



Smoking Behavior and Workplace Health Promotion Among Municipal Employees: A Study of Greater Amman Municipality Staff in Jordan

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Abstract

This study explores how common smoking is among employees of the Greater Amman Municipality (GAM) in Jordan. It looks at patterns and reasons behind smoking within the context of both national and global efforts to create smoke-free public spaces. We used a cross-sectional design and a structured electronic questionnaire to gather data on tobacco use, demographics, job stress, quitting behavior, and knowledge of available support services. The results show that 36% of GAM employees smoke, with traditional cigarette use being the most common type. Smoking behavior is notably linked to factors like how long employees have worked there, their stress levels, and the age at which they started smoking. Although 53% of smokers tried to quit, only 32% of those who knew about cessation clinics actually used them. Almost 70% of respondents reported being exposed to second-hand smoke, even though 66% thought GAM was a smoke-free environment. These findings emphasize how workplace culture, psychological stress, and gaps in enforcement contribute to ongoing smoking habits. The study highlights the urgent need for health promotion strategies that include support for quitting, mental health resources, and effective policy actions focused on municipal workers. It adds to the existing literature on occupational health in urban areas of the Middle East and backs national tobacco control efforts aimed at cutting down smoking in public sector workplaces.

Introduction

Tobacco use is still the leading preventable cause of illness and early death worldwide. It leads to over 8 million deaths each year and places a heavy economic burden on public health systems (World Health Organization, 2024). In addition to its direct health effects, smoking in large organizations, especially in the public sector, decreases productivity, increases absenteeism, and raises healthcare costs. As a result, the workplace has become a vital setting for implementing targeted health promotion and smoking cessation programs (Centers for Disease Control and Prevention, 2023; Flynn *et al.*, 2018).

In Jordan, smoking rates are among the highest in the Middle East. The Global Adult Tobacco Survey (GATS) showed that in

2019, 66% of adult males and 17% of females were current tobacco users. There have also been rising trends in the use of waterpipes and electronic cigarettes (World Health Organization, 2019). Cultural norms, work-related stress, and limited access to cessation resources shape these behaviors (Alkouri *et al.*, 2023; Rababah & Al-Hammouri, 2022). International evidence also highlights the diverse health impacts of tobacco use. Studies in Indonesia have shown that active smokers often present with lower vitamin D levels and impaired lung function (Lorensia *et al.*, 2025; Laksono *et al.*, 2025), while hookah smoking has been associated with elevated uric acid and asymptomatic gout (Jumaah *et al.*, 2025). These findings underscore the multifaceted risks of tobacco use and reinforce the need for

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institutional-level analyses in urban workplaces such as the Greater Amman Municipality (GAM).

Research shows that workplace tobacco control, especially smoke-free policies along with cessation support, can lower smoking rates significantly (Al-Jayyousi, 2022; Ayaz *et al.*, 2024). A Cochrane review confirms that interventions such as behavioral counseling and medicine can effectively promote quitting (Cahill & Lancaster, 2014; Glasgow *et al.*, 2004). However, enforcing these measures and getting employees to participate remain ongoing challenges, particularly in public institutions (Daba *et al.*, 2024; Wynne *et al.*, 2018). Recent meta-analyses indicate that multi-component cessation programs, which include behavioral counseling, nicotine replacement therapy (NRT), and digital tools, work significantly better than single interventions (Yuan *et al.*, 2023; Baay *et al.*, 2024). These results support the WHO's recommendation for integrated tobacco control strategies in public institutions (World Health Organization, 2024; United Nations Development Programme, 2024).

Global reviews also emphasize that cessation programs are most effective when they are part of a supportive organizational culture (Eriksen *et al.*, 2015; Esmaeilisaraji & Yazdi, 2024). Flynn *et al.* (2018) stress the importance of engaging leadership, encouraging peer support, and clearly enforcing policies to promote healthier behaviors. Baay *et al.* (2024) add that when staff are involved in shaping health promotion programs, it boosts participation and long-term effectiveness. Tobacco control in public institutions also supports wider sustainability and governance goals. The United Nations Development Programme (2024) states that local governments play an essential role in creating smoke-free environments, especially when policies are integrated into urban health strategies and backed by leadership across sectors.

The Greater Amman Municipality (GAM) aims to be a leader in public health by promoting a “smoke-free, healthy city.” This commitment is outlined in a detailed anti-smoking action plan for 2024–2026, which calls for strong internal interventions. However, successful policy implementation

requires accurate and up-to-date data about the institution. Organizational policies need a clear understanding of employee behaviors, psychological factors influencing smoking, and the effectiveness of existing cessation support. This situation highlights the urgent need for a thorough empirical assessment within GAM. A large-scale analysis is necessary to move beyond general statistics and identify practical challenges in following policies. Important unknowns include how tobacco is consumed (such as cigarettes, Argileh, e-cigarettes), psychological triggers like work-related stress, and how engaged employees are with GAM's cessation clinics. The extent of second-hand smoke (SHS) exposure in municipal facilities is also a crucial measure of how well policies are enforced (Farran *et al.*, 2024; Hersi *et al.*, 2024).

This study aims to carry out a detailed, organization-wide assessment of smoking behaviors and attitudes among GAM employees. The main objectives are threefold: (1) to determine the current smoking rates and associated demographic and behavioral traits, (2) to find out the main reasons for starting and continuing smoking, as well as factors that motivate quitting, and (3) to assess employee awareness, use, and perceived effectiveness of cessation resources while measuring SHS exposure in the workplace. These findings will help create a data-driven foundation for refining and implementing GAM's anti-smoking strategies for 2024–2026.

Methodology

This study used a quantitative, cross-sectional survey design to assess smoking prevalence, behavior patterns, and related attitudes among employees of the Greater Amman Municipality (GAM). The research took place in 2025 as part of GAM's effort to create a “smoke-free, healthy city” and to guide its Executive Plan for Tobacco Control (2024–2026). The study aimed to gather specific data to support policy development and promote health in the workplace. The target group included all GAM employees, covering a wide range of professional, technical, and administrative roles across

various departments and sectors. This approach ensured representation from diverse job categories and work settings within the municipality.

A purposive sampling strategy was used to achieve near-complete coverage of the employee population by widely distributing the survey digitally. Table 1 shows the distribution of the sample size across GAM administrative units. The target sample size was 5,373 employees. Of those, 4,602 completed the questionnaire out of 5,373 targeted across GAM administrative units, resulting in a high response rate of 85.6% and providing strong representation across GAM's organizational structure. The Public Works Sector contributed the largest share (1,070), followed by the Regional and Environmental Sector (930) and the Community Development Sector (929). Smaller contributions came from Independent Departments (427), the Health and Agricultural Sector (505), and the Financial Sector (261). Notably, the Administrative Sector recorded 281 completed questionnaires. This distribution ensured a broad representation of GAM's organizational structure.

Data were collected using a structured electronic self-administered questionnaire. This method aimed to encourage wide participation, protect respondent anonymity, and simplify data collection from GAM's geographically

and functionally diverse workforce. The questionnaire aimed to gather information across five key areas:

Socio-demographic characteristics: Gender, age, education level, marital status, and household income.

Smoking status and patterns: Type of tobacco used (cigarettes, waterpipe, e-cigarettes), how long smoking lasted, and average daily use.

Determinants and quitting behavior: Reasons for smoking (stress, addiction, social influence), past quit attempts, and reasons for stopping.

Awareness and use of institutional support: Knowledge of GAM's smoking cessation clinics and use of available services.

Workplace environment: Exposure to second-hand smoke, views on smoke-free policy enforcement, and satisfaction with GAM's anti-smoking efforts. The questionnaire was reviewed by public health experts and pilot-tested for clarity and relevance before full deployment.

Quantitative data were analyzed using descriptive statistical methods. We calculated frequencies and percentages to summarize socio-demographic variables, smoking prevalence, consumption patterns, cessation behavior, and perceptions of workplace tobacco control. This analysis offered a complete overview of smoking-related behaviors and attitudes within GAM. It served as a basis for targeted policy recommendations and intervention design.

Table 1. Sample Size Distribution by Administrative Unit

Administrative Unit	Target Sample	Completed Questionnaires
Independent Departments	530	427
Public Works Sector	1,329	1,070
Economic Planning and Development Sector	192	199
Community Development Sector	1,029	929
Health and Agricultural Sector	628	505
Financial Sector	286	261
Administrative Sector	221	281
Regional and Environmental Sector	1,158	930
Total	5,373	4,602

Results and Discussion

This section presents the key findings of a survey conducted among 4,602 employees of the Greater Amman Municipality (GAM). The focus is on smoking rates, behaviors, factors influencing smoking, efforts to quit, second-hand smoke exposure, and adherence to policies. The discussion interprets these findings in the context of health promotion in the public sector and urban tobacco control. Table 2 below presents the socio-demographic profile of the surveyed GAM employees (N = 4,602). The workforce was predominantly male (65.4%), with most respondents aged between 26 and 45 years (62%). In terms of education, nearly two-thirds held at least a bachelor's degree (61%), while 13% pursued postgraduate studies. The majority of employees were married (70%), and household income was concentrated between 400 and 800 JOD per month (62%). Smoking prevalence reached 36%, with higher rates observed among males and those aged 26–45, underscoring the need for targeted

interventions within this demographic group.

Table 3 summarizes smoking behavior among GAM employees (N = 4,602). Overall, 36% (n = 1,657) reported being current smokers, a notably high rate for a public health-oriented institution. Traditional cigarettes were the predominant form of tobacco use (77.9%), followed by waterpipe (11.1%) and e-cigarettes (7%), while 4% reported using multiple products. More than half of smokers consumed between 11 and 20 cigarettes daily (54.6%), and nearly one in five exceeded 20 cigarettes per day (17.7%), reflecting moderate to heavy consumption patterns. Duration of smoking further underscored the chronic nature of tobacco use, with almost two-thirds (64%) reporting a history of more than 10 years. Early initiation was also prevalent: over half of smokers (53.4%) began before the age of 21, most commonly at ages 18 (19.8%) and 20 (17.3%). This pattern highlights the vulnerability of late adolescence and early adulthood as critical windows for tobacco

Table 2. Socio-Demographic Characteristics of GAM Employees (N = 4,602)

Variable	Category	Count	Percentage
Gender	Male	3,012	65.4
	Female	1,590	34.6
Age Group	18–25 years	598	13.0
	26–35 years	1,472	32.0
	36–45 years	1,380	30.0
	46–55 years	920	20.0
	56+ years	232	5.0
Educational Level	High school or less	782	17.0
	Diploma	1,012	22.0
	Bachelor's degree	2,208	48.0
	Postgraduate (Master's/PhD)	600	13.0
Marital Status	Single	1,104	24.0
	Married	3,220	70.0
	Divorced/Widowed	278	6.0
Monthly Income	<400 JOD	460	10.0
	400–600 JOD	1,380	30.0
	601–800 JOD	1,472	32.0
	>800 JOD	1,290	28.0
Smoking Status	Smokers	1,657	36.0
	Non-Smokers	2,945	64.0

Table 3. Summary of Smoking Behavior among GAM Employees (N = 4,602)

Indicator	Category/Type	Count	Percentage
Smoking Status	Smokers	1,657	36.0
	Non-Smokers	2,945	64.0
Type of Smoking	Cigarettes	1,290	77.9
	Waterpipe (Argileh)	184	11.1
	E-cigarettes	116	7.0
	Combinations (any two or three types)	67	4.0
Daily Cigarette Consumption	<5	47	3.5
	5–10	327	24.2
	11–20	737	54.6
	>20	239	17.7
Smoking Duration	<1 year	33	2.0
	1–5 years	249	15.0
	6–10 years	314	19.0
	>10 years	1,061	64.0

Table 4. Smoking Initiation and Prevalence by Demographic Characteristics (N = 4,602)

Demographic Variable	Category	Smoking Prevalence (%)	Initiated Before Age 21 (%)
Gender	Male	43.8	58.2
	Female	21.2	46.5
Education Level	High school or less	52.7	61.3
	Diploma	39.3	56.8
	Bachelor's degree	31.8	52.4
	Postgraduate (MSc/PhD)	24.2	43.7
Age at Smoking Initiation	18 years	—	19.8
	20 years	—	17.3
	<21 years (combined)	—	53.4

uptake, consistent with national and regional evidence linking urban environments, social exposure, and stress to early smoking initiation. Collectively, these findings emphasize the urgent need for workplace programs that address both long-standing behavioral patterns and the socioeconomic determinants of tobacco use.

In Jordan, Alkouri *et al.* (2023) and Shalan *et al.* (2024) found that starting to smoke at a young age is linked to peer influence, stress, and a lack of understanding of long-term health risks. These studies highlight the need for early actions aimed at students, vocational trainees,

and young professionals before smoking habits become established. Preventive steps should include education in schools, campaigns to engage youth, and early access to quitting resources.

Table 4 presents smoking initiation and prevalence by demographic characteristics among GAM employees (N = 4,602). Smoking rates were substantially higher among males (43.8%) compared to females (21.2%), with early initiation also more common among men (58.2% vs. 46.5%). Education showed an inverse relationship with smoking: more than half of employees with only a high

school education were smokers (52.7%), while prevalence declined to 24.2% among those with postgraduate degrees. Nevertheless, the largest group of smokers in absolute numbers were employees with midlevel education (diploma and bachelor's degrees), underscoring the need for interventions that target this populous and at-risk segment of the workforce, highlighting the need for interventions that target this sizable and vulnerable segment of the workforce. This pattern is consistent with global evidence linking education to health literacy and greater success in smoking cessation (World Health Organization, 2024; Centers for Disease Control and Prevention, 2023). Early initiation was prevalent overall, with 53.4% of smokers reporting that they began before the age of 21, most commonly at ages 18 (19.8%) and 20 (17.3%). These findings align with regional evidence linking lower educational attainment and adolescence to higher tobacco uptake, reinforcing the importance of tailored prevention strategies (Abdulrahim & Jawad, 2018; Qattan *et al.*, 2021).

Table 5 summarizes smoking cessation behavior and second-hand smoke (SHS) exposure among GAM employees. Addiction (36%), workplace stress (32%), and social influence (25%) were the primary reasons cited for smoking. Among smokers, 53% reported at least one quit attempt, with an average of three attempts. Health concerns (32%) and financial pressures (31%) were the most common motivators for cessation, followed by family

influence (17%) and medical advice (9%). Despite 54% of smokers being aware of GAM's cessation clinics, only 32% reported using these services, suggesting limited engagement with available support. SHS exposure was widespread, with 69% of employees reporting exposure, even though 66% perceived GAM as a smoke-free environment. These findings highlight both the persistence of nicotine dependence and the gap between institutional smoke-free policies and employees' lived experiences, underscoring the need for stronger workplace interventions.

These findings show a conflict in behavioral drivers: internal psychological dependence and external work stressors. The strong impact of work-related stress highlights the need to include stress management and mental health support in cessation programs. The fact that more than half of smokers have tried to quit shows a strong motivation. This suggests that the main issue is not a lack of intent, but rather the availability and accessibility of effective, long-term cessation support.

Smoking behaviors among municipal employees are influenced by various psychosocial stressors, workplace dynamics, and cultural norms. In Jordan, starting and continuing tobacco use often relate to peer influence, perceived stress, and limited ways to cope. Shalan *et al.* (2024) found that smoking initiation among Jordanian adults frequently connects to social exposure and psychological distress, especially in urban and institutional

Table 5. Smoking Cessation and SHS Exposure Summary

Indicator	Category/Type	Count/Rate
Cessation Attempts	Attempted to quit	53
	Average number of attempts	3
Motivations for Quitting	Health	32
	Financial	31
	Family influence	17
	Medical advice	9
	Other	11
Clinic Awareness and Use	Aware of cessation clinics	54
	Visited clinic	32
Second-Hand Smoke Exposure	Reported SHS exposure	69
	Perceived GAM as smoke-free	66

settings.

Regional studies show that institutional pressures and weak enforcement of smoke-free norms contribute to ongoing smoking in public sector environments. Nakkash *et al.* (2022) reported high rates of cigarette and waterpipe smoking in Eastern Mediterranean countries, citing workplace stress and cultural acceptance as key factors. These findings highlight the need for targeted efforts that address both behavioral and environmental factors related to tobacco use. Employee involvement in health programs is also shaped by psychological and organizational elements. Gaalat (2024) stresses that personality traits and perceived support from the organization affect participation in wellness initiatives. This suggests that passive responses to cessation programs may reveal deeper behavioral tendencies rather than being a simple refusal. Flynn *et al.* (2018) underscore the importance of building a supportive workplace culture, where leadership support and peer encouragement boost the effectiveness of health initiatives.

Organizational strategies that combine tobacco control with broader efforts to enhance the psychosocial work environment have shown lasting impact. Aust *et al.* (2023) found that these interventions not only lower smoking rates but also improve employee satisfaction, retention, and overall well-being, supporting the long-term success of institutional health promotion. While 54% of employees knew about GAM's internal smoking cessation clinics, only 32% of them used the clinics. Among the visitors to these clinics, 78% chose Nicotine Replacement Therapy (NRT), showing they followed best practices. One important finding is the large gap between awareness and use. Barriers could be the locations being inconvenient, limited appointment times, privacy issues, or doubts about effectiveness (Itumalla & Aldhmadi, 2020; Karam & Mneimneh, 2018). To support its goal of a smoke-free urban area, GAM has set up three cessation clinics. One clinic, developed with the World Health Organization (WHO), provides a complete model that combines behavioral counseling, nutritional advice, psychological support, and NRT. This clinic, located in King Abdullah II Gardens, also features a walking track and outdoor gym

for both employees and the larger community. This project shows GAM's dedication to overall urban health and its goal to improve outdoor fitness facilities throughout the city.

To boost usage, GAM needs to conduct a qualitative study to find and fix access issues. Other public sector programs have faced similar challenges, where strong leadership and a positive organizational culture are essential for success (Gupte *et al.*, 2021; Kouvonen *et al.*, 2005; Sharara, 2008). A large percentage of employees, 69%, reported being exposed to second-hand smoke (SHS) in GAM facilities. This is surprising because 66% see GAM as a smoke-free place, and 77% are happy with anti-smoking efforts. This gap shows a problem with how policies are enforced and followed. Exposure to SHS is a serious health risk for non-smokers and damages the reliability of tobacco control measures. The difference between noticed exposure and perceived satisfaction may indicate that passive smoking is becoming normal or that expectations about enforcement are low (Suhadi *et al.*, 2025; Tate *et al.*, 2021).

The high prevalence of smoking and SHS exposure among GAM employees is consistent with international evidence on the health risks of tobacco use. For example, studies in Indonesia have demonstrated that smoking contributes to reduced vitamin D levels and lung function decline (Lorensia *et al.*, 2025; Laksono *et al.*, 2025). Moreover, waterpipe smoking has been linked to asymptomatic gout through elevated uric acid levels (Jumaah *et al.*, 2025; Van Loon *et al.*, 2005), underscoring the hidden burden of tobacco-related morbidity. These parallels suggest that institutional interventions in GAM should not only address behavioral determinants but also anticipate broader physiological consequences documented in other settings. Similar issues have been seen in other low- and middle-income countries. In Nepal, smoke-free laws did not stop widespread SHS exposure because of weak accountability systems. Basnet *et al.* (2022) point out that enforcement struggles when institutions do not have clear reporting systems and ownership.

GAM has health inspectors and fines for smoking violations, but this study did not evaluate those mechanisms. The high rates of SHS exposure suggest that enforcement might

be applied inconsistently or may not be visible enough to employees. GAM needs to improve internal monitoring, create confidential reporting options, and apply disciplinary actions consistently to maintain its legally required smoke-free workplace. It is also important to note that data collection occurred before a major institutional intervention. Following the study, GAM initiated a capacity-building program that included retraining health inspectors and appointing tobacco control focal points across all administrative units. This initiative aims to enhance policy implementation, improve workplace surveillance, and reinforce smoke-free norms. While its impact is not reflected in the current findings, the program represents a proactive step toward institutional accountability and health promotion. Future evaluations will be needed to assess its effectiveness in reducing SHS exposure and improving compliance.

These findings highlight the need to connect local enforcement with international standards. The WHO Framework Convention on Tobacco Control (FCTC) stresses the importance of strong smoke-free policies backed by institutional responsibility and monitoring. Additionally, the MPOWER package—specifically the “Protect” and “Enforce” parts—calls for the effective application of smoke-free laws and organized enforcement to protect public health. Recent assessments of the FCTC 2030 program point out the challenges and opportunities for speeding up tobacco control implementation in LMICs. There is a need for stronger institutional responsibility, coordination across sectors, and training for enforcement (Siddiqi *et al.*, 2023). GAM should review and enhance its efforts based on these global standards to ensure real protection for non-smokers and ongoing progress towards a tobacco-free workplace. The economic burden of smoking in public institutions goes beyond healthcare costs. Presenteeism and productivity loss among smokers can cut institutional efficiency by up to 15% (Marshall *et al.*, 2024; Centers for Disease Control and Prevention, 2022). Current smokers cost employers much more in terms of healthcare use, absenteeism, and productivity loss, estimated at \$900 to \$1,383 annually per employee (Van den Brand

et al., 2020).

Return on investment is highest when cessation programs meet employee needs and receive active support from leadership. A systematic review by Baay *et al.* (2024) shows that comprehensive workplace cessation interventions are clinically effective and cost-efficient, especially when part of broader occupational health strategies. Likewise, Virtanen *et al.* (2025) point out that workplace health promotion programs boost both employee well-being and organizational performance. By investing in extensive cessation initiatives, organizations can enhance employee well-being and institutional productivity. Long-term success relies on continuous improvement, leadership involvement, and staff participation. Establishing feedback mechanisms promotes ownership and accountability, which are key factors in sustaining behavioral change and creating a healthier organizational environment (Aust *et al.*, 2023; Flynn *et al.*, 2018; Kava *et al.*, 2019).

While the findings provide useful insights into smoking behavior among GAM employees, several limitations should be noted. First, the cross-sectional design captures behavior and perceptions at just one point in time, which limits our ability to draw causal conclusions. Second, relying on self-reported data may lead to recall or social desirability bias, especially when participants discuss their smoking status or efforts to quit. Third, although the sample size was large and representative of GAM’s workforce, the findings may not apply to other institutions (World Health Organization EMRO, 2016; Zain *et al.*, 2023). Some subgroups, such as postgraduate employees or younger workers, were not fully represented, which could impact the accuracy of subgroup analyses. Finally, while the survey examined awareness and use of cessation services, it did not assess the quality, availability, or long-term results of these programs. Future research should use longitudinal studies and qualitative methods to better explore behavioral trends and institutional obstacles.

Conclusion

This assessment of the Greater Amman Municipality (GAM) workforce confirms that

tobacco use is a significant public health and institutional issue. With a smoking rate of 36% and 69% of employees reporting exposure to second-hand smoke (SHS), the findings stress the need to strengthen workplace tobacco control. While 53% of smokers expressed a desire to quit and 54% knew about cessation services, actual use of these services remains low at 32%. This shows a gap between the availability of policies and actual behavior. GAM has already started an anti-smoking action plan that includes health inspectors, administrative penalties, trained liaison officers, and secret monitoring. These efforts show a commitment from the organization, but the ongoing SHS exposure indicates that enforcement visibility, cultural resistance, and ongoing behavioral support are still major issues. The findings are similar to those in other low- and middle-income countries, where policy development often outstrips implementation. GAM's experience highlights the need for strategies that integrate enforcement, education, and employee wellness. It is important to connect these efforts with global frameworks like the WHO FCTC and MPOWER to strengthen GAM's role in urban tobacco control and promote healthier public sector environments in the region.

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