Original Article

The Prevalence of Smoking and Associated Risk Factors among Students at Secondary School in Hodeidah Governorate

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How to cite this article: Mohammed Ahmed Suhail, Khaled AL-Selwi, Sadeq Abdo Mohammed Alwesabi et. al. The Prevalence of Smoking and Associated Risk Factors among Students at Secondary School in Hodeidah Governorate. International Journal of Nursing Education / Vol. 17 No. 1, January-March 2025.

Abstract

Background: Smoking is a significant public health concern, particularly in developing countries, with over one billion individuals engaging in tobacco use globally. **This study aimed** to investigate the prevalence of smoking and associated risk factors among secondary school students in Hodeidah governorate, Yemen, in 2022. **Methodology:** A descriptive cross-sectional design was employed, involving a sample of 1,000 students from urban and rural areas, selected through a simple random sampling technique. Data was collected using a self-administered structured questionnaire covering demographic details, smoking habits, risk factors, and perceptions. The data was analyzed using IBM SPSS (version 28), employing descriptive and inferential statistics, with Chi-square tests to evaluate relationships between variables.

Results: 21.8% of students were smokers, with smoking prevalence higher among rural residents (22.3%) and females (26.8%). Socio-demographic factors such as gender and marital status significantly influenced smoking behavior, with divorced students exhibiting the highest smoking rates (75%). The study also revealed significant associations between smoking and having relatives or friends who smoke.

Conclusion: These findings highlight the need for targeted smoking prevention strategies that consider demographic variations, focusing on early interventions in schools, community engagement, and culturally sensitive approaches to reduce smoking rates among adolescents in Yemen.

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Submission date: Oct 2, 2024 **Revision date:** Nov 4, 2024 **Published date:** February 15,2025

Conclusion: The study highlights a notable prevalence of smoking among secondary school students, with gender, residency, and marital status as key determinants of smoking behavior. Female students and rural residents showed higher smoking rates, indicating a need for targeted interventions.

Keywords: smoking prevalence, adolescents, secondary school, risk factors, Yemen, Hodeidah.

Introduction

Smoking is one of the most common forms of recreational drug use. Tobacco smoking is the most popular form, being practiced by over one billion people globally, of whom the majority are in the developing countries. [1]

Smoking generally has negative health effects, because smoke inhalation inherently poses challenges to various physiologic processes such as respiration. Smoking tobacco is among the leading causes of many diseases such as lung cancer, heart attack, COPD, erectile dysfunction, and birth defects.

Diseases related to tobacco smoking have been shown to kill approximately half of long-term smokers when compared to average mortality rates faced by non-smokers. Smoking caused over five million deaths a year from 1990 to 2015. [2] The health hazards of smoking have caused many countries to institute high taxes on tobacco products, publish advertisements to discourage use, limit advertisements that promote use, and provide help with quitting for those who do smoke. [1] Many smokers begin during adolescence or early adulthood. [3] During the early stages, a combination of perceived pleasure acting as positive reinforcement and desire to respond to social peer pressure may offset the unpleasant symptoms of initial use, which typically include nausea and coughing. After an individual has smoked for some years, the avoidance of withdrawal symptoms and negative reinforcement become the key motivations to continue.

More recently, other neurological diseases such as Parkinson's disease(PD) and Alzheimer's disease (AD) have also been studied in relation to smoking. Smoking is practiced by using flaming tobacco and inhaling the smoke. Smoking has been broadly studied in association to diverse neurological disorders (NDs), mainly vascular and degenerative diseases such as AD, Parkinson's disease, anxiety, and stroke. [3]

Recently, many researchers have investigated the effects of smoking on cognitive functions. Most of these studies showed a decline in cognitive function that is attributed to the effects of cigarette smoke exposure [4-5]

Members of below poverty line smoke cigarettes spend 40% of their earnings at the price of the necessities pushing them to further poverty. [6] There is inverse relationship observed between tobacco smoke and the income group. Cigarette smoking is mostly observed in the lower socio-economic status group. [7]

Cigarette smoking hampers the socioeconomic development of the country as death in half of cigarette smokers occur in economically productive age group. [8]

Every year 3 million people die due to smoking according to WHO estimates [9]. The major health problem is cigarette smoking among children and adolescents [10]. Today an estimated 150 million young people use tobacco [11]. Studies indicate that smoking among adolescents is rising, especially among boys. The Global Youth Tobacco Survey (GYTS) reported that about 9% of Yemeni students aged 13-15 years are smokers, with boys smoking more than girls. According to the GYTS, about 10.1% of Egyptian students (aged 13-15 years) use some form of tobacco. Around 7.1% are cigarette smokers. In Jordan the smoking among youth is high. The GYTS in Jordan showed that around 22% of students aged 13-15 years are tobacco users, with about 18.3% smoking cigarettes and a significant portion using waterpipes. Waterpipe smoking is often seen as less harmful but is widely used among youth [12]. Majority of tobacco users worldwide began when they were adolescents. It is the age of transition of mind, and they tend to be experimenting new things. They are vulnerable to changes happening around them. Their minds are very much influenced by the peer pressure, the affect being greater than the influence from members of the house. According to Global Adult Tobacco Survey (GATS) among minors (15- 17), 9.6% consumed

tobacco in some form and most of them were able to purchase tobacco products [13] Research on smoking in the Yemen is crucial due to its high prevalence, especially among youth and women, alongside unique cultural and social factors. Waterpipe use is widely accepted and perceived as less harmful, contributing to rising tobacco use, particularly among adolescents. Peer pressure, aggressive marketing by tobacco companies, and weak enforcement of tobacco control policies exacerbate the issue. Additionally, gender dynamics are shifting, with increasing smoking rates among women. The region's healthcare systems, already under strain, face significant burdens from tobacco-related diseases, making localized research essential to inform effective prevention strategies, stronger regulations, and public health interventions.

The role of nurses; From a nursing education perspective, nurses play a critical role in tobacco prevention and cessation efforts within Yemen. Nursing programs must emphasize tobacco-related health education, equipping future nurses with the skills to counsel patients on the risks of smoking. In addition, nurses can advocate for stronger tobacco control policies and contribute to public health campaigns by raising awareness about the harmful effects of smoking, including waterpipe use.

Aim of the study: The prevalence of smoking and associated risk factors among students at secondary school at Hodeidah governorate, Yemen 2022.

Objectives

1. To identify prevalence of smoking among students of secondary school.
2. To assess association between participants socio-demographic and smoking habit.
3. To find relationships between demographic data and risk factors with smoking among students at secondary school

Methods

Design

Descriptive cross-sectional design was used to achieve the aim of the study

Setting

Secondary schools at Hodeidah governorate, Yemen. Hodeidah is a coastal governorate at the west of Yemen. It is one of the highest population governorates in Yemen.

Sampling

The sample was collected using simple random technique.

The conference sample included 1000 participants during study period during from December 2022 to February 2023

Data collection method

The subject of the scientific research was chosen and presented to the scientific committee in the faculty, then approval was taken. The questionnaire was written then it was approved by them and permission was taken to present it to the Education Office in Hodeidah governorate after that 50 pilot samples were taken, according to pilot result, the questionnaire was corrected and 1000 samples collected then analyzed by using SPSS (version 28).

Self-administrated structured modified questionnaire with closed questions used, which consist of four parts: demographic data, smoking habit, risk factors and perception

Pilot study

A pilot study was conducted with a convenience sample of 20 secondary students. Descriptive statistics were employed to evaluate the pilot study data, focusing on metrics such as response rates, survey completion times, and participant feedback on the survey's content and format. To measure the internal consistency of the survey items, Cronbach's alpha coefficient was calculated. Participants in the pilot study were excluded from the main study to prevent duplication and maintain the integrity of the data analysis. The questionnaire was modified according to the results

Validation of Questionnaires

The validity of the questionnaires was approved by 5 Medical Professionals. The reliability of the tools was assessed using Cronbach's alpha, with values of 0.84, 0.85, and 0.78, respectively.

Ethical consideration

Ethical clearance was obtained from faculty of Medicine & Health scientific in Hodeidah

University; on 13/ 11/2022 Reference no. 302/2022 For data collection, to Ministry of Education office in Hodeidah governorate; then informed consent was obtained from the study participants (students) before administering the questionnaire.

The permission was taken from the school administration and participant's student.

Data analysis

The data was analyzed by IBM SPSS (version 28). Both descriptive and inferential statistic were used. The result will be shown on data displaying methods, like graphs or tables, Chi-square test was used to evaluate relationship between variables with P<0.05 considered significant in all tests, P- value <0.001 well best highly significant.

Result

Table (1): Socio-demographic characteristics of study participants.

In table (1): we see that the students in the study are equal in gender (50%), near of two-thirds (61.3%) live in the urban, the most of students (94.5%) are single and more than two fifth (43%) in the third level of secondary school.

Figure (1): Prevalence of smokers among students at secondary school

Show in this figure (1): the most of samples (78.2%) were no-smokers, and the smokers are (21.8%). the female sample the percentage of smokers was (26.8%). While the percentage of was males (16.8%).

Table (2): Residency of smokers among students at secondary school

It is clear from the table (2) that the highest percentage of smokers among secondary school students were from the rural, where their percentage reached 22.3%.

Table (3): Marital Status of smoker among students at secondary school

Table (3) shows that three-quarters (75%) of divorced students are smokers, followed by married students, at 47.9%, and then widowed students.

Table (4): association between socio-demographic and participants' perception about smoking

In the table (4): show that Gender, Smoking Status, and the Presence of Smokers Among Relatives/Friends: There are highly statistically significant differences between gender and whether participants smoke (p = 0.000) as well as between gender and having relatives or friends who smoke (p = 0.000). This indicates that gender plays a critical role in both smoking behavior and social influences related to smoking.

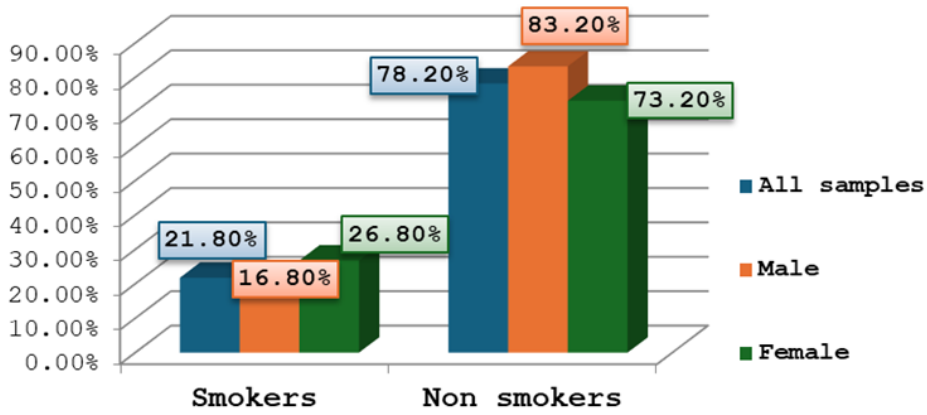
The relationship between gender and the number of cigarettes smoked per day is also highly statistically significant (p = 0.000). This indicates that men and women differ in the amount they smoke.

Additionally, the reasons for smoking show significant gender differences (p = 0.000), meaning that the motivations or factors driving smoking behaviors vary between men and women.

These highly significant p-values (0.000) suggest that gender is a key demographic factor influencing smoking behaviors, the social environment surrounding smoking, and the reasons behind smoking in this sample.

Table (1): Socio-demographic characteristics of study participants.

Variables		Count	(%)
Gender	Male	500	50 %
	Female	500	50 %
Residency	Rural	389	38.7 %
	Urban	611	61.3%
Marital status	Single	945	94.5%
	Married	48	4.8%
	Divorced	4	0.4%
	Widow	3	0.3%
Occupation	Yes	261	26.1%
	No	739	73.9%
Educational level (Secondary school)	First	280	28.0%
	Second	290	29.0%
	Third	430	43.0%



Figer (1): Prevalence of smokers among students of secondary school

Table (2): Residency of smokers among students of secondary school

Residency	Residency of smokers			
	Smokers		Nonsmokers	
	Count	(%)	Count	(%)
Rural	87	22.3 %	302	77.7 %
Urban	131	21.3%	485	78.7 %

Table (3): Marital Status of smokers among students of secondary school:

Marital status	Marital Status of smokers			
	Smokers		Nonsmokers	
	Count	(%)	Count	(%)
Single	191	20.3%	754	79.7%
Married	23	47.9 %	25	52.1%
Divorced	3	75.0%	1	25.0%
Widow	1	33.3%	2	66.7%

Table (4): association between socio-demographic and participants' perception about smoking

N	participants' perception aboutsmoking	Gender		Residency		Marital Status	
		chi- square	P-value	chi- square	P-value	chi- square	P-value
1.	Are you smoking	15.371	0.000	2.022	0.364	3.553	0.737
2.	Duration of smoking	0.732	.694	9.807	0.007	6.895	0.331
3.	Do you have relative or friends who is smoker	15.372	.000	2.022	.364	3.553	.737
4.	Smoke regularly	5.172	.160	1.372	. 712	5.079	.827
5.	Number of cigarettes per day	41.660	.000	20.513	.015	27.610	.031
6.	Reasons of smoking	144.00	.000	10.704	.016	9.719	.285
7.	Addicted to smoking	8.447	.076	1.604	.008	6.068	.640
8.	Smoking is essential to you	.159	.690	.021	.886	2.805	.423
9.	Read about the harms of smoking	3.421	.181	.793	.873	1.401	.966
10.	Has smoking caused health problems or psychological problems to you?	1.752	.466	1.364	.508	3.205	.524
11.	Know that smoking is the main cause of cancer	3.663	.160	5.888	.053	1.814	.936
12.	Trying or wanting to quit smoking	1.880	.002	1.158	.560	1.303	.971
13.	Encouraged someone to quit smoking	4.735	.192	1.280	.734	6.721	.666

Discussion

Every year, over three million individuals worldwide die prematurely due to smoking and tobacco use, with one million of these deaths occurring in developing nations.

In this study, a total of students from both rural and urban areas in Hodeidah governorate, totaling 1,000, were surveyed. Additionally, the prevalence of smoking among these secondary school students was found to be 21.8%. This figure was higher than in Ethiopia (11.1%),[14] Sudan (13.6%)[15], Malaysia (10.1%)[16], China (4.7%)[17], and lower than in Bangladesh (55%)[18], Saudi Arabia (36.1%)[19], Nairobi (32.2%)[20], Botswana (29%)[21].

Although no biological markers were used to validate the smoking status reported by the students, the risk of underreporting was reduced by ensuring the confidentiality of the collected information. This confidentiality was maintained by excluding teachers from the interview rooms and allowing only the research team to collect the questionnaires.

The results showed that 38.5% of the students who reported smoking were male, while 61.5% were female. This indicates that the prevalence of smoking among female students at the secondary school level in Hodeidah governorate is significantly higher than among their male counterparts, despite traditional, cultural, and social norms that discourage smoking among women.

This trend may be attributed to the increasing rates of smoking and early initiation of smoking habits among adolescents. The findings of this study align with those of (**Mbongwe et al. in 2017**) [21], who reported the highest prevalence among the 18-year-old age group.

The study also revealed that the prevalence of smoking was higher among students in rural areas compared to those in urban areas among secondary school students, a finding that is consistent with the research by (**Zeng et al. in 2022**) [17].

The views of participants on smoking in secondary schools; 64.8% of participants mentioned having friends who smoke, aligning with research conducted by (**Ilukho et al, 2019**) [22] in Nigeria, which found that students with friends who smoked were 5 times more inclined to smoke compared to those without such friends; Therefore, 10.8% of smokers admitted to smoking in the presence of their friends. 4.5% of participants stated that personal and family issues were the main reasons for starting to smoke.

Conclusion

This study highlights several important findings regarding smoking behavior and perceptions among secondary school students. Gender plays a crucial role in smoking habits, with significant differences in smoking status, the number of cigarettes smoked, and reasons for smoking between males and females. Smoking is also more prevalent among females, a finding that warrants further attention.

Residency influences both the duration of smoking and addiction, with rural students showing higher smoking rates and greater susceptibility to addiction. Marital status, while less significant overall, is a strong factor in specific groups, particularly among divorced and married students.

Overall, these findings suggest that smoking interventions must be tailored to address the unique challenges faced by different demographic groups, with special attention given to gender-specific motivations, the impact of rural residency on smoking habits, and the heightened smoking rates among divorced students. Gender, in particular, stands out as a key determinant of smoking behavior, indicating a need for focused public health strategies that consider the social environment, cultural factors, and individual motivations of both male and female students.

Recommendation

Based on the results, it is suggested that

- Measures to prevent and control tobacco use are necessary and should begin early, ideally at the elementary school level.
- Parents need to be dedicated to putting this all-encompassing policy into action and to keep it going around tobacco control.
- Schools should enhance their anti-smoking initiatives to stop students from smoking.
- It's important to get students involved in these anti-smoking efforts because friends often encourage smoking.

- Religious figures could also be crucial in this effort by offering the right guidance to decrease tobacco use, consumption, and to help people quit smoking.

Acknowledgment: First, I would like to thank the male and female students from secondary schools in Al-Hodeidah Governorate who agreed to participate in this research. I also thank the school managers who allowed us to conduct the research after approval from the Ethics Committee of the Faculty of Medicine and Health Sciences at Al-Hodeidah University. Code no. 302/2022

Disclosure: The authors report there are no conflicts of interest in this work.

Funding: The project was funded by the authors

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