

The Effectiveness of a Smoking Cessation Initiative Among Employees in a Textile Factory

Ahmet Ergin¹, Semiha Balcı², Caner Özdemir³, Hüseyin Öztürk⁴, Betül Özdemir⁵, Huriye Uyar⁶, Oğuz Kilinç⁷

¹Department of Public Health, Pamukkale University, Faculty of Medicine, Denizli, Turkey

²Occupational Physician, Menderes Textile, Denizli, Turkey

³Division of Epidemiology, Department of Public Health, Ankara University, Faculty of Medicine, Ankara, Turkey

⁴Independent MD, Istanbul, Turkey

⁵General Directorate of Public Health, Ministry of Health, Ankara, Turkey

⁶Occupational Health Nurse, Menderes Textile, Denizli, Turkey

⁷Department of Pulmonology, Faculty of Medicine, Dokuz Eylül University, İzmir, Turkey

Cite this article as: Ergin A, Balcı S, Özdemir C, et al. The effectiveness of a smoking cessation initiative among employees in a textile factory. *Turk Thorac J.* 2021; 22(6): 446-449.

Abstract

OBJECTIVE: In this study, we aimed to investigate the effectiveness of a smoking cessation initiative for workers who are smokers in a textile factory located in Denizli, Turkey.

MATERIAL AND METHODS: This retrospective cohort was conducted by using the occupational health and safety unit records of 821 workers who are smokers. All participants underwent cognitive behavioral therapy, and in case of need, a suitable pharmacological treatment was initiated. The status of smoking cessation was checked at the end of the third month with a carbon monoxide breath monitor. A chi-square test was performed to make comparisons between categorical variables. Logistic regression analysis (backward) was used to evaluate the factors related to the smoking cessation status.

RESULTS: The ratio of participants who gave up smoking was 74.3%, and 63% of them used a pharmaceutical aid to quit smoking. Working in the department of finishing and using a pharmaceutical aid to quit smoking were related to increased success in smoking cessation.

CONCLUSION: Outcomes of our study emphasize that workplace-based smoking cessation programs may create a huge impact on smoking cessation among workers. Pharmacological aid and cognitive behavioral therapy have been associated with success in quitting smoking.

KEYWORDS: Smoking, smoking cessation, addiction, workplace, occupational physician

Received: February 24, 2021

Accepted: May 10, 2021

INTRODUCTION

The tobacco epidemic is considered important as one of the biggest health problems in the world, causing more than 8 million deaths annually worldwide, and 7 million of them are directly related to its use.¹ With the persistence of the current smoking patterns, tobacco will kill nearly 1 billion people in the still-continuing century, mostly in low- or middle-income countries.²

In Turkey, 31.4% of the adult population over 15 years of age are current daily or occasional smokers.³ In 2013, Turkey became the first country to achieve success in the MPOWER package of WHO, which is composed of 6 basic strategies to reduce or eliminate tobacco consumption worldwide, and other countries were advised to follow the outstanding footsteps of Turkey.⁴ Despite progress in the field, smoking is still a lingering problem in Turkey, and the prevalence of smoking resurged in the home stretch.⁵

Workplaces prove to be potentially suitable settings to implement tobacco control interventions on account of the possibility to reach large numbers of people who may not be covered via other channels and who spend nearly one-third of their lives at work.⁶⁻⁸ Some additional advantages of any smoking cessation intervention in a workplace also include the encouragement of sustained peer-group support and positive peer pressure and the preparedness of occupational health staff in order to give professional support.^{7,9} In addition, the smoking ratio among workers in many indoor workplaces in Turkey is quite high.^{10,11} However, the consultancy ratio to occupational physicians in order to quit smoking is quite low, although a considerable amount of workers who smoke feel regretful of being smokers.¹² Studies also demonstrated that smokers have notably increased absenteeism and occurrence of accidents and injuries.^{13,14}

The goal of our study was to investigate the effectiveness of a smoking cessation initiative for workers who smoke in a textile factory located in Denizli, Turkey.

Corresponding author: Caner Özdemir, e-mail: canerozdemir88@hotmail.com

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MATERIAL AND METHODS

Study Population and Design

This retrospective cohort was conducted in 2018 in the factory of Menderes Textile located in Denizli, Turkey. Out of 3787 total workers, the 2017-2018 term occupational health and safety unit records of 821 workers who smoke were evaluated. All current smokers in the workplace were included in the present study. All participants underwent cognitive behavioral therapy, and the suitable pharmacological treatment option was provided to smokers with a Fagerström score ≥ 3 (moderate and high dependence).

Data and Measures

Smoking cessation status was the dependent variable of the study. The smoking cessation status of the participants was confirmed with %COHb (carboxyhemoglobin, blood CO) levels measured by calibrated carbon monoxide breath monitor.

Independent variables of this study were age, gender, educational status, marital status, the department in which the participant works, willingness to quit smoking, use of pharmaceutical treatment to quit smoking, number of cigarettes smoked (pack-year), initial Fagerström test score, levels of CO ppm (carbonmonoxide in parts per million in breath) and %COHb, and household income per capita.

Statistical Analysis

Data were analyzed with SPSS v. 17 (SPSS Inc.; Chicago, IL, USA). Descriptive statistics data are expressed as values and percentages for categorical variables and arithmetical means \pm SD (standard deviation) for continuous variables. The chi-square test was used to make comparisons between categorical variables. The possible factors identified with univariate analysis were further entered into the logistic regression analysis with backward selection to determine independent predictors of smoking cessation status. *P* values $< .05$ were considered statistically significant.

Ethical Approval

Before the study was commenced, the Non-interventional Review Board approved the study protocols at the Pamukkale University Faculty of Medicine in Denizli, Turkey.

RESULTS

The study population consisted of 821 workers with full baseline and 3-month follow-up data.

In Table 1, the demographic, socioeconomic, and smoking-related characteristics of participants are summarized. In this study, 98.3% (807/821) of the participants were male. This is mainly due to the fact that nearly no female workers were employed in the factory. Among them, 72% (591/821) of the participants were working in the finishing department.

The ratio of participants who gave up smoking was 74.3% (610/821), and 63% (517/821) of them used a pharmaceutical aid to quit smoking. The univariate and multivariate analysis of the contribution of socioeconomic and smoking-related characteristics on smoking cessation among participants were summarized in Tables 2 and 3, respectively.

Table 1. Demographic, Socioeconomic and Smoking-Related Characteristics of Participants Characteristics

	<i>n</i>	%
Age (mean \pm SD)	36.2 \pm 7.8	
Gender		
Female	14	1.7
Male	807	98.3
Educational status		
Elementary school	264	32.3
Secondary school	258	31.5
High school	247	30.2
Associate degree	32	3.9
Undergraduate	17	2.1
Marital status		
Single	614	74.8
Married	207	25.2
Department at work		
Finishing	591	72.0
Weaving	58	7.1
Confection	68	8.3
Machinery energy	69	8.4
Administrative	9	1.1
Water treatment	7	0.9
Storehouse	19	2.3
Initial Fagerström score		
0-2 (minimally dependent)	222	33.3
3-7 (moderately dependent)	420	63.0
8-10 (highly dependent)	25	3.7
Willingness to quit smoking		
Yes	773	94.2
Indecisive	48	5.8
Use of a pharmaceutical option		
Yes	517	63.0
No	304	37.0

MAIN POINTS

- In our study, 3 out of every 4 workers quit smoking in the favor of the smoking cessation initiative conducted in the workplace.
- The main determinants in quitting success were the department in which the participant was working and the presence of a pharmaceutical aid.
- This study instantiates that the benefits of any intervention of occupational physicians on smoking cessation are potentially important and encouraging in the quitting journey.

Table 2. Univariate Analysis of Socioeconomic and Smoking-related Characteristics on Smoking Cessation Success among Participants Characteristics

	Quit Smoking (n, %)	Continue Smoking (n, %)	P
Gender			
Female	7 (50.0)	7 (50.0)	.043
Male	603 (74.7)	204 (25.3)	
Educational status			.050
Elementary school	210 (79.5)	54 (20.5)	
Secondary school	188 (72.9)	70 (27.1)	
High school	178 (72.1)	69 (27.9)	
University	31 (63.3)	18 (36.7)	
Marital status			.065
Single	465 (75.7)	149 (24.3)	
Married	145 (70.0)	62 (30.0)	
Department at work			<.001
Finishing	495 (83.8)	96 (16.2)	
Others	112 (49.8)	113 (50.2)	
Initial Fagerström score			<.001
0-2 (minimally dependent)	185 (83.3)	37 (16.7)	
3-7 (moderately dependent)	273 (65.0)	147 (35.0)	
8-10 (highly dependent)	14 (56.0)	11 (44.0)	
Willingness to quit smoking			<.001
Yes	610 (78.9)	163 (21.1)	
Indecisive	-	48 (100.0)	
Use of a pharmaceutical option			<.001
Yes	420 (81.2)	97 (18.8)	
No	190 (62.5)	114 (37.5)	

P values are for chi-square tests. A statistical significance of $P < .05$ is highlighted in bold.

It was found that being male ($P = .043$), working in the finishing department ($P < .001$), having a lower initial Fagerström test score ($P < .001$), being motivated to quit ($P < .001$), and using a pharmaceutical aid ($P < .001$) smoothed the way to quit smoking (Table 2).

Using logistic regression model (backward), we analyzed the effects of some characteristics, such as age, gender, educational status, department in which the participant was working and household income per capita, and some baseline measures, such as willingness to quit smoking, use of a pharmaceutical option, number of cigarettes smoked daily, initial Fagerström test score, levels of CO ppm, and levels

Table 3. Multivariate Analysis of Socioeconomic and Smoking-Related Characteristics on Smoking Cessation Success Among Participants

	OR	95% CI	P
Working in the Finishing department	12.3	7.7-19.7	<.001
Use of a pharmaceutical option	2.6	1.6-4.3	<.001

OR, odds ratio.

Logistic regression model (backward) was performed using characteristics, such as age, gender, educational status, department in which the participant was working and household income per capita, and some baseline measures, such as willingness to quit smoking, use of a pharmaceutical option, number of cigarettes smoked daily, initial Fagerström test score, levels of CO ppm and levels of %COHb (Nagelkerke $R^2:0.47$). A statistical significance of $P < .05$ is highlighted in bold.

of %COHb on smoking cessation. As a result, working in the finishing department (Beta: 12.3; 95% CI: 7.7-19.7; $P < .001$) and using a pharmaceutical aid to quit smoking (Beta: 2.6; 95% CI: 1.6-4.3; $P < .001$) were related with increased success in smoking cessation (Nagelkerke $R^2: 0.47$) (Table 3).

DISCUSSION

In our study, almost 3 out of 4 smoking workers in a textile factory quit smoking with the help of cognitive behavioral therapy performed by the occupational physician. Additionally, about 2 out of 3 participants needed pharmaceutical aid to quit smoking. Two factors have been found to be independently related to increased success in smoking cessation: working in the finishing department and using a pharmaceutical aid to quit smoking.

The results of this present study concord with other reports on the effectiveness of workplace smoking cessation initiatives that adopt many different techniques and enforce the idea that workplaces are the suitable settings with their motivating social fabric to employ smoking cessation interventions.

Coskun Beyan and Varol delivered compulsory smoking cessation training to the smoking workers of a paint manufacturing department in a factory located in Turkey. As a result of this initiative, after 6 months, 23% of the participants who attended the program succeeded to quit smoking, whereas only 4% of the non-participant employees succeeded to quit ($P < .001$). Participants in the smoking cessation initiative exhibited nearly 6 times higher quitting rates compared to the non-participants in the program.¹⁵ Hutter et al.¹⁶ examined the results of performing short seminars on Austrian workers who smoke. In their study, the 1-year quit rate was found to be 40-55%, and it is emphasized that a dense 6-h counseling period without a pharmaceutical aid was sufficient and successful to maintain abstinence for 1 year.¹⁶ Lang et al.¹⁷ compared two different interventions by occupational physicians: simple advice of smoking cessation and more detailed advice including a “quit date” and extra support among 1095 employees of a gas and electric company. The quit

success rate after 1 year was 13.5% in the simple-advice group and 18.4% in the detailed-advice group. Additional benefits were shown to be 5% more of smokers who quit smoking and a 36% of relative increase in smoking cessation rate compared with simple advice.¹⁷

The strength of our study is that this smoking cessation initiative for textile factory workers could be a gilt-edged investment to both employees and employers. This individual cognitive behavioral therapy and pharmacological support pack resulted in almost 75% smoking cessation rate among workers, which would be considered as an attractive and cost-effective intervention to increase smoking abstinence rates of workers and decrease absenteeism and injuries at the workplace. Another strength is that the dropout rate is low.

However, some limitations should be considered. Owing to a relatively homogenous group of workers from 1 textile company, it is hard to generalize the findings to all types of workers who smoke in any industry. Additionally, evaluating the short-term effects (3 months) of the intervention is another limitation. In order to check the durability of these successful outcomes, long-term follow-up should be considered. Lastly, our results may not be generalized to smoking workers with higher and lower socioeconomic status, given that blue-collar workers have a unique smoking profile. In comparison to white-collar workers, they are more likely to smoke related to a couple of socioeconomic reasons and are not successful enough in quitting.

In conclusion, the outcomes of our study complement many earlier findings, showing that workplace-based smoking cessation programs may create a huge impact on smoking cessation of workers. Pharmacological aid and cognitive behavioral therapy have been associated with success in quitting smoking. An overachievement in smoking cessation can be achieved if the confirmation of the smoking status is performed properly and the most suitable cessation method is defined by providing required support and follow-up. Encouraging employers and occupational healthcare providers on smoking cessation interventions may bring successful outcomes in various business lines.

Ethics Committee Approval: The study was approved by the Ethics Committee of Non-Interventional Clinical Trials of Pamukkale University Faculty of Medicine (Date: September 25, 2018, number: 18).

Informed Consent: Verbal and Written informed consent was obtained from the patients who agreed to take part in the study.

Peer Review: Externally peer-reviewed.

Author Contributions: Concept - A.E., S.B., C.Ö., H.Ö., B.Ö., H.U., O.K.; Design - A.E., S.B., C.Ö., H.Ö., B.Ö., H.U., O.K.; Supervision - A.E., S.B., O.K.; Resources - S.B., H.U.; Materials - S.B., H.U.; Data Collection and/or Processing - A.E., S.B., C.Ö., B.Ö., H.U.; Analysis and/or Interpretation - A.E., C.Ö., B.Ö.; Literature Search - C.Ö., H.Ö., B.Ö.; Writing Manuscript - A.E., S.B., C.Ö., H.Ö., B.Ö., H.U., O.K.; Critical Review - A.E., S.B., O.K.

Acknowledgments: The authors would like to thank the Board members of Menderes Textile for their contribution and to Salih Gümrü (Pharm PhD) for assistance in coordination.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: Digitization procedure of raw data used in this publication was funded by Pfizer PFE İlaçları A.Ş.

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