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Smoking prevalence among university students, Minia, Egypt

Shaimaa Moustafa Hafez
Public Health Assistant lecturer, Department of Public Health and Preventive Medicine, Minia University, El Minia 61511, Egypt
Corresponding author email: shaimaamoustafa400@yahoo.com

Eman Ramadan Ghazawy
Public Health Assistant Professor, Department of Public Health and Preventive Medicine, Minia University 61511, El Minia 61511, Egypt
Email: emanghazawy@yahoo.com

Eman Mohamed Mahfouz
A Public Health Professor, Department of Public Health and Preventive Medicine, Minia University, El Minia 61511, Egypt
Email: emanmahfouz39@yahoo.com

Tarek Ahmed Abd-El Rahman
Public Health Assistant Professor, Department of Public Health and Preventive Medicine, Minia University, El Minia 61511, Egypt
Email: Tarek1.mohamed@mu.edu.eg

Shimaa Anwer Emam
A Public Health Lecturer, Department of Public Health and Preventive Medicine, Minia University, El Minia 61511, Egypt
Email: shimaa_anwer3@yahoo.com

***Abstract*---**Cigarette smoking remains the leading cause of preventable disease, disability, and death, killing more than 8 million people a year around the world. Young adults and youths are the vulnerable group which the smoking companies focus on their markets. University students have higher risk to develop smoking habit because they start showing independency; friends have great influence on their behaviours, seeking attraction and popularity as well as being exposed to great social and emotional stresses. This study is conducted to Detect of smoking prevalence among university students, smoking influencing factors and to assess smoking index and its determining factors. This cross-sectional study was conducted among undergraduate students in Minia University, Minia, Egypt, during the period from March–to May, 2019 among 714 students;

(426 from Faculty of Medicine and 288 from faculty of Arts and social sciences), using a self-administered questionnaire which include demographic characteristics including age, gender, type of college, study grade, nationality, family structure, socio-economic status and residence status. Smoking history was taken and smoking index was calculated for smokers= (Number of cigarettes per day × number of smoking years). (96.6%) of students are non-smoker, (2.8%) are smoker and only (0.6%) are ex-smoker, smoking prevalence is significantly higher in male (7.6%), international students (10%), also there is a non-significant higher prevalence among rural (3%), theoretical (4.5%) and non-resident students (3.1%). Higher age, male students and theoritical faculty students are 1.69, 28.9 and 5.8 times respectively significantly more likely to be smoker. Smoking risk and predictors among university students could be measured more precisely if samples were to be collected from different universities. And as this study is cross-sectional, we can only assess associations and not causality. Although, the prevalence of smoking in this study was very low but still there is a great needs for organization of frequent anti-tobacco campaigns in universities and public places with involvement of the students as educators.

***Keywords*---**smoking prevalence, university students, preventable disease, Egypt.

Introduction

Tobacco smoking among young adults has become a global health concern, leads to disease and disability and harms nearly every organ of the body. There are about 1.07 billion smokers worldwide, of whom 908 million are men and 162 million are women, with the majority from low- and middle-income countries. Cigarette smoking remains the leading cause of preventable disease, disability, and death, killing more than 8 million people a year around the world. More than 7 million of those deaths are the result of direct tobacco use while around 1.2 million are the result of non-smokers being exposed to second-hand smoke. All forms of tobacco are harmful, and there is no safe level of exposure to tobacco (WHO, 2021).

In Egypt, tobacco consumption is steadily increasing through years and imposes public health burden (Hanafy et al., 2010). The number of tobacco users has greatly increased in Egypt over the last decade (Foada et al., 2018). Last Egypt Stepwise Survey 2017 showed that (22.8%) of the Egyptians older than 18 years old are current tobacco smokers with almost (1.6%) reduction in smokers' number than the previous survey which was held in 2012 (WHO, 2017). In 2021, The Prevalence of moking in egypt increased to be 24.4% (WHO, 2021), according to the study conducted among university students in cairo, the prevalence of smoking among students was 24.2% (Atwa et al., 2019).

Smoking affects almost every organ in the human body (such as circulatory, respiratory, gastrointestinal and musculoskeletal systems), increases the risk for

several diseases, and reduces the health of smokers in general. The key effect of smoking cigarettes is primarily on the lungs with approximately 85% of chronic obstructive pulmonary disease (COPD) and lung cancer and about 33% of other cancers (i.e., esophagus, oral cavity, uterus, stomach, and pancreas) related to smoking (Leshargie et al., 2019)

Young adults and youths are the vulnerable group which the smoking companies focus on their markets. University students have higher risk to develop smoking habit because they start showing independency; friends have great influence on their behaviours, seeking attraction and popularity as well as being exposed to great social and emotional stresses (Almutairi, 2010 *and* Halperin et al., 2010).

The primary factors associated with student smoking status include socioeconomic status, family/friends, smoking behavior, alcohol use, sex, faculty, year of education, and residing with friends. However, diverse geographical regions have different risk factors due to their cultural-sociological differences (Eticha and Kidane, 2014). Also, it could be related to alleviation of stress, life problems, peer pressure, social acceptance, family history of smoking, lower parents' educational level, and the desire to attain high personality profile (Amin et al., 2016)

Aim of study

1- Detection of smoking prevalence among university students.
2- Detection of smoking influencing factors.
3- Assesement of smoking index and its determining factors.

Methodology

This cross-sectional study was conducted among undergraduate students in Minia University, Minia, Egypt, during the period from March–to May, 2019. Minia University is composed of 20 Faculties, and the sample was chosen randomly from students studying inside the main campus, which harbours 16 Faculties (faculties of Science, Pharmacy, Medicine, Nursing, Education, Physical Education, Art Education, Specific Education, Kindergarten Education, Fine Arts, Tourism and Hotels, Alsun, Dar Al-Uloum, Computer and ITCs Science and Law).

A simple random sample technique was used to select students. The sample size was calculated according to this formula: $n = [z^2 - p\ (1 - p)]/e^2$, where n = sample size, z = is the 95% confidence level (CI), p = expected prevalence of smoking among students (24.3%) and e = the 5% margin of error. Accordingly, the minimum sample size needed was 283 students; however, to increase the validity and the power of the study, we invited randomly triple the minimum sample size, 849 students, to participate in the study. Of whom 135 students refused to participate. Thus, a total 714 students; (426 from Faculty of Medicine and 288 from faculty of Arts and social sciences) were included in the study, with a response rate of 84%.

Data collection

Participants were asked to complete a self-administered questionnaire which include demographic characteristics including age, gender, type of college, study grade, nationality, family structure, socio-economic status and residence status. Smoking history was taken and smoking index was calculated for smokers= (Number of cigarettes per day × number of smoking years).

Based on pack-years of smoking, subjects were classified as (Lee et al., 2011 and Feng et al., 2018).

- never smokers (0.0 pack-years),
- light smokers (0.1-20.0 pack-years), less than 400
- moderate smokers (20.1-40.0 pack-years), 400- 799
- and heavy smokers (> 40 pack-years) >= 800

Results

Table (1): Personal characteristics of the studied college students, Minia University, 2020

Socio-demographic characteristics	Mean ± SD or N (%)
Age (years)	19.89 ± 1.47 (17-28)
Sex Male Female	 238 (33.3%) 476 (66.7%)
Residence Urban Rural	 313 (44.7%) 395 (55.3%)
Nationality Egyptian International	 704 (98.6%) 10 (1.4%)
Faculty Practical Theoretical	 426 (59.7%) 288 (40.3%)
Grades First grade Fourth grade	 399 (55.9%) 315 (44.1%)
Housing type with family university residence Private residence	 420 (58.8%) 122 (17.1%) 172 (24.1%)

As shown in table (1), the age of study participants ranges from (17-28) years with a mean of (19.89 ± 1.47). Female students (66.7%) are more than males (33.3%), and more than half of participants (55.3%) reside in rural areas. The majority of students are Egyptian, only 10 students are international. From all the studied

students, 426 (55.7%) Studying at practical faculty (Faculty of Medicine) and 288 (40.3%) studying at theoretical faculty (Faculty of Arts and social sciences). About (56%) at first grade and (44%) at fourth grade. (58.8%) of students are non-resident living with their family, (17.1%) of students live at university residence and (24.1%) of them live in private off campus residence**.**

Table (2): Smoking status of the studied college students, Minia University, 2020

Smoking status	Mean ± SD or N (%)
Smoking status	
Smoker	20 (2.8%)
Ex-smoker	4 (0.6%)
Non smoker	690 (96.6%)
Smoking type:	20
Cigarette only	1 (5%)
Shisha only	4 (20%)
Both cigarette and shisha	15 (75%)
Smoking index:	64 ± 115.91
light smokers (<400)	15 (93.8%)
moderate smokers (400-799)	1 (6.2%)
heavy smokers (≥800)	0
Causes of smoking cessation:	
Affect my health	3 (75%)
Know its dangers	1 (25%)
cost	0

Regarding smoking status in table (26), (96.6%) of students are non-smoker, (2.8%) are smoker and only (0.6%) are ex-smoker. (75%) of smokers, smoke both cigarette and shisha, (93.8%) of cigarette smokers are light smoker with smoking index (64 ± 115.91). (75%) of ex-smoker reported that health problems of smoking as a most common cause of smoking cessation.

Table (3): Sociodemoraphic factors affecting moking status of the studied college students, Minia University, 2020

Smoking status	Smoker N= (20)	Non-smoker N= (690)	Ex-smoker N= (4)	P-value
Sex				
Male	18 (7.6%)	216 (90.8%)	4 (1.7%)	<0.0001*
Female	2 (0.4%)	474 (99.6%)	0 (0%)	
Residence				
Urban	8 (2.5%)	308 (96.6%)	3 (0.9%)	0.4
Rural	12 (3%)	382 (96.7%)	1 (0.3%)	
Nationality				
Egyptian	19 (2.7%)	682 (96.9%)	3 (0.4%)	<0.0001*
International	1 (10%)	8 (80%)	1 (10%)	

Faculty Practical Theoretical	 7 (1.6%) 13 (4.5%)	 417(97.9%) 273 (94.8%)	 2 (0.5%) 2 (0.7%)	 0.06
Grades First grade Fourth grade	 10 (2.5%) 10 (3.2%)	 386 (96.7%) 304 (96.5%)	 3 (0.8%) 1 (.3%)	 0.6
Housing type with family university residence Private residence	 13 (3.1%) 3 (2.5%) 4 (2.3%)	 407 (96.7%) 117 (5.9%) 166 (96.5%)	 0(0%) 2(1.6%) 2(1.2%)	 0.1

* p value was calculated by using Chi-square test.

As shown in table (3), smoking prevalence is significantly higher in male (7.6%), international students (10%), also there is a non-significant higher prevalence among rural (3%), theoretical (4.5%) and non-resident students (3.1%).

Table (4): Multiple logistic regression analysis for factors affecting smoking status among college students, Minia University, 2021

Independent variables	Adjusted odds (95% CI)	P-value
Age	1.69 (1.17 - 2.44)	0.005*
Sex Male Female	 28.91 (6.22 - 134.35) Ref	0.000*
Residence Rural Urban	 1.31 (0.46 - 3.69) Ref	0.6
Nationality International Egyptian	 3.85 (0.23 - 65.59) Ref	0.3
Faculty Theoretical Practical	 5.88 (1.88 - 18.39) Ref	.002*
Grade First Fourth	 1.17 (0.31 - 4.40) Ref	0.8
Housing status Non-resident University Private	 1.88 (0.45 - 7.94 1.19 (0.20 - 7.09) Ref	0.6 0.3 0.8

Table (4) illustrates the associations between various factors and smoking status. Higher age, male students and theoritical faculty students are 1.69, 28.9 and 5.8 times respectively more likely to be smoker with adjusted OR (95%CI) 1.69 (1.17 - 2.44) for age, 28.91 (6.22 - 134.35) for male sex and 5.88 (1.88 - 18.39) for theoretical faculty.

Discussion

Regarding smoking status in the present study, (96.6%) of students were non-smoker, (2.8%) were smoker and only (0.6%) were ex-smoker (Table 2), a study conducted in Saudi Arabia revealed that smoking prevalence among its university students was (9.5%) (Abd El Kader and Al Ghamdi, 2018), and a higher prevalence of the smokers among Cairo university students was (24.2%) (Atwa et al., 2019).

As regard smoking type, (75%) of smokers in the present study, smoke both cigarette and shisha (Table 2), in the study conducted by (Atwa et al., 2019), the majority of the smokers and ex-smokers preferred smoking shisha (75%) and electronic cigarettes (59%) most, while World Health Organization Survey among university students in 2014, revealed that students preferred smoking cigarettes than shisha (World Health Organization, 2014).

Smoking prevalence was higher in male students than females (Table 3) and the multivariate adjusted odds ratio was 28.91 (6.22 - 134.35) (Table 4), This is in agreement with the study of Eid *et al.*, which found that the prevalence of current smokers among male students was significantly higher than that among female students (28.5 vs. 0.9%), and attributed this to the culture of the Egyptian society (Eid et al., 2015). This is in agreement with many studies carried out in Mediterranean and Arab countries that reported a significantly higher prevalence of smoking among men, which may be because of the social acceptability of smoking habits among men (Haddad and Malak,2002).

Smoking more common among theoretical faculty students than practical students (Table 3), also theoretical faculty students are 5.8 more likely to be smoker with an adjusted odds 5.88 (1.88 - 18.39) (Table 4), this can be explained as theoretical faculties' students might have more time to socialize and gathering meetings which mostly accompanied with smoking any type of tobacco products in addition to the exposure to the friends' pressure to smoke**,** also practical faculties' students are more oriented by the negative social and harmful effects of smoking as they are linked to the scientific field than other students.
These results were collectively agreed with the higher prevalence of smoking among theoretical faculties' students, who have the double risk to be smokers than practical faculties' students (Atwa et al., 2019).

In multiple linear regression, higher age of students was significantly associated with smoking more than younger students (Table 4), older students had more friend ships and more peer pressure chances for smoking than first year students who were still affected by parental supervision and have no experiences.This was similar to the study of prevalence and determinants of smoking status among university students in Turkey, where the overall smoking prevalence increases with age and in comparison, of first and last year students, smoking prevalence was higher among last-year students compared to first-year students (Ozcebe et al., 2014)

In contrast, in studying Smoking patterns, attitudes and motives among 2-year versus 4-year college students, it was found that higher rates of smoking among

2-year college students in comparison with 4-year university students (Berg et al., 2011). According to housing status in the present study, smoking more common in non-resident students (3.1%) followed by university residents (2.5%) then private residents (2.3%) but with no statistically significant difference (p-value > 0.05) (Table 3), this could be due to strict regulations inside residence halls against smoking.

This could be explained by results of a national study that declared that cigarette use by college students in smoke-free housing was significantly lower among residents of smoke-free housing (21.0%) as compared with residents of unrestricted housing (30.6%, p<0.0001) (Wechsler et al., 2001). Contradictory, another study of prevalence and determinants of cigarette smoking among university students showed that living in smoke-free residency (OR:1.29; CI:1.05-1.59), had positive association with current smoking (p<0.05) (Karadoğan et al., 2018)

Another study determining prevalence and factors associated with cigarette smoking among resident university students in Bangladesh, revealed overall prevalence of cigarette smoking among university resident students was 32.6% (Ahmed et al., 2020), Also prevalence of substance abuse specially related to smoking among university dormitory students of Shahid Beheshti University of Medical Sciences, Iran, was 15.4% (Babaei Heydarabadi et al., 2015). The students living in dormitories are more vulnerable to drug abuse and smoking due to the lack of parental supervision and the impact of peer pressure.

Conclusion

Smoking prevalence was very low among studied students (2.8%), (75%) of smokers, smoked both cigarette and shisha, (93.8%) of cigarette smokers were light smoker with smoking index (64 ± 115.91). (75%) of ex-smoker reported that health problems of smoking as a most common cause of smoking cessation. smoking prevalence is significantly higher in male (7.6%), international students (10%), also there is a non-significant higher prevalence among rural (3%), theoretical (4.5%) and non-resident students (3.1%). The most important predictors in determining of smoking status were, age , sex and student faculty.

Recommendation

1- Smoking risk and predictors among university students could be measured more precisely if samples were to be collected from different universities. And as this study is cross-sectional, we can only assess associations and not causality
2- Although, the prevalence of smoking in this study was very low but still there is a great needs for:
   - Organization of frequent anti-tobacco campaigns in universities and public places with involvement of the students as educators.
   - Development of smoking cessation clinics inside the universities and motivate the students to visit them for free.
   - Setting up strict rules to prohibit smoking in public universities.

- Introduction of compulsory periodic antitobacco workshops for all university students.
- Raising up the public awareness to the importance of the familial supportive role and supervision to protect our sons and daughters from all hazards including smoking and addiction.
- Potential interventions could include campus-wide smoking bans, increased social/sport entertainment, and more educational activities about the health risks associated with smoking.

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