

Prevalence of Cigarette, E-Cigarette, and Hookah Smoking and Exposure to Secondhanded Tobacco Smoke at Home and Workplace Among Adults in Zawia, Libya: A Cross-Sectional Study

Shokri Ayad Halila^{1*}

¹University of Zawia - Faculty of Education Zawia - Department of Biology. Zawia, Libya

¹Department of Biology, Faculty of Education Zawia, University of Zawia. Zawia, Libya

¹ORCID: <https://orcid.org/0009-0005-4146-0403>

Correspondence Author: Shokri Ayad Halila^{1*}

Publication Date: 2025/11/14

Abstract:

➤ Introduction:

Smoking, in all its forms (cigarettes, e-cigarettes, and hookah), remains one of the most significant public health challenges worldwide, especially in low- and middle-income countries. In Libya, reports indicate an increase in smoking rates, particularly among youth; however, studies on smoking in the city of Zawia are almost non-existent.

➤ Methodology:

A cross-sectional study was conducted in Zawia, Libya, over a six-month period (June–December 2024). A random sample of 2,123 men was surveyed using a questionnaire designed to collect necessary data. A second questionnaire, specifically designed for male smokers, was administered to 100 smokers. Data were analysed using IBM SPSS Statistics version 25.

➤ Results:

Overall, 48.3% of participants were smokers; 35% of smokers smoked at home, and 63% smoked at work. The study demonstrated that family influences smoking habits. Seventy-eight percent of smokers indicated a desire to quit smoking, and 47% of smokers quit smoking for a period.

➤ Conclusion:

The study reveals a high prevalence of smoking in Zawia and highlights the presence of secondhand smoke at high rates in homes and workplaces. In light of these findings, there is an urgent need to establish awareness programs to strengthen anti-smoking efforts in Libya.

Keywords: Cigarettes, E-Cigarettes, Hookah, Secondhanded Smoke, Smoking Prevalence, Libya.

How to Cite: Shokri Ayad Halila (2025) Prevalence of Cigarette, E-Cigarette, and Hookah Smoking and Exposure to Secondhanded Tobacco Smoke at Home and Workplace Among Adults in Zawia, Libya: A Cross-Sectional Study.

International Journal of Innovative Science and Research Technology, 10(11), 333-342.

<https://doi.org/10.38124/ijisrt/25nov034>

I. INTRODUCTION

Tobacco entered Europe via America in the late fifteenth century and was initially used for medical purposes, spreading first to the United Kingdom, then across Europe

and eventually worldwide[1]. Studies have shown a positive link between smoking and mental illness, as individuals with mental health conditions are more likely to smoke [2].

The World Health Organization estimates that there are approximately 1.1–1.3 billion smokers globally, with 70–80% residing in low- and middle-income countries, including 700 million male smokers in developing regions. Among adults, around 47% of men and 12% of women smoke, consuming an estimated 6 trillion cigarettes annually [3]. Tobacco use is a leading cause of death, responsible for 5–8 million deaths each year worldwide, including 7 million from direct tobacco use and approximately 1.2 million from passive smoking by nonsmokers [4]. If current trends continue, the number of deaths due to smoking could exceed 10 million by 2030, 70% of which are expected in developing countries [5]. Over the next 50 years, an estimated 450 million people may die from tobacco-related diseases without appropriate interventions [6].

Smoking is a major risk factor for numerous diseases, including cardiovascular disease, type 2 diabetes, coronary heart disease, and age-related macular degeneration [7–9]. Cigarette smoking increases oxidative stress and decreases nitric oxide activity, affecting vascular endothelial function and accelerating atherosclerotic plaque formation [9]. About half of regular smokers who begin before the age of 18 will die from tobacco-related diseases [10]. Smoking also contributes significantly to premature death, accounting for 12% of all causes globally [10, 11].

Exposure to secondhand smoke (passive smoking) represents an additional public health risk, particularly for infants, children, and pregnant women [12, 13]. Passive exposure can occur directly through inhalation or indirectly via contaminated surfaces, leading to multiple health complications [12]. Many countries have introduced regulatory measures, such as banning smoking in enclosed public areas [14].

Tobacco use also imposes considerable economic burdens. The global cost of smoking-related healthcare, productivity loss, and other expenses exceeds 1.4 trillion US dollars annually [15].

Globally, smoking remains the most common form of tobacco use, with widespread consumption of cigarettes, e-cigarettes, and hookah [16]. Tobacco smoke was officially declared a carcinogen in 2002 [17]. In the Arab region, smoking prevalence varies widely: 72% in Saudi Arabia, 33.1% in Yemen, 46.7% in Egypt, 46% in Kuwait, 28.3% in Libya, and 26% in Lebanon [15]. Libya has implemented several tobacco control strategies, including bans on public smoking, advertising restrictions, and prohibiting sales to minors [18].

➤ Importance

Despite the substantial body of research on smoking, data from Zawia City remain limited. Understanding local patterns of smoking—including cigarettes, e-cigarettes, and hookah—as well as exposure to secondhand smoke in homes and workplaces is essential for developing effective, targeted tobacco control strategies.

➤ Objective

This study aims to investigate the prevalence of smoking among men over 20 years of age in Zawia, Libya, examine exposure to secondhand smoke in domestic and workplace settings, and explore determinants such as age of smoking initiation and the impact of family smoking habits on individual smoking behaviours.

II. METHODS

➤ Study Design and Sampling

This cross-sectional study was conducted from June 2024 to December 2024 to investigate the prevalence and determinants of smoking behavior among men in Zawia, Libya. A random sampling technique was employed to select participants for two distinct questionnaires: one targeting the general male population ($n = 2123$) and another specifically for smokers ($n = 100$).

Inclusion criteria included men aged 20 years and older residing in Zawia, while exclusion criteria were men under 20, non-residents, or those unwilling to participate. The sample size was calculated using statistical power methods to ensure adequate representation of the target population.

➤ Data Collection Instruments

Two structured questionnaires were used in this study. The first questionnaire collected demographic information, smoking status, and occupational data. The second questionnaire, designed specifically for smokers, comprised six sections: demographic information, smoking habits and behaviours, influencing factors, familial smoking, awareness and prevention, and environmental influences.

The questionnaires were pre-tested for clarity and reliability, and internal consistency was evaluated using Cronbach's alpha.

➤ Data Analysis

Data were analysed using IBM SPSS Statistics version 25. Descriptive statistics summarized participant characteristics, and correlation analyses were conducted to examine relationships between variables. Given the sample size of the smoker-specific questionnaire, the analysis primarily focused on descriptive and exploratory statistics to identify trends and patterns. Statistical significance was set at $p < 0.05$.

Artificial intelligence tools, including Meta AI and ChatGPT, were utilized to assist in the formulation of the introduction and in supporting the interpretation and synthesis of results.

➤ Ethical Considerations

This study involved only questionnaire completion, with no medical procedures or interventions. Participation was voluntary, and all participants provided informed consent prior to completing the questionnaires. Confidentiality and anonymity were strictly maintained, and data were securely stored to prevent any identification of participants.

III. RESULTS

A. Part 1: Demographic Characteristics of Smokers and Non-Smokers

A total of 2123 male participants were included in the study, with a mean age of 40.95 years (standard deviation = 6.54). The age range was between 20 and 80 years. The majority of participants (75.8%) were in the 40-50 year age group, followed by the 30-40 year age group (11.2%). The most common blood group was O (56.9%), followed by A (33.0%).

Regarding smoking status, approximately half of the participants were smokers (48.3%), while the remaining were non-smokers (51.7%). The majority of participants (73.2%) were employed, while 26.8% were freelancers. To analyse the differences between smokers and non-smokers, a chi-square

test was used. The results showed significant differences between smokers and non-smokers in terms of age (p -value = 0.001) and occupation (p -value = 0.005). However, there were no significant differences between smokers and non-smokers in terms of blood group (p -value = 0.21).

The current study's results showed a significant impact of job type on smoking (Sig. = 0.002), where some jobs may be more prone to stress or environments that encourage smoking. In contrast, age (Sig. = 0.341) and blood type (Sig. = 0.678) did not show a significant impact on smoking. The F-value for the overall model was 3.59, which is statistically significant (Sig. = 0.013), indicating that the statistical model has a significant impact on the dependent variable (smoking).

The demographic characteristics of male smokers and non-smokers are shown in Table 1.

Table 1 Demographic Characteristics of Male Smokers and Non-Smokers

Variable		Age	Blood Group	Smoking	Job Type	Age Groups
N	Valid	2123	2123	2123	2123	2123
	Missing	0	0	0	0	0
Mean		40.95	2.84	1.51	1.26	2.8474
Std. Deviation		6.54	1.38	0.49	0.44	0.69
Range		60.00	3.00	1.00	1.00	4.00
Minimum		20.00	1.00	1.00	1.00	1.00
Maximum		80.00	4.00	2.00	2.00	5.00

This table summarizes the demographic characteristics of the study participants ($n = 2123$). Variables include age, blood group, smoking status, job type, and age groups. Descriptive statistics include mean, standard deviation, range, minimum, and maximum. Significant differences were observed between smokers and non-smokers in age and job type ($p < 0.05$), but not in blood group ($p = 0.210$).

- Placement in text: See Table 1 for demographic characteristics of male smokers and non-smokers.

Additional detailed tables for Questionnaire 1 are provided in Appendix a (Supplementary Material).

B. Part 2: Results of the Smoking Survey to Study the Prevalence of Smoking and its Influential Factors.

➤ Part 2.1: Demographic Information of Smokers

This study included a sample of 100 male smokers, with a mean age of 41 years (SD = 10.41, range = 20-72 years). The age distribution was as follows: 19% of participants were

aged 20-30, 22% were aged 30-40, 41% were aged 40-50, 14% were aged 50-60, and 4% were aged 60 or older. The participants' educational background revealed that 58% held a high school diploma, 34% held a bachelor's degree, and 8% held a master's or doctoral degree. The distribution of blood types was: O (52%), A (31%), B (11%), and AB (6%). Regarding monthly income, the distribution was: 28% received 1000 dinars, 49% received 2000 dinars, 19% received 3000 dinars, and 4% received 4000 dinars, with a mean monthly income of 1990 dinars (SD = 798). Furthermore, the mean age of smoking initiation was 21 years (SD = 5), with the youngest age being 10 years and the oldest being 40 years. The mean duration of smoking was 20 years (SD = 10).

Demographic details of smokers are summarized in Table 2.

Table 2 Presents Demographic Information About Smoke

S	Variable	Mean	Std Dev	Range	Min	Max
1	Age	41.18	10.41	52	20	72
2	Age Category	2.62	1.07	4	1	5
3	Educational Level	1.50	0.64	2	1	3
4	Job Type	1.11	0.31	1	1	2
5	Blood Group	2.79	1.35	3	1	4
6	Monthly Income	1990	798	3000	1000	4000
7	Income Category	1.99	0.797	3	1	4
8	Age of Smoking Initiation	21.09	5.09	30	10	40

9	Smoking Duration	2.23	1.01359	4	1	5
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This table presents the demographic profile of smokers (n = 100), including age, age category, educational level, job type, blood group, monthly income, income category, age of smoking initiation, and smoking duration. Data include mean, standard deviation, range, minimum, and maximum values.

- Placement in Text: Demographic details of smokers are summarized in Table 2.

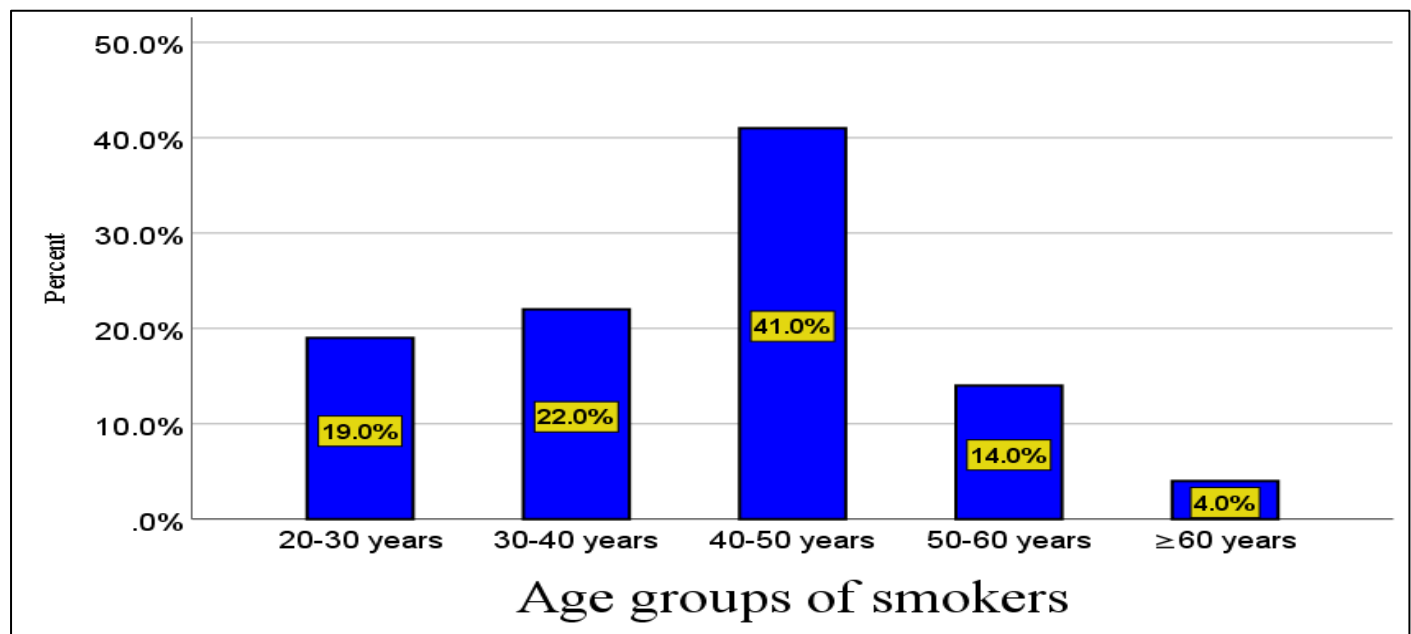


Fig 1 Illustrates the Percentage of Smokers by Age Group.

This bar chart represents the percentage distribution of smokers across different age groups in the study sample (n = 100). The highest prevalence was observed in the 40–50 years group (41%), followed by 30–40 years (22%).

- Placement in Text: Figure 1 illustrates the percentage of smokers by age group.

➤ Part2-2: Results of Smoking Habits and Behaviours

This study of 100 male smokers revealed that all participants (100%) smoked conventional cigarettes, with 12% also smoking e-cigarettes and 30% smoking shisha, while the mean price of a pack of cigarettes was 4.77 dinars (SD = 2.87, range = 2-14 dinars), and the mean daily cigarette

consumption was 21.60 cigarettes (SD = 12.41, range = 5-40 cigarettes), distributed as follows: 12% smoked 5 cigarettes, 20% smoked 10 cigarettes, 41% smoked 20 cigarettes, and 27% smoked 40 cigarettes; additionally, 86% of participants consumed tea and 91% drank coffee. Correlation analysis showed a weak inverse relationship between cigarette consumption and education level ($r = -0.2$, $p = 0.05$), a non-significant relationship between income and cigarette consumption ($r = -0.1$, $p = 0.1$), and a moderate direct relationship between income and cigarette pack price ($r = 0.3$, $p = 0.01$).

Table 3 presents detailed statistics for smoking habits and behaviours.

Table 3 Results of Smoking Habits and Behaviours.

S	Variable	Mean	Standard Deviation	Range	Min	Max
1	Cigarette Smoking	1.00	0.00	0.00	1.00	1.00
2	E-Cigarette Smoking	1.88	0.32	1.00	1.00	0000
3	Hookah Smoking	1.70	0.46	1.00	1.00	2.00
4	Cigarette Pack Price	4.76	2.86	12.00	2.00	14.00
5	Smoking Quantity	2.83	0.96	3.00	1.00	4.00
6	Smoking per Day	21.60	12.40	35.00	5.00	40.00
7	Tea Consumption	1.14	0.34	1.00	1.00	2.00
8	Coffee Consumption	1.09	0.28	1.00	1.00	2.00

Table 3 presents statistical results of smokers' habits and behaviours, including cigarette smoking, e-cigarette smoking, hookah smoking, cigarette pack price, smoking

quantity, cigarettes smoked per day, and consumption of tea and coffee.

- Placement in text: "Table 3 shows detailed statistics for smoking habits and behaviours.

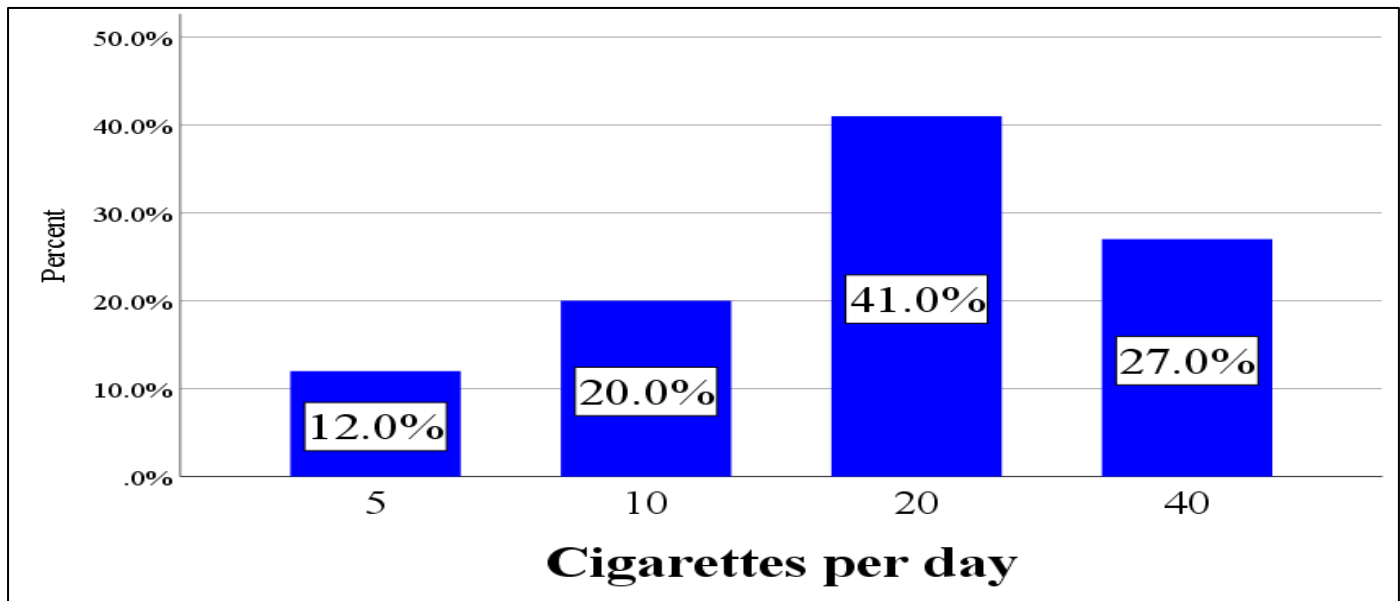


Fig 2 Shows the Prevalence of Daily Cigarette Smoking

This figure illustrates the percentage distribution of daily cigarette consumption among smokers (n = 100). Most participants smoked 20 cigarettes daily (41%), followed by 40 cigarettes (27%).

- Placement in text: Figure 2 shows the prevalence of daily cigarette smoking.

➤ Part2-3: Results of Influencing Factors

This study provided specific insights into the smoking habits of the studied community, revealing that 47% of individuals initiated smoking at school, 17% were influenced by relatives, 6% by television, 23% were self-taught, and 7% learned from neighbourhood peers. The findings also

indicated that 35% of participants smoked at home, whereas 65% did not; 63% smoked at the workplace, while 37% did not; 56% required smoking before bedtime, whereas 44% did not; and 68% smoked immediately after waking up, compared to 32% who did not. Moreover, 97% of participants reported the prevalence of tobacco shops in their area, with only 3% indicating their absence. Notably, correlation analysis revealed a weak inverse relationship between educational level and smoking at home (correlation coefficient: -0.35) and a moderate inverse relationship between educational level and smoking at the workplace (correlation coefficient: -0.42).

Table 4 presents the factors influencing smoking behaviour.

Table 4 Factors Influencing Outcomes.

S	Variable	N	Mean	Std. Deviation	Range	Min	Max
1	Place of Learning Smoking	100	2.26	1.43	4	1	5
2	Smoking at Home	100	1.65	0.48	1	1	2
3	Smoking at Work	100	1.37	0.49	1	1	2
4	Necessity of Smoking Before Sleep	100	1.44	0.50	1	1	2
5	Necessity of Smoking After Waking Up	100	1.32	0.47	1	1	2
6	Availability of Tobacco Shops in the Area	100	1.03	0.17	1	1	2

Table 4 presents descriptive statistics on factors influencing smoking behaviour, including place of smoking initiation, smoking at home/work, necessity of smoking before sleep/after waking up, and the availability of tobacco shops. Data include mean, standard deviation, range, minimum, and maximum.

- Placement in Text See Table 4 for factors influencing smoking behaviour.

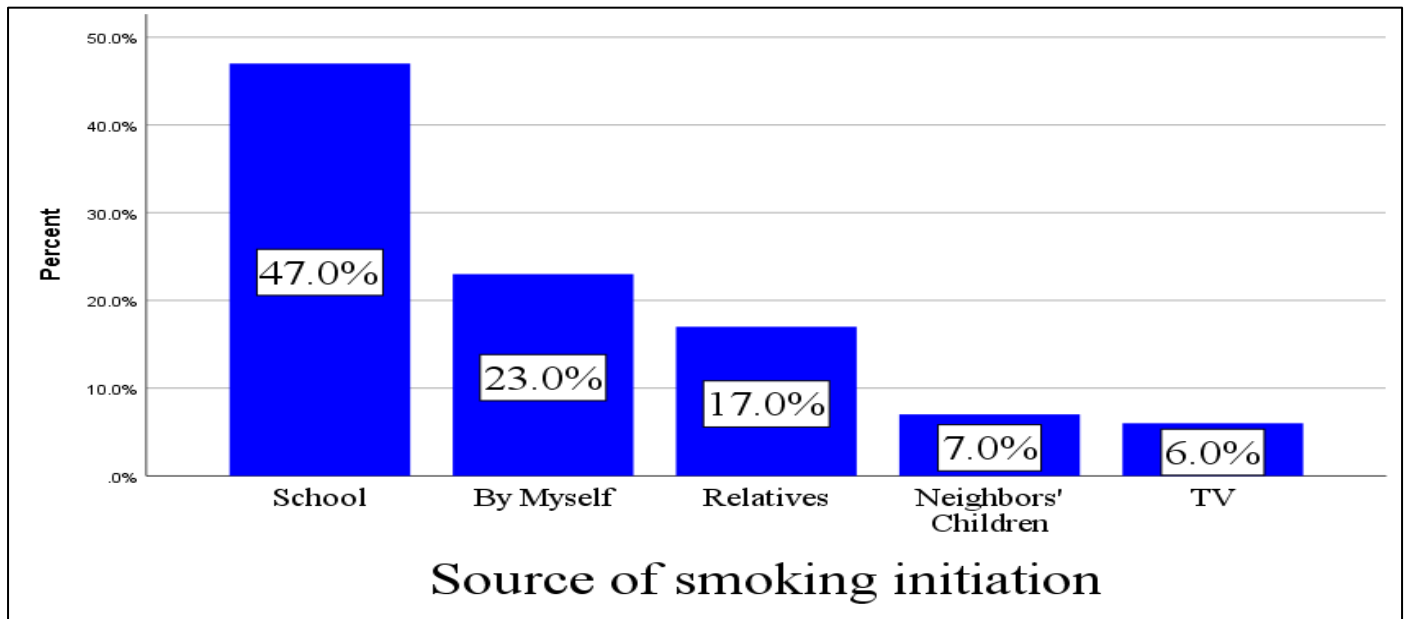


Fig 3 Illustrates the Sources of Smoking Initiation.

This chart illustrates the sources that influenced smoking initiation, including school, relatives, television, self-learning, and neighbourhood peers. The highest source was school (47%), followed by self-learning (23%).

- Placement in text: Figure 3 illustrates the sources of smoking initiation.

➤ Part 2-4: Results of Family Smoking

The study revealed that the prevalence of smoking among fathers was 54%, whereas 46% were non-smokers. In contrast, the prevalence of smoking among maternal uncles was 79%, with 21% being non-smokers, and among paternal

uncles, it was 87%, with 13% being non-smokers. Furthermore, 72% of brothers were smokers, while 28% were non-smokers. Regarding the presence of female smokers in the community, 39% of participants reported the presence of female smokers, 8% reported their absence, and 53% were uncertain. Notably, statistical analysis revealed a strong positive correlation between individual smoking habits and having smoking relatives, with correlation coefficients of 0.75 ($p < 0.01$) for fathers, 0.83 ($p < 0.01$) for maternal uncles, and 0.87 ($p < 0.01$) for paternal uncles, indicating a significant association between familial smoking patterns and individual smoking behavior.

Family smoking patterns are shown in Table 5.

Table 5 Statistical Characteristics of Family Smoking.

s	Variable	Mean	Std. Dev	Min	Max	Range
1	Father smokes	1.46	0.50	1.00	2.00	1.00
2	Uncle (M) smokes	1.21	0.41	1.00	2.00	1.00
3	Uncle (P) smokes	1.13	0.34	1.00	2.00	1.00
4	Brother smokes	1.28	0.45	1.00	2.00	1.00
5	Seen women smoking	2.14	0.95	1.00	3.00	2.00

This table presents statistical characteristics of family smoking habits among smokers' relatives, including father, uncles (maternal and paternal), brothers, and the presence of female smokers. Data include mean, standard deviation, minimum, maximum, and range.

- Placement in text Family smoking patterns are shown in Table 5.

➤ Part2-5: Results of Awareness and Prevention

The study revealed that all participants (100%) were aware of the health risks associated with smoking, with a standard deviation of 0.00. Furthermore, 90% of participants reported the presence of health warnings on cigarette packs, while 10% reported their absence, with a mean of 1.10 and

standard deviation of 0.30. Regarding advice to quit smoking, 82% of participants received advice to quit, while 18% did not, with a mean of 1.18 and standard deviation of 0.39. Additionally, 77% of participants had previously attempted to quit smoking, while 23% had not, with a mean of 1.23 and standard deviation of 0.42. Concerning the belief that smoking reflects personality, 17% of participants believed that smoking reflects their personality, while 83% did not, with a mean of 1.83 and standard deviation of 0.38. Finally, 98% of participants believed that smoking helps improve their mood, while 2% did not, with a mean of 1.02 and standard deviation of 0.14.

Smokers' attitudes and perceptions are summarized in Table 6.

Table 6 Descriptive Statistics of Attitudes and Perceptions Towards Smoking.

s	Variable	Mean	Std. Dev	Range	Min	Max
1	Smoking is harmful	1.00	0.00	0.00	1.00	1.00
2	Advice to quit smoking	1.18	.38	1.00	1.00	2.00
3	Quit smoking	1.23	.42	1.00	1.00	2.00
4	Health warnings on cigarettes	1.10	.30	1.00	1.00	2.00
5	Smoking reflects personality	1.83	.37	1.00	1.00	2.00
6	Smoking improves mood	1.02	.14	1.00	1.00	2.00

Table 6 shows descriptive statistics for smokers' attitudes and perceptions regarding smoking, including awareness of harmful effects, advice to quit, health warnings, and beliefs about smoking.

- Placement in text: See Table 6 for smokers' attitudes and perceptions.

➤ Part2-6: Results of Environmental Influences on Smokers

The study revealed that 78.0% of participants had considered quitting smoking, while 22.0% had not, with a mean of 1.22 and standard deviation of 0.41. Furthermore, 80.0% of participants believed that the current situation increases their smoking rate, while 20.0% did not, with a mean of 1.20 and standard deviation of 0.40. Regarding the

impact of the current situation on reducing smoking, 14.0% of participants believed it contribute to reducing smoking, while 86.0% did not, with a mean of 1.86 and standard deviation of 0.34. Additionally, 18.0% of participants believed the current situation contributes to quitting smoking, while 82.0% did not, with a mean of 1.82 and standard deviation of 0.38. Moreover, 47.0% of participants had quit smoking for a period, while 53.0% had not, with a mean of 1.5 and standard deviation of 0.50. Finally, among those who quit smoking, 70.0% relapsed within less than a year, 16.0% after one year, 4.0% after two years, 4.0% after three years, 3.0% after four years, and 3.0% after five years or more, with a mean of 1.63 and standard deviation of 1.23.

Environmental influences on smoking are summarized in Table 7.

Table 7 Descriptive Statistics of Environmental Determinants of Smoking Behaviour.

S	Variable	Mean	Std. Dev	Range	Min	Maxi
1	Thought about quitting	1.22	.416	1.00	1.00	2.00
2	Current situation increases smoking	1.20	.402	1.00	1.00	2.00
3	Current situation reduces smoking	1.86	.348	1.00	1.00	2.00
4	Quit smoking for a period	1.53	.501	1.00	1.00	2.00
5	Duration of quitting	1.63	1.23	5.00	1.00	6.00

This table presents descriptive statistics of environmental factors affecting smoking behaviour, such as thoughts about quitting, influence of current situation, quitting attempts, and duration of quitting.

- Placement in text: Environmental influences on smoking are summarized in Table 7.

Additional detailed tables for Questionnaire 2 are provided in Appendix B (Supplementary Material).

IV. DISCUSSION

A. Part 1: Discussion of the First Questionnaire - Demographic Characteristics of Smoking and Non-Smoking Men.

The results indicate that the majority of participants were in the 40-50 year age group, which may suggest that this age group is more likely to participate in health studies. The results also show that blood group O is the most common among participants, which is consistent with the distribution of blood groups in the general population [19]. Regarding smoking; approximately half of the participants were smokers, which suggest that smoking is still a major public health problem. Studies have shown that smoking increases the risk of many diseases, including cardiovascular disease

and cancer [20, 21]. The results also show significant differences between smokers and non-smokers in terms of age and occupation, which may suggest that age and occupation are factors that influence smoking behavior. Occupational stress can affect public health behaviours, including smoking [22, 23]. For example, a recent study found that workers in high-stress jobs were 30% more likely to smoke compared to workers in low-stress jobs [24]. (These results can be interpreted through theories that suggest that occupational stress can lead to increased tension and anxiety, which may increase the likelihood of resorting to smoking as a coping mechanism. On the other hand, the lack of a significant impact of age and blood type on smoking may indicate that other factors such as environment and culture play a larger role in determining smoking behaviours. This result is consistent with studies that suggest that social and environmental factors play an important role in determining public health behaviours [25, 26].

B. Part 2: Results of the Smoking Survey to Study the Prevalence of Smoking and its Influential Factors.

➤ 2-1: Discussion of Demographic Information about Smokers

The current findings indicate that the age group 40-50 years is most susceptible to smoking, which may be linked to

increased psychological and social pressures in this age group. The average age of smoking initiation is 21 years, suggesting that most participants started smoking at a young age, consistent with previous research showing that smoking is a significant problem among young people [27]. The results also show that educational level, occupation, and monthly income play a role in shaping smoking behaviours, with the majority of participants holding a high school diploma, working in the government sector, and receiving low to moderate monthly salaries. This is consistent with previous research indicating that individuals with lower educational levels and lower-income occupations are more likely to smoke [28]. Based on these findings, anti-smoking strategies can be developed targeting specific population groups, such as young people and those with lower educational levels. These strategies may be more effective if they include educational and therapeutic components, such as smoking cessation programs and nicotine replacement therapy [29-31].

➤ 2-2: Discussion of Smoking Habits and Behaviours.

The current findings indicate that all participants smoke conventional cigarettes, and a low percentage of individuals use e-cigarettes. Additionally, a considerable proportion of individuals use water pipes. These results are consistent with previous research showing that smoking is a significant problem among young people [27]. The results also show a weak inverse relationship between the number of cigarettes smoked and educational level, suggesting that individuals with higher educational levels tend to smoke fewer cigarettes. Furthermore, there is a very weak inverse relationship between income and the number of cigarettes smoked, indicating that individuals with higher incomes tend to smoke fewer cigarettes. A moderate direct relationship exists between income and the price of cigarette packs, suggesting that individuals with higher incomes tend to purchase more expensive cigarette packs. The average price of a cigarette pack in Libya is \$0.595625, with a standard deviation of \$0.35826, ranging from \$0.25 to \$3.125 per pack. Studies suggest that increasing cigarette prices can lead to a decrease in consumption, especially among young people and low-income individuals. Governments can use cigarette taxes as a tool to increase revenue and deter cigarette consumption [32]. Therefore, increasing taxes on cigarettes in Libya could be an effective way to reduce smoking rates and improve public health. Effective pricing policies can also contribute to reducing cigarette smuggling and illicit trade. These findings can inform the development of anti-smoking strategies and reduction of cigarette consumption, which may be more effective if they include educational and therapeutic components, such as smoking cessation programs and nicotine replacement therapy [29, 32].

➤ 2-3: Discussion of Influencing Factors.

The current findings indicate that smoking is a significant problem among participants, and there is a widespread presence of tobacco shops in the studied areas, which may impact smoking rates and underscore the need for measures to limit their proliferation, as emphasized by the World Health Organization [28] in its efforts to combat smoking in society. Additionally, a substantial proportion of individuals rely on smoking as a habit before bedtime and

after waking up, which may affect their sleep quality and overall health, as noted by Fiore et al [29]. In their study on treating tobacco use and dependence. The results also suggest an inverse relationship between educational level and smoking at home and work, indicating that individuals with higher educational levels tend to smoke less in these settings. This finding is consistent with previous studies highlighting the crucial role of education in reducing smoking risks, such as the study by Jamal et al [27], which found that higher educational levels are associated with lower smoking rates.

➤ 2-4: Discussion of Family Smoking

These findings highlight the crucial role of family in shaping smoking behavior among individuals, where relatives who smoke can significantly influence an individual's behavior, particularly during adolescence, through social learning and social pressures [33]. The results also underscore the need for further efforts to educate individuals about the risks of smoking and provide support for quitting this harmful habit [34]. Preventive and therapeutic strategies for smoking can be effective in reducing smoking rates and improving public health [35].

➤ 2-5: Discussion of Awareness and Prevention

The results indicate a high awareness of the health risks associated with smoking among participants, with all of them agreeing that smoking is harmful to health. This is consistent with previous studies that have shown that awareness of the risks of smoking plays a crucial role in changing individual behavior [36]. However, a significant proportion of participants believe that smoking helps improve their mood, which may suggest that there is a need for further efforts to provide support and assistance to individuals to quit smoking, as recommended by Al-Nafisah's study [37].

➤ 2-6: Discussion of Environmental Influences on Smokers

"The findings indicate that the unstable political and economic conditions in Libya after the 2011 events have contributed to the exacerbation of mental and physical health problems, including smoking. The lack of security and stability has led to increased levels of stress and anxiety among individuals, which may lead to an increase in smoking rates as a means of coping with these psychological and social pressures [37]. Moreover, most participants desire to quit smoking, but face challenges in achieving this due to psychological and social pressures, and the lack of sufficient support or effective strategies. Thus, more effective support and intervention strategies are required to assist smokers in quitting and maintaining abstinence, while considering the political, economic, and social factors that influence individual health [38].

V. LIMITATIONS AND STRENGTHS

This study has some limitations. The sample was drawn exclusively from the city of Zawia, so the results cannot be generalized to the whole of Libya. Additionally, the use of self-administered questionnaires may have introduced reporting bias. Nevertheless, the study provides valuable insights into smokers' behavior, including the prevalence of smoking and exposure to secondhand smoke at home and at

work. The relatively large sample size and the inclusion of all types of smoking (cigarettes, e-cigarettes, and hookah) strengthen the reliability of the findings and their relevance for public health planning.

VI. CONCLUSIONS

Smoking represents a significant public health problem in Zawia City, with a prevalence of approximately 48.3%. Exposure to secondhand smoke is also considerable, affecting around 35% of participants at home and 63% at work. Family and environmental influences play an important role in shaping smoking behavior, while the average daily cigarette consumption is about 21.6 cigarettes, indicating heavy use among many smokers. Additionally, the average age of smoking initiation is approximately 21 years, highlighting early uptake of this harmful habit.

These findings emphasize the urgent need for targeted public health interventions and comprehensive tobacco control strategies in Zawia City to reduce smoking prevalence and protect population health.

➤ What is Already Known About this Topic?

- Smoking in all its forms (cigarettes, e-cigarettes, and hookah) is a leading cause of preventable morbidity and mortality worldwide.
- Passive smoking poses a public health risk, especially for infants, children, the elderly and pregnant women.
- Data on smoking habits, passive smoking, and smoker behavior in Libya are limited.

➤ What this Study Adds

- This study provides recent data on smoking (cigarettes, e-cigarettes, and hookah) in Zawiya, Libya.
- It reports the prevalence of smokers and passive smoking at home and at work in Zawiya.
- The findings highlight the urgent need for public health interventions to reduce tobacco use in Zawiya and Libya.
- Funding: This research received no external funding.

RECOMMENDATIONS

This study primarily estimates the prevalence of smoking among men in the study city, highlighting the need for additional research to examine smoking behaviour as well as factors that contribute to learning to smoke. Such future research is needed to comprehensively understand smoking patterns among all smokers and to provide targeted interventions that address the social, economic, environmental, psychological, and cultural influences that influence smoking initiation.

ACKNOWLEDGEMENTS

The authors would like to extend their sincere gratitude to all participants who contributed to this study, and to those

who assisted in questionnaire distribution and data collection. Their valuable contributions made this research possible.

- Funding: None

• Competing Interests:

The author is the sole contributor to this study and declares no conflicts of interest.

• Authors' Contributions:

The author, Shokri Ayad Halila, conceived the study, designed the methodology, collected and analysed the data, and wrote the manuscript.

REFERENCES

- [1]. Doll R. Uncovering the effects of smoking: historical perspective. *Int J Epidemiol*. 1998; 27(1):1-5.
- [2]. Khosravani V, Nickelic AV, Spada MM, Samimi Ardestani SM, Najafi M. The independent contribution of positive and negative metacognitions about smoking to urge to smoke, withdrawal symptoms and dependence in smoking-dependent men. *Clin Psychol Psychother*. 2024; 31(4):e3024. doi:10.1002/cpp.3024
- [3]. Nasser A, Salah A, Al-Hebshi N, Al-Nasser L. Smoking prevalence, attitudes and associated factors among students in health-related departments of community college in rural Yemen. *Tob Induce Dis*. 2018; 16:5.
- [4]. Nadeem M. Smoking dynamics: factors supplementing tobacco smoking in Pakistan. *IEEE Trans Comput Soc Syst*. 2024; 11(1):87-98.
- [5]. Panahi R, Mohammadi Y, Akbarpour S. The effect of education on knowledge and attitude towards the harmful effects of smoking among students of Shahid Beheshti University of Medical Sciences, Tehran. *J Health Field*. 2018; 6(1):20-25.
- [6]. Ugochukwu O, Eze E, Nwankwo U. Awareness and perception of harmful effects of smoking in Abia State, Nigeria. *Niger J Cardiol*. 2015; 12(2):91-95.
- [7]. World Health Organization. Smoking linked to early vision loss and cataracts. Geneva: WHO; 2022.
- [8]. Zhang S, Zhang J, Zhao Y, Li M, Yang Q, Wang Y et al. Association of cigarette smoking, smoking cessation with the risk of cardiometabolic multimorbidity in the UK Biobank. *BMC Public Health*. 2024; 24:567.
- [9]. Semprini J. How did the COVID-19 pandemic change cigarette smoking behavior? *Lifestyle Med*. 2024; 5(1):45-52.
- [10]. Intarut N, Siri Wong W, Tanasugarn C. Promoting smoke-free environments: the impact of thirdhand smoke awareness on smoking bans at home. *Asian Pac J Cancer Prev*. 2023; 24(9):2917-2921.
- [11]. Wagijo M, Sheikh A, Been JV. Reducing tobacco smoking and smoke exposure to prevent preterm birth and its complications. *Paediatr Respir Rev*. 2017; 22:3-10.
- [12]. Daher N, Saleh R, Jaroudi E, Sheheitli H, Badr T, Sepetdjian E et al. Comparison of carcinogen, carbon

- monoxide, and ultrafine particle emissions from narghile waterpipe and cigarette smoking: sidestream smoke measurements and assessment of second-hand smoke emission factors. *Atmos Environ.* 2010; 44(1):8-14.
- [13]. Nasser A, Almahdi H, Ghanem M, Al-Kabsi A. The prevalence of smoking (cigarette and waterpipe) among university students in some Arab countries: a systematic review. *Asian Pac J Cancer Prev.* 2020; 21(3):655-662.
- [14]. Sadeghi F, Hosseini M, Rahimi H. Prevalence of smoking among Iranian university students: a systematic review and meta-analysis. *J Subst Use.* 2025; 30(1):12-21.
- [15]. Lisetska IS, Divnych TY. The problem of the prevalence of smoking habit among adolescent girls. *Ukr J Health Woman.* 2024; 30(2):89-95.
- [16]. Elaswidi H, Alzergany M. Smoking prevalence and associated factors among male students at Misurata University, Libya: a cross-sectional study. *Tob Prev Cessat.* 2025; 11:18.
- [17]. Luzzatto L. Blood groups and red cell antigens. *Int Soc Blood Transfuse.* 2018.
- [18]. Jha P. The hazards of smoking and the benefits of stopping. *Lancet.* 2019; 394(10209):1123-1136.
- [19]. Peto R. Smoking and health: 50 years on from the Royal College of Physicians report. *J Public Health (Oxf).* 2018; 40(3):475-476.
- [20]. Kouvonen A, Kivimäki M, Cox SJ, Poikolainen K, Cox T, Vahtera J. Work stress and smoking: a systematic review. *J Occup Environ Med.* 2018; 60(5):462-472.
- [21]. West R, Raw M, McNeill A, Stead L, Aveyard P, Bitton J et al. The impact of work environment on smoking behaviours: a systematic review. *J Workplace Behav Health.* 2020; 35(2):123-138.
- [22]. Harris J, Sun H, Chen L, Xu J, Zhang Y, Wang X. The relationship between work stress and smoking: a systematic review. *J Occup Health Psychol.* 2022; 27(2):147-158.
- [23]. Kaplan R, Larkin GL, Wingard DL. Social determinants of health and smoking: a review of the literature. *J Behav Med.* 2019; 42(3):537-548.
- [24]. Sallis J, Owen N, Fisher EB. Environmental and social determinants of smoking: a review of the literature. *Health Place.* 2020; 63:102764.
- [25]. Jamal A, Gentzke A, Hu S, Cullen K, Apelberg B, Homa D et al. Tobacco use among middle and high school students — United States, 2011–2017. *MMWR Morb Mortal Wkly Rep.* 2018; 67(22):629-633.
- [26]. World Health Organization. WHO report on the global tobacco epidemic, 2019: offer help to quit tobacco use? Geneva: WHO; 2019.
- [27]. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ et al. Treating tobacco use and dependence: 2008 update. Rockville: US Department of Health and Human Services; 2008.
- [28]. Rigotti NA. Smoking cessation in the perioperative period. *Anesthesiol Clin.* 2012; 30(3):539-554.
- [29]. West R, Shiffman S. Smoking cessation: a global challenge. *Lancet.* 2018; 391(10130):1648-1659.
- [30]. West R, Shiffman S. Fast facts: smoking cessation. Oxford: Health Press; 2004.
- [31]. Reid JL, Rynard VL, Czoli CD, Hammond D. Tobacco use and exposure in Canada: summary of results from the 2018 and 2019 Canadian youth tobacco and vaping survey. *Tob Control.* 2020; 29(4):464-468.
- [32]. World Health Organization. Tobacco. Geneva: WHO; 2021.
- [33]. Centers for Disease Control and Prevention. Smoking & tobacco use. Atlanta: CDC; 2022.
- [34]. Awadalla NJ, El-Amin RA, Elhassan I, Al-Hazmi A, Omer MA, Al-Ahmadi JR. Students' knowledge, attitude, and practice towards smoking and its cessation: A cross-sectional study from Jazan University, Saudi Arabia. *Tob Induc Dis.* 2020; 18:1-9. doi:10.18332/tid/117076
- [35]. Al-Nafisah R. The impact of smoking on mental health. *J Public Health.* 2020; 42(1):45-52.
- [36]. Shiffman S, Sweeney C, Ferguson SG. Relapse to smoking: a review of the literature. *J Smok Cessat.* 2018; 13(2):69-81.
- [37]. Cahill K, Stevens S, Perera R, Lancaster T. Pharmacological interventions for smoking cessation. *Cochrane Database of Systematic Reviews.* 2013; 10:CD013782. Doi: [10.1002/14651858.CD013782] (<https://doi.org/10.1002/14651858.CD013782>).
- [38]. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. Treating tobacco use and dependence: 2020 update. *Am J Respir Crit Care Med.* 2020; 201(9):1044-1054. doi:10.1164/rccm.202001-0134ST.