, we considered important to devote a specific study for the narghile and thus, a particular section for this issue was synthesized in the questionnaire. Although participation in this study was neither compulsory nor rewarded, we obtained an acceptable response rate (41%) compared to other studies[36].

Prevalence of smoking

The data revealed that a total of 15% of students (35.3% of male students and 7.5% of female students) were smokers. Considering the pressing need for health care professionals to work toward reducing the rates of smoking[2], this prevalence is a cause for concern and should be alarming. It shows failure of health school curriculum to invoke health conscious behavior among educators and thus, a failure of their role model in society. The little available information in Tunisia indicates that, previously, the prevalence was comparable, ranging from 29.6% to 31.8% for males and from 0.7% to 3.3% for females among Medical students21, 24 This prevalence was lower than that found in a recent study2 (32,6%) carried out among Nursing students in Sousse, Tunisia in 2013. In addition, the prevalence found by the present study was higher than that detected in neighboring countries such as Morocco where it ranges from 3.2% among female to 25.7% among males[37]. Worldwide, it was higher than that found in Syria (6.8%)32 and India (6.6%)38, it was comparable to those in Spain (13% to 15%)39 and Poland (13%)40, but lower than that found in Turkey 19.6% 41and China (26.8%)[42]. The overall prevalence among health sciences students (15%) was lower than that among the general population (31.6%)43. These data confirm the trend reported in other recent studies (Spain[39], Greece[44],

Japan[45]). The prevalence of smoking among female students (7.5%) was higher than that among females in the general population (1%)[11]. This result shows the importance of smoking among females in this specific population. The sex ratio of tobacco smokers is also interesting to study. It was nearly five times more common among male students compared to female students. This is, in fact, a typical feature of Mediterranean countries[46, 47,] due to the unfavorable perception of women smoking in society. In other countries like Syria[32] and Turkey[41], the prevalence of smoking was also higher among males than females. However, in Tunisia, the prevalence of females' smokers is still high [21]. Smoking among women students was probably fuelled by a more 'liberal' attitude toward women[21] and also the marketing of lighter cigarettes meant for women by the tobacco industry[48]. Particularly noteworthy in the present data is that the prevalence of smoking among Pharmacy students was higher (18.9%) than that among Medical students (10.2%) which could be attributed to the fact that tobacco-related issues are discussed in more detail in Medical training with externs and interns. This likely accounted for the greater likelihood that Medical students are more confronted to the harmful effects of smoking compared to Pharmacy students[49]. Other studies havecompared the prevalence of smoking between different fields of health sciences[50-52]. A study conducted in Brazil among 782 students showed that the highest rates of smoking were found among Pharmacy students (29.6%)[51]. Findings of a report from the Global Health Professional Survey in 2005 indicated also that the prevalence in Pharmacy (47.1%) was higher than in Medicine (43.3%)[52]. Moreover, the prevalence of smoking in the present study was higher among students in the sixth year (19.3%) than among students in the second year (12.3%). This increase during academic years was also showed in others studies in Tunisia[2, 24] and France[53].

Profile of the smokers

Concerning smokers, it was observed that most of them have smoked for less than four years. The frequency of smoking was 10 to 20 cigarettes per day for the majority. This frequency was higher than that found in China (less than 5 cigarettes/day for the majority)[33] and in Japan (less than 10 cigarettes/day)[54]. The most common reason for smoking was to cope with stress (32.6%). Undoubtedly, it is a general conviction that smoking helps people ease up stress and forget about their weaknesses. In the literature, studies have shown that the most common reason for smoking among health sciences students was to cope with stress (55)% in Sousse, Tunisia[2], to relax (38.5%) in Saudi Arabia[55], and for curiosity (62.3%) in Poland[56]. It is worth mentioning that 67.4% smoked at the faculty. In addition, the results of the present study showed that six of ten smokers were thinking to quit. Isn't this an encouraging finding which offers us both hope and challenge? The prevalence of smokers thinking to quit was higher in Medicine (72.4%) than in Pharmacy (57.6%). It may be due to the fact that Medical curriculum make students more aware of the harmful effects of smoking more than the Pharmacy one. The rate of those willing to quit smoking in Japan was comparable to that found in the present study (more than 50%)[45], but in Saudi Arabia it was higher (92.3%)[55]. However, given that they were still smoking, many students failed to quit because of the dependency and the wish to avoid the unpleasant symptoms accompanying the lowering of nicotine concentration in blood. But is it the only dependency among smokers?

Co-addiction among smokers

Results found that 43.6% of smokers consumed alcohol (55% for males and 31.4% among females). In Greece, a study carried out among Medical students has shown that 35.6% of male and 34.7% of female smokers consumed alcohol[44]. In fact, the co-occurrence of alcohol and nicotine addiction in humans is well documented[57] and studies have also demonstrated a significant association between alcohol drinking and tobacco use[58]. In addition, this prevalence was higher among Pharmacy smoking students (56.1%) than Medical smoking students (24.1%). It could be due to the fact that Pharmacy students are wealthier than Medical students. In fact, studies have shown that monthly family income was significantly associated with alcohol use[59]. Moreover, results found in the present study showed that 21.1% of smokers consumed cannabis and 5.3% consumed psychotropic drug. In the literature, several studies documented an association between cigarette smoking and substance use[60, 61]. Despite the importance of cannabis use in the Arab world[62, 63] studies concerning association between smoking and cannabis use are rare. MY Khan has found in his study carried out among university students in Peshawar that the most frequent co-addiction among smokers was marijuana (cannabis) with a prevalence of 50%, followed by alcohol (43.8%) and other substances (6.2%)[64]. The present study revealed that drug use was more frequent among Medical smoking students (6.9%) than among Pharmacy smoking students (4.5%). It can be explained by the fact that drugs are more disposable in the Hospital. This important co-addiction among smokers highlight the need to develop anti-smoking programs and to particularly cope with the factors associated.

Factors associated to smoking

Three factors significantly associated were detected in the multivariate analysis: male sex, Faculty of Pharmacy and academic difficulties. Indeed, it is clear that sex is a factor strongly associated with smoking and it has been demonstrated previously in the medical literature[3, 18, 45]. In addition, being a student in Pharmacy was significantly associated with smoking. A study carried out in Turkey has shown also that the lowest prevalence of smoking was found in Medicine[65]. The main factor is certainly academic difficulties. A study carried out in India[66] showed that academic failure was significantly more prevalent among students who reported the use of chewing tobacco or cigarettes, as compared with non-smokers. Students with academic difficulties had greater social susceptibility for smoking, and poor knowledge and self-efficacy for avoiding tobacco[66]. Indeed, the academic difficulties would lead to a bad social integration reflecting difficulties of communication with friends and parents. This fact can cause a high level of stress leading to a smoking behavior in order to deal with stress. Chalmers reported in his study that the perceived stress influenced the use of cigarettes[67]. Given that Medical training causes anxiety, which negatively affects the mental health of students[68], this training may possibly have an indirect negative effect on smoking. Naquin et al showed that students who smoked experienced higher stress levels than students who did not smoke [69]. These findings demonstrate that students do not, in fact, know adequately the relationship between stress and smoking or cannot find an effective coping method to replace smoking. In the present study, results didn't find a significant association between stress and smoking.

Absence of a role model

An overview of the present study stresses the high prevalence of smoking among students with increasing rates among females, an important co-addiction among smokers and a risky educational environment. Students' negative beliefs and their own unhealthy behavior may have consequences on their preventive work[70, 71]. It contradicts the message to smokers that quitting is important. Smoking health sciences students in Kuwait were also significantly less likely to agree with their professional responsibility to help smokers quit than were non-smoking students[72]. These findings suggest that smoking cessation interventions would need to be heedful of the influence of the role model on their target population.

Propositions

The question then is what this study adds? Otherwise how it could pave the way for developing health education and tobacco control programs? The first step is offering services for students. Cooperative means in the Faculty are important to enhance students' efforts, including workshops, conferences and collaborative initiations. Universities can also offer psychological support for students to deal with failure and stress. As such, tobacco cessation strategies should encourage healthy behaviors. There should be strong policies that will ensure a smoking free environment in institutions of health sciences. It can reduce the accessibility of tobacco and may discourage initiation and boost the success rates of smokers willing to quit[73]. Second, as it was proposed in other studies[32, 42, 74], tobacco education programs should be introduced into school curricula. One of the major barriers is time constraints and an already overloaded curriculum. For that it was suggested[74] to provide examples of how other schools have successfully addressed the problem. These examples can serve as models to follow and thus students will appreciate that the extra effort involved is worthwhile[74]. Finally, it would be of great interest to extend the study to other regions in Tunisia and to focus on other future health professionals (dentists, nurses).

To conclude, this study has found a high prevalence of smoking accounted for three associated independently factors (male sex, Faculty of pharmacy and academic difficulties). The present study confirms that tobacco smoking is still an important problem among Medical and Pharmacy students. More collaboration is needed to enhance anti-smoking interventions and to make the Faculties of health sciences a tobacco free environment and to improve the role model of students as future health professionals.

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