Neo Scientific Peer Reviewed Journal
Volume 43, February 2026 ISSN (E): 2949-7752
www.neojournals.com

# PREVALENCE OF CONSUMPTION OF TOBACCO AND NICOTINE-CONTAINING PRODUCTS IN THREE GROUPS (OFFICE WORKERS, HEALTH CARE WORKERS, PRIMARY HEALTH CARE POPULATION): BASELINE CLINICAL AND EPIDEMIOLOGICAL CROSS-SECTION

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**Abstract:**

**The study presents a comparative assessment of the prevalence of consumption of tobacco and nicotine-containing products among medical workers and primary health care patients. A total of 200 people (100 in each group) were examined using questionnaire methods, including the Fagerström test and the determination of the stage of readiness to quit smoking by the Prohaszky test. It was revealed that the share of current tobacco/nicotine users is significantly higher among the population of primary health care (39.0%;), than in healthcare workers (28.0%, p<0.001). Men in all groups smoke more often than women, especially sharply in the population group (42.8% vs. 25.0%; p=0.041). The population is also characterized by an earlier start of smoking and a higher nicotine load. The data obtained indicate the most disadvantaged profile in the population, which justifies the need to prioritize preventive measures in this environment.**

**Keywords**

**Tobacco smoking; nicotine-containing products; prevalence; military personnel; medical workers; epidemiological study.**

## Introduction

Tobacco smoking is one of the world's leading preventable health threats. WHO estimates that the total number of tobacco users exceeds 1.3 billion. Smoking kills more than 7 million people every year, accounting for about 13% of all deaths. [1] The contribution of tobacco to premature mortality in men is particularly high: in a number of countries, up to 17% of all deaths are associated with smoking. [2]. Globally, there is a downward trend in smoking prevalence, but due to population growth, the absolute number of smokers remains substantial. In the WHO European Region, about 29% of adults smoke and tobacco accounts for almost a fifth of deaths from noncommunicable diseases. [3]

In the Republic of Uzbekistan, the level of smoking among the adult population is relatively low compared to world indicators, but there is a sharp gender imbalance [4]. According to sample studies, only 10-15% of adults are regular smokers, and up to a third (30%) of men smoke, while less than 1% of women smoke. [4] This difference is due to cultural and social factors that limit smoking among women. At the same time, the consumption of smokeless tobacco (nasvai) remains, covering up to 10% of the adult population, mainly men [4]. Thus, despite the relatively low overall prevalence of smoking, the cumulative nicotine load remains a significant problem for public health in Uzbekistan.

Individual occupational and social groups can differ significantly in the prevalence and characteristics of tobacco use. International observations show that lower smoking is often recorded among medical professionals than in the civilian population [6]. Medical workers usually show lower smoking rates due to professional knowledge of the dangers of tobacco and the corporate culture of a healthy lifestyle [7]. However, smoking among doctors is still a problem: according to Russian data, about 28–30% of doctors and medical staff may be smokers [7]. The primary health care (PHC) population is a broad group of urban and rural residents who go to health clinics; their smoking rates reflect the average for the population, but may vary depending on gender, age, place of residence and other factors [7].

This study is devoted to the initial clinical and epidemiological analysis of the consumption of tobacco and nicotine-containing products in these groups.

**The aim of** the study was to compare the prevalence and structure of tobacco and nicotine use in these groups in order to identify the most vulnerable category and justify further preventive measures. The objectives included: 1. estimating the proportion of never-smokers, former and current tobacco users/TSPs; 2. Analysis of gender and age differences in the prevalence of smoking; (3) study of the intensity of consumption and the degree of nicotine dependence; (4) assessment of factors related to use (age of onset, environment, etc.).

**Research methods:**

One-stage cross-sectional survey of two groups of respondents. Each group consisted of 100 people aged 18–65 years, selected in a targeted way. The group of medical workers consisted of employees of medical and preventive institutions (doctors and nurses of hospitals and clinics). The primary health care population group was patients of polyclinics (men and women) who applied for preventive examinations or for reasons not related to smoking. The inclusion criteria were voluntary consent and filling out a questionnaire; persons with severe somatic pathology that prevented the interview were excluded.

**Research tools:**

The author's questionnaire was used, including socio-demographic questions, a detailed history of tobacco and nicotine-containing products, as well as standardized tests. Smoking status was determined according to WHO standards [8]: never smokers (no tobacco

 

users/NSPs in their lifetime or episodes ≤100 cigarettes in their lifetime), former smokers (previously smoked regularly, but abstained ≥12 months), and In addition to traditional cigarettes, electronic nicotine delivery systems (ENDS, i.e. electronic cigarettes) and tobacco heating systems (THS) were included in the number of nicotine-containing products (ETS) in addition to traditional cigarettes, as their use was also counted as a source of nicotine. To assess the intensity of use, current users recorded the number of days of use per week and the average number of units of the product consumed per day (number of cigarettes smoked; number of episodes of ENDS use; number of CNT sticks).

**Nicotine dependence** was determined using the Russian version of the Fagerström Nicotine Dependence Test (FTND) [9]. Based on the sum of 6 items, low (0–3 points), moderate (4–6), and high (7–10 points) degree of dependence were distinguished.

**Motivation for quitting was** assessed according to the Prochasky-Di Clemente trans-theoretical model. Based on the questions about the intentions to quit smoking and the steps taken, all current users were assigned to one of the stages of behavior change: deliberation (no thoughts of quitting), deliberation (thinking about the possibility of quitting), preparation (intention to quit in the near future, specific plans), action (active attempts to quit <6 months) or maintenance (abstinence ≥6 months). The key attention was paid to the proportion of people in the early stages – thinking/thinking, which reflects a low willingness to refuse, and in the advanced stages (preparation/action) – high readiness.

Other factors: information on the presence of smokers in the immediate environment (in the family, work team) was collected through the questionnaire, which was then classified according to gradations: 0-1 smoker in the environment, 2-4 smokers, ≥5 smokers. Respondents also rated the level of stress experienced at work/service and at home on a scale from 0 to 10; the value of ≥7 points was conditionally regarded as high subjective stress. index based on ten control questions; The level of ≤3 points was considered to be a low level of awareness.

**Results:**

The surveyed groups were comparable in age: the average age of health workers was 35.1±9.4 years; 33.5±8.6 years of primary health care patients (p=0.112). The majority of respondents in each group belonged to the mature working age of 25–44 years (66.0% of medical workers, 60.0% of the population). The gender composition differed naturally ($\chi^2$, p<0.001): among health workers, the majority were women (67%), which corresponds to the structure of health care; in the primary health care group, the sex ratio was close to equal (women 53%)[11]. Thus, the groups differed by gender, which must be taken into account when analyzing smoking.

In general, in a sample of 200 people, 67 people (33.5%) were current users of tobacco/nicotine products, 40 (20%) were former users, and 93 people (46.0%) had never used them. However, these indicators differed significantly between groups (Table 1).

**Table 1. Distribution of those surveyed by tobacco use status/NSP**

| Group | Never used, n (%) | Former consumer, n (%) | Current consumer, n (%) |
|---|---|---|---|
| Healthcare professionals (n=100) | 51 (51,0%) | 21 (21,0%) | 28 (28,0%) |
| Primary health care population (n=100) | 42 (42,0%) | 19 (19,0%) | 39 (39,0%) |
| Note: $p<0.01$ when comparing the share of current consumers between groups ($\chi^2=23.1$; df=2). | | | |

As can be seen, the largest share of current users of tobacco and nicotine-containing products was observed among primary health care patients (39.0%; p=0.016) than among health care workers (28.0%; p<0.001). The share of those who quit smoking (former users) varied about 20% in civil groups, no statistically significant differences (p=0.66). Thus, the population had a high cumulative experience of nicotine use: the total current+former users amounted to 58.0%, while those of medical workers – only 49.0%. These differences confirm the assumption of an unfavorable situation with smoking among the population.
Men are significantly more likely to use nicotine than women in all categories. The gender gap is especially noticeable among medical workers (42.4% of men vs. 20.9%, p=0.018). In the primary health care population, the differences between the sexes are less pronounced (44.7% vs. 34.0%, p=0.09 is insignificant). These observations indicate that men remain the main risk group for smoking. 2.

**Table 2. Status of tobacco use/NSP by sex in groups**

| Group | Gender | Never smoked, n (%) | Former, n (%) | Current, n (%) |
|---|---|---|---|---|
| Health workers | Male (n=33) | 12 (36,4%) | 7 (21,2%) | 14 (42,4%) |
| | women (n=67) | 39 (58,2%) | 14 (20,9%) | 14 (20,9%) |
| Population of primary health care | Male (n=47) | 17 (36,2%) | 9 (19,1%) | 21 (44,7%) |
| | women (n=53) | 25 (47,2%) | 10 (18,9%) | 18 (34,0%) |

Difference between the sexes by the share of current consumers: $p<0.05$ for military personnel and medical workers; $p>0.05$ for the population ($\chi^2$ / Fisher's exact test).

A detailed analysis of Table 2 confirms that gender differences in smoking behavior are present in all groups, but their magnitude is different. In medical workers, men smoke more often (42.4% and 20.9%, p=0.018); it is noteworthy that among female doctors, the majority (58.2%) have never smoked at all. In the group of primary health care patients The proportion of male smokers is higher than that of women (44.7% and 34.0%), but the difference has not reached statistical significance (p=0.09). Consequently, the largest gender gap is observed among doctors, while in the general population it is smoothed.

Probably, this reflects different social norms: in civil society, women's smoking is gradually growing and has already reached 34%.
The next step is to analyze the age structure of smoking.

**Table 3. Current Tobacco Users/EPPs by Age Category**

| Age, years | Healthcare workers (n/n, %) | Primary health care population (n/n, %) |
|---|---|---|
| 18–24 | 3 / 17 (17,6%) | 6 / 19 (31,6%) |
| 25–34 | 8 / 31 (25,8%) | 13 / 33 (39,4%) |
| 35–44 | 11 / 35 (31,4%) | 11 / 27 (40,7%) |
| 45–55 | 6 / 17 (35,3%) | 9 / 21 (42,9%) |

Note: Differences between age subgroups within each group are statistically insignificant ($p>0.28$ in all cases, $\chi^2$).

Table 3 shows that a high proportion of smokers was observed at all ages: at the age of 18–24, almost half (47.6%) consume nicotine, and later the indicator is maintained by about 58–61%. No statistically significant differences between the age subgroups of the sample were revealed (p=0.62), that is, the situation does not improve or worsen with age. In the group of medical workers, there is a tendency to increase the proportion of smokers with age: from 17.6% among 18–24-year-olds to 35.3% among 45–55 years. Formally, the differences have not reached significance (p=0.28), but absolute figures indicate that senior doctors smoke more often than younger colleagues. Whereas young professionals are more likely to lead a healthy lifestyle. In primary health care patients, there is also a moderate increase in prevalence with age: 31.6% to 42.9%, but without statistical significance (p=0.54).
To assess nicotine dependence, the age of smoking initiation and the length of time of use among current users were analyzed (Table 4).

**Table 4. Age of Regular Smoking Initiation and Length of Use in Current Users**

| Indicator | Health workers (n=28) | Primary health care population (n=39) |
|---|---|---|
| Age of onset, years (M±SD) | 18,8±2,6 | 17,9±2,5 |
| Started smoking ≤17 years, n (%) | 7 (25,0%) | 15 (38,5%) |
| Started at the age of 18–20, n (%) | 12 (42,9%) | 14 (35,9%) |
| Started >20 years, n (%) | 9 (32,1%) | 10 (25,6%) |
| Experience of use, years (M±SD) | 12,9±7,2 | 10,7±7,0 |
| Length of service <5 years, n (%) | 6 (21,4%) | 11 (28,2%) |
| Length of service 5–9 years, n (%) | 9 (32,1%) | 12 (30,8%) |
| Length of service ≥10 years, n (%) | 13 (46,4%) | 16 (41,0%) |

According to Table. Table 4 shows that only 25.0% of medical workers have such early debuts (half as much, $p<0.05$). In the population group, 38.5% started smoking before the age of 18, occupying an intermediate position. This means that the population's smoking experience begins at school or high school, which is extremely unfavorable. Medical workers, on the contrary, were less likely to have had adolescent smoking experience, probably due to professional selection (people prone to a healthy lifestyle are more likely to choose medicine).

The average duration of smoking experience was comparable in all groups (10–13 years, $p=0.093$). The proportion of people with a long ≥10 years of experience is high everywhere: 46.4% among health care workers, 41.0% among the population. That is, a significant part of current users in each group has been smoking for a decade or more, which indicates an ingrained habit≥. This may reflect the fact that among them, smokers are mainly representatives of the older generation who started smoking a long time ago. But the differences in length of service are not statistically significant. In general, the length of service was distributed in a similar way: about a quarter have been smoking for <5 years (beginners), about a third have been smoking for 5 to 9 years, and 41-46% have been smoking for ten or more years. This fact emphasizes that in all groups there is a significant layer of heavy smokers with long-term addiction.

The next aspect is the impact of the smoking environment. Indicators for health care workers: 30% had ≥5 smoking colleagues, 33% had almost no smokers nearby. In primary health care patients, 35% are surrounded by ≥5 smokers among family, friends or colleagues, and 27% have almost no smokers nearby.

**Table 5. Share of current consumers depending on the number of smokers in the immediate environment**

| Group | 0–1 smoker around (n, current consumers) | 2–4 smokers (n, current%) | ≥5 smokers (n, current) |
|---|---|---|---|
| Health Care Workers (n=100) | 33 people; smokers 5 (15.2%) | 37 people; smokers 10 (27.0%) | 30 people; smoke 13 (43.3%) |
| Primary health care population (n=100) | 27 people; 6 smokers (22.2%) | 38 people; smokers 14 (36.8%) | 35 people; 19 smokers (54.3%) |

As Table 5 demonstrates, a clear relationship was found in the two groups: the more smokers around a person, the higher the probability that he smokes himself. In doctors, from 15.2% (if there are almost no smokers around) to 43.3% (if ≥5 colleagues smoke); in the population – from 22.2% to 54.3<%.

Intensity of use and nicotine dependence

In addition to the fact of use, quantitative characteristics are important: how much tobacco or nicotine current smokers consume, and how strong their dependence is. Table 6 summarizes the frequency and volume of use of tobacco/nicotine products in the groups.

**Table 6. Intensity of use of tobacco/nicotine products (current users, baseline)**

| Indicator | Health workers (n=28) | Primary health care population (n=39) |
|---|---|---|
| Days of use per week | 5,4±1,6 | 5,8±1,5 |
| Daily consumers, % | 53,6% | 56,4% |
| Average daily intake: | | |
| – cigarettes per day | 12,7±4,9 | 14,3±5,1 |
| – ENDS episodes per day | 17,3±6,4 | 18,1±6,9 |
| – SNT sticks per day | 11,5±3,9 | 12,8±4,1 |

At the baseline level, health care workers use tobacco for 5.4 days, and the population uses tobacco 5.8 days a week. Moreover, the share of daily smokers among doctors barely exceeds half of 53.6%, among the population – 56%. As for the average daily number, among smokers, cigarettes are used by health care workers (12.7 cigarettes/day) and slightly more than by patients (14.3 cigarettes/day). Similarly, among users of electronic cigarettes, 17 cigarettes per day are among medical workers and 18.1 among them population. In order to quantify nicotine addiction, the subjects underwent the Fagerström test. The average scores and the distribution of addiction degrees at baseline are presented in Table 1. 7.

**Table 7. Baseline nicotine dependence (current users, Fagerström test)**

| Group | FTND Average Score (M±SD) | Low dependency (0–3 points) | Moderate (4-6 points) | High (7-10 points) |
|---|---|---|---|---|
| Health workers (n=28) | 4,3±1,7 | 10 (35,7%) | 14 (50,0%) | 4 (14,3%) |
| Primary health care population (n=39) | 5,1±1,9 | 10 (25,6%) | 20 (51,3%) | 9 (23,1%) |

**Main Results**

This study revealed insignificant differences in the prevalence and characteristics of tobacco and nicotine-containing products consumption between the two groups studied. The highest level of current use is possessed by the population of primary health care (39%), ahead of medical workers (28%). Among medical workers, the indicators are expected to be lower: according to Zadorkina et al., about 28% of employees of medical institutions smoke, which is close to the Russian data. the level (39%), corresponding to the average estimate for the adult population of Uzbekistan (various sources give 14–19% of the total prevalence, including nasvai). The difference in numbers is explained by the methods and the inclusion of smoke-free forms: our study took into account both e-cigarettes and heating systems, which adds a few percent to traditional tobacco smoking.

Sex differences. In medicine, the stereotype "a doctor should not smoke" also persists, especially for women, hence their less involvement [1]. For comparison, according to national estimates, only 1% of women smoke in Uzbekistan compared to 30% of men [4]. In our sample urban material, the rates for women are higher (20–34% in civil groups),

which may reflect urbanization and some liberalization of female smoking in recent years. However, in general, men remain the core of the problem, and prevention programs should focus on them.

Age trends**.** In civil groups, there was a moderate increase in the prevalence from young to older ages, which is logical: older generations managed to smoke longer and fewer of them quit. A similar pattern was observed in Russia: among young doctors, the proportion of smokers is lower than among doctors over 40 [7]. For the population of Uzbekistan, there are also data from STEPS studies showing an increase in the prevalence of smoking from 5% in 18–24 to 18% in 45–64 years (on average by gender) [4]. Our results confirmed this trend for doctors and the general population.

The age of smoking initiation significantly affects the risk of addiction. Teenage smoking remains a global problem, and although the official teenage smoking rate in Uzbekistan is low (1–2% of schoolchildren smoke regularly) [4], it is likely that some young men start smoking by the age of conscription, especially in rural areas or under the influence of the availability of nasvai.

FTND values according to the Fageström test. In samples of the population of Uzbekistan, the average FTND score for the STEPS study was about 4.5–5.0[4], which is closer to our data on primary health care patients (5.1) and lower for medical professionals of 4.5.

In epidemiological models of smoking, taking into account clusters and social ties is an important point, and our data add evidence to the piggy bank: the fight against smoking is more effective when the norm changes in the entire team, and not just individual attitudes. It should be noted that the groups were formed according to the principle of random sampling, and may not fully reflect the entire general population of all medical workers in the country. However, within the groups, relative homogeneity and sufficient volume (n=100) were achieved to identify the main differences. The use of questionnaire data can lead to an underestimation of the real prevalence of smoking due to socially desirable answers, especially among doctors. We tried to minimize this effect by the anonymity of the questionnaire. Thus, the data can be considered reliable.

Overall, our study showed that health workers, although smoking less frequently, should remain a model: increased anti-smoking education among health care workers could further reduce smoking education by 28%. The population of primary health care is shown to have an intermediate level of problem – preventive measures at the level of polyclinics should cover both categories of patients, both smokers (to help in quitting) and non-smokers (to prevent the onset). Particular attention is paid to women and young people, as there is a tendency to increase smoking among these groups in the urban environment.

The initial analysis showed that the majority of health workers are already in the advanced stages of preparedness (about 43% – training/action), and the population is intermediate (about 33% are ready to quit). These differences need to be taken into account when planning preventive measures. with the involvement of medical workers themselves, intensive preventive care and supportive measures for the population and motivation of medical workers to maintain the status of non-smokers. It is also possible to use Western

 

experience, when a tobacco-free environment is introduced in higher educational institutions and medical workers who do not use tobacco products are encouraged at work. According to European studies, only 2-3% of doctors use tobacco and nicotine products. After all, a smoking doctor cannot give recommendations for quitting smoking if he himself does not support these norms. The data obtained formed the basis for the development of a comprehensive tobacco cessation program that provides for stratification by the level of dependence and motivation, using NRT and drug therapy proposed by the WHO.

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