The Medical Journal of Tikrit University (2025) 31 (2): 297-311
DOI: http://dx.doi.org/10.25130/mjotu.31.2.33

IRAQI Academic Scientific Journals

ISSN: 1813-1638

The Medical Journal of Tikrit University

Available online at:www.mjotu.com

MJTU

The Medical Journal of Tikrit University

Assessment of Knowledge, Attitudes, and Prevalence of Different Types of Tobacco Products Smoking in Rania District, Sulaimani-Iraq

Emad Abdalla Hama [(1)]; Shahow Abdulrehman Ezzaddin [(2)]

[1]Department of Clinical Sciences, College of Medicine, University of Sulaimani, Kurdistan Region, Iraq.
[2]Department of Clinical Sciences, College of Medicine, University of Sulaimani.

Keywords: *Tobacco smoking; Knowledge; Attitudes; Smoking prevalence; Rania District; Kurdistan Region*

ARTICLE INFO

Article history:

Received 01 Jul 2025
Accepted 01 Sep 2025
Available online 31 Dec 2025

Citation:

ABSTRACT

Background: Tobacco smoking remains one of the leading preventable causes of morbidity and mortality worldwide. While global and regional data are abundant, localized studies are essential for understanding the knowledge, attitudes, and prevalence (KAP) of tobacco use within specific communities.

Methods: A community-based cross-sectional study was conducted between April and July 2025 in Rania District and its sub-districts (Chwarqwrna and Hajyawa). Using a multistage convenience sampling method, 820 individuals aged ≥12 years were recruited. Data were collected via a validated, bilingual (English/Kurdish) questionnaire adapted from the Global Youth Tobacco Survey (GYTS). Statistical analysis was performed with SPSS version 25, using descriptive statistics, Chi-square tests, and logistic regression to determine associations. A p-value <0.05 was considered significant.

Results: The mean age of participants was 29.6 ± 12.5 years, with 83.2% males. Among respondents, 61% were active smokers, while 39% were non-smokers. Knowledge levels were fair in 66% of participants, with a significant association between knowledge and tobacco use (p=0.021). Neutral attitudes toward smoking predominated (84.1%) and were significantly associated with smoking behaviors (p<0.001). Peer influence and sociodemographic factors, including male gender and middle socioeconomic status, were strongly associated with smoking initiation and continuation.

Conclusion: The study highlights a high prevalence of smoking in Rania District, compounded by moderate knowledge and neutral attitudes toward tobacco use. Targeted interventions addressing knowledge gaps, reshaping social norms, and strengthening local tobacco control measures are urgently required.

Corresponding author E mail: Emad91hama@gmail.com

INTRODUCTION

Tobacco use continues to be one of the leading causes of preventable morbidity and mortality worldwide. Despite decades of research and public health initiatives, smoking remains a major contributor to the global burden of non-communicable diseases (NCDs). It is directly responsible for cancers, cardiovascular disease, chronic respiratory conditions, and premature mortality. The World Health Organization (WHO) has consistently highlighted tobacco use as one of the greatest threats to public health, with millions of deaths occurring annually as a direct result of active smoking and additional deaths attributable to second-hand smoke (1).

Globally, the prevalence of smoking has shown a downward trend in some high-income countries due to strict tobacco control policies, yet in many low- and middle-income regions, including parts of the Middle East, the prevalence remains high or is rising (2). The introduction of new tobacco products and the persistence of cultural acceptance have further complicated control efforts. Cigarette smoking remains the most common form, but narghile (waterpipe) and electronic cigarettes have rapidly expanded in popularity, particularly among younger populations (3).

The global burden of tobacco:

The WHO estimates that more than eight million people die each year from tobacco use, with more than one million of these deaths due to exposure to second-hand smoke (1). Tobacco smoke contains thousands of chemicals, many of which are toxic and carcinogenic, contributing to disease and disability (4). While smoking prevalence has decreased in high-income countries, tobacco use remains disproportionately high in low- and middle-income nations, where 80% of smokers reside. The Eastern Mediterranean Region (EMR), including Iraq, demonstrates some of the highest rates globally, especially among men (5).

Narghile smoking, once confined to specific Arab cultures, has become a global phenomenon, with increasing evidence of its harmful health consequences. Users are often unaware that a single narghile session may expose them to smoke volumes many times higher than that from cigarettes (6). Electronic cigarettes (e-cigarettes), marketed as safer alternatives, have grown popular among youth, though studies confirm that they still deliver nicotine and harmful aerosols (7).

Tobacco use in Iraq and the Kurdistan Region:

In Iraq, tobacco smoking remains a widespread and pressing health problem. Studies have estimated that between one-fifth and one-third of adults in Iraq smoke, with the majority being men (5, 8). Although fewer women report smoking due to cultural and social stigma, underreporting is common, and evidence suggests that prevalence among young women is rising, particularly with narghile use (9).

Within the Kurdistan Region, high rates of tobacco use have been documented in several governorates. Surveys conducted in Erbil, Duhok, and Sulaimani report significant prevalence of cigarette smoking

among men and an emerging trend of narghile use among both genders (9). The proliferation of cafés and restaurants offering narghile has normalized the practice in urban and semi-urban settings. The presence of electronic cigarettes in local markets has introduced new challenges, with young adults increasingly experimenting with these devices under the misconception that they are harmless (10).

Although Iraq has ratified the WHO Framework Convention on Tobacco Control (FCTC), enforcement of tobacco control measures has been weak. Laws exist to prohibit smoking in public places and restrict tobacco advertising, but compliance is inconsistent (5). In the Kurdistan Region, enforcement is further challenged by political and economic instability, limited public health infrastructure, and cultural tolerance of smoking (11).

Health consequences of smoking:

The detrimental health effects of tobacco are extensive and well established. Cigarette smoking is causally linked to cancers of the lung, larynx, oral cavity, bladder, pancreas, and stomach, as well as to ischemic heart disease, stroke, and chronic obstructive pulmonary disease (12). Even occasional smoking significantly increases risk.

Pathogenetic effects on blood vessels: Tobacco smoke contributes significantly to vascular injury. Nicotine and other toxic compounds induce endothelial dysfunction, oxidative stress, and arterial stiffness, leading to accelerated atherosclerosis and vascular inflammation. These pathophysiological changes increase the risk of hypertension, ischemic heart disease, and stroke. Recent evidence confirms that smoking-induced vascular dysfunction is a key mechanism linking tobacco exposure to cardiovascular morbidity and mortality (13).

Narghile smoking is often misperceived as safer because smoke passes through water. However, studies have shown that waterpipe smoke contains high levels of carbon monoxide, nicotine, tar, and carcinogens, and that exposure during a single session may be greater than that from multiple cigarettes (13). Similarly, electronic cigarettes deliver nicotine alongside other harmful chemicals; while their long-term health effects are still being studied, evidence already suggests they pose substantial risks (14).

Second-hand smoke (SHS) also contributes to significant morbidity and mortality. Non-smokers exposed to SHS are at increased risk of lung cancer, heart disease, and respiratory illnesses, while children exposed at home are more likely to suffer from asthma, respiratory infections, and sudden infant death syndrome (1). In Iraq, where smoking in public places and households is common, SHS exposure is a significant concern.

Knowledge, attitudes, and practices:

Understanding the knowledge, attitudes, and practices (KAP) of communities is essential for tobacco control. According to the KAP model, knowledge influences attitudes, and both collectively shape behaviors. However, evidence indicates that awareness alone may not always translate into healthier practices, especially in contexts where cultural and social norms support tobacco use (15).

Studies in Iraq and Kurdistan have revealed partial knowledge about the harms of smoking. Many individuals recognize the risk of cancer and respiratory disease, yet misconceptions persist, particularly about narghile and e-cigarettes (16). Attitudes are often neutral or permissive, with smoking considered a socially acceptable habit, especially among men. For example, surveys among university students in Erbil and medical students in Baghdad revealed relatively high levels of knowledge but also high prevalence of smoking, suggesting a disconnection between knowledge and behavior (9, 17).

Tobacco control efforts in Iraq:

The Iraqi government has taken steps to regulate tobacco through national legislation consistent with the FCTC. Policies include restrictions on advertising, requirements for health warnings, and bans on smoking in public places. However, enforcement has been uneven, with widespread violations observed in cafés, restaurants, and government offices (5). Public health campaigns are sporadic and underfunded, and smoking cessation services remain limited.

In the Kurdistan Region, the situation is further complicated by weak regulatory frameworks and cultural norms that accept tobacco use as part of social life. Smoking is common in universities, social gatherings, and households, with little restriction or social disapproval (16). The lack of comprehensive, community-based data has hindered efforts to design tailored interventions.

Rationale for the study:

Despite national and regional surveys, there is a lack of detailed research in semi-urban and rural areas such as Rania District. Most existing studies focus on large cities or specific subpopulations, such as students or health professionals. Localized studies are essential to identify patterns of prevalence, knowledge, and attitudes in specific communities, as interventions must be culturally sensitive and context-specific.

Rania District, located in Sulaimani Governorate, has a youthful population and a vibrant café culture where smoking, particularly narghile, is socially accepted. Anecdotal evidence suggests high prevalence of smoking, especially among young men. However, systematic data are lacking.

This study was designed to fill this gap by providing a comprehensive assessment of the prevalence of cigarette, narghile, and electronic cigarette use in Rania District, alongside an evaluation of community knowledge and attitudes toward smoking. By exploring associations between sociodemographic factors, knowledge, attitudes, and smoking behavior, this study provides evidence that can guide targeted interventions and policy measures in the Kurdistan Region.

Aim:

To assess the knowledge, attitudes, and prevalence of smoking different types of tobacco products among residents of Rania District, Sulaimani Governorate, Kurdistan Region, Iraq.

Objectives:

1. To estimate the prevalence of cigarette, narghile, and electronic

cigarette smoking among residents of Rania District.
2. To assess the level of knowledge regarding health risks of smoking.
3. To evaluate community attitudes toward tobacco use.
4. To determine associations between sociodemographic factors and smoking prevalence.
5. To identify the relationship between knowledge, attitudes, and smoking practices.

MATERIALS AND METHODS

Study design and setting:

A community-based cross-sectional study was conducted between April and July 2025 in the Rania District of Sulaimani Governorate, located in the Kurdistan Region of Iraq. The district comprises the central town of Rania and two sub-districts, Chwarqwrna and Hajyawa. The region is characterized by a young population, rapid urbanization, and evolving lifestyle trends. These dynamics make it an important site for studying tobacco use patterns.

Study population and eligibility criteria:

The target population consisted of residents of Rania District aged 12 years and above. Eligibility criteria included permanent residency in the district and the ability to provide oral informed consent (for interviewed). Exclusion criteria were refusal to participate and inability to complete the questionnaire due to language or cognitive barriers.

Sample size determination:

The sample size was calculated using the single population proportion formula, assuming an expected prevalence of smoking of 50% (to maximize variability), a 95% confidence interval, and a 5% margin of error. After adjusting for a 10% non-response rate, the final required sample size was estimated at 820 participants. This ensured adequate power to detect statistically significant associations between smoking status and independent variables.

Sampling procedure:

A multistage convenience sampling technique was employed. First, the district was stratified into three areas: Rania center, Chwarqwrna, and Hajyawa. Within each stratum, households and community gathering points (e.g., markets, cafés, and health centers) were selected proportionally to population size. Eligible individuals within these sites were invited to participate until the allocated quota was reached.

Data collection instrument:

Data were collected using a structured questionnaire form developed in English and translated into Kurdish with back-translation to ensure accuracy, (both self-administered/interview) through Google form link. The questionnaire was adapted from the Global Youth Tobacco Survey (GYTS) and previous regional KAP studies on tobacco use. It consisted of five sections:

1. **Sociodemographic characteristics** (age, gender, marital status, education level, occupation, and socioeconomic status).
2. **Smoking prevalence and practices**, including use of cigarettes, e-cigarettes, narghile,

frequency of use, and age of initiation.

3. **Knowledge** of health risks associated with tobacco use (scored based on correct responses).
4. **Attitudes** toward smoking, measured using Likert-scale items reflecting beliefs, perceptions, and social acceptability.
5. **Influencing factors**, such as peer influence, family history, and exposure to anti-smoking campaigns.

The questionnaire was pilot-tested on 50 participants outside the study sample to ensure clarity and reliability. Cronbach's alpha was used to assess internal consistency, yielding coefficients of 0.82 for the knowledge domain and 0.79 for the attitude domain, indicating good reliability.

Measurement of variables:

- **Knowledge:** Scored on a scale of 0–10 based on responses to 10 items about health risks. Scores were categorized as *poor* (≤ 3 points), *moderate* (4-7 points), and *high* (≥ 8 points).
- **Attitudes:** Measured through 10 Likert-scale items with 5 responses from strongly disagree to strongly agree (total 50 points). Responses were aggregated and categorized as; < 25 points=*negative* (anti-smoking), 25-35 points=*neutral*, and > 35 points =*positive* (pro-smoking).
- **Smoking status:** Participants were categorized as *current smokers* (smoked any tobacco product in the past 30 days), *Ex-smokers* (previously smoked but quit for at least 6 months), and *non-smokers* (never smoked).
- **Sociodemographic factors:** Gender, age group, education, marital status, and socioeconomic status (classified into low, middle, and high based on income and occupation).
- **Socioeconomic status (SES) scores and levels:** A total 23-point scoring system was used to classify the respondents according to their socio-economic status (SES). The total score (23) was divided into three categories: ≤7 (low), 8-14 (medium), and ≥15 (high) according to father and mother education level (0-5 point for each), father and mother job (1-4 point or each), house ownership (0-2 point), car ownership (0-1 point), income (0-2 point).

Ethical considerations:

Ethical approval for the study was obtained from the Research Ethics Committee of the College of Medicine, University of Sulaimani (Ref: 207 at 20/1/2025). The study adhered to the principles of the Declaration of Helsinki. Oral informed consent was obtained from all participants (interviewed). Confidentiality was assured by anonymizing responses and restricting access to data. Participation was voluntary, and respondents could withdraw at any time without consequences.

Data analysis:

Data were entered and analysed using IBM SPSS Statistics version 25 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to

summarize the data. The Chi-square test was employed to examine associations between categorical variables. Statistical significance was set at $p < 0.05$.

RESULTS

Sociodemographic characteristics:

A total of 820 participants completed the survey, producing a strong response rate. The age of respondents ranged from 12 to 65 years, with a mean of 29.6 years (SD ± 12.5). The largest proportion (over one-third) belonged to the 16–29 years age group. Males made up the majority (83.2%) while females constituted 16.8%. This gender imbalance reflects both the demographic characteristics of the district's public spaces and the greater social acceptability of male participation in surveys and smoking-related discussions. In terms of marital status, 48.9 % were single, while 47.9 % were married. Education levels varied: 30.0 % of respondents had completed secondary education, 28.7% had attained a university degree, and smaller proportions reported either primary education or postgraduate qualifications. Socioeconomic status (SES), measured through income and occupation indicators, showed that 52.6% were classified as middle SES, 33.9 % low SES, and 13.5 % high SES. (as shown in Table: 1).

Prevalence of tobacco use:

Overall, 61% of respondents were active/current smokers, 7% were Ex-smokers, and 20% reported never smoking. Cigarettes were the most widely used product, consumed by 50.2% of participants. Narghile smoking was reported by 3.8%, while 7.1% used electronic cigarettes. Among active/current smokers, 68% reported poly-use, combining more than one type of tobacco product. Mean ± SD age of initiation was 16.84 ± 4.514 years, with males initiating at a younger age than females ($p < 0.05$). The majority of cigarette smokers reported daily use, while narghile was typically consumed weekly in cafés or social gatherings. (as shown in figure: 1).

Knowledge of tobacco-related harms:

Knowledge levels were categorized into three groups: good (25.6%), fair (66.2%), and poor (8.2%). The mean + SD of knowledge score was 6.25 + 1.899 ranging from 0 to 10 with a relatively balanced distribution around the mean, among active/current smokers shows that 139 (17%) good, and 46 (5.6%) poor. While 227 (27.7%) of non-active/current smokers have fair knowledge. Misconceptions were particularly evident regarding alternative products: among total population 59.5% believed electronic cigarettes were safe (p=0.003), and 41.5% believed narghile was less harmful because smoke passes through water (p=0.033). These findings demonstrate both partial awareness and persistent myths. (as shown in figure: 2)

Attitudes toward smoking:

The majority of respondents (84.1%) expressed neutral attitudes toward smoking, while 4.0% reported negative attitudes and 11.8% positive attitudes. Neutral responses often included views that smoking is a "personal choice" or "not harmful in moderation''. Education and gender were non significantly associated with attitudes. (24.8%) of respondents with education level college or above and followed by secondary education level (23.9%) have neutral attitudes toward smoking respectively, (p-value=0.238)

indicates that attitudes similarly across education levels. Attitudes category among different sex shows that (70.6%) of males and (13.5%) of females have neutral attitudes toward smoking within no significant differences among both sex groups (p-value=0.130). (as shown in figure: 3)

Association between knowledge and attitudes:

Statistical analysis revealed significant associations between knowledge and attitudes. The relation between respondents' attitudes toward smoking and the level of knowledge in the study sample; results confirm that among the total of those who have negative attitudes 27 (82.8%) have moderate knowledge level while among the total respondents with neutral attitudes 690 (84.1%) results find that only 51 (7.4%) have low knowledge level. Furthermore, respondents with positive attitudes toward smoking in the study, findings illustrate that 65 (67%) of respondents have moderate knowledge level. Regarding the association between attitudes and knowledge levels (p-value=0.021) prove that knowledge levels positively influence attitudes and individuals with more knowledge are likely to exhibit neutral and positive attitudes, whereas those with negative attitudes tends to have lower knowledge level. (as shown in figure: 4)

Sociodemographic determinants:

Gender was a strong determinant of smoking. While 57.9% of men reported smoking, only 3.2% of women did so. This gap reflects cultural acceptability, where male smoking is tolerated and even expected in social contexts, while female smoking is stigmatized and likely underreported. Age was also significant: the highest prevalence 31.1% was found among participants aged 16–29 years consistent with initiation during adolescence and continuation into young adulthood. SES analysis showed smoking to be most common among middle-income groups 33.9%, lower among low SES 20.9%, and somewhat lower among high SES groups 6.3%. This may reflect affordability, as well as differences in exposure to health information. (as shown in table: 2)

Factors influencing smoking:

Respondents demonstrate that peer pressure (31.3%), curiosity, habit and enjoyment (31.2%), and (25.5%) stress relief are factors associated with smoking among study population. Peer influence was therefore the strongest factor in smoking initiation. 10.1% of respondents finds that parenteral smoking habit also normalized the behavior and contributed to early tobacco smoking initiation. (as shown in figure: 5)

DISCUSSION

Sociodemographic characteristics:

The youthful demographic profile is consistent with Kurdistan's population structure, which is characterized by a large proportion of adolescents and young adults (9). Similar distributions have been noted in previous smoking studies in Iraq, where younger males are typically overrepresented, reflecting both cultural factors and the higher likelihood of smoking uptake at these ages (17). Similar patterns of higher male tobacco use are observed in other contexts such as a study in the Kingdom of Saudi Arabia in 2021 found a smoking prevalence of 14.09%, with a notable disparity between genders

(25.34% among men vs. 1.91% among women). This aligns with the significant male representation in the study (18).). This likely reflects (a) the study's community sampling with a majority male composition (83% male), (b) presence of a wide age range 16–29 yrs group, and (c) local cultural or environmental factors (availability, social norms), lead to male predominance of smoking is consistent with regional patterns reported in Iraq and neighbouring countries.

Prevalence of smoking:

This prevalence is substantially higher than national estimates from the WHO Stepwise survey in Iraq, which reported adult smoking prevalence at around 20–25% (5). The discrepancy may reflect both localized cultural norms in Rania and possible underreporting in national surveys due to stigma among women. Similar findings have been reported in Erbil and Sulaimani, where prevalence among men is notably higher than the national average (19). The strong popularity of narghile aligns with regional evidence indicating its rising use among youth in the Middle East (3). The high prevalence of smoking in Rania District (61%), which is nearly double the national average reported in Iraq and considerably higher than prevalence rates in many neighbouring countries. For example, a national survey in Jordan and Palestine estimated smoking prevalence at 59.5% and 56.5% respectively among adults (3). The finding that cigarettes remain the most commonly used product, followed by narghile and e-cigarettes, is consistent with regional and global evidence from Lebanon (20)and Saudi Arabia (21) Respectively. The higher prevalence in Rania may be explained by a combination of weak tobacco control enforcement, strong peer influence, and limited community-level health interventions.

Knowledge levels regarding tobacco use:

Similar knowledge gaps have been reported in studies across Iraq and Kurdistan. For instance, (9) noted that while students in Erbil recognized smoking as a cause of cancer, far fewer understood its relationship with reproductive health. (22) also reported widespread misconceptions about narghile, with many participants perceiving it as a harmless leisure activity. A 2020 cross-sectional study among university students in Oman also assessed knowledge about smoking. Although specific scores differ, that study identified significant differences in knowledge scores based on gender and educational attainment, supporting current study findings of better knowledge among females and those with higher education (23). Knowledge gaps were evident in this study, with most participants classified as having fair knowledge. This is similar to findings in Iran, where observed that incomplete knowledge of tobacco harms contributed to continued smoking among university students (24). Moreover, misconceptions about narghile and e-cigarettes as "safer" alternatives persist globally underscoring the urgent need for targeted health communication (7). These findings emphasize the need for comprehensive health education that targets specific misconceptions.

Attitudes towards smoking:

These findings are consistent with surveys conducted in Iraq, which highlight the persistence of cultural permissiveness toward smoking (8) and other countries in

Middle East (21, 23). Neutral attitudes reflect the normalization of smoking in social gatherings, cafés, and households. Furthermore, research on adolescents' beliefs, attitudes, and social norms regarding smoking highlights how these constructs shape an individual's intentions and influence changes in smoking behavior (25). In contrast, stronger anti-smoking attitudes are observed in Western countries with strict tobacco control enforcement (26). Most possible explanation that the "neutral" attitudes observed in the study might a lack of strong negative perception, potentially contributing to continued or initiated smoking behaviors, another reason may be because the majority of study participants were smokers.

Knowledge-attitudes association:

These findings support the KAP model, which suggests that knowledge and attitudes influence practices (27). However, they also highlight that knowledge alone is insufficient: even individuals with moderate knowledge may continue smoking if attitudes remain permissive. This was also reported by (9, 17), who found that medical students in Baghdad and Erbil continued smoking despite awareness of health risks, often citing stress and peer influence as justifications.

Sociodemographic characteristics of active smokers:

These determinants are consistent with findings from Erbil and Baghdad, where smoking prevalence was significantly higher among young males and varied with SES (8, 9). And aligns strongly with global and regional trends observed in recent literature (28-30). Research on socioeconomic differences in adolescent smoking in Denmark (31) and on socioeconomic inequalities in smoking in China both highlight the persistent impact of socioeconomic factors on smoking behavior (32). Regarding marital status, our findings show a notable presence of active smokers among both married (30.9%) and single (unmarried or engaged) individuals (28.3%). This is supported by studies like the one from Saudi Arabia, which identified marital status as a significant determinant of current smoking status (18). The relationship between education level and smoking behavior is complex and has been a focus of recent research. While some studies suggest a protective effect of higher education against smoking, others reveal more nuanced associations. For example, a study in France (published 2023) indicated a widening social inequality gap in smoking rates, with individuals with lower educational levels being more vulnerable to smoking (33). These findings suggest that while our study shows a substantial proportion of active smokers at higher educational levels, further investigation into the specific contexts and types of tobacco products consumed within these groups may be warranted.

Factors influencing smoking:

The present research identified peer pressure, curiosity, habit, enjoyment, and stress relief as significant factors associated with the initiation of smoking. These findings are supported by regional studies, which show that adolescents are particularly vulnerable to peer and family influence (9, 34). Similarly reported that peer environments strongly influenced initiation among university students (27, 35). This consistency across studies

reinforces the pervasive influence of social environment and personal coping mechanisms on tobacco initiation.

Implications for public health:

The high prevalence of smoking in Rania District, combined with moderate knowledge and neutral attitudes, suggests that current tobacco control measures are inadequate. Awareness campaigns must move beyond general messages and directly address misconceptions about narghile and e-cigarettes.

Recommended strategies include:

- Stronger enforcement of smoke-free legislation in public spaces.
- Culturally tailored educational programs targeting youth in schools and universities.
- Community-level interventions that address peer pressure and family influences.
- Accessible cessation services, particularly for young adults.

Strengths and limitations:

Strengths:

- Large, community-based sample (n = 820).
- Inclusion of both urban and semi-urban sub-districts.
- Use of a validated questionnaire adapted from international surveys.
- First study to comprehensively assess tobacco use, knowledge, and attitudes in Rania.

Limitations:

- Cross-sectional design prevents causal inference.
- Self-reported data may underestimate prevalence, especially among women.
- Convenience sampling may limit generalizability.
- No biochemical validation of smoking status.

CONCLUSION

This study assessed the knowledge, attitudes, and prevalence of smoking different types of tobacco products in Rania District, Sulaimani Governorate, Kurdistan Region, Iraq. The findings reveal a concerningly high prevalence of tobacco use, with cigarettes remaining the most commonly consumed product, followed by narghile and e-cigarettes. Notably, a significant proportion of participants were poly-users, reflecting global trends in diversified tobacco consumption. Although general awareness of tobacco-related harms was moderate to high, knowledge gaps persisted, particularly regarding the risks associated with alternative products such as e-cigarettes and narghile. Neutral attitudes dominated the community, highlighting a cultural permissiveness toward smoking behaviors. The interplay of these factors—high prevalence, incomplete knowledge, and permissive attitudes—underscores the normalization of tobacco use in everyday life. Sociodemographic factors, particularly male gender, younger age, and middle socioeconomic status, were strongly associated with tobacco use. Peer influence and family history further reinforced smoking initiation and continuation, consistent with regional and international evidence.

Acknowledgments:

The author expresses deep gratitude to **Assistant Professor Dr. Shahow Abdulrehman Ezzaddin**, Department of Clinical Sciences, College of Medicine, University of Sulaimani, for his valuable supervision and guidance throughout this research. Special thanks are extended to the faculty and staff of the University of Sulaimani for their continuous support. The author also acknowledges the participants from Rania District, Chwarqwrna, and Hajyawa, whose cooperation made this study possible.

Conflicts of Interest:

The author declares that there are no conflicts of interest regarding the publication of this article.

Funding Statement:

This study received no external funding. It was conducted as part of the requirements for the Master of Public Health program at the University of Sulaimani.

REFERENCES

1. WHO. Tobacco Key Facts: World Health Oraganization; 2023 [15 December 2024]. Tobacco Key facts]. Available from: https://www.who.int/news-room/fact-sheets/detail/tobacco

2. Maziak W. The global epidemic of waterpipe smoking. Addictive behaviors. 2011;36(1-2):1-5.

3. Nakkash R, Khader Y, Chalak A, Abla R, Abu-Rmeileh NM, Mostafa A, et al. Prevalence of cigarette and waterpipe tobacco smoking among adults in three Eastern Mediterranean countries: a cross-sectional household survey. BMJ open. 2022;12(3):e055201.

4. Cornelius ME. Tobacco product use among adults—United States, 2020. MMWR Morbidity and mortality weekly report. 2022;71.

5. Organization WH. WHO global report on trends in prevalence of tobacco use 2000–2030: World Health Organization; 2024.

6. Ahmad W, Ahmad A, Ali MD, Hassan YA, Albanai RAR, Al-Dossary RB, Alabdullah AA. Cross sectional online survey to determine the prevalence, knowledge, attitude and practice of smoking tobacco among students of medical science college in Dammam, Saudi Arabia. Journal of Pharmacy and Bioallied Sciences. 2021;13(3):305-11.

7. Pokharel U. E-CIGARETTES THEORY TO ALTERNATIVE TO SMOKING AND ASSOCIATED EMERGING HEALTH CONCERNS. 2024.

8. Al-Delaimy AK, Al-Ani WA. Prevalence of hookah smoking and associated factors among male high school students in Iraq. BMC public health. 2021;21:1-9.

9. Hamad KJ, Al-Tawil NG. Patterns of Cigarette and Waterpipe Smoking in Erbil City, Iraq. A Household Survey. Zanco Journal of Medical Sciences (Zanco J Med Sci). 2024;28(2):315-28.

10. Pike JR, Miller S, Cappelli C, Tan N, Xie B, Stacy AW. Using marketing frameworks to predict the effects of e-cigarette commercials on youth. Young consumers. 2023;24(2):149-64.

11. Kurdistan24. A person dies every 20 minutes in Iraq due to smoking 2022 [Report]. Available from: https://www.kurdistan24.net/en/story/388705/A-person-dies-every-20-minutes-in-Iraq-due-to-smoking-related-health-issues%C2%A0.

12. Benowitz NL, Liakoni E. Tobacco use disorder and cardiovascular health. Addiction. 2022;117(4):1128-38.

13. Al-Hadrawi MK, Jabar ZSA, Hasan AA, Hammadi KA. Study the Effect of Tobacco Smoking (Cigarette and Hookah) on Some Blood Parameters in the Samples of Iraqi People in Al-Najaf Governorate. Medical Journal of Babylon. 2024;21(Suppl 1):S39-S43.

14. Margham J, McAdam K, Cunningham A, Porter A, Fiebelkorn S, Mariner D, et al. The chemical complexity of e-cigarette aerosols compared with the smoke from a tobacco burning cigarette. Frontiers in chemistry. 2021;9:743060.

15. Haddad C, Lahoud N, Akel M, Sacre H, Hajj A, Hallit S, Salameh P. Knowledge, attitudes, harm perception, and practice related to waterpipe smoking in Lebanon. Environmental Science and Pollution Research. 2020;27(15):17854-63.

16. Muhammad Ahmed S. Prevalence and Perceptions toward Electronic Cigarettes (Vaping) Use among Medical Students: A New Public Health Challenge in Kurdistan Region, Iraq. Journal of Medicinal and Chemical Sciences. 2024;7(5):720-8.

17. Mohammed AS, Neamah MA. Assessment of Attitudes towards E-cigarettes Smoking among Middle School Students in Baghdad City/Iraq. Indian Journal of Forensic Medicine & Toxicology. 2021;15(3).

18. Qattan AM, Boachie MK, Immurana M, Al-Hanawi MK. Socioeconomic determinants of smoking in the Kingdom of Saudi Arabia. International Journal of Environmental Research and Public Health. 2021;18(11):5665.

19. Younus MS, Ahmed K, Lak RT. The Smoking Prevalence Among University Students in Erbil City/Iraq. Eurasian Journal of Science and Engineering. 2023;9(1):197-203.

20. Lugemwa T. Quitting Behavior among adolescent waterpipe (Hookah) smokers in Lebanon and its relationship to Vaping: The University of Memphis; 2024.

21. Alzahrani BM. Social Determinants of Health and Use of E-Cigarettes Among Saudi Adult Users in Riyadh City, Saudi Arabia: A Cross-Sectional Study: Alfaisal University (Saudi Arabia); 2025.

22. Jamil H, Albahri M, Al-Noor N, Al-Noor T, Heydari A, Rajan A, et al., editors. Hookah smoking with health risk perception of different types of tobacco. Journal of Physics: Conference Series; 2020: IOP Publishing.

23. Al Omari O, Abu Sharour L, Heslop K, Wynaden D, Alkhawaldeh A, Al Qadire M, Khalaf A. Knowledge, attitudes, prevalence and associated factors of cigarette smoking among university students: a cross sectional study. Journal of community health. 2021;46(3):450-6.

24. Zahedi H, Sahebihagh MH, Sarbakhsh P, Gholizadeh L. The association between cigarette smoking attitudes and social capital among Iranian health and medical students: a cross-sectional study. BMC Public Health. 2021;21:1-8.

25. Olsen IG, Garritsen HH, van de Goor I, Kunst AE, Rozema AD. Adolescents' beliefs, attitudes and social norms with regard to smoking and sports: a qualitative study. BMJ open. 2021;11(8):e046613.

26. Vaihekoski A, Lagström H, Eloranta S, Bäärs S, Hannula A, Lehvikkö M, Salakari M. Influencing adolescents' attitudes towards nicotine products: A systematic review. Nordic Studies on Alcohol and Drugs. 2022;39(5):568-84.

27. Mohammadnezhad M, Kengganpanich M. Factors affecting smoking initiation and cessation among adult smokers in Fiji: A qualitative study. Tobacco induced diseases. 2021;19:92.

28. Reitsma MB, Kendrick PJ, Ababneh E, Abbafati C, Abbasi-Kangevari M, Abdoli A, et al. Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and attributable disease burden in 204

countries and territories, 1990–2019: a systematic analysis from the Global Burden of Disease Study 2019. The Lancet. 2021;397(10292):2337-60.

29. Shafiee A, Oraii A, Jalali A, Alaeddini F, Saadat S, Masoudkabir F, et al. Epidemiology and prevalence of tobacco use in Tehran; a report from the recruitment phase of Tehran cohort study. BMC Public Health. 2023;23(1):740.

30. Yusoff MFM, Lim KH, Saminathan TA, Hasani WSR, Lourdes TGR, Ghazali SM, et al. The pattern in prevalence and sociodemographic factors of smoking in Malaysia, 2011–2019: Findings from national surveys. Tobacco Induced Diseases. 2022;20:84.

31. Kjeld SG, Lund L, Andersen S, Bast LS. Socioeconomic differences in cigarette smoking and alternative tobacco product use among adolescents in a school-based smoking preventive intervention: findings from the second year of the X: IT II study. Frontiers in Public Health. 2022;10:825585.

32. Huang MZ, Liu TY, Zhang ZM, Song F, Chen T. Trends in the distribution of socioeconomic inequalities in smoking and cessation: evidence among adults aged 18~ 59 from China Family Panel Studies data. International Journal for Equity in Health. 2023;22(1):86.

33. Andersen AJ, Hecker I, Wallez S, Witteveen A, Lora A, Mittendorfer-Rutz E, et al. Are we equally at risk of changing smoking behavior during a public health crisis? Impact of educational level on smoking from the TEMPO cohort. BMC Public Health. 2023;23(1):1016.

34. Fadli RK, Achadi A. Perilaku Merokok Siswa SMP di Kecamatan Panongan Kabupaten Tangerang Tahun 2015. Jurnal Arsip Kesehatan Masyarakat. 2019.

35. Vitória P, Pereira SE, Muinos G, De Vries H, Lima ML. Parents modelling, peer influence and peer selection impact on adolescent smoking behavior: A longitudinal study in two age cohorts. Addictive behaviors. 2020;100:10613.

TABLES

Table 1: Sociodemographic characteristics of study participants (n=820).

Age Groups	≤15yrs	72	8.8 %
	16-29yrs	388	47.3 %
	30-45yrs	249	30.4 %
	≥45yrs	111	13.5 %
Sex	Male	682	83.2 %
	Female	138	16.8 %
Education level	Read and write	47	5.7 %
	Secondary	246	30.0 %
	Primary	66	8.0%
	College and above	235	28.7%
	Intermediate	197	24.0 %
	Illiterate	29	3.5 %
Marital status	Widow/Widower	17	2.1 %
	Divorced	7	0.9 %
	Separated	2	0.2 %
	Married	393	47.9 %
	Single (unmarried or engaged)	401	48.9 %
	Widow/Widower	17	2.1 %
	Divorced	7	0.9 %
Current occupation	Jobless	83	10.1 %
	Retired	16	2.0 %
	Self/Own Business	135	16.5 %
	Student	249	30.4 %
	Housewife	50	6.1 %
	Employed	167	20.4 %
	Daily Worker	120	14.6 %
Place of residence	Chwarqurna	175	21.3 %
	Hajyawa	175	21.3 %
	Ranya	470	57.3 %
Socioeconomic status	Low	278	33.9 %
	Medium	431	52.6 %
	High	111	13.5 %
Total		100 %	

Table 2: Comparison between sociodemographic characteristics among active smokers

Variable	Category	Active smokers' frequency	Percent
Age Groups	≤15yrs	25	3.0%
	16-29yrs	255	31.1%
	30-45yrs	149	18.2%
	≥45yrs	72	8.8%
	Male	475	57.9%

Sex	Female	26	3.2%
Education level	Read and write	29	3.5%
	Secondary	155	18.9%
	Primary	39	4.8%
	College and above	146	17.8%
	Intermediate	115	14.0%
	Illiterate	17	2.1%
Marital status	Widow/Widower	10	1.2%
	Divorced	4	0.5%
	Separated	2	0.2%
	Married	253	30.9%
	Single (unmarried or engaged)	232	28.3%
Current occupation	Jobless	66	8.0%
	Retired	7	0.9%
	Self/Own Business	107	13.0%
	Student	113	13.8%
	Housewife	5	0.6%
	Employed	104	12.7%
	Daily Worker	99	12.1%
Place of residence	Chwarqurna	106	12.9%
	Hajyawa	110	13.4%
	Ranya	285	34.8%
Socioeconomic status	Low	171	20.9%
	Medium	278	33.9%
	High	52	6.3%
Total		501	61.1%

FIGURES

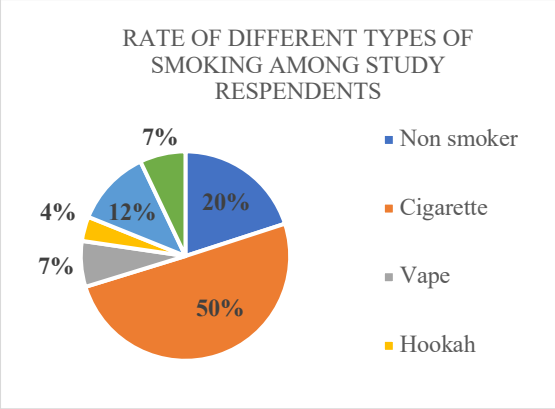

Figure 1. Prevalence of tobacco product use among respondents.

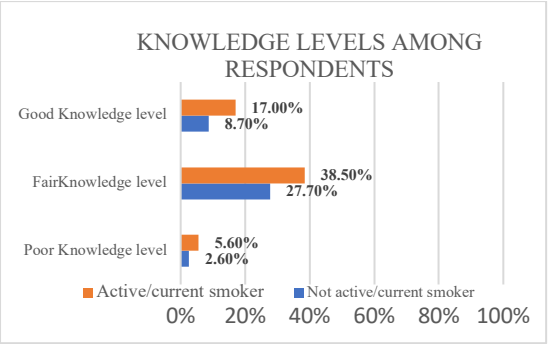

Figure 2: Knowledge levels among smoker and non-smokers.

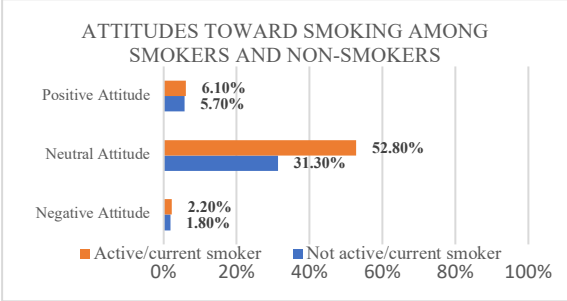

Figure 3: Attitudes level among smokers and non-smokers.

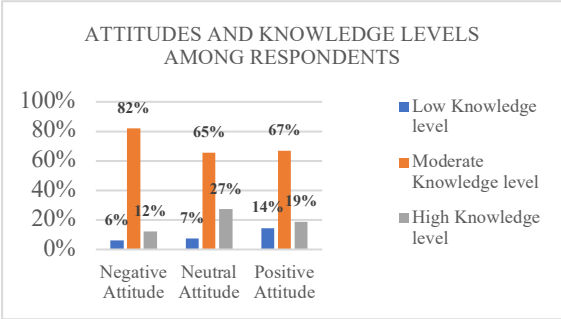

Figure 4: Attitudes-Knowledge levels association in the study sample

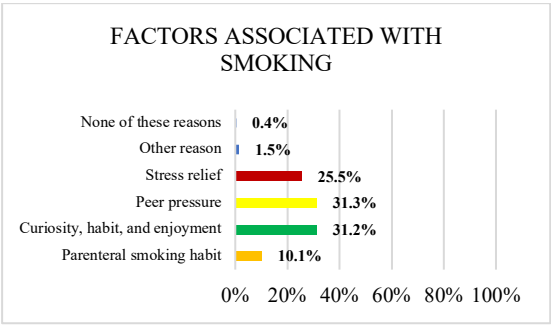

Figure 5: Factors associated with smoking among study respondents.