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The Prevalence of Tobacco Smoking among Secondary School Students in Babil Governorate, Iraq, 2014

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Abstract: ***Background: Tobacco smoking among adolescents remains a critical public health issue globally, with significant long-term health and socioeconomic consequences. Despite Iraq's ratification of the WHO Framework Convention on Tobacco Control (FCTC), data on youth smoking in regions like Babil Governorate are limited. This study assessed the prevalence and determinants of tobacco use among secondary school students in Babil Governorate, Iraq, in 2014. Methods: A cross-sectional study was conducted among 1,390 students (934 males, 456 females) from 13 randomly selected urban and rural schools. Data were collected via an anonymous, self-administered questionnaire adapted from the Global Youth Tobacco Survey (GYTS). Descriptive statistics, chi-square tests, and logistic regression were used to analyze smoking prevalence and associated factors ($p < 0.05$). Results: The study found an overall smoking prevalence of 16.4% among secondary school students, with significantly higher rates among males (21.1%) compared to females (6.8%). Smoking prevalence showed a clear age-related pattern, rising to 32.4% among 19-year-olds. Urban students reported nearly twice the smoking rate of their rural counterparts (19.2% vs 10.2%). Several key factors emerged as significant predictors of smoking behavior: academically struggling students smoked at higher rates (21.7%) than their successful peers (11.3%), while parental employment status showed notable associations - students with unemployed fathers (20.2%) or housewife mothers (20.5%) were more likely to smoke. Social influences proved particularly strong, with students exposed to smoking classmates (26.2%) or teachers (28.0%) showing elevated smoking rates. The data revealed that most smokers (62.7%) began tobacco use before entering secondary school, with friends being the most common source of first cigarettes (38.2%). While awareness of smoking's link to lung cancer was relatively high (72.7%), knowledge about other health risks like cardiovascular (8.5%) and digestive (1.6%) consequences remained alarmingly low among respondents. Conclusion: Smoking prevalence among Babil adolescents is alarmingly high, driven by peer pressure, stress, and urban residence. Gender disparities and low quit intentions (26.3%) underscore the need for targeted school-based interventions, stricter tobacco sales regulations, and enhanced health education. Policymakers should prioritize enforcement of FCTC measures and parental engagement to reduce youth smoking in Iraq.***

Keywords: Tobacco smoking, adolescents, Iraq, Babil Governorate, prevalence, school-based study

1. Introduction

Tobacco smoking remains one of the most significant public health challenges worldwide, contributing to millions of preventable deaths annually. Despite global efforts to curb its prevalence, smoking continues to be a major risk factor for chronic diseases, including cardiovascular disorders, respiratory illnesses, and various cancers [1]. Adolescents are particularly vulnerable to initiating tobacco use due to a combination of psychosocial, environmental, and behavioral factors [2]. The World Health Organization (WHO) estimates that nearly 80% of the world's smokers begin before the age of 18, highlighting the critical importance of addressing smoking behavior among youth [3]. In Iraq, tobacco consumption has been a growing concern, with studies indicating rising smoking rates among adolescents, particularly in secondary schools [4]. This study investigates the prevalence of tobacco smoking among secondary school students in Babil Governorate, Iraq, in 2014, aiming to provide insights into regional trends and contributing factors.

The global burden of tobacco-related diseases underscores the urgency of monitoring and intervening in adolescent smoking behaviors. According to the Global Youth Tobacco Survey (GYTS), many low- and middle-income countries report alarmingly high smoking rates among teenagers, often exacerbated by lax regulatory policies and aggressive tobacco industry marketing [5]. In the Eastern Mediterranean Region (EMR), where Iraq is located, smoking prevalence among adolescents has been rising, with cultural norms and peer influence playing significant roles in smoking initiation [6]. Studies from neighboring countries, such as Iran and Jordan, have reported smoking rates among school students ranging from 10% to 25%, with males significantly more likely to smoke than females [7,8]. These findings suggest that regional patterns of tobacco use may share common determinants, necessitating localized studies to inform targeted interventions.

In Iraq, the aftermath of decades of conflict, economic instability, and weakened healthcare infrastructure has contributed to public health crises, including rising tobacco consumption. Research conducted in Baghdad and other Iraqi governorates has demonstrated that adolescent smoking is influenced by factors such as family smoking habits, accessibility of tobacco products, and exposure to smoking in public spaces [9,10]. A study by Al-Hamadawi et al. (2010) found that nearly 20% of male secondary school students in Baghdad were regular smokers, with many citing stress relief and social acceptance as primary motivations [11]. However, data from Babil Governorate remain limited, despite its large adolescent population and socio-cultural dynamics that may differ from other regions. Understanding the local prevalence and determinants of smoking is crucial for designing effective school-based prevention programs.

The transition from childhood to adolescence is a critical period for the adoption of health-risk behaviors, including tobacco use. Psychological theories, such as the Social Learning Theory, suggest that adolescents often model

behaviors observed in peers, family members, or media figures [12]. Additionally, the Theory of Planned Behavior posits that attitudes, subjective norms, and perceived behavioral control shape intentions to smoke, which in turn predict actual smoking behavior [13]. Empirical studies have confirmed that peer pressure, parental smoking, and exposure to tobacco advertising significantly increase the likelihood of adolescent smoking [14,15]. In Iraq, where communal and familial ties are strong, these social influences may be particularly pronounced, necessitating further exploration within the context of Babil Governorate.

The health consequences of adolescent smoking extend beyond immediate respiratory effects, influencing long-term morbidity and mortality. Early initiation of smoking is associated with higher nicotine dependence in adulthood, making cessation more difficult [16]. Furthermore, adolescent smokers are more likely to experiment with other substances, such as alcohol and illicit drugs, compounding public health risks [17]. The economic burden of tobacco-related diseases also strains healthcare systems, particularly in resource-limited settings like Iraq, where medical services are already overstretched [18]. Given these implications, identifying the prevalence and correlates of smoking among secondary school students in Babil Governorate is essential for developing early intervention strategies.

Despite the known risks, tobacco control measures in Iraq have faced challenges, including weak enforcement of anti-smoking laws and limited public awareness campaigns. Although Iraq ratified the WHO Framework Convention on Tobacco Control (FCTC) in 2008, implementation of key provisions—such as advertising bans and smoke-free public spaces—has been inconsistent [19]. School-based anti-smoking initiatives are rare, and many educators lack training to address student tobacco use effectively [20]. A study by Al-Mosawi (2012) highlighted that only 30% of Iraqi secondary schools had anti-smoking policies, with even fewer providing cessation support for students [21]. This gap underscores the need for updated, region-specific data to advocate for stronger policy measures and educational interventions.

The present study seeks to fill this gap by examining the prevalence of tobacco smoking among secondary school students in Babil Governorate in 2014. By assessing smoking rates, gender differences, and associated factors (e.g., peer influence, family smoking, and accessibility of tobacco products), this research aims to contribute to the limited body of literature on adolescent tobacco use in Iraq. The findings will provide a foundation for policymakers, educators, and public health professionals to design targeted prevention programs tailored to the socio-cultural context of Babil Governorate. Given the long-term health and economic consequences of adolescent smoking, such efforts are vital to reducing the burden of tobacco-related diseases in Iraq and similar settings.

2. Methodology

Study Design and Setting

This study employed a cross-sectional design to assess the prevalence of tobacco smoking among secondary school students in Babil Governorate, Iraq, in 2014. The study was conducted in both urban and rural schools to ensure a representative sample of the student population.

Study Population and Sampling

The target population included male and female secondary school students (grades 10–12) across public and private schools in Babil Governorate. A multistage random sampling technique was used:

1) First stage: Schools were stratified by district (urban/rural) and gender (male/female/mixed).
2) Second stage: Classes were randomly selected from each school.
3) Third stage: Students were randomly chosen from selected classes.

Data Collection

Data were collected via a self-administered, anonymous questionnaire, adapted from the Global Youth Tobacco Survey (GYTS) and modified to fit the local context [1, 5, 7]. The questionnaire included sections on:

- Demographics (age, gender, grade level).
- Smoking behavior (ever smoked, current smoking frequency, types of tobacco used).
- Factors influencing smoking (peer pressure, family smoking habits, accessibility to tobacco).
- Knowledge and attitudes toward smoking risks.

Trained research assistants distributed the questionnaires and ensured confidentiality.

Ethical Considerations

- Ethical approval was secured from the Ministry of Education and school authorities.
- Parental consent and student assent were secured before participation.
- No personal identifiers were collected to maintain anonymity.

Data Analysis

Data were analyzed using SPSS version 20. Descriptive statistics (frequencies, percentages) were used to summarize smoking prevalence. Chi-square tests and logistic regression) were applied to examine associations between smoking and sociodemographic factors. A p-value < 0.05 was considered statistically significant.

3. Results

1) Study Population and Smoking Prevalence

A total of 1,390 secondary school students (934 males, 456 females) across 13 schools in Babil Governorate, Iraq, were surveyed. The overall prevalence of current tobacco smoking was 16.4%, with significant gender disparity:

- 21.1% of males were smokers.
- 6.8% of females were smokers.

2) Socio-Demographic Characteristics

Key demographics of participants:

- Age: Majority (23.9%) were 16 years old.
- Gender: 67.2% male, 32.8% female.
- Residence: 69.0% urban, 31.0% rural.
- Grade: 37.4% in fourth grade, 33.5% in fifth, 29.1% in sixth.

Table 1 summarizes the socio-demographic distribution and smoking prevalence.

Table 1: Socio-Demographic Characteristics and Smoking Status (N=1,390)

Variable	Total (%)	Smokers (%)	Non-Smokers (%)	P-value
Grade				**0.0001**
Fourth	37.4	11.3	88.7	
Fifth	33.5	16.1	83.9	
Sixth	29.1	23.2	76.8	
Age (Years)				**0.0001**
14	1.6	4.5	95.5	
15	15.5	6.5	93.5	
16	23.9	8.7	91.3	
17	22.9	20.4	79.6	
18	18.1	20.3	79.7	
19	10.4	32.4	67.6	
Gender				**0.0001**
Male	67.2	21.1	78.9	
Female	32.8	6.8	93.2	
Residence				**0.0001**
Urban	69	19.2	80.8	
Rural	31	10.2	89.8	

3) Factors Associated with Tobacco Use

a) School Performance

- Students who failed academically had higher smoking rates (21.7% vs. 11.3%, *P=0.0001*).
- Those with multiple failure years smoked more (29.3% for ≥3 failures vs. 18.2% for one failure).

b) Parental Influence

- Parental loss: 50% of students with both parents deceased smoked (*P=0.144, NS*).
- Parental education: Higher smoking rates among students with fathers holding MSc/PhD (30.9%, *P=0.001*).

c) Employment status:

- Unemployed fathers: 20.2% smoking vs. 15.6% (*P=0.029*).
- Housewife mothers: 20.5% smoking vs. 9.4% (*P=0.0001*).

d) Behavioral and Social Factors

- Part-time jobs: 25.3% of working students smoked *(P=0.0001)*.
- Non-relative smokers (peers/teachers): 23.5% smoking vs. 14.6% for relatives *(P=0.0001)*.

4) Smoking Initiation and Patterns

- Age of initiation: 62.7% started before secondary school.
- Source of first cigarette: Friends (38.2%), self-purchased (24.1%), relatives (12.3%).
- Daily consumption: 60.1% smoked 1–9 cigarettes/day; 4.8% smoked ≥20.

Table 2: Smoking Initiation Patterns (N=228 Smokers)

Variable	%
First cigarette source	
Friends	38.2
Self	24.1
Relatives	12.3
Place of first use	
Home	23.2
School	7.9
Other	68.9

5) Motives for Smoking and Cessation

- Primary reasons for smoking: Stress (39.9%), enjoyment (25.4%), peer imitation (15.8%) [Figure 1].
- Quit intentions: 26.3% wanted to quit (economic reasons: 40%; health concerns: 38.3%) [Figure 2].

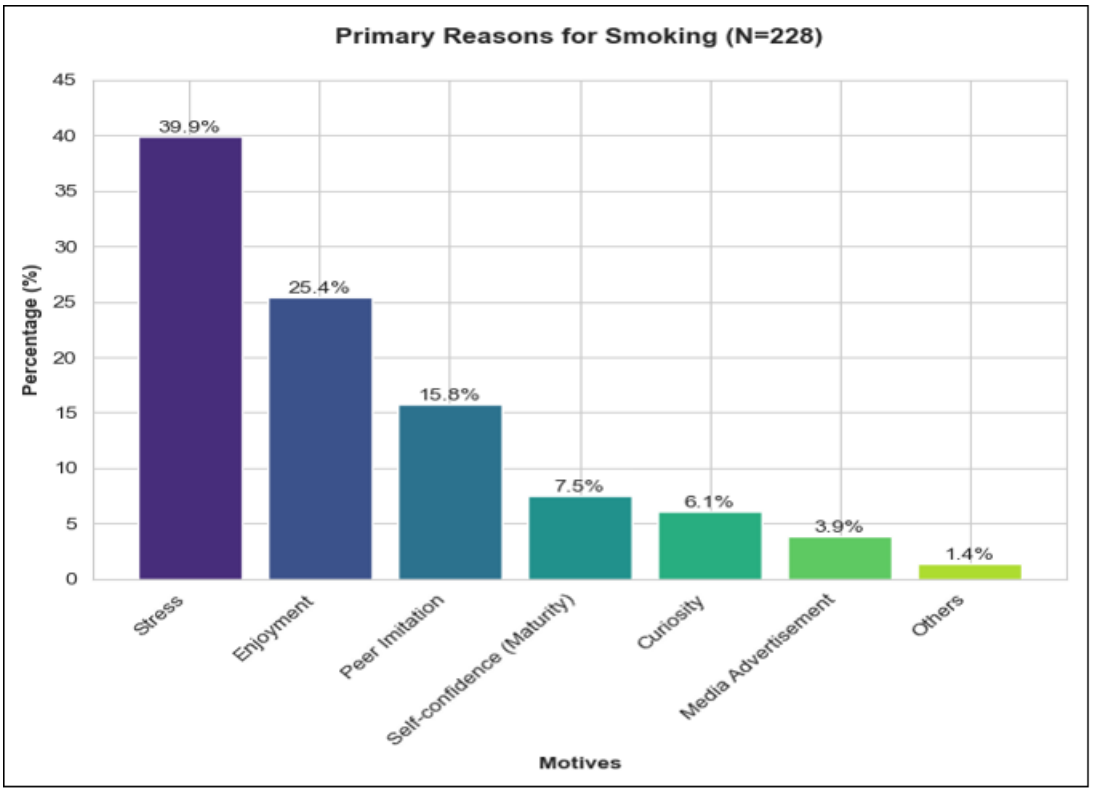

Figure 1: Motives for Smoking (N=228)

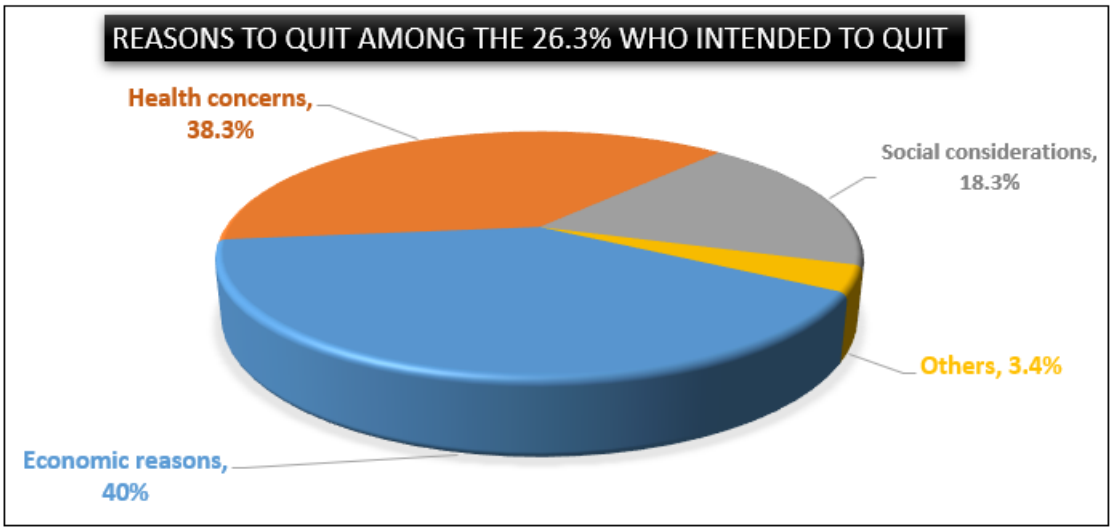

Figure 2: Reasons to quit among the 26.3% who intended to quit

6) Awareness and Control Measures

- Hazards awareness: 72.7% knew smoking causes lung cancer [Figure 3].
- Suggested control measures [Figure 4]:
  - Ban sales (41.7%).
  - Health education (30.6%).

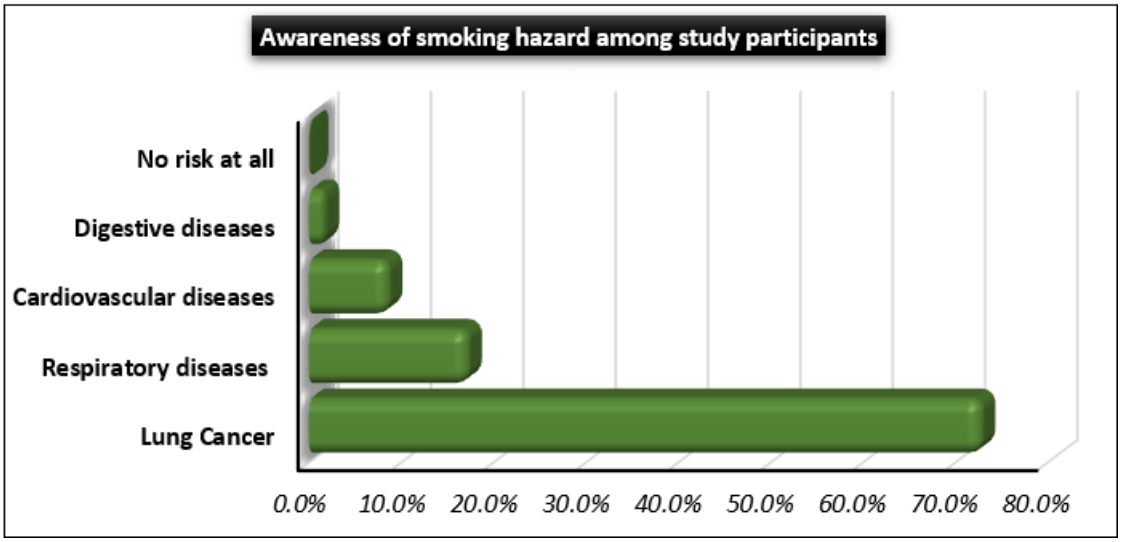

Figure 3: Study participants according to their awareness of smoking hazard, N=1390

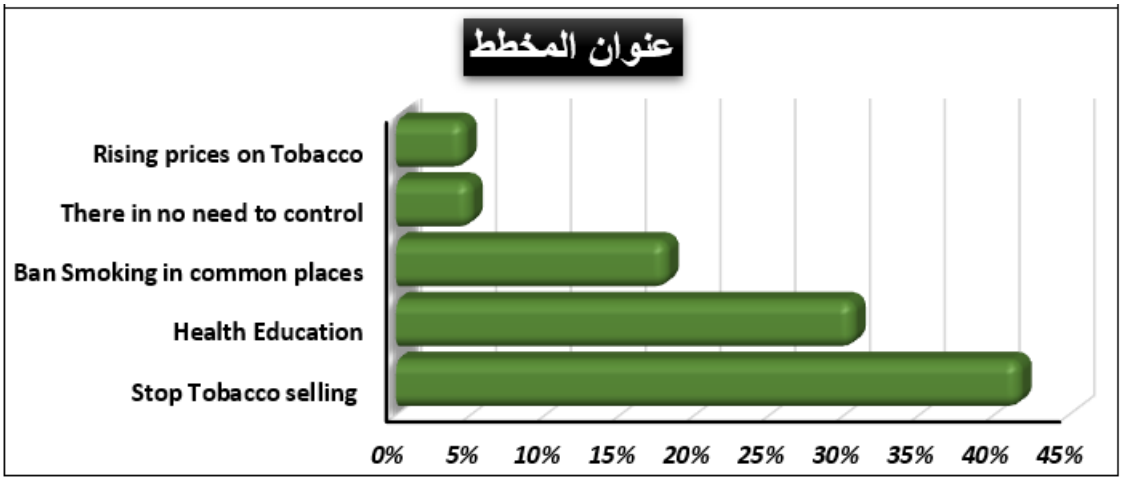

Figure 4: Preferred Smoking Control Strategies (N=1,390)

7) Logistic Regression Analysis

Key predictors of smoking (adjusted odds ratios, AOR):

- Male gender: AOR = 0.375 (*P=0.000*).
- Urban residence: AOR = 0.516 (*P=0.001*).
- Part-time job: AOR = 0.667 (*P=0.021*).
- Father's education (higher degree): AOR = 1.897 (*P=0.023*).

Table 3: Logistic Regression of Smoking Predictors

Variable	AOR	95% CI	P-value
Male gender	0.375	0.288–0.590	0.000
Urban residence	0.516	0.348–0.767	0.001
Part-time job	0.667	0.472–0.942	0.021

4. Discussion

The present study assessed the prevalence of tobacco smoking among secondary school students in Babil Governorate, Iraq, in 2014, along with associated sociodemographic and behavioral factors. The findings revealed a smoking prevalence of **16.4%**, which aligns with previous studies in Iraq but shows variations when compared to regional and international data.

Prevalence of Tobacco Use

The smoking rate in this study (16.4%) is consistent with the 2007 Global Youth Tobacco Survey (GYTS) in Kurdistan (15.3%) (55) but higher than the 2008 GYTS in Baghdad (3.2%) (102). This discrepancy may be due to differences in tobacco product inclusion (e.g., cigarettes only vs. all forms of tobacco). The prevalence was lower than that reported among Al-Mustansiriya University medical students (27%) (57), likely due to age differences and university-level social influences. Comparatively, an Iranian study (2003–2004) found a 14.3% smoking rate, with higher prevalence among boys (18.5% vs. 10.1%) (103), reinforcing gender disparities observed in our study.

1) Socio-Demographic Influences

- Age: Smoking increased with age, peaking at 19 years (32.4%), consistent with studies in India (105) and the U.S. (106, 107), where initiation peaked at 13–14 years.
- Gender: Males had a significantly higher smoking rate (21.1% vs. 6.8%), aligning with studies in Saudi Arabia (108) but contrasting with some GYTS data (109) where gender differences were less pronounced. Cultural norms likely contributed to underreporting among females (110).
- Domicile: Urban students smoked more (19.2% vs. 10.2% rural), similar to findings in Basrah (112), possibly due to socioeconomic and modernization factors. However, U.S. studies (113) reported higher rural smoking, highlighting cultural differences.

2) Academic Performance and Family Factors

- Academic Achievement: Failed students smoked more (21.7% vs. 11.3%), consistent with U.S. studies (114, 115) linking poor performance to smoking. However, a German twin study (68) found education reduced smoking duration but not initiation.
- Parental Influence: Parental smoking and single-parent households increased smoking risk, as seen in New England (117) and Dutch studies (118). Surprisingly, higher parental education correlated with increased student smoking, contradicting studies in Germany (119) and Saudi Arabia (120). This may reflect affluent families' greater tobacco access or social permissiveness.

3) Social and Peer Influence

- Peers and Relatives: Students with smoker classmates (26.2%) or teachers (28.0%) had the highest smoking rates, supporting the peer selection hypothesis (124, 125). A Taiwanese study (125) confirmed teachers' influence, while European research (126) highlighted friends' and family's roles.
- First Cigarette Source: 38.2% got cigarettes from friends, similar to studies in Yemen (132) and the U.S. (133), emphasizing peer pressure's role.

4) Motivations and Barriers to Smoking

- Initiation Reasons: Stress (39.9%) and enjoyment (25.4%) were primary motivators, aligning with Malaysian (127) and U.S. studies (135).
- Quitting Intentions: Only 26.3% intended to quit, citing health (38.3%) and cost (40%) as reasons. Contrastingly, Palestinian (138) and U.S. studies (137) showed higher quit intentions but low success rates without support.

5) Awareness and Control Measures

- Health Knowledge: Most students recognized lung cancer risks (72.7%), but awareness of cardiovascular (8.5%) and digestive diseases (1.6%) was low, similar to Malaysian (127) and Indian (141) findings.
- Control Suggestions: Students proposed banning sales (41.7%), health education (30.6%), and public smoking bans (18.1%), echoing WHO recommendations (142).

Limitations

1) Self-reporting bias was possible, as data were not verified by biochemical tests.
2) Cross-sectional design limits causal inference.
3) Regional focus (Babil only) may not generalize nationally.

5. Conclusion

This study highlights a concerning smoking prevalence among Iraqi adolescents, driven by peer influence, stress, and poor academic performance. Gender and urban-rural disparities persist, while family and teacher roles in prevention remain critical. School-based interventions, stricter tobacco laws, and parental engagement are urgently needed to curb youth smoking. Future research should explore longitudinal trends and cessation strategies tailored to Iraqi youth.

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