

# The Effect of Working in a Smoke-Free Workplace on use of Smoking and Smokeless Tobacco

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## Abstract

**OBJECTIVES:** The aim of this study was to evaluate whether smokeless tobacco (Maras powder) use increased among smokers working at smoke-free workplaces or not.

**MATERIAL AND METHODS:** In Kahramanmaraş city, 242 male workers who were current or former smokers, working at strictly smoke-free workplaces were included in this study. A total of 21 questions, including the Fagerstrom Test for Nicotine Dependence, were asked.

**RESULTS:** All the participants were male with a mean age of 29.33±6.66 years, and the age range was 17-55 years. Current smokers were 90 (37.2%) and former smokers were 152 (62.8%). Former smokers were asked the reason why they quit smoking; the predominant reasons were the health hazards of smoking and the financial burden of cigarettes. The quitting rate was significantly higher among married participants (p=0.023). Maras powder users were 184 (76%), users who never smoked were 54 (22.3%), and former users were 4 (1.7%). We asked the Maras powder users if they had been using it before the smoking bans, and 96 workers (51.1%) answered "no." The question "Did the use of Maras powder increase with smoking bans?" was asked, and 118 workers (62.8%) answered "yes." The level of education among Maras powder users was significantly lower than non-users (p=0.001).

**CONCLUSION:** Working in smoke-free workplaces is associated with increased rates of quitting smoking and also with increased use of Maras powder, a local form of oral smokeless tobacco.

**KEYWORDS:** Smoke-free workplace, Maras powder, smokeless tobacco

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## INTRODUCTION

Tobacco is a plant that is considered to originate in the territory of North and South Americas [1]. The most common form of tobacco consumption in general is smoking, which is the most important cause of preventable deaths worldwide. According to the World Health Organization (WHO), each year worldwide, about 6 million people (9% of all deaths) die as a result of smoking-related diseases: in high-income countries, 18% of all deaths are associated with tobacco use; in medium-income countries, 11%; and in low-income countries, 4% [2].

Tobacco control has been undertaken with the support of international policies. WHO published the "Framework Convention on Tobacco Control (FCTC)" in 2003, which plays an important role in these regulations and is a directory guide for tobacco control in all countries [3]. This protocol agreement was approved by the Turkish Parliament and enforced in 2004. The WHO's MPOWER policy measures were published in 2008. In the same year, Turkey adapted the necessary law to combat smoking [4,5]. With this law, smoking in enclosed areas has been prohibited from 19 July 2009 and has been implemented in totality. In recent years, while smoking is decreasing in many developed countries, it is increasing in many low- and middle-income countries. This increase in tobacco use will cause an increase in deaths attributable to tobacco use in these countries [6,7].

There are many preparations for tobacco use that can be classified into two types: smoking tobacco and smokeless tobacco. Narghile is a type of non-cigarette smoking. In Turkey, 2.3% tobacco users use narghile [7]. Smokeless tobacco is absorbed by the nasal and oral mucosae. A form of smokeless tobacco called Maras powder (MP) is applied to the oral mucosa and is used mostly in the southeastern region of Turkey, especially in the cities of Kahramanmaraş and Gaziantep. It is obtained from a tobacco plant species known as *Nicotiana rustica* (Linn). Plasma nicotine concentrations of Maras powder users are 8-10 times higher than those of cigarette users [8,9].

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The purpose of this study is to determine whether the use of Maras powder, a form of smokeless tobacco, increases in workers strictly not allowed to smoke at workplaces.

## MATERIAL AND METHODS

Out of 955 male workers working in a textile factory not allowed to smoke, 680 workers were queried; due to shift-work situation, 275 evening and night shift workers could not be evaluated. Out of these 680 workers, 268 workers did not want to contribute toward this study, either due to self-defining character as being a never-smoker or not willing to participate in this study. A total of 412 workers that were smokers and former smokers were included in the study and were requested to complete the questionnaire. We employed a 15-item questionnaire consisting of questions about smoking, alcohol consumption, Maras powder use, and education, and an additional 6-item Fagerstrom Test for Nicotine Dependence (FTND) questionnaire. When filling the questionnaire, the term "smoker" was used for workers who smoked regularly. The term "former smoker" was used for workers who smoked before [10]. In order to obtain correct results, personal identifying information was not taken within the questionnaire. Our study has been approved by the Ethics Committee of the Kahramanmaraş Sutcu Imam University School of Medicine.

### Statistical Analyses

The calculations were performed using the Statistical Package for the Social Sciences (SPSS Inc.; Chicago, IL, USA) 17.0 statistical software package. For statistical analysis, chi-square, independent t-test, and Mann-Whitney U test were used. Here  $p < 0.05$  was accepted as statistically significant.

## RESULTS

Out of the 412 male workers participating in the study, only 242 (58.7%) could be evaluated. Workers not evaluated for the survey either had missing information or reported as being a never-smoker. The age range was from 17 to 55 years, and the average age was  $29.33 \pm 6.66$  years. Sociodemographic features of the workers are listed in Table 1. The smoking, drinking, alcohol consumption, and Maras powder use statuses are listed in Table 2.

Out of the 242 workers, 184 (76%) were using Maras powder (Table 2). The amount of daily Maras powder use was between one-half to two bags (each bag was approximately 20 g), the frequency range was 2-20 times per day, and mean frequency was  $6.3 \pm 3.5$  times.

When we compared the smoker and former smoker groups according to marital status, we found that married workers had higher rates of smoking cessation ( $p = 0.023$ ). Smoker and former smoker groups were compared according to Maras powder use, age, and education level, and the results are shown in Table 3.

We also found that Maras powder users had lower educational status and the difference was statistically significant ( $p = 0.001$ ). The mean age and marital status of Maras powder users and non-users are shown in Table 4.

**Table 1.** Sociodemographic characteristics of workers

Characteristics	Mean $\pm$ SD	Min-Max
Age	29.3 $\pm$ 6.7	17-55
Height	172.6 $\pm$ 5.7	157-189
Weight	72.7 $\pm$ 12.0	50-115
BMI	24.4 $\pm$ 3.8	16.1-38.4
<b>Marriage status</b>	<b>n=242</b>	<b>%</b>
Married	200	82.6
Non-married	42	17.4
<b>Education status</b>	<b>n=242</b>	<b>%</b>
Uneducated	4	1.6
Primary school	79	32.6
Secondary school	71	29.3
High school	66	27.3
University	22	9.1

BMI: body mass index; Min: minimum; Max: maximum; SD: standard deviation

## DISCUSSION

In the United States, at least 53000 annual non-smokers' deaths have been linked to passive smoking: for every 8 smokers, tobacco kills about 1 non-smoker. Since August 2001, smoking has begun to be prohibited in closed working environments by local regulations [11]. Turkey legalized the tobacco control law for a complete ban on smoking in all enclosed public areas and workplaces, and the WHO has stated this in its 2009 report [12]. In Turkey, the prevalence of tobacco use decreased from 31.2% in 2008 to 27.1% in 2012. Reduction was reported in both men (from 47.9% to 41.5%) and women (from 15.2% to 13.1%) [4]. The WHO reported that the adult smoking prevalence in Turkey was 22% in 2013 [13].

In a study from Turkey, persons being referred to an outpatient smoking cessation clinic were analyzed. Here, 83.7% of them were married, and the reasons for application to the clinic were asked: fear of deteriorating health was 44%; to be a good role model for their children and the desire to see their children's future, 16.3%; current illness, 9.8%; and shortness of breath, 6.9% [14]. In another study, an increase in cigarette prices was found to cause 2-3-fold more cessation or reduction of smoking in young and low-income people as compared to other reasons [15]. Our results were similar, and we found that smoking cessation was significantly higher among married than unmarried workers. The most common reason for quitting smoking was the harmful effect on health, followed by financial burden.

In a review about working in smoke-free workplaces covering 4 countries and 26 workplaces, Fichtenberg et al. [11] determined that 3.8% employees quit smoking and 3.1% reduced the number of cigarettes smoked. In the same study, it was shown that a 10% increase in cigarette prices led to a 4% decline in cigarette consumption in smoke-free workplaces. Smoking cessation in workplaces where a total smoking ban was applied was 2 times higher than places with a partial

**Table 2.** Status of drinking alcohol, smoking, and Maras powder use among workers

Habitudes of participants	n	%
<b>Alcohol use (n=242)</b>		
Yes	23	9.5
No	219	90.5
<b>Smoking (n=242)</b>		
Smoker	90	37.2
Former smoker	152	62.8
<b>Cigarette type (n=157)</b>		
Branded	112	71.3
Non-branded	35	22.3
Homemade	10	6.4
<b>Reason of smoking cessation (n=152)</b>		
Health hazards	101	66.5
Financial burden	43	28.3
Social pressure	4	2.6
Smoking ban	4	2.6
<b>Maras powder use (n=242)</b>		
Non-user	54	22.3
User	184	76.0
Former user	4	1.7
<b>Maras powder use before smoking ban (n=188)</b>		
User	92	48.9
Non-user	96	51.1
<b>Use of Maras powder with smoking ban (n=188)</b>		
Non-increased	70	37.2
Increased	118	62.8
<b>Reasons of increased Maras powder use (n=131)</b>		
Cost of cigarette	42	32.1
Smoking ban	41	31.3
Cigarette related complaints	48	36.6
<b>Cigarette per day (n=81)</b>		
<10 cigarette	59	72.8
11-20 cigarette	18	22.2
21-30 cigarette	1	1.2
>30 cigarette	3	3.7
<b>Fagerstrom Nicotine Dependence Test (n=80)</b>		
Low	41	51.3
Low-moderate	14	17.5
Moderate	8	10.0
High	11	13.7
Very high	6	7.5

BMI: body mass index; Min: minimum; Max: maximum; SD: standard deviation

smoking ban. The authors of the same study also emphasized that smoke-free workplaces not only protect non-smokers from the dangers of passive smoking but also encourage smokers to stop or decrease consumption [11]. In our study,

**Table 3.** Comparisons of marital and educational status, mean age, and Maras powder use between smokers and former smokers

Characteristics	Smokers	Former smokers	p*
<b>Marriage status</b>			
Married	69	133	0.023
Non-married	21	19	
Mean age	28.9±6.9	29.6±6.5	0.38
<b>Education status</b>	4.2±1.0	4.0±1.0	0.09
<b>Maras powder use</b>			
User	64	120	0.08
Non-user	25	29	

\*p<0.05 is statistically significant.

**Table 4.** Comparison of marital status, average age, and education between Maras powder users and non-users

Characteristics	Maras powder users	Maras powder non-users	p*
<b>Marriage status</b>			
Married	160	40	0.23
Single	24	14	
Divorced	0	0	
<b>Average age</b>	29.0	31.0	0.44
<b>Education level**</b>	4.0±1.0	4.5±1.1	0.001

\*p<0.05 is statistically significant. \*\*Uneducated: 1, Primary school: 2, Secondary school: 3, High school: 4, University: 5

we thought that the reasons for the high smoking cessation rate (62.8%) were related to the enforced total smoke-free workplaces, and that smoking was accepted as a cause for dismissal.

Smokeless tobacco is widely used in the USA. In the USA, 14% adult men are cigarette users and 6.5% are chewing tobacco, snuff, or dip users. The most commonly used tobacco product among US adults was cigarettes, followed by smokeless tobacco [13,16]. It was determined that smokeless tobacco increases the risk of oral, esophageal, and pancreatic cancers, and also increases the risk of stroke and heart attacks [17-20]. The American Heart Association does not recommend the use of smokeless tobacco as an alternative to quitting smoking or as a smoking cessation product [21]. However, in 2011, the American Council on Science and Health (ACSH) published a booklet entitled "Helping Smokers Quit: The Science Behind Tobacco Harm Reduction." In this booklet, it was shown that "smokeless tobacco use is at least 98% safer than smoking and it had a major effect on reduce smoking rates in Sweden, but it was not a gateway for smoking cessation" [22]. In our country, 94.8% smokers smoked manufactured cigarettes, and only 0.8% smoked water pipes [4]. There is no data on the prevalence of smokeless tobacco use in Turkey, but it is known to be used in southeastern cities. In these cities, studies discussing the side effects of Maras powder are very limited, and it is necessary to evalu-

ate the relationship of its use with diseases, especially cancer and heart diseases. It should be emphasized that American and Scandinavian smokeless tobacco products contain only tobacco, but Maras powder contains oak, walnut, or grape ash including tobacco, which may have an additional harmful effect [1].

In Sweden, men quitting smoking by using snus as a single support succeeded in stopping completely at a 66% rate, as compared to 47% of those using nicotine gum or 32% for those using nicotine patches; similar results were also seen in women. It was also emphasized that the use of snus in Sweden is related to a reduced risk of being a daily smoker and an increased possibility of quitting smoking [23]. Similar conclusions were also reached in Norway. The Norwegian Institute for Alcohol and Drug Research reported that the incidence of smoking in young Norwegian men had decreased from 50% in 1985 to 30% in 2007, while, at the same time, the use of snus increased from 10% to 30% [24]. In our study, we reported that in a full smoke-free workplace, the usage rate of Maras powder was 76%. After the smoking ban, the use of Maras powder increased in 62% participants. There is no prohibition on Maras powder use in the smoke-free workplace, which can increase the Maras powder use.

In our study, we found that among workers working in smoke-free workplaces, the rate of smoking cessation increased: with the smoking ban, the use of smokeless tobacco, namely, Maras powder, also increased. Additionally, we found that the use of these tobacco products was higher among people with low levels of education. We thought that with the expansion of the smoking ban, it is important to provide necessary education and support to prevent people from switching to smokeless tobacco.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Kahramanmaraş Sütçü İmam University School of Medicine.

**Informed Consent:** We took permission from manager and volunteer workers were taken to study. The ethics committee was asked for permission from workers and was not needed because it was voluntary.

**Peer-review:** Externally peer-reviewed.

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**Conflict of Interest:** No conflict of interest was declared by the authors.

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