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Prevalence and Pattern of Smoking among Primary Health Care Patients

Almoutaz Alkhier Ahmed[1]*, Nazar Khalid Zarroug[2], Mohamed Elfadel Abbas[3], Samer Mohammed Syed[4], Mohammed Abd El-moneim Alyas[5], Gais Mohamed Osman[6], Khalid Mohydin[7] and Aisha Abdulrahman Alzarooni[8]

[1]A/Professor -MBRU, SSR family medicine -Nad Alhamar Health Center. DAHC

[2]SR family Medicine – Nad Alhamar Health Center – DAHC

[3]SR family Medicine - Nad Alhamar Health Center – DAHC

[4]SR family medicine -Nad Alhamar Health Center – DAHC

[5]SR family medicine -Nad Alhamar Health Center – DAHC

[6]SR family medicine -Nad Alhamar Health Center – DAHC

[7]SR family medicine -Nad Alhamar Health Center – DAHC

[8]Consultant Family Medicine, Head of Nad Alhamar Health Center – DAHC

Abstract

Introduction: Smoking continues to pose a major public health challenge in the Eastern Mediterranean Region, with rising prevalence and increased use of alternative tobacco products.

Objective: This study aimed to determine the prevalence and patterns of tobacco use, identify the typical age of initiation, and evaluate the association between tobacco use and chronic non-communicable diseases among adults visiting a primary health care centre in Dubai.

Method: A cross-sectional descriptive study was conducted in January 2026 among adults aged ≥18 years or older at Nad Alhamar Health Centre one of Dubai Academic Health Corporation primary health care centres

Results: A total of 324 participants with complete smoking assessment data were randomly selected. The prevalence of smoking was 33.6%, predominantly among males (96.4%, $p<0.005$). The mean age of smokers was 34.2±14 years, with an average age of initiation of 18.2±4.2 years. Cigarettes were the most common form of tobacco use (44.9%), followed by vaping (22%) and Medwakh (18.3%). Smoking was associated with several chronic non-communicable conditions, including diabetes (11.9%), hypertension (17.4%), ischemic heart disease (9.2%), and chronic kidney disease (0.9%), with some individuals having multiple comorbidities.

Conclusion: The findings show a marked trend in smoking prevalence and its association with non-communicable diseases among adults in this setting. These results illustrate the importance of carrying out targeted preventive measures and smoking cessation interventions.

Keywords: Smoking, Cigarettes, Medwakh, Water pipes.

Introduction

Tobacco use continues to be one of the most significant contributors to global morbidity and mortality. It accounts for approximately eight million deaths each year [1]. It remains a critical public health challenge. This is especially true in low- and middle-income countries, where more than 80% of the world's smokers reside, according to the World Health Organization [2]. These regions often face additional barriers, including limited access to healthcare, lower levels of health awareness, and weaker tobacco control policies. All these factors contribute to the persistence and growth of tobacco consumption.

In recent years, patterns of tobacco use have evolved, especially in the Eastern Mediterranean Region (EMR). One notable trend is the increasing popularity of water pipe smoking, also known as shisha or hookah. It is often mistakenly perceived as a safer alternative to cigarette smoking [3]. This misconception has fuelled its widespread adoption, particularly among young adults and adolescents. However, research has shown that water pipe smoking carries many of the same health risks as traditional cigarette use. These include exposure to toxic chemicals, carcinogens, and addictive nicotine.

The health consequences of tobacco use are extensive and well-documented. Smoking is strongly associated with a wide range of non-communicable diseases. These include various forms of cancer, cardiovascular diseases such as heart disease and stroke, and chronic respiratory conditions like chronic obstructive pulmonary disease (COPD) [4]. Beyond physical health, tobacco use is also linked to mental health issues. These include nicotine dependence, anxiety disorders, and depression. Together, these factors further increase its overall burden on individuals and healthcare systems.

Within EMR countries, smoking prevalence shows considerable variation across populations. Among men, rates can reach 50%. Among women, they may be around 10%. This difference reflects both cultural norms and differences in social acceptability [5]. Alarmingly, tobacco use is increasingly being observed among younger age groups. This shift in behaviour could lead to long-term public health challenges. The growing availability and marketing of alternative tobacco products, including electronic cigarettes and vaping devices, have further sped up this trend. These products are often promoted as less harmful or as cessation tools. However, their long-term health effects remain uncertain, raising concerns about both health risks and economic implications.

In the context of the United Arab Emirates, and specifically Dubai, tobacco use remains a pressing issue. A household survey conducted in

***Corresponding Author:** *Almoutaz Alkhier Ahmed, A/Professor -MBRU, SSR family medicine -Nad Alhamar Health Center. DAHC

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2019 reported an overall smoking prevalence of 15.8%. Higher rates were observed among men (20.9%) compared to women (7.9%) [6]. These findings highlight the ongoing need for targeted public health interventions, increased awareness campaigns, and stricter regulatory measures. These steps are needed to reduce tobacco consumption and mitigate its associated health risks.

Methodology

A cross-sectional descriptive study design was used to investigate tobacco use patterns among adults. Ethical approval was obtained from the Dubai Scientific Research Ethics Committee (DSREC-04/2026_05). The sample size was determined using a standard formula for single-proportion studies. Based on findings from previous regional research, the prevalence of tobacco use among the target population was estimated at 15.8%. With a 95% confidence level, a margin of error (absolute precision) of 5%, and a total population size of approximately 1,200 patients, the minimum required sample size was calculated to be 175 patient records. This sample size was deemed sufficient to yield reliable, generalizable estimates within the defined population.

Patient records were selected using simple random sampling with stratification. The study population was individuals attending Nad Al-hamar Health Center. Data were taken directly from their medical records. This approach minimized selection bias and ensured subgroup representation. The inclusion criteria specified that only individuals with a complete tobacco use assessment in their medical records and aged 18 or older were eligible to participate in the study. This ensured that the analysis focused on adult tobacco use patterns, excluding adolescents and children who's behavioural and health profiles may differ significantly.

A range of variables was collected to support a comprehensive analysis. These included demographic characteristics (such as age and gender), types of tobacco use (e.g., cigarettes, water pipes, or other forms), age of smoking initiation, and the presence of associated medical conditions. Collecting these variables allowed for a multidimensional understanding of tobacco use and its potential health implications.

Data analysis was performed using IBM SPSS Statistics (version 26; IBM Corporation, Armonk, NY). All data were coded and entered the software. The primary outcome was the prevalence of current tobacco use, calculated as a percentage of the total sample. Tobacco use was categorized as current smokers or non-smokers. Non-smokers included ex-smokers and never-smokers. Descriptive statistics were used to summarize data. Categorical variables appeared as proportions and percentages. Continuous variables appeared as means with standard deviations (mean ± SD).

To examine the relationships between tobacco, use and other variables, inferential statistical analysis was performed. The chi-square test was used to assess associations between categorical variables, such as tobacco use status and demographic or clinical characteristics. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful association between variables.

Results

A total of 324 participants met the eligibility criteria (Figure 1) and were included in the analysis. This provided a thorough summary of tobacco use patterns and associated health conditions within the study population. The overall prevalence of smoking was 33.6% (No=109; 4 female ,105 male). This means approximately one in three individuals reported current tobacco use. This relatively high prevalence accentuates the continued public health burden of smoking in the studied group.

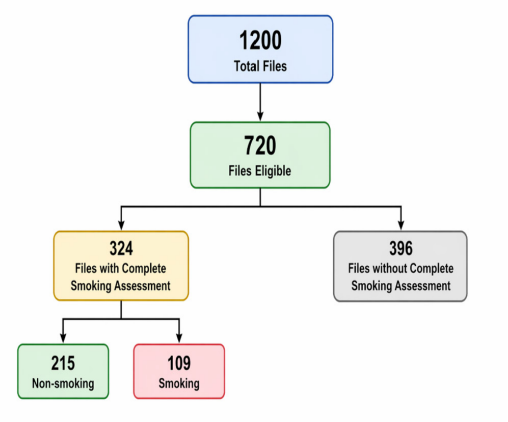

Figure 1: *Sample selection.*

A striking gender disparity was observed among smokers. The vast majority were male (96.4% of all smokers), and this association was statistically significant ($P < 0.005$). This finding highlights a strong gender-related pattern in tobacco use, suggesting that smoking continues predominantly a male behaviour in this population, potentially affected by cultural, social, or behavioural factors. The mean age of smokers was 34.2 years (SD ±14), showing a broad age distribution from young adults to older individuals (Table 1). The average age at which smokers started was 18.2 years (SD ±4.2). Most began during late adolescence or early adulthood, which is a vital developmental period. Early initiation likely causes long-term dependence and a greater risk of persistent disease.

Table 1: *Smoking by Age distribution.*

Age group (year)	Numbers of participants
<20	9.1% (no 10)
20 - 30	37.6% (no 41)
30 - 40	18.3% (no 20)
40 - 50	10.09% (no 11)
50 - 60	6.4% (no 7)
>60	5.5% (no 6)

In terms of tobacco products, cigarettes were the most used form, accounting for 44.9% of smokers. Alternative tobacco products were also widely used, reflecting diversification in smoking habits. Vaping devices accounted for 22% of use, followed by medwakh (18.3%), water pipes (11.9%), tobacco pouches (1.8%), and cigars (0.9%) (Table 2). These results indicate that although traditional cigarette smoking remains dominant, newer and culturally specific forms of tobacco use are more common.

Table 2: *Pattern of smoking.*

Cigarettes	44.9% (No = 49)
Vapes	22% (No =24)
Water-pipe	11.9% (No +13)
Medwakh	18.3% (No = 20)
Nicotine Pouch	1.8% (No = 2)
Cigar	0.9% (N0 =1)

Age-specific patterns of tobacco use showed significant differences across groups. Among individuals younger than 20 years, medwakh was the predominant form of smoking, accounting for 40% of use (Table 3). This suggests that medwakh may be especially attractive or accessible to younger users. In the 20–30-year age group, vaping emerged as the most common form (41.3%), showing a shift toward modern alternatives among young adults.

Table 3: *Distribution of smoking pattern per age.*

Age	Pattern of smoking	Percent
<20 year	Medwakh	40%
20 – 30 years	Vape	41.3%
30 – 40 years	Cigarette	46.4%
40 – 50 years	Cigarette	54.5%
50– 60 years	Cigarette	50%
>60 years	Cigarette	100%

Cigarette smoking became increasingly dominant with advancing age. In the 30–40 age group, 46.4% of smokers used cigarettes (Table 3). This proportion rose further with increasing age: 54.5% in those aged 40–55 years, 50% in the 50–60 age group, and 100% among individuals aged 60 years or older (Table 3). This trend implies that older generations are more prone to adhere to conventional smoking methods, while younger groups diversify their tobacco use.

Smoking was also significantly associated with the presence of non-communicable diseases (39.4%), reinforcing its role as a major health risk factor. Among smokers, 11.9% were diagnosed with diabetes mellitus, while 17.4% had hypertension. Additionally, 9.2% reported ischemic heart disease, and 0.9% had chronic kidney disease (Table 4). These findings highlight the substantial burden of chronic illness within the smoking population.

Table 4: *Associated Non-communicable Chronic Diseases (Diabetes mellitus type 2, Hypertension, Ischaemic heart disease and chronic kidney diseases in smoker vs non-smokers.*

	Smoker (no 109)	Non-smoker (no 215)	P value	Relative Risk
Diabetes mellitus type 2 (DM2)	11.9%	12.5%	0.43	0.95 (CI 0.5 -1.8)
Hypertension (HTN)	17.4%	7.9%	0.005	2.2 (CI 1.9 – 4.06)
Ischemic heart disease (IHD)	9.2%	7.9%	0.01	2.9 (CI 1.2-7.5)
Chronic kidney disease (CKD)	0.92%	0.93%	0.49	0.98 (CI 0.09 – 10.75)
DM2+HTN	5.5%	5.1%	0.43	1.07 (CI 0.4 – 2.8)
DM2+HTN+IHD	6.4%	2.7%	0.051	2.3 (CI 0.8 – 6.7)
DM2+HTN+IHD+CKD	0	0.04%	0.41	0.39 (CI 0.2-8.1)

Importantly, a subset of participants experienced multiple coexisting conditions, reflecting the compounding impact of smoking on health. Specifically, 5.5% of individuals had both type 2 diabetes and hypertension, while 6.4% had a combination of type 2 diabetes, hypertension, and ischemic heart disease (Table 4). These comorbidities significantly increase the risk of complications, healthcare utilization, and mortality.

Smokers had a much higher risk of hypertension and ischemic heart disease, with risk more than doubling and nearly tripling. Smoking showed no significant association with diabetes mellitus or chronic kidney disease, and most combined comorbidities had no clear relationship. Multiple conditions (DM2 + HTN + IHD) showed a borderline increase, but the difference was not statistically significant (table 4). These findings suggest that, in this sample, smoking mainly increases cardiovascular risk, not metabolic or renal risks (Table 4).

Overall, the findings demonstrate a substantial prevalence of smoking, particularly among males, with early initiation and diverse patterns of tobacco use across age groups. The strong association between smoking and multiple non-communicable diseases further emphasizes the urgent need for targeted prevention and intervention strategies. Efforts should focus on reducing early initiation, addressing emerging tobacco products such as vaping and medwakh, and promoting cessation programs tailored to high-risk groups.

Discussion

Despite widespread access to tobacco cessation clinics in Dubai and the United Arab Emirates (UAE), smoking prevalence has not significantly declined. This persistent rate indicates that, beyond available cessation services, entrenched social, cultural, and product-specific factors continue to fuel tobacco use. Synthesizing two decades of epidemiological research in the UAE reveals concerning trends in usage rates, demographic patterns, and the evolving landscape of tobacco consumption.

One of the earlier studies conducted by Obaid et al. [7] investigated tobacco use among school students aged 10 to 20 years in Dubai. Their findings revealed an overall smoking prevalence of 14.6%, with cigarette smoking accounting for 11.2% and waterpipe (shisha) use at 2.2%. This study provided an early indication that tobacco use begins at a relatively young age, with cigarettes being the dominant form of consumption among adolescents. However, the presence of waterpipe smoking, even at lower levels, signaled the beginning of diversification in tobacco use behaviors among youth.

Subsequent research by Crooks and Wolff [8], which examined 399 adolescents with a mean age of 16.9 years, reported a higher smoking prevalence of 23.4%. This marked increase compared to earlier findings suggests either a rise in tobacco use among youth or differences in study populations and methodologies. Regardless, the data underscores the concerning level of tobacco exposure among adolescents in the UAE and highlights the need for targeted prevention strategies at the school and community levels.

Aden et al. [9] evaluated individuals applying for premarital screening programs in Abu Dhabi and found a smoking prevalence of 24.7%. Cigarette smoking was most common (11.5%), followed by Medwakh (5.9%), waterpipe (4.8%), and combined use (2.5%). The study highlighted significant gender disparities-males had much higher rates (19.2%) than females (3.5%)-reflecting regional sociocultural norms. It also emphasized the cultural specificity of Medwakh use in the UAE.

A large cross-sectional survey by Al-Houqani, Ali, and Hajat [10] further expanded understanding of smoking behaviors in the UAE. They found higher smoking rates in males (24.3%) compared to females (0.8%), with the highest prevalence among males aged 20 to 39. Cigarette use dominated (77.4%), with Medwakh, waterpipe, and cigars also used, illustrating the range of tobacco products favoured in the UAE.

In a study focusing specifically on younger populations, Al-Shemmari, Shaikh, and Sreedharan [11] examined Dokha use among secondary school students in Ajman. Their results revealed that 24% of partici-

pants were current users of Dokha, while 39% had ever smoked cigarettes and 36% had ever used Dokha. These findings are particularly alarming, as they indicate high levels of experimentation and current use among adolescents. The popularity of Dokha, in particular, may be attributed to misconceptions about its safety, ease of access, and cultural acceptance. This highlights the need for public health interventions that address not only cigarette smoking but also alternative forms of tobacco use that are gaining traction among youth.

More recent data from Alareesi et al. [12], who studied 500 patients attending primary healthcare clinics in Dubai, reported a smoking prevalence of 23.6%. This study also identified the average age of smoking initiation as 18 to 19 years, which aligns with earlier findings and suggests that late adolescence and early adulthood remain key periods for the onset of smoking behaviour. The consistency of this initiation age across studies indicates a persistent window of vulnerability that could be targeted through preventive interventions.

Examining these studies collectively reveals a key challenge: smoking prevalence in Dubai has increased over time despite expanded cessation services. For example, prevalence rose from 14.6% in 2010 (Obaid et al.) to 23.6% in 2020 (Alareesi et al.). This approximate 9% increase underscores the inadequacy of current strategies, likely due to changing product preferences and persistent social dynamics. The ongoing rise in tobacco use, despite policy and service improvements, demands reassessment of intervention approaches.

Conclusion

In conclusion, while the UAE has made significant investments in tobacco cessation infrastructure, the persistence and apparent increase in smoking prevalence indicate that additional, multifaceted approaches are needed. These should include stronger public health policies, enhanced education and awareness campaigns, stricter regulation of emerging tobacco products, and culturally sensitive interventions that address the underlying social determinants of smoking. Without such comprehensive efforts, the burden of tobacco-related diseases is likely to continue rising, posing a significant challenge to public health in Dubai and the wider UAE. This review and synthesis of tobacco use studies in Dubai, and the United Arab Emirates has several limitations that should be considered when interpreting the findings. First, the included studies vary considerably in their design, study populations, sampling methods, and time periods, which limits the ability to directly compare prevalence estimates across studies. Differences in age groups (school students, university students, and adults attending healthcare facilities) introduce heterogeneity that may influence reported smoking rates and patterns of tobacco use.

Second, most of the data are based on self-reported questionnaires, which are subject to recall bias and social desirability bias. This is particularly relevant in the UAE context, where smoking among females may be underreported due to cultural sensitivities and social stigma. As a result, actual prevalence rates, especially among women, may be higher than reported. Third, many studies are cross-sectional, limiting the ability to establish causal relationships or to assess changes in individual smoking behaviours over time. While trends can be inferred from repeated cross-sectional studies, they do not provide longitudinal evidence of smoking initiation, cessation, or relapse patterns.

Finally, some studies have relatively small or non-representative sample sizes, particularly those conducted in specific settings such as schools or primary care clinics, which may limit generalizability to the broader UAE population.

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