Original Article

Smoking and Its Correlates among Secondary School Students in Al-Hilla City 2018

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Abstract

Background: Although the prevalence of smoking has been decreasing in the developed countries in recent years, the less developed countries, such as Iraq, are facing an impact from smoking prevalence rise. **Objective:** The study objective was to assess the prevalence of smoking and its correlates among secondary school students. **Materials and Methods:** A descriptive cross-sectional epidemiological study was conducted on the secondary school students 4th, 5th, and 6th for males and females who were indiscriminately selected from 15 secondary schools located in Al-Hilla city\Babylon Province\Iraq during the period from March 7 to April 30, 2018. A questionnaire adapted from global school-based student health survey (2013) was used to collect data. **Results:** Of 860 students, only 810 responded and completed the questionnaire (response rate 94.2%). The overall prevalence of smoking was 32.0%, and the majority of smokers were male. The dominant type of tobacco smoking in this study appeared to be a hookah in about two-thirds (one-third exclusive hookah smoking and one-third mixed hookah and cigarette smoking), and multiple reasons have been found to impulse the student to smoking and that the friend was the first tobacco source. A significant association has been found between tobacco smoking and gender, age, grade, income, marital status, having alive parents, abuse, early age work, school performance, having a family member with medical diseases, family relationship, and sleeping difficulties ($P < 0.05$). **Conclusion:** The high prevalence of smoking was revealed among secondary school students, especially hookah tobacco smoking, and some factors appear to play a pivotal role in smoking initiation. Hence, preventive measures need to be applied.

Keywords: Hookah, prevalence, secondary school students, tobacco smoking

Introduction

Tobacco smoking is a major public health threat at the present time. Globally and in 2010, there are almost one billion males and twenty hundred and fifty million females who are smokers.[1] While in 2016, the number of people aged 15 or more who smoke raised to 1.1 billion.[2] Annually, seven million smokers die prematurely because of the diseases caused by tobacco smoking.[3] Not tobacco smoking only cause death, but second-hand smoke also responsible for 890,000 deaths per annum.[3] One of the most risk factors for nicotine dependence and facing troubles with smoking cessation is the smoking during adolescence life.[4]

Any level of tobacco exposure during adolescence period of life could carry a huge concern, and different factors affect this concern. The adolescent brain is still developing that makes it more susceptible to developmental changes by nicotine, which affects its growth.[5] Several sociodemographic factors may act as a predictor for smoking initiation among adolescents, which include familial structure and economic status.[6] Furthermore, mental and emotional problems (including depression and recent adverse life events), parents' education, adolescents beliefs about smoking and perception of schoolmates' smoking, and other substance are additional factors that increase the smoking risk among adolescents.[7-9]

Although the prevalence of smoking has been decreasing in the developed countries in recent years, the less developed countries, such as those in the middle east, are facing an impact from smoking prevalence rise.[10] Despite this fact, there are only a few data available about the prevalence and the associated factors of tobacco smoking among secondary school students in Iraq. With the above-mentioned motives,

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the aim of this study was to assess the prevalence of smoking and its correlates among secondary school students in Al-Hilla city, Babil, Iraq, during 2018.

Materials and Methods

A descriptive cross-sectional epidemiological study was conducted on the secondary school students 4th, 5th, and 6th grades for males and females who were indiscriminately selected from 15 secondary schools located in Al-Hilla city\Babylon province\Iraq during the period from March 7 to April 30, 2018. The study protocol was revised and approved by the Scientific Committee of the University of Babylon\College of Medicine\Family and Community Medicine Department and the Research Ethics Committee in the college. Permissions from Babylon educational directorate and the school management authorities have been obtained. Verbal informed consent was obtained from each student enrolled in the study, after explaining the purpose of this questionnaire. All the information achieved from the participants was kept trusted.

The tool of data collection was a pretested questionnaire adopted from previous standard national surveys and studies,[11-15] and the organized questionnaire was validated by a panel of five experts. The repeatability and validity of the questionnaire were tested by piloting.

Data analysis

Statistical analysis was carried out using IBM SPSS Statistics for Windows, Version 20.0. (Armonk, NY: IBM Corp). Categorical variables were presented as frequencies and percentages. Continuous variables were presented as (means ± standard deviation). Student's *t*-test was used to compare the means between two groups. Pearson's Chi-square test (χ^2) and Fisher's exact test were used to find the association between categorical variables. $P \leq 0.05$ was considered statistically significant.

Results

Overall, 860 secondary school students participated in this study. Among those participants, 50 refused to complete the questionnaire, with a response rate of 94.2%.

Table 1 shows the distribution of students according to sociodemographic characteristics including (age, gender, place of residence, income, and grade). The mean age for participants was (17.15 ± 1.21) years, and ages were ranged from 15 to 23 years. Majority of the participants were male (70.0%), from urban residency (89.9%), with good economic status (60.0%), and most of them were in 5th grade of their study (56.2%).

Figure 1 reveals that about one-third of the population under study was tobacco smokers (32%).

Table 2 shows that the distribution of smoker students according to smoking correlates including (smoking affects school performance, smoking habit among family members, smoking affects the relationship with the family, smoking creates domestic and school violence, desire to quit smoking, and the source of first cigarette or hookah). The data show that most of the smokers believed that the smoking does not affect their school performance (64.9%). The percentage of students who have a smoker family member was 67.2%, while 63.3% of them affirmed that smoking affects their relationship with their families, and nearly, half of them stated that the smoking creates school and domestic violence (51%).

Most of the students admitted that they have the desire to cease smoking (64.5%). Friends were the main source of first cigarette and hookah (70.7%). Regarding the age of smoking initiation, the most reported age was 15–16 years old (59.5%), 10.8% of them started at or younger than 12 years old, and the less age for smoking initiation was 19–20 years (0.7%).

Table 1: The distribution of students according to sociodemographic characteristics

Sociodemographic variables	*n* (%)
Age (years)	17.15±1.20 (15-23)
Gender	
Female	243 (30.0)
Male	567 (70.0)
Total	810 (100.0)
Place of residence	
Urban	728 (89.9)
Rural	82 (10.1)
Total	810 (100.0)
Income	
Enough	486 (60.0)
Fairly enough	204 (25.2)
Not enough	120 (14.8)
Total	810 (100.0)
Grade	
4th	282 (34.8)
5th	455 (56.2)
6th	73 (9.0)
Total	810 (100.0)

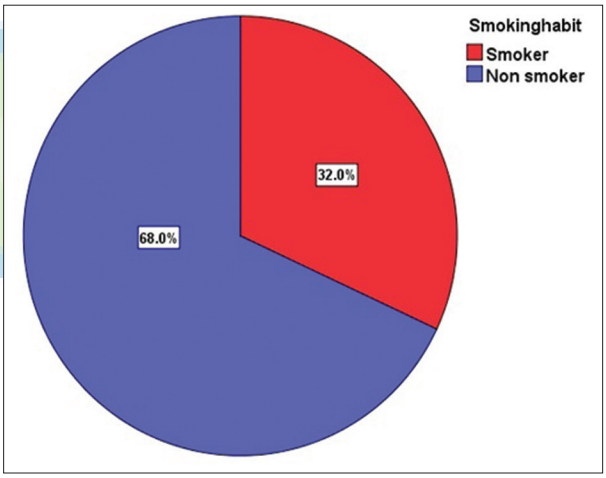

Figure 1: Distribution of tobacco smoking habits among the students

Table 3 shows the distribution of smoker students according to type [Table 3a] and cause of smoking [Table 3b]. The results presented show that the majority of the smoker students smoke either hookah or both hookah and cigarette (32.0% and 32.8%, respectively). While the proportion of students who smoke cigarette only was 13.1%, hookah, electronic cigarette (e-cigarette), and cigarettes were 15.1%, e-cigarette and hookah were 5.8%, and those who smoke e-cigarette and cigarette were 0.8%. Most of the students admitted that multiple reasons play a role in the initiation of smoking (53.4%).

Table 2: The distribution of students according to smoking correlates (n=259)

Variables correlated with smoking	n (%)
Affecting school performances	
Yes	91 (35.1)
No	168 (64.9)
Total	259 (100.0)
Having a smoker family member	
Yes	174 (67.2)
No	85 (32.8)
Total	259 (100.0)
Smoking affects the relationship with your family	
Yes	95 (36.7)
No	164 (63.3)
Total	259 (100.0)
Smoking creates domestic violence	
Yes	132 (51.0)
No	127 (49.0)
Total	259 (100.0)
The desire to quit smoking	
Yes	167 (64.5)
No	92 (35.5)
Total	259 (100.0)
Source of first cigarette or hookah	
Friend	183 (70.7)
Brother	31 (12.0)
Cousin	40 (15.4)
Father	4 (1.5)
Uncle	1 (0.4)
Total	259 (100.0)
Age of smoking initiation	
≤12	28 (10.8)
13-14	45 (17.4)
15-16	154 (59.5)
17-18	30 (11.6)
19-20	2 (0.7)
Total	259 (100.0)

Table 3a: The distribution of students according to smoking types and causes

Type of smoking	n (%)
Only cigarette smoking	34 (13.1)
Only e-cigarette	1 (0.4)
Only hookah	83 (32.0)
Cigarette and e-cigarette	2 (0.8)
Hookah and cigarette	85 (32.8)
Hookah and e-cigarette	15 (5.8)
Hookah, e-cigarette and cigarette	39 (15.1)
Total	259 (100.0)

Table 4 shows the association between tobacco smoking and study variables including (gender, place of residence, marital status, economic status, and grade). These data reveal that the majority of smokers were male, only ten females reported to be smokers, and it has been shown that most of the smokers were single. Using Fisher's exact test, monthly income and grade of study significantly correlated with the smoking ($P < 0.001$). While there is no significant relationship with the residence domain ($P = 0.09$).

Table 5 shows the associations between tobacco smoking and study variables including (alive parent, divorced parent, lost a beloved person, having a medical disease or mental illness, the family member having a medical or mental disease, sleeping difficulties, physical abuse during childhood, and sexual abuse previously). The results shown here report that there is a significant association between smoking and the study variables including alive parent, family member with medical diseases, sleeping difficulties, physical abuse during childhood, and any history of sexual abuse ($P < 0.05$) while other variables, divorced parent, lost a beloved person, having a medical disease, having a mental illness, and a family member having a mental illness have no significant correlation with smoking ($P > 0.05$).

Table 6 shows the associations between tobacco smoking and study variables including (bullied by school colleagues, bullying school colleagues verbally or physically, facing difficulties in study performance, the father physically abused the mother during childhood, child labor, working now, and compelled to dismiss homework). All the study variables presented here, except bullied from school colleagues, have been shown to correlate significantly with smoking ($P < 0.001$).

Discussion

This study reported important findings of the prevalence of smoking among secondary school students. In this study, the overall prevalence of smoking among secondary school students was 32%, where most of them were male and only ten females were smokers. This smoking prevalence is higher than that found in another local study (21.8%).[16] According to studies conducted in other countries in the region, the prevalence of smoking among adolescents was ranged between 12% and 29.8% in Saudi Arabia and 7.1% in Iran.[17,18] While according to the US 2016 national survey on drug use and health, the prevalence of current smokers among 12–17-year-old population was 15% and this is further lower than the pattern of our finding.[19] These differences may be due to different sample size in addition to certain environmental and social factors.

Furthermore, smoking models have been examined during this study. The pattern of the smoking model in the current study was that mixed smoking (hookah and cigarette) and smoking hookah only were the most prevalent models (32.8% and 32.0%, respectively) while smoking e-cigarette was the lowest model being used by the students (0.4%). These findings were comparable with that of another study carried out in Iraq, which found that the main tobacco use is the cigarette (13.9%) followed by shisha/hookah (4.8%) and pipe (1.4%).[20]

The results of this study revealed that hookah use is a growing concern among secondary school students as two-thirds of the smoker students were using hookah. This finding may be attributed to the wrong belief among the population that hookah use is less harmful than cigarette smoking, being accepted by friends and frequent attending social places such as coffee shops which influence attendee healthy behavior. The prevalence of hookah use has increased several folds than its use in 2012, where it was only (4.8%).[16] It is the nearest results to the ever reported highest hookah use was among Lebanese youth (65.3%).[21] It is obvious that the percentage of hookah use reported here is much higher than in other communities, for example, the current hookah use among north Carolina high school students was 6.1%, in Canada 5.4%, and in Iran was 6.0% in 2011.[22-24]

Moreover, the reasons (imitation, peer pressure, psychological stress, and self-proven) behind smoke initiation have been examined and observed in this study. These reasons have shown to interact and play a major role as a cause for smoking initiation among students. Multiple reasons were the main cause of smoking initiation in more than half of the reported cases. Psychological stress was the second frequent cause, while only minor proportions were related to peer pressure and both imitation and self-proven. Twenty-eight cases revealed no reason as a cause for tobacco use which constitutes (10.8%), this needs further analytic studies to identify the real causation of this bad habit. A study in Saudi Arabia by Bassiony[17] found that peer pressure and psychosocial pressure act as a risk factor for smoking, while another study who had been conducted in Iran stated that there is no significance between smoking and psychological stress, such as depression and anxiety.[25]

In addition, this study found that about two-thirds of the smoker students have a family member who is smokers, which means that it could act as a risk factor for smoking. While most of the reported cases affirmed that friend was the source of first hookah or cigarette. Similar findings have been found in other studies were done in Iraq, where the main predictors for smoking initiation were parents and close friend smoking.[20] Another study held in Brazil showed the same results, where having a smoker friend increase the risk of smoking initiation,

Table 3b: The distribution of students according to smoking causes

Cause of smoking	*n* (%)
Imitation	11 (4.2)
Peer pressure	14 (5.4)
Psychological stress	57 (22.0)
Self-proven	11 (4.2)
No reason	28 (10.8)
Multiple reasons	138 (53.4)
Total	259 (100.0)

Table 4: Associations between tobacco smoking and demographic variables

Study variables	*n* (%)	Smoking		χ^2	*P*
		Yes	No		
Gender					
Male	567 (100.0)	249 (43.92)	318 (56.08)	123.87	<0.001*
Female	243 (100.0)	10 (4.12)	233 (95.88)		
Place of residence					
Urban	728 (100.0)	226 (31.04)	502 (68.96)	2.868	0.09
Rural	82 (100.0)	33 (40.24)	49 (59.76)		
Marital status					
Single	751 (100.0)	233 (31.03)	518 (68.97)		0.022* (F)
Married	16 (100.0)	4 (25.0)	12 (75.0)		
Engaged	42 (100.0)	21 (50.0)	21 (50.0)		
Divorce	1 (100.0)	1 (100.0)	0 (0.0)		
Income					
Enough	486 (100.0)	127 (26.13)	359 (73.87)	23.07	<0.001*
Fairly enough	204 (100.0)	75 (36.76)	129 (63.24)		
Not enough	120 (100.0)	57 (47.50)	63 (52.50)		
Grade					
4th	282 (100.0)	71 (25.18)	211 (74.82)	47.87	<0.001*
5th	455 (100.0)	139 (30.55)	316 (69.45)		
6th	73 (100.0)	49 (67.12)	24 (32.88)		

*$P \leq 0.05$ was significant. F: Fisher's exact test

Table 5: Associations between tobacco smoking and study variables (*n*=810)

Study variables	*n* (%)	Smoking		χ^2	*P*
		Yes	No		
Alive parent					
Yes	755 (100.0)	235 (31.13)	520 (68.87)	7.71	0.021*
One of them	33 (100.0)	11 (30.0)	22 (70.0)		
No	22 (100.0)	13 (59.0)	9 (41.0)		
Divorced parent					
Yes	37 (100.0)	17 (45.9)	20 (54.1)	3.47	0.06
No	773 (100.0)	242 (82.03)	53 (17.97)		
Lost a beloved person					
Yes	551 (100.0)	188 (34.12)	363 (65.88)	3.643	0.056
No	259 (100.0)	71 (27.41)	188 (72.59)		
Having a medical disease					
Yes	75 (100.0)	26 (34.60	49 (65.40)	0.275	0.6
No	735 (100.0)	233 (31.70)	502 (68.30)		
Having a mental illness					
Yes	43 (100.0)	17 (39.53)	26 (60.47)	1.193	0.275
No	767 (100.0)	242 (31.55)	525 (68.45)		
A family member having a medical disease					
Yes	251 (100.0)	100 (39.84)	151 (60.16)	10.34	0.001
No	559 (100.0)	159 (28.44)	400 (71.56)		
A family member having a mental illness					
Yes	54 (100.0)	20 (37.04)	34 (62.96)	0.682	0.409
No	756 (100.0)	239 (31.61)	517 (68.39)		
Sleeping difficulties					
Yes	273 (100.0)	122 (44.69)	151 (55.31)	30.59	<0.001*
No	537 (100.0)	137 (25.51)	400 (74.49)		
Being physically abused during childhood					
Yes	135 (100.0)	79 (58.51)	56 (41.49)	52.47	<0.001*
No	675 (100.0)	180 (26.67)	495 (73.33)		
Being sexually abused previously					
Yes	37 (100.0)	24 (64.86)	13 (35.14)	19.28	<0.001*
No	773 (100.0)	235 (30.40)	538 (69.60)		

*$P \leq 0.05$ was significant

and the friend was the source of the first cigarette.[26] While a study in Iran confirmed the same results reported in herein study.[27]

More than half of the smoker students in this study confessed that smoking creates domestic problems due to violence, but it did not affect their school performance (64.9%) or the relationship with their families (63.3%). These findings are compatible with the results of other studies, which found no significant effect of smoking on schooling,[28] and smoking is considered the first gateway for juvenile delinquency[29] and is associated with all types of violence in both males and females.[30]

This study assessed further the proportion of secondary school students who have the desire to quit smoking. The results demonstrated that about two-thirds of the smoker students have the desire to quit smoking. This proportion is nearly similar to what has been reported previously in that the percentage of 12–15-year-old population who have the desire to quit was exceeded 50%.[31] In this report, the percentage in Iraq was more than 60%, while it ranged from 32.1% (Uruguay) to 90.2% (Philippines) and ranged from 49.1% (United Arab Emirates) to 75.8% (Yemen).[31] While a study conducted in Istanbul-Turkey, 8% of the same population expressed the same wish.[32] The high rate of smoking cessation desire is a positive attitude to build an antismoking interventional campaign for this age group.

Furthermore, the association between students' demographic data and smoking initiation has been examined. In this study, the mean age of smoker students is (17.69 ± 1.33) and there was a significant association between age and smoking and that the most common age of starting smoking is 15–16 year about 59.46%, this highlights the importance of the educational programs at primary and intermediate school to protect this age group. Similarly, urbanity significantly affected the smoking initiation, and this result comes into agreement with the findings of another study.[33] On the other hand, one Indian study revealed that smoking was higher in the rural areas.[34] There is a significant association between tobacco smoking

Table 6: Association between tobacco smoking and study variables

Study variables	*n* (%)	Smoking		χ^2	*P*
		Yes, *n* (%)	No, *n* (%)		
Bullied by school colleagues					
Yes	182 (100.0)	66 (36.26)	116 (63.74)	1.98	0.159
No	628 (100.0)	193 (30.73)	435 (69.27)		
Bullying school colleagues verbally or physically					
Yes	125 (100.0)	78 (62.40)	47 (37.60)	62.9	<0.001*
No	685 (100.0)	181 (26.42)	504 (73.58)		
Facing difficulties in the study performance					
Yes	377 (100.0)	184 (48.81)	193 (51.19)	91.85	<0.001*
No	433 (100.0)	75 (17.32)	358 (82.68)		
The father physically abused the mother during childhood					
Yes	103 (100.0)	57 (55.34)	46 (44.66)	29.61	<0.001*
No	707 (100.0)	202 (28.57)	505 (71.43)		
Childhood labor					
Yes	224 (100.0)	112 (50.0)	112 (50.0)	46.24	<0.001*
No	586 (100.0)	147 (25.09)	439 (74.91)		
Working now					
Yes	262 (100.0)	148 (56.49)	114 (43.51)	106.98	<0.001*
No	548 (100.0)	111 (20.26)	437 (79.74)		
Compelled to dismiss homework					
Yes	151 (100.0)	105 (69.54)	46 (30.46)	120.38	<0.001*
No	659 (100.0)	154 (23.37)	505 (76.63)		

*$P \leq 0.05$ was significant

and school grades. The highest number of smoker students is among 6th grade (67.12%), which may reflect the academic stress and the pressure by their families and society who expect the highest academic grades from the students. This finding is affirmed by the results of another study held in Iran, where the prevalence of tobacco smoking is increasing with age and educational grades.[35]

As mentioned in the introduction that some social factors may put the students at the risk of smoking. This study reported no significant association between smoking and parental divorce. This differs from what has been demonstrated in other studies, which showed that living in single-parent, nonparental families and step parent was significantly related to higher odds of smoking among students.[36] The possible explanation for this discrepancy is that Iraqi students refuse to disclose personal information about their families because of the general costume. In the same line, this study further revealed that bereavement or losing a beloved person did not have a significant effect on smoking initiation among students. In contrast, another study showed that parental bereavement is a risk factor for smoking in adolescents.[37]

Furthermore, an association between health status and smoking has been observed. Having a medical disease was not linked to smoking among secondary school students. Yet, another study stated that having a poor subjective health status carries a risk for smoking initiation.[38] This difference in results may be due to different age group, a different way of data collection (web-based versus paper and pencil survey), or sample size. In similar fashion to having a medical disease, having a mental illness has not appeared to be a significant factor for smoking initiation. This finding is compatible with another study results, where depressive symptoms had no consequence on smoking.[39]

History of physical and sexual abuse was further studied, and it has been shown that these factors may play a role in smoking initiation among secondary school students. Similarly, Spratt *et al*. found that child abuse has a strong association with smoking initiation, and the odds of smoking were four times higher in those with severe childhood abuse.[40]

Other factors have also been studies, which include sleeping difficulties and family income. In terms of sleeping difficulties, it has been found that there was a significant association with smoking among the population under study, which agrees with another study results.[41] Identically, a significant association between smoking and higher family income has been reported, which is found in other studies.[6,42,43] This study, further, showed a significant correlation between being a bully with smoking but no significant relationship with being a bully victim. This finding is quite similar to the finding of Morris *et al*.[44]

A significant relationship has been found between smoking and broken family relation, and it was consistent with the results of another study which linked fair family relationship with smoking ($P > 0.001$).[6] Herein, the study also found a strong association between poor school performance and smoking which is congruent with the results of other studies.[45,46]

Smoking was significantly associated with the child and adolescents labor and if compelled to dismiss homework because of the labors, and this comes into an agreement with another study conducted in Brazil and found that child labor is a predictor for smoking during adolescence with.[47]

Conclusion

This study demonstrated the high prevalence of hookah smoking among secondary school students and its correlates. A significant association has been found between smoking and several social and familial factors. Educational and interventional programs that could be implemented at either a school-based or community level should come to control the tobacco epidemic among young age group population in Iraq.

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Conflicts of interest

There are no conflicts of interest.

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