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Original Article

Smoker Relatives of Inpatients: A Reasonable but Heterogeneous Target Population for Smoking Cessation Program

Yatan Hastaların Sigara İçen Akrabaları: Sigarayı Bırakma Programı İçin Makul Ama Heterojen Bir Hedef Kitle

Burak Yasin Aktaş[1], Beril Hüseyin[2], Deniz Yüce[2], Ömer Dizdar[2], Mustafa Erman[2], Mutlu Hayran[2], İsmail Çelik[2]

[1]Department of Medical Oncology, Hacettepe University, Cancer Institute, Ankara, Türkiye
[2]Department of Preventive Oncology, Hacettepe University, Cancer Institute, Ankara, Türkiye

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ORCID IDs of the authors: B.Y.A. 0000-0001-5460-4895, B.H. 0000-0003-4421-7650, D.Y. 0000-0003-0725-5447, Ö.D. 0000-0003-0911-9078, M.E. 0000-0001-5884-4669, M.H. 0000-0003-2594-6794, İ.Ç. 0000-0003-1182-3865.

ABSTRACT

Objective: Tobacco consumption is a well-known cause of morbidity and mortality. Therefore, smoking cessation is a fundamental primary and secondary disease protection objective. This study aimed to implement a smoking cessation program for first- and second-degree relatives of inpatients hospitalized for smoking-related diseases.

Methods: We planned to evaluate the effects of targeting relatives of hospitalized patients on the contemplation of smoking cessation. Participants who have a hospitalized relative in any of the Hacettepe University Hospital Internal Medicine, Oncology, or Cardiology clinics between February and April 2016 for a smoking-related disease were included in the study. The smoking status of the participants has been recorded and smokers were included in the cohort.

Results: During the study period, 761 persons were interviewed in the clinics and it was found that 337 patient-relatives (44.2%) were smokers. A total of 332 participants who obtained inclusion criteria were informed about the smoking cessation program. A total of 159 individuals (47.9%) were approved to be referred to smoking cessation clinic. The mean age of participants who agreed to be included in the smoking cessation program was significantly lower than those who refused (41.8 ± 11.1 vs. 45.1 ± 13.8, $P = .01$). The education level of the participants who agreed to be included in the smoking cessation program was significantly higher than those who refused ($P = .009$).

ÖZ

Amaç: Tütün tüketimi önemli bir morbidite ve mortalite nedenidir. Bu nedenle, sigarayı bırakmak, hastalıklardan birincil ve ikincil korunmda en önemli hedeflerden biridir. Bu çalışmada, sigaraya bağlı hastalık nedeniyle yatarak tedavi gören hastaların birinci ve ikinci derece yakınlarına sigara bırakma programının uygulanması amaçlanmıştır.

Yöntemler: Bu çalışamda hastanede yatan hastaların yakınlarını hedeflemenin sigarayı bırakma düşüncesi üzerine etkilerini değerlendirmeyi planlandı. Hacettepe Üniversitesi Hastanesi İç Hastalıkları, Onkoloji veya Kardiyoloji kliniklerinden herhangi birinde Şubat-Nisan 2016 tarihleri arasında sigaraya bağlı bir hastalık nedeniyle yatan akrabası olan katılımcılar çalışmaya dahil edildi. Katılımcıların sigara içme durumu kaydedildi ve sigara içenler kohorta dahil edildi.

Bulgular: Çalışma süresince kliniklerde 761 kişi ile görüşülmüştür. 337 hasta yakını (%44,2) sigara içiyordu. Dahil edilme kriterlerine sahip toplam 332 hasta sigara bırakma programı hakkında bilgilendirildi. Toplam 159 kişi (%47,9) sigara bırakma polikliniğine sevk edilmeyi kabul etti. Sigara bırakma programına katılmayı kabul edenlerin yaş ortalaması, reddedenlere göre daha düşüktü (41,8 ± 11,1 vs. 45,1 ± 13,8, $P = ,01$). Sigara bırakma programına katılmayı kabul edenlerin eğitim düzeyi, reddedenlere göre daha yüksekti ($P = ,009$). KOAH hastalarının yakınları sigara bırakma kliniklerine diğer hastalık gruplarına göre daha fazla başvurmayı kabul etti ($P = ,006$).

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Sorumlu Yazar/Corresponding Author: Burak Yasin Aktaş, **E-mail:** byaktas@hotmail.com

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Relatives of chronic obstructive pulmonary disease patients agreed to apply to the smoking cessation clinics more than any other disease group ($P = .006$).

Conclusion: According to the results of this study, patient relatives can be considered as an important target group in smoking cessation programs.

Keywords: Smoking cessation, teachable moment, inpatients, tobacco control

Sonuç: Bu çalışmanın sonuçlarına göre hasta yakınları sigara bırakma programlarında önemli bir hedef grup olarak kabul edilebilir.

Anahtar Kelimeler: Sigarayı bırakma, öğretilebilir an, yatan hastalar, tütün kontrolü

INTRODUCTION

Tobacco consumption is one of the most important public health problems worldwide and is defined as a chronic disease with relapses by the World Health Organization (WHO).[1]

It is estimated that more than 7.5 million people worldwide die from smoking-related causes annually.[2] Projections have shown that this number will approach 8.5 million in 2030.[3] It is known that in the last 50 years, more than 20 million people died in the United States due to diseases related to tobacco use. One out of every 5 in this country is related to smoking.[4] Smoking shortens life expectancy by at least 10 years. While smoking frequency decreases in developed countries and men, a continuous increase is observed in developing countries and women. Due to the higher population growth rate in developing countries, an increase is expected in the total number of smokers worldwide. As a result, it is estimated that the use of tobacco and tobacco products will be an important health problem, especially in developing countries in the coming years. According to the Türkiye Burden of Disease Study, 12.7% of total deaths in Türkiye in 2004 were associated with tobacco use.[5]

World Health Organization has published a tobacco control report that provides a roadmap for tobacco control to all countries and has identified 6 strategies that have proven to be effective in tobacco control. The word MPOWER consists of the initials of the first words of the 6 expressions that point to these strategies. The letter "O" in this abbreviation represents the "Offer help to quit tobacco use" recommendation.[6]

MAIN POINTS

- Among smoker relatives of inpatients, almost half of the participants (47.8%) were willing to apply to the smoking cessation outpatient clinic which suggests that the right target population has been selected.
- Younger participants, more educated participants, and participants who have relatives hospitalized for chronic obstructive pulmonary disease were more prone to be included in the smoking cessation program.
- Gender and Fagerstrom score were insignificant for contemplation of smoking cessation among participants.

The contribution of smoking cessation support to quit smoking rates has been shown in many different studies. The effectiveness of the support provided by trained personnel in smoking cessation outpatient clinics was determined in the study evaluating the smoking control program implemented in Türkiye, which was previously published by our group.[7] The benefits of behavioral therapy and pharmacotherapy in smoking cessation have been demonstrated. The best results are obtained by using both approaches together. The effectiveness of the support given in the smoking cessation outpatient clinics in smoking cessation suggests that ensuring that more smokers apply to these outpatient clinics will contribute to tobacco control.[8]

A teachable moment is defined as a set of events or conditions that can lead to the development of positive health behavior in individuals. The most well-known teachable moments associated with smoking are episodes of acute illnesses.[9] Whether it is related to smoking or not, having a health problem that requires the individual to visit hospital is also effective in quitting smoking.[10] Being diagnosed with a smoking-related illness or being hospitalized are also potential teachable moments for smoking cessation.[11] Pregnancy is also a crucial period to maximize efforts to help individuals to quit smoking.[12] On the other hand, people who have not personally faced the devastating effects of smoking but have experienced these effects as a patient's relative may also be an important target population, but studies on this group are limited.

In this study, we aimed to implement smoking cessation program in first- and second-degree relatives of patients hospitalized in a tertiary referral university hospital. It is planned to evaluate the effect of choosing the relatives of hospitalized patients as the target group for smoking cessation on the intention to quit smoking (contemplation).

METHODS

Study Design

The study is designed as a descriptive study. First, patients who are hospitalized for one of the smoking-related diseases (hypertension, coronary artery disease, chronic

obstructive pulmonary disease, and malignancy) in one of the Internal Diseases, Medical Oncology, or Cardiology clinics of Hacettepe University Hospital between February and April 2016, were determined. Demographic and medical information of the patients who accepted to participate in the study were recorded. Patients who continued to smoke were informed about the harms of smoking and the smoking cessation program.

Then, first- and second-degree relatives (mother, father, sibling, spouse, child, grandchild) of the patients who were followed up with the determined diagnoses were interviewed. Smoker and non-smoker relatives were recorded. Smokers were included in the cohort.

Participants who met the inclusion criteria were interviewed at the specified services and the information was recorded in the voluntary registration form. All interviews were conducted by the same researcher in the doctor's rooms in the wards. Smoker participants were informed about the relationship between health problems and smoking and the smoking cessation outpatient clinic. A sample brochure introducing the smoking cessation program was given to the volunteers in order to facilitate remembering and communication. The communication information of the participants who agreed to get help for smoking cessation was recorded, and a smoking cessation clinic appointment was arranged.

The protocol of this study, which was designed as a descriptive study, was submitted to the Hacettepe University Non-Interventional Clinical Research Ethics Committee, and research approval was obtained at the meeting dated 06 January 06 2016. The decision was numbered GO 15/804-26.

Study Population

Inclusion Criteria

- First- and second-degree relatives (mother, father, sibling, spouse, child, grandchild) of patients who were hospitalized in one of Hacettepe University Hospital wards (Internal Medicine, Oncology, Cardiology) between February 1 and April 30, 2016, with a diagnosis of smoking-related disease.

Exclusion Criteria

- Relatives of patients under the age of 18 and
- Those who have been diagnosed with a smoking-related disease in the last 3 months.

Statistical Analysis

While descriptive statistics are given for continuous variables, mean and standard deviation were used for normally distributed variables, median and range were used for non-normally distributed or ordinal variables, and number and percentage were used for categorical variables. In pairwise comparisons, Student's *t*-test was used if continuous variables were in normal distribution and chi-square test was used for categorical variables. Post hoc analyses were made with Bonferroni correction in analyses where more than 2 variables were examined. The study population was defined as a prospective cohort of smoker relatives of hospitalized patients with a diagnosis of smoking-related disease. In the analyses, variables related to the willingness to apply for a smoking cessation program of all participants (contemplation-to-tr eat group) were evaluated. In this descriptive study, 125 relatives of patients from each group were planned to be recruited, but the number of participants to be included in the study was revised due to the small number of patients diagnosed with malignancy after the pre-test. $P < .05$ was accepted for statistical significance in all comparisons. Statistical analyses were done using Statistical Package for the Social Sciences version 22.0. (IBM SPSS Corp.; Armonk, NY, USA).

RESULTS

The patients who were hospitalized in Hacettepe University Hospital (Internal Medicine, Oncology, and Cardiology wards) between February and April 2016 were included in the study.

A total of 241 patients with a history of smoking (current/former smoker) were included. Of the patients, 76 (31.5%) were followed up with a diagnosis of hypertension (HT), 72 (29.8%) of coronary artery disease (CAD), 63 (26.1%) of chronic obstructive pulmonary disease (COPD), and 30 (12.4%) of malignancy. A total of 78 patients were women (32.3%). The mean age of the patients was 63.7 (63.7 ± 12.5). The median number of cigarettes consumed was 30 pack-years. The distribution of the patients included in the study by age, gender, and diagnosis is shown in Table 1.

During the study period, 761 patient relatives were interviewed in the clinics. Of the patients' relatives who were interviewed, 337 (44.2%) were smokers. Five individuals were excluded from the study because of recent smoking-related disease diagnosis. Demographic data, number of cigarettes smoked in pack-years, medical history, and Fagerstrom addiction scores of 332 smokers were recorded.

Of the smokers included in the cohort, 115 (34.6%) were women. The mean age of the group was 43.5 ± 12.7 years. Of the individuals, 8 (2.4%) were illiterate, 123 (37.0%) were primary-school graduates, 142 (42.8%) were high-school graduates, and 59 (17.8%) were higher-education

Table 1. Distribution of Patients Included in the Study by Diagnosis, Mean Age, and Gender.

	HT (n = 76)	CAD (n = 72)	COPD (n = 63)	Malignancy (n = 30)	Total (n = 241)
Female	32	19	20	7	78
Male	44	53	43	23	163
Age, *mean ± SD*	58.5 ± 14	62.3 ± 10.5	71.7 ± 10.1	63.3 ± 8.9	63.7 ± 1.5

CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; HT, hypertension; SD, standard deviation.

graduates. Participants had smoked a median of 20 pack-years (1-100). Male individuals smoked a median of 25 pack-years (1-100), while female individuals smoked a median of 10 pack-years (1-35). The mean Fagerstrom score of the individuals was 5.0 ± 2.48.

Smoker participants were informed about the relationship between health problems and smoking and the smoking cessation outpatient clinic. Of 332 individuals, 159 (47.9%) declared their willingness to attend the smoking cessation outpatient clinic and agreed to get help in quitting smoking (acceptors). The communication information of the participants who agreed to get help for smoking cessation was recorded, and a smoking cessation clinic appointment was arranged.

Of the 159 individuals who wanted to apply to the smoking cessation outpatient clinic, 50 (31.4%) were female, and 109 (68.6%) were male. There was no significant difference between gender and willingness to seek outpatient help for smoking cessation ($P = .24$). While the mean age of the individuals who accepted to apply to the smoking cessation outpatient clinic was 41.8 ± 11.1, the mean age of the group who did not accept was 45.1 ± 13.8 ($P = .01$) (Table 2).

Around 67 (59.8%) of 112 participants whose relatives were followed up with the diagnosis of COPD, 45 (45.5%) of 99 participants whose relatives were followed up with the diagnosis of COPD, 42 (41.6%) of 101 participants whose relatives were followed up with the diagnosis of HT and 5 (25%) of 20 participants whose relatives were followed up with a diagnosis of malignancy agreed to apply to the smoking cessation outpatient clinic. A statistically significant difference was found between the disease groups in terms of the consent of the relatives of the patients to participate in the smoking cessation program ($P = .006$) (Table 2).

While 2 of 8 (25%) illiterate participants stated that they want to participate in a smoking cessation program, 46 (37.6%) of 123 primary school graduates, 77 (54.2%) of 142 high school graduates, university graduates, 34 out of 59 university graduated participants (57.6%) agreed to participate in the program. A statistically significant relationship was found between education level and acceptance to participate in a smoking cessation program ($P = .009$) (Table 2).

The mean Fagerstrom score of individuals who accepted to apply to the outpatient clinic was 5.2 ± 2.3. The mean Fagerstrom score of individuals who refused to apply to the outpatient clinic was 4.8 ± 2.6. There was no statistically significant difference between the Fagerstrom scores of individuals who accepted and did not accept to apply to the outpatient clinic ($P = .17$) (Table 2).

DISCUSSION

This study was aimed to recommend a smoking cessation program to the first- and second-degree relatives of hospitalized patients with a diagnosis of smoking-related disease and to refer them to the smoking cessation outpatient clinic. There are few studies in the literature that evaluate the relatives of patients as the target group for smoking cessation. And, our primary result which shows

Table 2. Participant's Characteristics.

	Acceptor (n = 159)	Refuser (n = 173)	*P*
Age, *mean ± SD*	41.8 ± 11.1	45.1 ± 13.8	.010
Gender, %*			
Male	50.2	49.8	.240
Female	43.5	56.5	
Education, *%**			
Illiterate	25.0	75.0	.009
Primary	37.4	62.6	
High school	54.2	45.8	
University	57.6	42.4	
Patient diagnosis, *%**			
COPD	59.8	40.2	.006
Hypertension	41.6	58.4	
Malignancy	25.0	75.0	
Coronary artery disease	45.5	54.5	
Fagerstrom score, *mean ± SD*	5.2 ± 2.3	4.8 ± 2.6	.170

*Row ratios were given for gender, education, and patient diagnosis.
COPD, chronic obstructive pulmonary disease; SD, standard deviation.

almost half of the participants (47.8%) were willing to apply to the smoking cessation outpatient clinic suggests that the right target population has been selected.

It is crucial to strongly recommend every individual who smokes quit smoking. However, it is known that physician recommendations for smoking cessation are insufficient in hospital admissions. In a study in which 3037 smokers who applied to the hospital in the last 1 year were evaluated with a telephone questionnaire, 1555 patients (51.2%) were asked about their smoking status, 1383 patients (45.5%) were advised to quit smoking, and 453 patients (14.2%) were asked to quit smoking. It was shown to be offered help with smoking cessation, 257 patients (8.5%) were prescribed nicotine replacement therapy, and only 91 patients (3.0%) were given follow-up appointments.[13]

The positive effects of smoking cessation outpatient clinics on smoking cessation success are well-defined. Although success rates vary in different series, it has been shown that those who applied to the smoking cessation outpatient clinic quit smoking at a significantly higher rate than smokers who tried to quit smoking on their own. In a study conducted in Korea, the rate of smoking cessation at the end of the third month was 42.4% in 125 patients who were referred to the smoking cessation outpatient clinic.[14] In a study by Argüder et al[15], 400 patients who applied to the smoking cessation clinic in a tertiary center were retrospectively analyzed and the success of smoking cessation at the end of the third month was found to be 36.5%. In the study examining the results of the Türkiye Smoking Cessation Support Program, 3687 (27.9%) of 13 179 smokers who participated in the program reported that they had quit smoking in the telephone survey at the end of 1 year.[7]

Of the 761 patient relatives who agreed to be included in the study, 337 (44.2%) were smokers. Smoking prevalence was 53.7% in men and 33.4% in women. Compared with the Global Adult Tobacco Survey results, the prevalence of smoking in the study cohort was higher in women (13.1% vs. 33.4%) and men (41.5% vs. 53.7%). It is known that smoking shows familial clustering.[16] Therefore, the prevalence of smoking can be considered to be higher than that of the general population.

Of the 332 smokers, 159 (47.8%) stated that they wanted to quit smoking by applying to the smoking cessation outpatient clinic. The rate of acceptors is higher than the rate of patients who attempt to quit smoking on their own in the general population. A study examining the smoking status of relatives of patients who followed up with smoking-related disease showed that only 7.2% of patients' relatives quit smoking.[17] As seen in this study, the diagnosis of the relatives' disease increases the success of smoking cessation above the average population. However, it is below the contemplation level reached in our study. For this reason, it is thought that smoking cessation programs and campaigns targeting patients' relatives may be effective in increasing the success of smoking cessation.

In a study, including 34 smoking relatives of patients followed up with respiratory tract disease and 34 paired smoker control subjects with no known disease; the success of smoking cessation after 1 year was found to be 41.2% in the patient's relative group, comparing 38.2% in the control group. This difference is not statistically significant.[18] In a prospective study in which smokers who were scheduled for thoracic surgery due to a mass lesion and their smoking spouses were evaluated prospectively, 8 (44.0%) of 18 couples agreed to participate in a smoking cessation program. All 8 couples (100%) who participated in the study quit smoking. However, in this study, it was reported that patients who applied for control appointments were paid a fee.[19]

Our study found no significant difference between gender and wanting to seek outpatient help for smoking cessation ($P = .24$). Similarly, no difference was found between genders in a study in which 707 relatives of patients were examined for referral to the smoking cessation outpatient clinic.[20]

There are conflicting results in the literature regarding the relationship between smoking cessation success and age. In our study, the mean age of the acceptors was 41.8 ± 11.1, while the mean age of the refusers was 45.1 ± 13.8. This difference is statistically significant ($P = .019$). This difference is one of the critical results reached in the research. It is observed that younger individuals are more willing to seek outpatient help for smoking cessation. According to the Turkish National Smoking Cessation Support Program results, it was determined that the success of smoking cessation increased with age.[7] On the other hand, a study including 707 relatives of patients who were evaluated for inclusion in the smoking cessation program showed no significant difference between the mean age of the group that agreed to be included in the program and the participants who refused.[20] Although data regarding smoking cessation success and age are controversial, our study suggests that targeting young individuals may be effective in smoking cessation campaigns.

A statistically significant relationship was found between education level and acceptance to participate in a smoking cessation program. This result shows that participants with higher education levels are more willing to seek outpatient help to quit smoking. In the literature, few studies examine the relationship between smoking cessation and

education level in studies on patient relatives. In a study comparing the relatives of 34 smokers with respiratory disease with 34 smokers in the control group, there was no difference between the education levels of the groups regarding smoking cessation success.[18] According to the results of our study, the participation of high school and university graduates in smoking cessation programs was determined more frequently. Individuals with lower education levels should also be aware of these programs and ensure their participation.

In our study, there was no statistically significant difference between the Fagerstrom scores of individuals who accepted and did not accept to apply to the outpatient clinic. In the study of Çelik et al[7] in which the results of the Turkish National Smoking Cessation Program were analyzed, a statistically significant difference was found between the groups with low (0-4), medium (5-7), and high (8-10) Fagerstrom scores in terms of smoking cessation success.[7] The small sample size in our study may have prevented the detection of such a difference.

Our study had a number of notable strengths. First, this is a pioneer study on this topic. Moreover, all interviews with participants were conducted face to face by the same investigator. Finally, a wide range of tobacco-related inpatient diagnoses were included into study. This study had some limitations. First, the long-term smoking cessation results of the participants could not be followed. However, since the basic design of the study is to create intentions in individuals with a single interview, it would be appropriate to evaluate it in this context. Secondly, relatives of cancer patients may not have been adequately represented in the study.

In conclusion, the results of our study show that relatives of patients can be considered as an important target group in smoking cessation programs. There is a need for other prospective studies in this area.

Ethics Committee Approval: The protocol of this study was approved by the Hacettepe University Non-Interventional Clinical Research Ethics Committee. (Date: 06 January 2016, Decision No: GO 15/804-26).

Informed Consent: Written informed consent was obtained from individuals who agreed to participate in this study.

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