Tobacco product use and passive smoking in Afghanistan: A cross-sectional epidemiological study of prevalence and determinants

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ABSTRACT

INTRODUCTION Tobacco use poses a major public health challenge globally, with low- and middle-income countries, including Afghanistan, bearing a significant portion of the burden. Despite its known contribution to morbidity and mortality, comprehensive data on the prevalence, patterns, and determinants of tobacco use in Afghanistan remain limited. This study aims to address this gap by providing evidence on smoking, smokeless tobacco use, and passive smoking among Afghan adults.

METHODS This is a secondary data analysis of the 2018 Afghanistan World Health Organization STEPwise approach to NCD risk factor surveillance (STEPs), nationally representative, cross-sectional survey. The study included adults aged ≥18 years who were permanent residents of the selected households and consented to participate. Data were collected using structured, interviewer-administered questionnaires based on self-reported data. Descriptive statistics and logistic regression models were employed to determine the prevalence and predictors of smoking (any form, including cigarettes, pipes, shisha, etc.), smokeless tobacco use, and passive smoking.

RESULTS Among 3955 participants, the prevalence of current smoking was 8.9%, smokeless tobacco use 14.9%, and passive smoking 44.7%. Males were significantly more likely to smoke (AOR=5.0; 95% CI: 3.4–7.4) and use smokeless tobacco (AOR=23.0; 95% CI: 14.0–36.8) compared to females. Smoking prevalence peaked in the 35–44 years age group, while smokeless tobacco use was highest among individuals aged ≥55 years. Individuals with no education showed higher odds of using smokeless tobacco compared to educated individuals. Passive smoking was more common among urban residents (AOR=1.4; 95% CI: 1.2–1.6), whereas individuals with monthly income ≥50000 AFN showed lower odds (AOR=0.7; 95% CI: 0.6–0.9). Regionally, the Western region exhibited the highest odds of smoking (AOR=2.3; 95% CI: 1.5–3.7), whereas the Southern region had the highest prevalence of smokeless tobacco use.

CONCLUSIONS This study highlights the burden of tobacco use and passive smoking in Afghanistan and provides evidence of the sociodemographic and regional distribution of tobacco products in the country. These findings highlight important associations; however, further longitudinal studies are required to understand better the determinants and trends of tobacco use in the Afghan population.

INTRODUCTION

Tobacco use remains a significant public health concern globally, accounting for over 8 million deaths each year due to tobacco-related illnesses, including cardiovascular diseases, respiratory conditions, and various cancers[1]. In 2021, the World Health Organization (WHO) estimated

that overall, there were 1.3 billion tobacco users globally, of whom more than 80% are reported to live in low- and middle-income countries[1,2]. It is further estimated that this number of smokers contributes to approximately 880000 secondhand smoke-related deaths among non-smokers each year[3]. In low-income and conflict-affected countries like Afghanistan, the burden of smoking is exacerbated by socio-economic instability, limited healthcare access, and cultural factors that influence health behaviors[4]. Afghanistan's health system, already strained by years of conflict, faces additional challenges in controlling preventable risk factors like smoking, which has become an increasingly prominent cause of morbidity and mortality in the country[5].

The prevalence of smoking in Afghanistan is estimated at 9.2%, which is equivalent to around 2.2 million individuals in 2022, with significant gender disparities: 16.6% of men are current smokers, compared to only 1.8% of women[6,7]. These findings reflect broader trends in the region, where tobacco consumption is generally higher among men due to cultural norms that discourage smoking among women[8,9]. Another study conducted in 2105 showed that smoking behaviors in Afghanistan are shaped by several sociodemographic determinants, including age, education level, and socio-economic status, the factors that are similarly observed in global studies of tobacco use[10].

Beyond the individual health risks associated with smoking, passive smoking poses a significant public health threat in Afghanistan. In densely populated households, particularly in urban areas, exposure to secondhand smoke is common, contributing to a higher incidence of chronic diseases such as cancer and respiratory diseases among non-smokers, including children and women[11]. The social and cultural acceptance of smoking and smokeless tobacco, combined with limited enforcement of tobacco control policies, has resulted in widespread exposure to tobacco smoke in public and private spaces[12]. Furthermore, the availability of inexpensive tobacco products and limited public awareness of their harmful effects exacerbate the issue[13].

In Afghanistan, the healthcare system's ability to address smoking-related health risks is further limited by the scarcity of cessation services and the low utilization of nicotine replacement therapies (NRTs), despite their availability in pharmacies[12]. Public awareness of the health risks associated with smoking remains low, particularly in rural and underserved communities, where literacy rates and access to health information are limited.

The lack of comprehensive data on tobacco use and passive smoking in Afghanistan limits the ability of policymakers to prioritize and address this public health issue effectively. While some studies have examined the prevalence of smoking in urban settings[10,14-16], there is a paucity of nationally representative data that capture the breadth and depth of the problem. Furthermore, the influence of sociodemographic factors, including gender, age, education level, and economic status, on tobacco use and secondhand smoke exposure has received limited attention since 2015.

Given these challenges, understanding the social determinants of tobacco consumption is critical for developing targeted interventions that address the underlying causes of tobacco use in Afghanistan. This study seeks to address these critical knowledge gaps by providing a comprehensive epidemiological analysis of smoking, smokeless tobacco use, and passive smoking in Afghanistan. The objectives of this research are to: 1) determine the prevalence of smoked and smokeless tobacco use, and passive smoking across different population groups; 2) identify the sociodemographic, behavioral, and environmental determinants associated with tobacco use and secondhand smoke exposure; and 3) contribute evidence to inform future research and policy development.

METHODS

Study design and sampling

This study is a secondary analysis of data from the 2018 Afghanistan WHO STEP survey, a nationally representative cross-sectional survey designed to assess the prevalence of non-communicable disease (NCD) risk factors. The survey followed the standardized WHO STEPwise approach to NCD risk factor surveillance (STEPs), which collects data in three sequential steps: Step 1 includes self-reported demographic and behavioral risk factors; Step 2 involves physical measurements; and Step 3 includes biochemical assessments. Detailed information on the WHO STEPS survey can be found elsewhere[17].

The survey employed a multistage cluster sampling method to ensure national representativeness. The sample size for this study was defined as 3972 household members (males and females) across 50 randomly selected districts in 6 zones of Afghanistan; however, data were collected from 3955 participants. Participants provided informed consent, and data were collected through structured face-to-face interviews at their households. The response rate of the original survey was reported to be 94%.

Ethical considerations

The original STEPs survey protocol was approved by the Ministry of Public Health (MoPH) Institutional Review Board (IRB) in Afghanistan. All participants provided informed consent before data collection. No additional ethical approval was required for this secondary analysis, as it used de-identified publicly available data[17].

Study population

The study population consisted of permanent household residents aged 18–69 years who consented to participate. Temporary residents (those who were residents for <12 weeks), individuals outside the age range, and those who declined participation, were excluded from the survey.

To ensure the representativeness of the data, sample and non-response weights, clustering, and stratifications were accounted for in all analyses.

Measurement of variables

Outcome variables

The primary outcomes of interest in this analysis are the prevalence of smoking, current use of smokeless tobacco, and exposure to passive smoking. Active smoking was defined as the current use of cigarettes, cigars, or pipes, as recorded in the original questionnaire. Current use of smokeless tobacco was defined by the use of non-combustible tobacco products, including snuff by mouth, chewing tobacco, and betel. Passive smoking was derived from two questions asking respondents whether they were exposed to tobacco smoke at home or in the workplace. A participant was categorized as being exposed to passive smoking if they answered 'yes' to either question.

Covariates

Sociodemographic and behavioral characteristics were included as explanatory variables. The covariables in this analysis include age (18–24, 25–34, 35–44, 45–54, 55–64, and 65–69 years), sex (male, female), education level (none, primary/secondary education, high school, and higher education), residence (urban, rural), monthly income (AFN) (<10000, 10000–19999, 20000–49999, 50000–99999, and ≥100000), employment (employed, unemployed, student, retired), marital status (single, married, divorced/widowed), region (South-Eastern, Southern, Western, Northern, North-Eastern, Central), and alcohol consumption (yes, no). These variables were considered potential confounders and were adjusted for in the multivariable logistic regression models.

Data analysis

Data were analyzed using STATA version 15. Descriptive statistics were employed to estimate the prevalence of active smoking, smokeless tobacco use, and passive smoking. The distribution of tobacco exposure patterns across various sociodemographic variables is presented. Additionally, multiple logistic regression models were constructed to identify the independent determinants of smoking, tobacco use, and passive smoking. Variables included in the model were sex, education level, marital status, monthly income, and region. These covariates were selected based on theoretical relevance and prior evidence, as well as statistical significance in bivariate analyses. Results are presented as adjusted odds ratios (AORs) with 95% confidence intervals (CIs), and statistical significance was determined at $p<0.05$. Because the STEPs survey used a multistage cluster sampling design, all analyses accounted for the complex survey design by applying sampling weights and non-response adjustments provided in the dataset. Missingness was assessed for all study variables before analysis. The proportion of missing data was low (<3%) for most variables; however, the monthly income had a higher proportion of missing values (approximately 15%). Observations with missing values were excluded via listwise deletion, and analyses were conducted on complete-case data.

RESULTS

Demographic characteristics and prevalence of risk factors

The basic demographic characteristics of the participants and the distribution of different forms of smoking and tobacco use among demographic characteristics are described in Table 1. The mean age of the study population was 37.2 years (SD=14.5), and 48.8% were women. Most participants had no education (65.3%), and 80.1% were married. The distribution of sociodemographic characteristics of the participants is presented in Table 1. The study included 3955 participants, with 8.9% reporting current smoking, 8.6% as past smokers, 14.9% as current tobacco users, 3.7% as past tobacco users, and 44.7% experiencing passive smoking. The mean age at initiation of regular smoking was 20.6 years.

Tobacco use patterns show differences between males and females, with males having much higher rates of current smoking (13.6%) and current tobacco use (26.5%) compared to females (4.1% and 2.8%, respectively). Passive smoking exposure is also more common among males (57.9%) than among females (30.9%).

Age exhibits a clear association with tobacco use behaviors. Current smoking is most prevalent in the 35–44 years age group (11.6%), while current tobacco use increases with age, peaking among participants aged >64 years (32.7%). Passive smoking exposure remains consistently high across all age groups, ranging from 40.9% to 46.7%.

Education level influences tobacco exposure. Smoking is more prevalent among those with higher education levels; conversely, tobacco consumption shows higher rates among those with no education and those with secondary education. Employment status also plays a role, as employed individuals report higher rates of current smoking (11.5%) and current tobacco use (22.7%) compared to unemployed participants (6.3% and 6.5%, respectively).

Wealth also reveals an increasing trend of smoking and tobacco use among wealthier participants, with the highest smoking (13.2%) and smokeless tobacco (17.4%) prevalence observed among those with monthly incomes 50000–99999 and ≥100000 AFN, respectively. Married participants exhibit slightly higher rates of tobacco exposure (9.4% for smoking and 17% for smokeless tobacco) compared to single (8.1% and 5%, respectively) or widowed individuals (4.3% and 11%, respectively).

Finally, alcohol consumption is strongly associated with tobacco exposure, as individuals who consume alcohol report significantly higher rates of current smoking (60%) and smokeless tobacco use (30.3%) compared to non-drinkers (8.5% and 14.8%, respectively).

Table 2 provides a detailed description of smoking and

Table 1. Description of study participants and prevalence of different tobacco exposures among different demographic categories in Afghanistan, 2018 (N=3955)

Variables	Total n (%)	Current smoking n (%)	Past smoking n (%)	Current smokeless tobacco n (%)	Past smokeless tobacco n (%)	Passive smoking n (%)
Total	3955 (100)	354 (8.9)	338 (8.6)	589 (14.9)	124 (3.7)	1767 (44.7)
Sex						
Male	2022 (51.1)	275 (13.6)	298 (14.8)	535 (26.5)	114 (5.6)	1170 (57.9)
Female	1930 (48.8)	79 (4.1)	40 (2.1)	54 (2.8)	10 (0.5)	597 (30.9)
Missing values	3 (0.1)					
Age (years), mean (SD)	37.2 (14.5)					
Age at smoking initiation (years), mean (SD)	20.6 (7.5)					
Age (years)						
<24	996 (25.2)	70 (7.1)	37 (3.7)	60 (6.0)	8 (0.8)	465 (46.7)
25–34	882 (22.3)	81 (9.2)	57 (6.5)	100 (11.3)	17 (1.9)	398 (45.1)
35–44	796 (20.1)	92 (11.6)	74 (9.3)	124 (15.6)	21 (2.6)	356 (44.7)
45–54	625 (15.8)	58 (9.3)	71 (11.4)	112 (17.9)	34 (5.4)	256 (40.9)
55–64	408 (10.3)	31 (7.6)	62 (15.2)	117 (28.7)	55 (5.4)	175 (42.9)
>64	217 (5.5)	19 (8.8)	33 (15.2)	71 (32.7)	19 (8.8)	101 (46.5)
Missing values	31 (0.8)					
Education level						
None	2584 (65.3)	206 (7.9)	199 (7.7)	396 (15.3)	79 (3.1)	1074 (40.5)
Secondary	574 (14.5)	64 (11.2)	75 (13.1)	98 (17.1)	23 (4.0)	325 (56.6)
High school	572 (14.4)	56 (9.8)	44 (7.7)	68 (11.9)	16 (2.8)	287 (50.2)
Higher education	180 (4.6)	24 (13.3)	15 (8.3)	22 (12.2)	5 (2.8)	94 (52.2)
Missing values	45 (1.1)					
Employment status						
Employed	2001 (50.6)	230 (11.5)	245 (12.2)	455 (22.7)	96 (4.8)	1050 (52.5)
Unemployed	1755 (44.4)	111 (6.3)	74 (4.2)	114 (6.5)	22 (1.3)	627 (35.7)
Student	142 (3.6)	5 (3.5)	5 (3.5)	4 (2.8)	2 (1.4)	66 (46.5)
Retired	42 (1.1)	6 (15.3)	14 (33.3)	14 (33.3)	4 (9.5)	20 (47.6)
Missing value	15 (0.3)					
Monthly income (AFN)						
<10000	871 (22.1)	67 (7.7)	74 (8.5)	117 (13.4)	33 (3.8)	392 (45.0)
10000–19999	874 (22.1)	84 (9.6)	86 (9.8)	148 (16.9)	25 (2.9)	459 (52.5)
20000–49999	622 (15.7)	58 (9.3)	57 (9.2)	86 (13.8)	19 (3.1)	288 (46.3)
50000–99999	372 (9.4)	49 (13.2)	25 (6.7)	64 (17.2)	15 (4.0)	175 (47.0)
≥100000	641 (16.2)	68 (10.6)	69 (10.8)	118 (17.4)	21 (3.3)	280 (43.7)
Missing value	575 (15.5)					
Marital status						
Single	619 (15.7)	50 (8.1)	22 (3.5)	31 (5.0)	6 (0.9)	287 (46.4)
Married	3169 (80.1)	297 (9.4)	3.6 (9.7)	540 (17.0)	116 (3.7)	1430 (45.1)

Continued

Table 1. Continued

Variables	Total n (%)	Current smoking n (%)	Past smoking n (%)	Current smokeless tobacco n (%)	Past smokeless tobacco n (%)	Passive smoking n (%)
Divorced/widowed	163 (4.1)	7 (4.3)	10 (6.1)	18 (11.0)	2 (1.2)	50 (30.7)
Missing value	4 (0.1)					
Residence						
Rural	1877 (47.5)	157 (8.4)	154 (8.2)	292 (15.6)	68 (3.6)	796 (42.5)
Urban	2078 (52.5)	197 (9.5)	184 (8.9)	297 (14.3)	56 (2.7)	971 (46.7)
Region						
Southeastern	674 (17.1)	35 (5.2)	49 (7.3)	118 (17)	18 (2.7)	188 (27.9)
Southern	619 (15.6)	61 (9.9)	42 (6.8)	140 (22.6)	12 (1.9)	383 (61.9)
Western	643 (16.3)	76 (11.9)	62 (9.7)	75 (11.7)	19 (2.9)	319 (49.61)
Northern	666 (16.8)	77 (11.6)	53 (7.9)	121 (18.2)	19 (2.8)	290 (43.5)
Northeastern	638 (16.1)	32 (5.1)	63 (9.9)	57 (8.9)	28 (4.4)	228 (35.8)
Central	715 (18.1)	73 (10.2)	69 (9.7)	78 (10.9)	28 (3.9)	359 (50.3)
Alcohol consumption						
No	3919 (99.1)	334 (8.5)	333 (8.5)	579 (14.8)	122 (3.1)	1745 (44.5)
Yes	33 (0.9)	20 (60)	5 (15.2)	10 (30.3)	2 (6.0)	22 (66.7)

AFN: 1000 Afghan Afghanis about US$16.

Table 2. Distribution of smoking and tobacco product use patterns by sociodemographic and behavioral factors in Afghanistan, 2018 (N=3955)

Variables	Non-user n (%)	Non-smoker, tobacco n (%)	Smoker, no tobacco n (%)	Smoker and tobacco n (%)
Total	3082 (77.9)	516 (13.1)	281 (7.1)	73 (1.8)
Sex				
Male	1278 (63.2)	469 (23.2)	209 (10.3)	66 (3.3)
Female	1804 (93.5)	47 (2.4)	72 (3.7)	7 (0.4)
Age (years)				
<24	880 (88.3)	46 (4.6)	56 (5.6)	14 (1.4)
25–34	716 (81.2)	85 (9.6)	66 (7.5)	15 (1.7)
35–44	599 (75.2)	105 (13.2)	73 (9.2)	19 (2.4)
45–54	462 (73.9)	105 (16.8)	51 (8.2)	7 (1.1)
55–64	272 (66.7)	105 (25.7)	19 (4.7)	12 (2.9)
>64	133 (61.3)	65 (29.9)	13 (6.0)	6 (2.8)
Education level				
None	2023 (78.3)	355 (13.7)	165 (6.4)	41 (1.6)
Secondary	426 (74.2)	84 (14.6)	50 (8.7)	14 (2.4)
High school	458 (80.1)	58 (10.1)	46 (8.0)	10 (1.7)
Higher education	141 (78.3)	15 (8.3)	17 (9.4)	7 (3.9)
Employment status				
Employed	1371 (68.5)	400 (19.9)	175 (8.7)	55 (2.7)

Continued

Table 2. Continued

Variables	Non-user n (%)	Non-smoker, tobacco n (%)	Smoker, no tobacco n (%)	Smoker and tobacco n (%)
Unemployed	1543 (87.9)	101 (5.7)	98 (5.6)	13 (0.7)
Student	135 (95.1)	2 (1.4)	3 (2.1)	2 (1.4)
Retired	24 (57.1)	12 (28.6)	4 (9.5)	2 (4.7)
Monthly income (AFN)				
<10000	699 (80.2)	105 (12.1)	55 (6.3)	12 (1.4)
10000–19999	664 (75.9)	126 (14.4)	62 (7.1)	22 (2.5)
20000–49999	489 (78.6)	75 (12.1)	47 (7.6)	11 (1.8)
50000–99999	268 (72.0)	55 (14.8)	40 (10.7)	9 (2.4)
≥100000	467 (72.8)	106 (16.5)	56 (8.7)	12 (1.9)
Marital status				
Single	552 (89.2)	17 (2.7)	36 (5.8)	14 (2.3)
Married	2390 (75.4)	482 (15.2)	239 (7.5)	58 (1.8)
Divorced/widowed	139 (85.3)	17 (10.4)	6 (3.7)	1 (0.6)
Residence				
Rural	1444 (77.1)	273 (14.6)	138 (7.4)	19 (1.0)
Urban	1636 (18.8)	243 (11.7)	143 (6.9)	54 (2.6)
Region				
Southeastern	536 (79.5)	103 (15.3)	20 (2.9)	15 (2.2)
Southern	435 (70.3)	123 (19.9)	44 (7.1)	17 (2.7)
Western	495 (77.0)	72 (11.2)	73 (11.4)	3 (0.5)
Northern	484 (72.7)	105 (15.8)	61 (9.2)	16 (2.4)
Northeastern	552 (86.8)	52 (8.2)	27 (4.2)	5 (0.8)
Central	580 (81.2)	61 (8.5)	56 (7.8)	17 (2.4)
Alcohol consumption				
No	3073 (78.4)	512 (13.1)	267 (6.8)	67 (1.7)
Yes	9 (78.0)	4 (12.1)	14 (42.4)	6 (18.2)

AFN: 1000 Afghan Afghanis about US$16.

tobacco use patterns across various sociodemographic and behavioral groups. Overall, the majority of participants (77.9%) were non-users, around 13.1% were using only tobacco, followed by smokers with only 7.1%, and around 1.8% were both smokers and tobacco users. A notable gender difference was observed, with males exhibiting higher rates of smoking and tobacco use both in single-use forms and combined forms compared to females.

Age also played a critical role, as the prevalence of smoking and tobacco use increased with age. A clear increasing pattern is observed in tobacco consumption with age, while smoking prevalence is higher in the age group 35–54 years. The highest combined usage was observed in individuals aged 55–64 years (2.8%). The education level shows a similar trend, with the highest combined smoking and tobacco use rate among those with higher education (3.9%) compared to those with no formal education (1.6%).

Employment status further influenced these behaviors. Combined smoking and tobacco use are most prevalent among retired individuals (4.7%) compared to students who exhibited the lowest prevalence (1.4%). Married individuals had a higher prevalence of smoking and tobacco use individually; combined use was slightly higher among single individuals (2.3%) compared to married individuals (1.8%). Urban residents (2.6%) showed a higher prevalence of combined smoking and tobacco use compared to rural residents (1.0%), with regional differences indicating the highest combined prevalence in the Southern region (2.7%).

Finally, alcohol consumption was strongly associated with smoking and tobacco use. Individuals who consumed alcohol

Table 3. Factors associated with smoking, smokeless tobacco use, and passive smoking among adults in Afghanistan, 2018 (N=3952)

Variables	Crude model						Adjusted model					
	Smoking		Smokeless tobacco use		Passive smoking		Smoking		Smokeless tobacco use		Passive smoking	
	OR	95% CI	OR	95% CI	OR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Sex												
Female (ref.)												
Male	3.7	2.8–4.8	12.5	9.4–16.7	3.1	2.7–3.5	5.0	3.4–7.4	23.0	14.0–36.8	3.9	3.1–4.8
p	**<0.000**		**<0.000**		**<0.000**		**<0.000**		**<0.000**		**<0.000**	
Age (years)												
<24 (ref.)												
25–34	1.3	0.9–1.9	2.0	1.4–2.8	0.9	0.8–1.1	1.3	0.8–1.9	1.4	1.0–2.2		
35–44	1.7	1.3–2.4	2.9	2.1–4.0	0.9	0.8–1.1	1.7	1.1–2.6	1.9	1.2–2.9		
45–54	1.4	0.9–1.9	3.4	2.4–4.7	0.8	0.6–1.0	1.2	0.7–1.9	2.2	1.5–3.4		
55–64	1.1	0.7–1.9	6.3	4.5–8.8	0.9	0.7–1.1	0.8	0.4–1.4	3.3	2.1–5.0		
>64	1.3	0.7–2.2	7.6	5.2–11.1	0.9	0.7–1.3	0.7	0.3–1.4	2.6	1.5–4.3		
p	**0.03**		**<0.000**		0.302		**0.005**		**<0.000**			
Education level												
None (ref.)												
Secondary school	1.4	1.1–1.9	1.1	0.8–1.5	1.9	1.6–2.3	1.1	0.7–1.5	0.8	0.6–1.0	1.5	1.2–1.9
High school	1.3	0.9–1.8	0.7	0.6–1.0	1.5	1.2–1.8	0.9	0.6–1.3	0.6	0.4–0.8	1.4	1.1–1.7
Higher education	1.8	1.1–2.8	0.7	0.5–1.2	1.6	1.2–2.2	1.1	0.7–1.9	0.4	0.2–0.7	1.4	1.0–2.0
p	**0.01**		**<0.05**		**<0.000**		0.92		**<0.05**		**<0.05**	
Marital status												
Single (ref.)												
Married	1.2	0.9–1.6	3.9	2.7–5.7	0.9	0.8–1.1	1.2	0.7–1.9	2.3	1.4–3.8	1.2	1.0–1.5
Divorced/widowed	0.5	0.2–1.1	2.4	1.3–4.3	0.5	0.4–0.7	1.8	0.7–4.7	7.6	3.2–18.1	1.3	0.8–2.1
p	**0.03**		**<0.000**		**<0.05**		0.58		**<0.000**		0.24	
Monthly income (AFN)												
<10000 (ref.)												
10000–19999	1.3	0.9–1.8	1.3	1.0–1.7	1.4	1.1–1.6	1.2	0.8–1.7	1.2	09–1.6	1.1	0.9–1.4
20000–49999	1.2	0.8–1.8	1.0	0.7–1.4	1.1	0.9–1.3	1.3	0.9–1.9	1.1	0.8–1.5	0.9	0.7–1.1
50000–99999	1.8	1.2–2.7	1.3	1.0–1.8	1.1	0.9–1.4	1.3	0.9–2.1	1.1	0.4–1.6	0.8	0.6–1.0
≥100000	1.4	1.0–2.0	1.4	1.1–1.9	0.9	0.7–1.2	1.2	0.8–1.8	1.4	1.0–2.0	0.7	0.6–0.9
p	**0.04**		**0.03**		**0.004**		0.59		0.32		**0.03**	
Employment status												
Employed (ref.)												
Unemployed	0.5	0.4–0.7	0.2	0.1–0.3	0.5	0.4–0.6	1.6	1.1–2.2	1.1	0.7–1.5	1.3	1.1–1.6
Student	0.3	0.1–0.7	0.1	0.1–0.3	0.8	0.6–1.1	0.4	0.2–1.1	0.4	0.1–1.3	0.9	0.6–1.4
Retired	1.3	0.5–3.1	1.7	0.9–3.2	0.8	0.5–1.5	0.7	0.2–2.4	0.9	0.4–2.0	0.5	0.2–1.0
p	**0.000**		**0.000**		**0.000**		**0.006**		0.478		**0.009**	

Continued

Table 3. Continued

Variables	Crude model						Adjusted model					
	Smoking		Smokeless tobacco use		Passive smoking		Smoking		Smokeless tobacco use		Passive smoking	
	OR	95% CI	OR	95% CI	OR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Residence												
Rural (ref.)												
Urban	1.2	0.9–1.4	0.9	0.7–1.1	1.2	1.1–1.4					1.4	1.2–1.6
p	0.23		0.256		**<0.05**						**<0.000**	
Region												
Southeastern (ref.)												
Southern	2.0	1.3–3.1	1.4	1.1–1.8	4.2	3.3–5.3	2.0	1.3–3.4	1.3	0.9–1.9	4.5	3.4–5.8
Western	2.4	1.6–3.7	0.6	0.5–0.9	2.5	2.0–3.2	2.3	1.5–3.7	0.4	0.3–0.6	3.0	2.3–4.0
Northern	2.4	1.6–3.6	1.1	0.8–1.4	2.0	1.6–2.5	1.9	1.2–3.1	0.5	0.3–0.7	2.6	1.9–3.4
Northeastern	0.9	0.6–1.6	0.5	0.3–0.6	1.4	1.1–1.8	0.9	0.5–1.6	0.3	0.2–0.5	1.5	1.1–1.9
Central	2.1	1.4–3.2	0.6	0.4–0.8	2.6	2.1–3.3	2.2	1.4–3.5	0.5	0.3–0.7	2.7	2.1–3.5
p	**<0.000**		**<0.000**		**<0.000**		**<0.000**		**<0.000**		**<0.000**	
Alcohol consumption												
No (ref.)												
Yes	16.5	8.7–33.5	2.5	1.2–5.3	2.5	1.2–5.1	12.6	5.4–29.0	2.3	0.8–1.2	1.6	0.7–3.7
p	**<0.000**		**<0.05**		**<0.05**		**<0.000**		0.137		0.242	

AOR: adjusted odds ratio. Empty cells indicate that the variable was not included in the multivariable logistic regression model for that outcome because it was not significantly associated in the bivariate analysis or was not relevant for that outcome.

exhibited significantly higher rates of combined smoking and tobacco use (18.2%) compared to non-drinkers (1.7%).

Determinants of smoking, smokeless tobacco use, and passive smoking

Table 3 presents the odds of smoking, smokeless tobacco use, and passive smoking against different demographic and socio-economic categories. For tobacco consumption and smoking, all variables, except residence location, were significantly associated in the bivariate model, which were included in the final multivariate model, while for passive smoking, age did not show a significant association in the bivariate model; therefore, it was not included in the multivariate model for passive smoking.

Smoking status exhibited a significant association with sex, age, region, and alcohol consumption. Males had a notably higher likelihood of smoking compared to females, with males being five times more likely to smoke (AOR=5.0; 95% CI: 3.4–7.4). Age also played a role, as individuals in the 35–44 years age group were 1.7 times more likely to smoke than those aged 16–24 years. Furthermore, regional differences were observed, with individuals residing in the central parts of Afghanistan showing a higher likelihood of smoking compared to those living in the Southeastern region (AOR=2.3; 95% CI: 1.5–3.7). Conversely, those living in the Northeastern region were less likely to smoke compared to those in the Southeastern region. Alcohol consumption was a strong predictor of smoking, with alcohol users being almost 12 times more likely to smoke (AOR=12.6; 95% CI: 5.4–29.0) than non-drinkers.

With regard to smokeless tobacco consumption, sex, age, education level, marital status, and region exhibited a significant association. Males had higher odds of smokeless tobacco use (AOR=23.0; 95% CI: 14.0–36.8). Among age groups, individuals aged 55–64 years exhibited the highest (AOR=3.3; 95% CI: 2.1–5.0) likelihood of using tobacco compared to younger groups. Education level also showed a significant association: the likelihood of smokeless tobacco use decreased as the education level increased. The data indicated that divorced or widowed individuals were more likely to use smokeless tobacco, with an AOR of 7.6 (95% CI: 3.2–18.1) compared to single individuals. Regionally, people living in the Northeastern parts of Afghanistan exhibited a lower likelihood of using smokeless tobacco (AOR=0.3; 95%

CI: 0.2–0.5) compared to those in other regions, highlighting the geographical variation in tobacco consumption patterns.

Passive smoking exposure was significantly associated with sex, education level, monthly income, employment, and region. Males were almost four times more likely to be exposed to passive smoking compared to females (AOR=3.9; 95% CI: 3.1–4.8). Education level also played a role, with individuals with higher levels of education being less likely to be exposed to passive smoking compared to those with lower levels of education. Monthly income showed a significant association, with individuals with low income more likely to be exposed to passive smoking than those with high income. As expected, urban residents were more likely (AOR=1.4; 95% CI: 1.2–1.6) to be exposed to secondhand smoke compared to those living in rural areas. Different regions exhibited significant differences in exposure to secondhand smoking, with the southern region having the highest likelihood and the Southeastern region having the lowest likelihood of reporting exposure.

DISCUSSION

This study provides an overview of the prevalence and determinants of smoking, smokeless tobacco use, and passive smoking among the Afghan population, based on data from the 2018 Afghanistan STEPS survey. The findings note associations between tobacco use and various sociodemographic, economic, and behavioral factors, offering regional evidence, which may help inform future research and tobacco control strategies in Afghanistan.

The overall prevalence of current smoking was high, with stark gender differences: males were significantly more likely to smoke than females. This disparity aligns with global trends in low- and middle-income countries (LMICs), where smoking is often perceived as a socially acceptable behavior for men but not for women due to cultural norms[18-20]. Similarly, the prevalence of smokeless tobacco use was higher among males compared to females, reflecting traditional patterns of tobacco consumption observed in South Asia[21]. Several factors may explain the higher prevalence of smoking, smokeless tobacco use, and secondhand smoking exposure among men than women in Afghanistan. Cultural norms play a significant role, as tobacco use is often considered socially acceptable for men, whereas it is stigmatized or discouraged for women[22]. Additionally, men are more likely to engage in social settings and environments where tobacco use is prevalent, such as workplaces, public spaces, or social gatherings[23]. Economic factors may also contribute, as men typically have greater financial autonomy to purchase tobacco products. Finally, gender-specific marketing by tobacco companies may target men more aggressively, further perpetuating these disparities[22].

Age was a significant determinant of tobacco use, with smoking prevalence peaking in the 35–44 years age group, and smokeless tobacco use being most common among those aged ≥55 years. These findings may reflect life-stage factors, where middle-aged adults face increased stress from work and family responsibilities, potentially contributing to higher smoking rates. Older individuals may have longstanding habits of smokeless tobacco use, as such products are culturally ingrained and viewed as a traditional practice in many parts of Afghanistan. These findings are consistent with studies from other LMICs, where older age groups often exhibit higher rates of smokeless tobacco use due to long-term habits and cultural practices[21,24].

One of the key findings is the mean age of initiation of smoking, which was found to be 20.6 years. Early initiation is associated with a higher risk of long-term tobacco dependence and an increased likelihood of developing smoking-related diseases such as lung cancer, respiratory disorders, and cardiovascular diseases later in life[25].

Education level exhibited an inverse relationship with smokeless tobacco use, with lower levels of education associated with higher prevalence. This may be due to limited health literacy among less educated individuals, reducing awareness of the health risks associated with smokeless tobacco. Additionally, smokeless tobacco products are often cheaper and more accessible, making them a preferred option for individuals with limited financial and educational resources. Conversely, secondhand exposure to smoking was found to be higher among educated individuals. This, at first paradoxical-sounding finding, may be explained by greater exposure to public spaces, workplaces, and social gatherings among educated individuals, where smoking may be prevalent despite regulations[26]. Educated individuals are also more likely to live in urban areas, where passive smoking exposure is typically higher due to population density and weaker enforcement of smoking bans in shared environments. These findings are in line with existing evidence in some low- and middle-income countries[27,28].

Monthly income presented an interesting dynamic in the analysis. Smoking and smokeless tobacco use, unlike existing evidence[21,24,29], were not significantly associated with monthly income in the adjusted model, suggesting that these behaviors might be widespread across all economic groups in Afghanistan. This pattern could reflect the affordability of tobacco products in the country, making them accessible to individuals regardless of their income. However, passive smoking was negatively associated with income, with those having low income being more likely to be exposed to secondhand smoke. This finding could be attributed to crowded living conditions and shared spaces in low-income households, where individuals have less control over smoking behaviors within the household. Moreover, wealthier individuals may have greater access to smoke-free environments or may be more aware of the risks of secondhand smoke, leading to reduced exposure.

Residence did not show a significant association with smoking or smokeless tobacco use in the adjusted logistic regression model. However, in the descriptive analysis, urban residents reported higher rates of combined

tobacco consumption compared to rural residents. Additionally, residence emerged as a critical determinant of passive smoking exposure, with urban residents reporting significantly higher odds of being exposed to secondhand smoke. This disparity could be attributed to higher population density and greater exposure to shared environments such as public transport, restaurants, and workplaces in urban settings. Rural areas, on the other hand, may have lower exposure due to less crowded living conditions and a cultural emphasis on outdoor activities, reducing the likelihood of secondhand smoke exposure within enclosed spaces.

Regional differences were also notable. Interestingly, participants from the Western region of Afghanistan reported the lowest odds of smokeless tobacco use but the highest odds of smoking. This unique pattern may be associated with regional cultural and behavioral differences in the region. As the Western part of Afghanistan is often considered more urbanized compared to other regions, the cultural acceptance of smokeless tobacco products like naswar may be lower. However, smoking might still hold social significance as a sign of modernity or status, particularly among urban dwellers[30]. Further research is required to explore how urbanization and cultural norms influence these behaviors in the Western region.

Another important trend in smokeless tobacco use across Afghanistan is the increasing popularity of paan, a cleaner and more stylish alternative to naswar, which has become particularly popular among the younger generation. Over the past few decades, paan has gained traction as a socially acceptable smokeless tobacco product, especially in urban areas[31]. This shift may help explain the growing prevalence of smokeless tobacco use among younger individuals and highlight the changing landscape in tobacco products and consumption patterns.

Alcohol consumption was strongly associated with smoking. This association is consistent with global evidence linking substance use behaviors, as alcohol consumption often co-occurs with other risk behaviors, including tobacco use[32,33]. The coupled occurrence between alcohol and tobacco consumption underscores the need for integrated prevention strategies targeting multiple substance use behaviors.

Strengths and limitations

The study strengths include use of nationally representative data and robust multivariate analysis to identify key determinants of tobacco use. The large sample size of the survey increases statistical power and precision. Furthermore, the use of the standardized WHO STEPS methodology ensures comparability with other similar countries and high data quality.

However, several limitations should be noted. First, the cross-sectional design precludes causal inferences about the observed associations. Second, the use of self-reported data may be subject to recall and social desirability biases, which could lead to misclassification of certain behaviors, particularly in the context of smoking and alcohol use. Third, although multiple sociodemographic variables were included in the analysis, the possibility of residual confounding due to unmeasured or imperfectly measured variables cannot be ruled out. Moreover, due to the socio-political instability of the study setting, the results may not be generalizable to more stable settings. Finally, the STEPS survey does not capture the frequency or duration of secondhand smoke exposure, which may have resulted in exposure misclassification, particularly for workplace-related exposure in urban settings.

CONCLUSIONS

This study highlights the substantial burden of tobacco use and passive smoking in Afghanistan, emphasizing the need for targeted, evidence-based interventions. Addressing the sociodemographic and behavioral determinants of tobacco use is essential for reducing the prevalence of smoking-related morbidity and mortality in the country. Future research should explore the long-term impact of tobacco control policies and interventions on population health outcomes in Afghanistan.

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AUTHORS' CONTRIBUTIONS
ASN: conceptualization, visualization, methodology, formal analysis, investigation, data curation, writing of the original draft, reviewing and editing of the manuscript. PD: conceptualization, methodology, reviewing and editing of the manuscript. AShN and SMGM: methodology, writing and editing of the manuscript. VW: project supervision, conceptualization, methodology, analysis, and reviewing of the manuscript. ASN, PD, AShN and SMGM: read and approved the final version of the manuscript.

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