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Prevalence and factors influencing smoking among medical students

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***Abstract*---**Background: Smoking creates a severe threat to the public's health that has been expanded worldwide, and it is considered a significant cause of illness and mortality. Objectives: The study's objectives are to identify the prevalence and determine the factors that motivate young adults to smoke and perceive their feelings after smoking. Methods: A descriptive study was conducted in Sudan during the year 2022 among 243 medical students registered in five educational levels and was chosen based on the criteria. Data was collected via an online questionnaire, analyzed by the SPSS program, and presented in tables and graphs. Results: The study enrolled 243 participants; 66.70% were male and 33.30% female; the male-to-female ratio was 2:1, as 63.0% in the age group of 27-35 and 37 were between 18 and 26 years. The prevalence of smoking was 18.10% and was found to have a strong relationship with males, while 47.30% were exposed to passive smoking. About 72.7% of smokers stated that they would have been smoking for less than 10 years, 68.18% smoked less than 10 cigarettes daily. The factors motivating students to smoke were psychological stress, influenced by friends, curiosity and experimentation, anxiety, and depression, which were found to be 59.10%, 40.90%, 34.10%, 31.80%, and 22.70 and 50% perceive feelings of psychological comfort, followed by 22.70% increased concentration, 20.5% physical comfort. In comparison, 9.10% expressed other feelings, and a few students experienced feelings of increased energy. Conclusion: The study revealed that the prevalence of smoking among university students was high, even among female students. Smoking cigarettes is a severe issue among medical students, exacerbated by socio-demographic and family-related factors.

***Keywords*---**prevalence, influencing factors, smoking, medical students, perceived feelings.

Introduction

Smoking is one of the non-communicable disease deaths that are most easily preventable. (1). World Health Organization (WHO) reported 10% of all CVDs are related to smoking. (2) The World Health Organization (WHO) also estimates that tobacco use kills 7 million people annually, or one in every ten fatalities, and 8 million people will die yearly from tobacco use diseases by 2030. (1) The public health impact of tobacco use, including cigarette smoking, is enormous and expanding, and in the world, smoking is regarded as the leading preventable cause of premature mortality. (3) According to the World Health Organization (WHO), 22% of people over the age of 15 worldwide are smokers, and about 6 million people die from smoking or being exposed to tobacco smoke. (4)

Secondhand smoke is another problem associated with smoking. Scientific evidence indicates that exposure to secondhand smoke causes illness, disability, and death. (5) There is now strong evidence that exposure to secondhand smoke also causes coronary artery disease in nonsmokers. (6). both active and passive smoking is perceived to be harmful to health, with related economic costs. If current smoking rates continue unabated, smoking-related deaths will rise to 7 million annually by 2020 and exceed 8 million annually by 2030. (7) Smoking is a risk factor for death for several medical reasons. Smoking and tobacco smoke are associated with premature death, economic loss to society, and a heavy burden on healthcare systems. (5), because the adverse health effects of smoking are severe and well documented. (8)

According to the National STEP Wise Survey, the prevalence of smoking and smokeless tobacco users in Sudan was 15.6 percent in 2016. Smokers accounted for 9.6% of the population, 17.1% of men, and 0.7% of women (9). By 2030, approximately 70% of smoking-related deaths worldwide will occur in low- and middle-income countries. (10). Particular attention should be paid to smoking among young people. Most smokers start smoking during puberty or shortly after graduating from high school. Adolescent smoking is a problem in developed countries in low- and middle-income countries, where there is no significant gender difference in smoking prevalence (11) According to studies, tobacco use typically begins in early adolescence and lasts into adulthood. Activities to prevent and stop smoking would be most effective for youth to avoid long-term health repercussions. (12)

College students are at higher risk of smoking, are more likely to have tobacco availability, and may be closely associated with smoking peers. At the same time, they are exposed to socio-emotional and educational policy challenges once they start studying. Medical students are aware of the health hazards of tobacco smoking and have seen cases of patients and deaths, but they smoke like doctors during their internships. Medical students can take responsibility for their communities' health care and influence their countries' future health policies. Healthcare professionals who smoke also send vague messages encouraging patients to quit. (8) Smoking students entering college are at increased risk of many diseases closely associated with smoking that lead to severe exhaustion and death. (13). Tobacco smoking prevalence is higher among medical students and may be higher than in the general population. A survey conducted in several

countries in the Middle East found a prevalence of 42.5% among university students. Medical students are an important sector of the community. They are tomorrow's clinicians and should play a key role in preventing tobacco use in society and shaping public health policy. (4). This study aims to identify the factors that motivate medical students to smoke, express their feelings related to smoking, and help students quit this hazardous habit.

Methodology

Study design

A descriptive study.

Study Participants

Participants were medical students of Alfajr College for Science and Technology, Khartoum, Sudan, from the bachelor program's first to the fifth educational level.

Inclusion criteria

The study included medical students, both gender male and females, ages between 16 to 35 years, who smoked and non-smoked and agreed to participate in the study.

Sample size

The sample size which was conducted in this study was 243 participants, calculated using the standard formula N = N/ 1+N (D2). (14)

Sample Technique and Procedure

It is a probability sample; every class member was a part of the study. The lists of the students were undertaken in the sample before the data collection to ensure all students' educational levels were within the boundaries of the study sample, and a sampling technique was followed to collect data. (15)

Data Collection

Data was collected via an online self-administered questionnaire after being pretested. The questionnaire contained personal data such as gender, age, social state, academic level, questions about factors that motivated the students to smoke, and students' feelings after smoking.

Data Analysis methods

The study data were analyzed by the Medical Statistical Package for Social Science (SPSS) version 16.0 after being coded and pre-tested. Descriptive analysis was carried out for participants' background information, factors that motivated students to smoke, and feelings after smoking (16), and the results were presented in the form of frequency and percentage tables and graphs. The

prevalence of smoking was estimated and compared with the gender of participants. Pearson's chi-square test for comparing a p-value of <0.005 was used to test the significance of the results.

Ethical approval

This study was conducted in accordance with human research procedures with ethical approval and was taken by the University Medical College. Participants were informed of the purpose of the study to obtain informed consent and agreement to participate in the study, and collected data and information were secured and confidentiality was assured for all students who participated in the study. (17).

Results

Table: 1-Background information of study participant

Background information		Frequency	Percentage
Gender	Male	162	66.7
	Female	81	33.3
	Total	243	100.0
Age/Year	18-26Year	153	63.0
	27-35Year	90	37.0
	Total	243	100.0
Education Level	First year	43	17.7
	Second year	49	20.2
	Third year	60	24.7
	Fourth year	46	18.9
	Fifth year	45	18.5
	Total	243	100.0
Marital status	Single	177	72.8
	Married	66	27.2
	Total	243	100.0

Table 1 shows that the males included in this study were 66.70%, while the females were 33.30%; the male-to-female ratio was 2:1. The participants in the age group of 18–20 years were 63%, and 37% of those aged 27–35 years. The participants from the third year had a higher participation rate of 24.70%, followed by 20.20% from the second year, 18.90% from the fourth year, 18.50% from the fifth year, and 17.70% from the first-year level of education, and about 72.80% of participants were single.

Table: 2-The status (prevalence) of smoking among study participants.

Status of smoking		Frequency	Percentage
Active smoking	Yes	44	18.1
	No	199	81.9
	Total	243	100.0
Exposed to passive	Yes	115	47.3

smoking	No	128	52.7
	Total	243	100.0

The prevalence of smoking among study participants was 18.10%, non-smoking was 81.90%, and 47.30% of the participants were exposed to passive smoking.

Table: 3-Cross-tabulation prevalence of smoking among the participants versus background information

Smoking	Frequency	Percentage	P-value
Gender	Male	21.0%	0.099
	Female	12.3%	
Age/Year	18-26Year	20.3%	0. 255
	27-35Year	14.4%	
Education Level	First year	9.3%	0. .000
	Second year	12.2%	
	Third year	8.3%	
	Fourth year	37.0%	
	Fifth year	26.7%	
	Married	9.1%	

Table 3 reflects the prevalence of smoking among the study population in relation to their gender, age, and education levels. Smoking prevalence was significantly higher in men than in women, at 21.0% and 12.3%, respectively. Smoking rates were also high at 20.3% for those aged 18-26 and 14.4% for those aged 27-35. A high prevalence (37.0%) of smokers was found among students in the fourth level of education, followed by 26.7% in the fifth year, 12.2% in the second year, and a low prevalence among students in the first and third years. This difference was statistically significant.

Table: 4- Smoking duration and number of cigarettes smoked among smoker participants

Smoking		Frequency	Percentage
Duration of smoking	<10 Years	32	72.7
	>10 Years	12	27.3
	Total	44	100.0
Cigarettes smoke/day	<10 Cigarettes	30	68.18
	>10 Cigarettes	14	31.82
	Total	44	100.0

This table reflects a high percentage showing 72.0% of smokers whose duration of smoking was less than ten years and about 68.18% of those who smoked less than ten cigarettes per day.

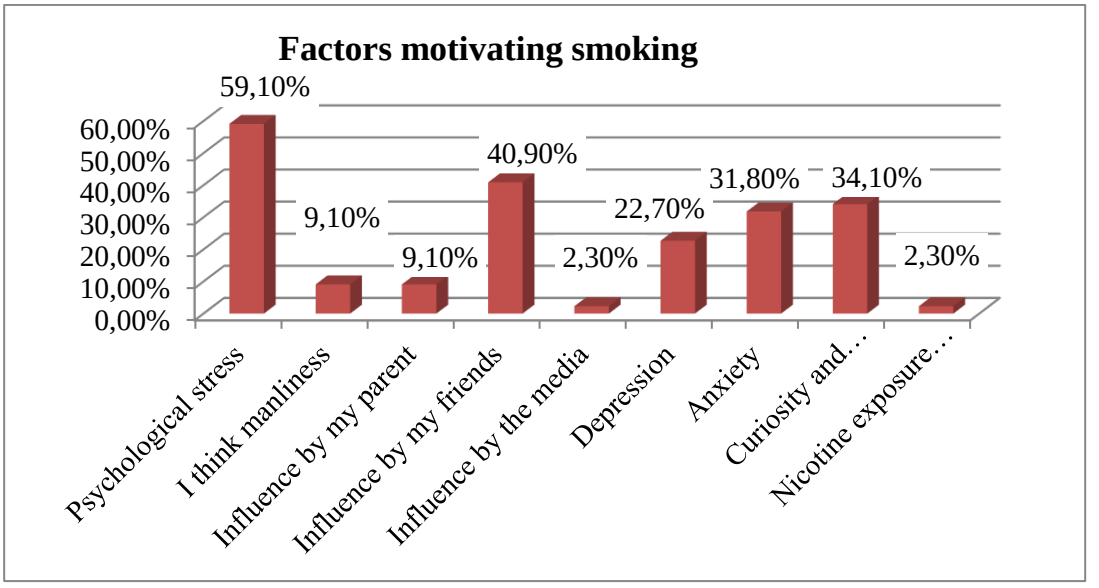

Figure: I- Factors motivating medical students to smoke. (n=44)

The figure above reflects the factors that motivate students to smoke: psychological stress influenced by friends, curiosity and experimentation, anxiety, and depression, which were found to be 59.10%, 40.90%, 34.10%, 31.80%, and 22.70, respectively. While the same factor percentages (9.10%) were influenced by parents and thoughts of manliness, low-effect factors were influenced by media and nicotine exposure during their childhood, both with the same proportion (2.30%).

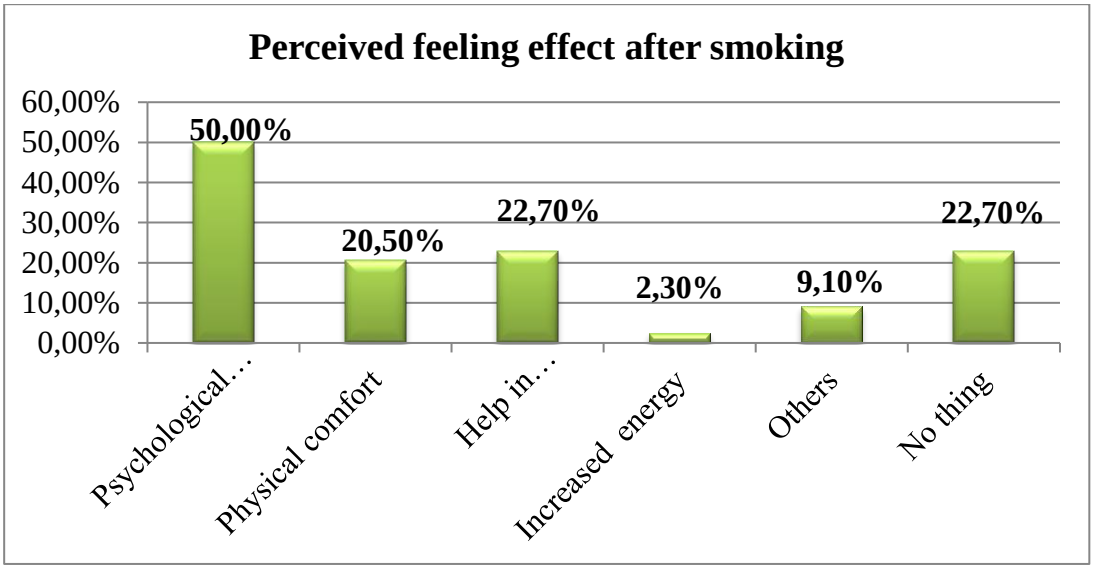

Figure: 1I- Perceived feelings effect of smoked participants after smoking. (n=44).

The figure showed the smoker students experienced feelings after smoking: about 50% experienced feelings of psychological comfort, followed by 22.70% increased concentration, 20.5% physical comfort, 9.10% expressed other feelings, and a few students experienced feelings of increased energy.

Discussion

For many years, smoking has been a serious and ongoing social issue throughout the world. (18). This study aimed to identify the factors that motivate medical students to smoke, and express their feelings after cigarette smoked, as well as to help them to quiet. The study was conducted among university medical students, which enrolled 243 participants, 66.70% of whom were males. Sixty percent of the students who took part in this study were between the ages of 18 and 20. Most participants were from the third year, and a low percentage of participants were from the first year of education. More than 40% were Khartoum residents, with a higher proportion of them from central Sudan and fewer participants from other nationalities. In addition to that, 72.80% of participants were single. In addition to that, 47.30% of the participants were exposed to passive smoking, which was higher than what found by previous studies, which found the prevalence of passive smoking, was 39.9% of all medical students. (19)

There are significant regional differences in the prevalence of smoking among medical students. The prevalence of smoking identified in this study was estimated based on the respondents' answers to whether they were smokers or not, based on the World health organization (WHO) smoking status criteria. Current smokers said they smoked at least 1 cigarette per day, either regularly or occasionally. (11) Based on this estimate, the study found that smoking prevalence among the participants was 18.10%. This prevalence was higher than that found by a study in Jazan, Saudi Arabia, which reported that smoking among medical students was 12.4 %. (19), and as reported by a study in Egypt in 2018. (8). other 10.3% of the surveyed students are active smokers, discovered by a study in 2022 in Poland. (18)

The prevalence found by this study was lower than that found by a study done in Bangladesh among medical students, which reported a prevalence of 67.0% among students (13). Another study done among university students in Jordan found a 35.0% prevalence of smoking among the participants. (20) Additionally, the study discovered a lower smoking prevalence than that of Georgia's undergraduate students, who made up 48.75% of the study group (11), and in Turkey, 34.7% for males, 14.1% for females, and 24%. (21) . Conversely, the study found that smoking was strongly associated with male gender and fourth-year students. This is similar to that reported by a study in Georgia. (11.)Also, the study found that about seventy percent of smokers' medical students' duration of smoking was less than ten years, and they smoked less than ten cigarettes daily. This means the participants may have started smoking early before their university education. These results agree with the one found by the previous study conducted in 2018, which reported more than half (56.0%) of cigarette smokers smoked < 10 cigarettes/day, and 22.5% smoked > 20 cigarettes/day. (20) Abu-elenin et al, 2018 reported that death at an earlier age among smokers is more than among nonsmokers; smokers die on average 10 years earlier than

nonsmokers. In addition, early smoking initiation increases smoking durability and smoking-related disease burden. (8)

Various factors contribute to and motivate medical students to smoke based on the literature and the associated factors motivating smoking, like peer pressure, age, sex, personal pleasure, family substance abuse, and poor academic achievement, are all factors of tobacco (22) This study found the most influential factors that motivated or associated with students' smoking were psychological stress, influenced by friends, curiosity and experimentation, anxiety, and depression. The least influential factors were parents, thoughts of manliness, the media, and nicotine exposure during their childhood. These results are similar to a study conducted in Egypt, which found that stress relief was the most common cause of smoking, followed by entertainment, sadness, and depression (42%,23%, and 18%, respectively). The same was reported in a Chinese study, which indicated that the main reasons for smoking were stress (42.8%), curiosity (34.4%), and loneliness (33.7%). (8)

The study also revealed that the smoker's students perceived or felt psychological comfort, increased concentration, and physical comfort after smoking. A few students experienced feelings of increased energy, while some expressed other feelings. A previous study documented that the respondents believed that smoking reduced their tension. (23) In a 2016 survey of reasons and motivations for smoking and barriers to quitting among a sample of young people in Jeddah, Saudi Arabia, 26% of those who did not quit cited a lack of willpower, while 25% for no reason, 22% said people around them smoke and 15.3% feel stressed at home or at work. The main motives for smokers are smoking with friends (42%), others (33.8%), and their father or brother (12%), followed by 7.8% of the media. (24)

More than six studies systematically examined factors associated with smoking among Saudi university students. They found that family and peer smoking status were the top two social factors with statistical associations in smoking behavior. It turns out that Students today are very depressed about their education system and family issues. The number of smokers, especially students, is constantly increasing. (25)

We believe that preventing young people from starting to smoke reduces the likelihood of becoming smokers later in life. Medical education does not appear to have a protective effect or influence on college students' attitudes and behaviors toward smoking. So, improving smoking cessation education in all medical and non-medical curricula is important. Medical students advise patients on smoking issues and act as role models for them. Therefore, college years are an excellent time to make medical students aware of the harmful effects of smoking. (11).

Conclusion

The study concluded that the prevalence of smoking among university students was high. This study also gives explored the factors that significantly motivated or associated with smoking cigarettes by students in Sudan, such as psychological stress, influenced by friends, curiosity and experimentation, anxiety, and

depression, and the least influenced factors were parents, thoughts of manliness, the media, and nicotine exposure during their childhood.

Recommendations

Increase students' awareness' about smoking hazards and its impacts on their health and psychological status by means of health education. Encouraging the role of families in monitoring children is important for early identification of this problem at an appropriate time, and by continuing to monitor and prevent risk factors for young smoking. It is much more important to prevent people from smoking. In addition, the mass media should pay more attention to the negative effects of this habit and send messages directly to young people and students. Future studies are recommended to investigate the effects of smoking on the health and academic performance of college students. Finally, the World Health Organization Framework Convention on Tobacco Control (FCTC) emphasizes the vital contribution of participation of health professional bodies, training, and healthcare institutions in tobacco control efforts is should be followed. (26)

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