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# The effects of environmental tobacco smoke exposure before starting to smoke on cigarette quitting therapies

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## ÖZET

**Sigara içmeye başlamadan önceki çevresel tütün dumanı maruziyetinin sigara bırakma tedavilerine etkisi**

*Bu çalışmada, sigara içmeye başlamadan önce çevresel tütün dumanı maruziyeti olan kişilerde sigara bırakma tedavilerine geçmiş maruziyetin etkilerini saptamayı, çevresel tütün dumanı maruziyeti için kaynak olan ortam ve kişileri belirlemeyi amaçladık. Çalışmaya 230 olgu alındı. Bu kişilere telefonla ulaşılarak sigara içmeye başlamadan önceki çevresel tütün dumanı maruziyeti, maruziyet yerleri, süreleri, ev içi ve ev dışı maruziyet kaynağı olan kişiler, sigara bırakma poliklinğinde önerilen tedavi ve süresi sorgulandı. Eğitim semineri bir tedavi yöntemi olarak kabul edildi. Önerilen nikotin replasmanı ve/veya bupropion tedavisini en az bir hafta kullanan ya da sadece eğitim programına katılan 169 kişi değerlendirildi. Sigara içmeyi bırakan 68 kişi kontrol, bırakmayan 101 kişi olgu grubu olarak tanımlandı. Olgu ve kontrol grupları arasında sigaraya ilk başlama yaşı, düzenli olarak sigara içmeye başlama yaşı, günlük içilen sigara sayısı, toplam paket/yıl ve nikotin bağımlılık skoru açısından farklılık saptanmadı. İki yüz on sekiz kişinin sigara içmeye başlamadan önce çevresel tütün dumanı maruziyeti vardı. Çevresel tütün dumanı maruziyetinin en fazla evde (%85.7) olduğu, ev içinde en fazla babadan (%77.2) kaynaklandığı saptandı. Annenin sigara içme oranı, olgu ve kontrol gruplarında %32.7 ve %25.4 olup, aradaki fark anlamlı bulundu ( $p= 0.009$ ,  $OR= 2.8$ ). Annenin sigara içicisi olması sigara bırakamama riskini 2.8 kat arttırmaktadır. Sigara içmeye başlamadan önce, evde çevresel tütün dumanı maruziyetine yol açan kişi sayısı, olgu grubunda kont-*

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rollere göre anlamlı oranda fazla saptandı ( $p= 0.044$ ). Çevresel tütün dumanı maruziyetinin sigara bırakma tedavileri sonuçlarını da olumsuz şekilde etkilediğini göstermiştir. Bu nedenle ev içi maruziyet önlenmeli özellikle anneler bu konuda eğitilmelidir.

**Anahtar Kelimeler:** Sigara bırakma tedavisi, çevresel tütün dumanı maruziyeti, annenin sigara içiciliği.

## SUMMARY

### *The effects of environmental tobacco smoke exposure before starting to smoke on cigarette quitting therapies*

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We aimed to determine the effects of environmental tobacco smoke (ETS) exposure before starting to smoke on cigarette quitting therapies and to determine source environment/individuals for ETS exposure. 230 individuals were contacted. We investigated person/s with ETS exposure before starting to smoke, places/duration of exposure, sources of exposure, therapy methods/durations recommended. Training seminar was also assumed as a therapy method. Those who were administered nicotine replacement and/or bupropion for a minimum of one week, 169 patients who only attended the training programme were evaluated. 68 patients who stopped smoking defined as controls, 101 patients who did not were defined as cases. There was no difference between case and control groups in terms of ages at initiation of smoking, ages at initiation of regular smoking, number of cigarettes per-day, total package-year and nicotine dependence score. 218 patients were found to have ETS exposure before starting to smoke. The highest ETS exposure was determined to be indoors (85.7%) and of paternal origin (77.2%). The rates of cigarette smoke exposure of maternal origin were 32.7% in cases, 25.4% in controls ( $p= 0.009$  OR= 2.8). The mother being a smoker was found to increase the risk of not being able to stop smoking by 2.8 times. The number of people causing ETS exposure was higher in cases compared to controls ( $p= 0.044$ ). ETS exposure have negative effects on the outcomes of cigarette quitting therapies. Indoor ETS exposure is the leading source of exposure. Therefore, indoor ETS exposure should be prevented, mothers should be trained concerning this matter.

**Key Words:** Smoking quitting therapy, environmental tobacco exposure, maternal smoking.

Smoking is a significant public health problem in terms of mortality, lost years and hospital costs, and it is the most important known disease and early death reason (1). According to estimations of the World Health Organisation (WHO), the number of smoking-related deaths will be around 10 million per year in 2020 (2).

In addition to smoking, environmental tobacco smoke (ETS) exposure poses significant side effects in terms of both child and adult health, and it ranks the first among preventable risk factors (3-5).

Long-term evaluations reveal that the prevention of ETS exposure seems like a potential power to reduce smoking habits of adults and children and to eradicate negative effects on health. Thus, prevention of smoking is as of great importance as cigarette quitting therapies. To this end, more efficient studies should be carried out concerning cigarette quitting therapies and factors affecting therapy results should be evaluated.

The aim of this study is to determine possible effects of ETS exposure history on cigarette quitting therapies for individuals with ETS exposu-

re before starting to smoke, and to determine source environment and individuals for ETS exposure.

### MATERIALS and METHODS

This is a questionnaire study of case-control type. All registered patients, who referred to the cigarette quitting polyclinic, attended the training seminar and who were then evaluated in the polyclinic and who were followed up for a minimum of six months, were included in the evaluation. Patients who were contacted by phone were applied a questionnaire prepared by ourselves. We were not able to apply the questionnaire to all patients in the group due to such reasons as changes in addresses and phone numbers, being outside the city or being abroad, death and refusing interview. Of the patients who were applied questionnaire, those received pharmacological therapy including the recommended bupropion and/or nicotine replacement, and those taken under follow-up after training without recommended pharmacological therapy were included in the study. The training is performed once time before polyclinic control, the participants acquaint about harmful affects of smoking. The groups consisting of patients who stopped smoking and who did not were defined as the control and the case groups respectively.

The participants of the questionnaire were asked about the therapy method recommended in cigarette quitting polyclinic, whether they received therapy and those receiving therapy were asked about the duration of therapy. Ages of first smoking, ages at initiation of regular smoking even if one cigarette a day, for how many years and how many cigarettes they smoke per day, exposure to environmental tobacco smoke before starting to smoke, places of exposure (house, work place, scholl..eg), person/s with indoor and outdoor sources of exposure were asked. Smoking cessation is defined as to stay away from cigarette and other tobacco products at least six mounths so those who did not smoke for at least six months after referring to polyclinic were considered as having stopped smoking (6). Participants considered as having stopped

smoking were asked whether they started smoking again, and those who started smoking were asked about the reasons and duration of smoking. Result of Fagerstrom Test for Nicotine Dependence (FTND), which was administered when patients first referred to clinics, and results of anxiety and depression scoring, general demographic characteristics, data relating to existing systemic and pulmonary diseases were obtained from registers of cigarette quitting polyclinic and added onto the data. Patients who received the recommended nicotine replacement therapy and/or bupropion therapy for at least one week were deemed as beneficiaries of the therapy and patients who received therapy for at least four weeks were deemed to have received therapy for a sufficient duration.

Data obtained by the questionnaires were entered on SPSS 10.0 statistical software for Windows and statistical analyses were carried out. Differences between case and control groups were evaluated by means of student t-test, and factors having impact on cigarette quitting were evaluated by chi-square ( $\chi^2$ ) analysis. Risk coefficients (OR) of factors affecting cigarette quitting were estimated to be within 95% confidence interval.

### RESULTS

388 people registered at cigarette quitting polyclinic were included in the evaluation and 230 of them (68.0%) were applied questionnaire by contacting via phone. 108 people could not be applied questionnaire due to changes in addresses and phone numbers, being outside the city or being abroad, death and refusing interview.

Of 230 patients who were applied questionnaire, 127 (55%) were women and 103 (44%) were men, and mean age was  $47.06 \pm 12.1$  (19-83). 65.7% of this group were married and educational levels of 81.3% were high school and above (Table 1). 31.7% had additional systemic diseases and 17% had accompanying pulmonary diseases. While hypertension and diabetes mellitus were the most prevalent systemic diseases, chronic obstructive pulmonary disease (COPD) was the most frequently seen accompanying pulmonary disease.

**Table 1. Demographic characteristics of case and control groups.**

Demographic characteristics	Case (n= 101)		Control (n= 68)		p	OR	CI
	n	%	n	%			
<b>Sex</b>							
Female	60	59.4	37	54.4	0.6	0.8	0.4-1.5
Male	41	40.6	31	43.1			
<b>Education</b>							
Secondary school/below	18	17.8	8	11.8	0.3	1.6	0.6-3.9
High school and above	83	82.2	60	88.2			
<b>Marital status</b>							
Married	56	55.4	50	73.5	<b>0.02</b>	<b>0.4</b>	<b>0.2-0.8</b>
Unmarried	45	44.6	18	26.5			

It was planned to administer pharmacological therapy to 212 of 230 patients who were applied questionnaire, and the remaining 18 would be followed up without medication after training. 152 of 212 patients who were recommended therapy used the recommended pharmacological therapy. Following the training seminar, follow-up without medication was also defined as a therapy method, and one of the 18 patients followed up accordingly was excluded from evaluation due to lack of data. A total of 169 patients including those who used the recommended pharmacological therapy and who were followed up without medication following the training seminar were included in the study. 68 of 169 patients who stopped smoking were defined as control group and the remaining 101 were defined as case group. Mean ages of case and control groups were determined as  $45.0 \pm 13.0$  and  $47.4 \pm 10.8$  respectively ( $p= 0.208$ ). There were 41 male (40.6%) and 60 female (59.4%) patients in case group, and 31 male (45.6%) and 37 female (54.4%) patients in control group. Table 1 shows general demographic characteristics of case and control groups. There was no significant difference between case and control groups in terms of sex and educational levels. Considering marital status in both groups, 55.4% of case group and 73.5% of control group were married (Table 1). The state of being married is significantly higher in control group than case group, and being married reduces the risk of not being able to stop smoking by 0.4 times.

There was no difference between case and control groups in terms of age of first smoking, age at initiation of regular smoking, number of cigarettes per day, total package-year, dependence levels determined by FTND, existence of anxiety and depression, and existence of pulmonary and systemic diseases (Table 2,3). There was no significant difference between cases and controls in medical treatment for smoking cessation.

218 of 230 patients who were applied questionnaire had exposure to environmental tobacco smoke (ETS) before starting to smoke. The tobacco product which 218 patients (94.7%) with ETS exposure were exposed to was cigarette. It was found that there were 197 patients (85.7%) with indoor ETS exposure before starting to smoke regularly, and it was the school with the highest exposure among places outside home. Figure 1 shows the environments in which patients are exposed to environmental tobacco smoke. It was determined that father is the main source of indoor ETS exposure (77.2%). Figure 2 shows sources of indoor ETS exposure.

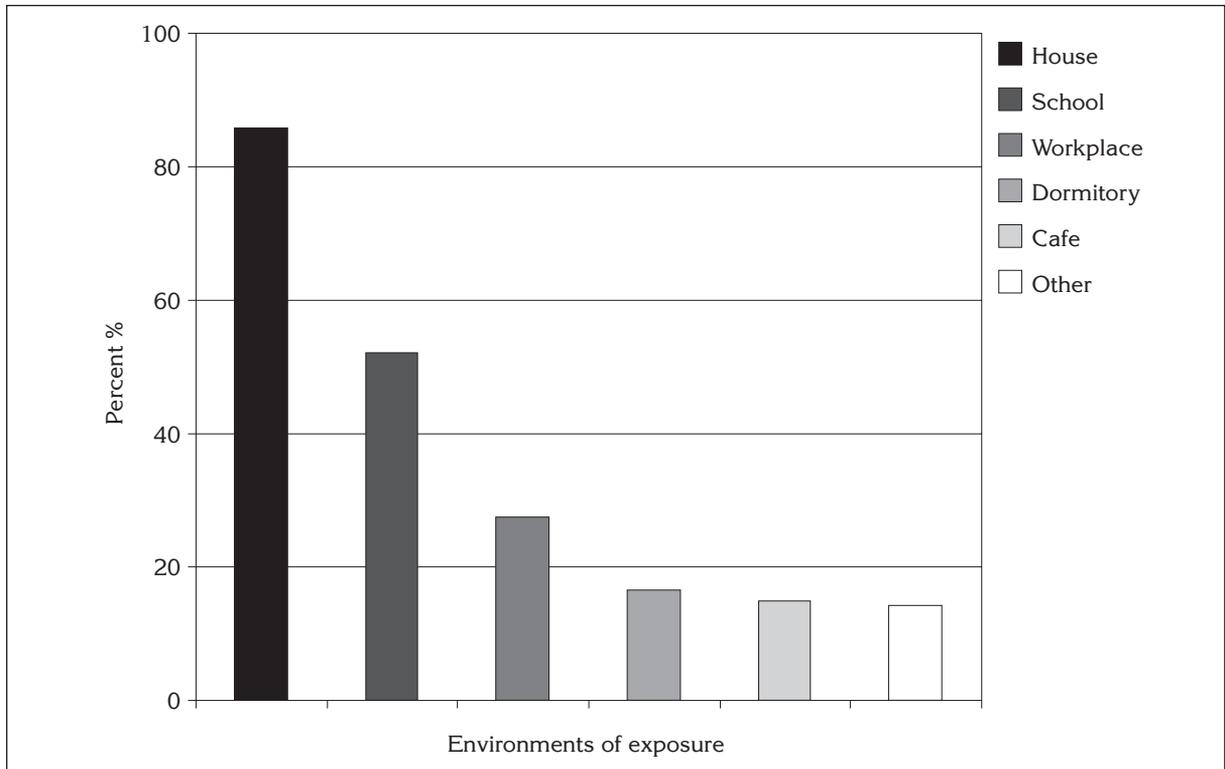
Indoor smoking rates were 84.2% in case group and 91.2% in control group, and there was no significant difference between ( $p= 0.273$ ). Maternal smoking rates were 32.7% and 25.4% in case and control groups respectively, and the difference was found significant between the groups. The mother being a smoker increases

**Table 2. Smoking characteristics of case and control groups.**

Smoking characteristics	Case		Control		p
	n	Mean ± SD	n	Mean ± SD	
Age at initiation of smoking	101	18.7 ± 5.2	68	17.9 ± 3.9	0.278
Age at initiation of regular smoking	100	20.0 ± 4.7	68	19.1 ± 3.8	0.220
Number of cigarettes per day	99	23.7 ± 11.0	66	23.0 ± 10.0	0.635
Package-year	98	30.4 ± 22.2	66	33.6 ± 20.6	0.353
FTND	100	5.2 ± 2.6	66	5.0 ± 2.5	0.696

**Table 3. Evaluation of FTND results of case and control groups.**

FTND (n= 165)	Case (n= 100)		Control (n= 66)		p
	n	%	n	%	
Very Low (0-2)	19	19.0	11	16.7	0.774
Low (3-4)	22	22.0	20	30.3	
Moderate (5)	13	13.0	7	10.6	
High (6-7)	26	26.0	14	21.2	
Very high (8-10)	20	20.0	14	21.2	

**Figure 1. Environments of passive exposure to tobacco products.**

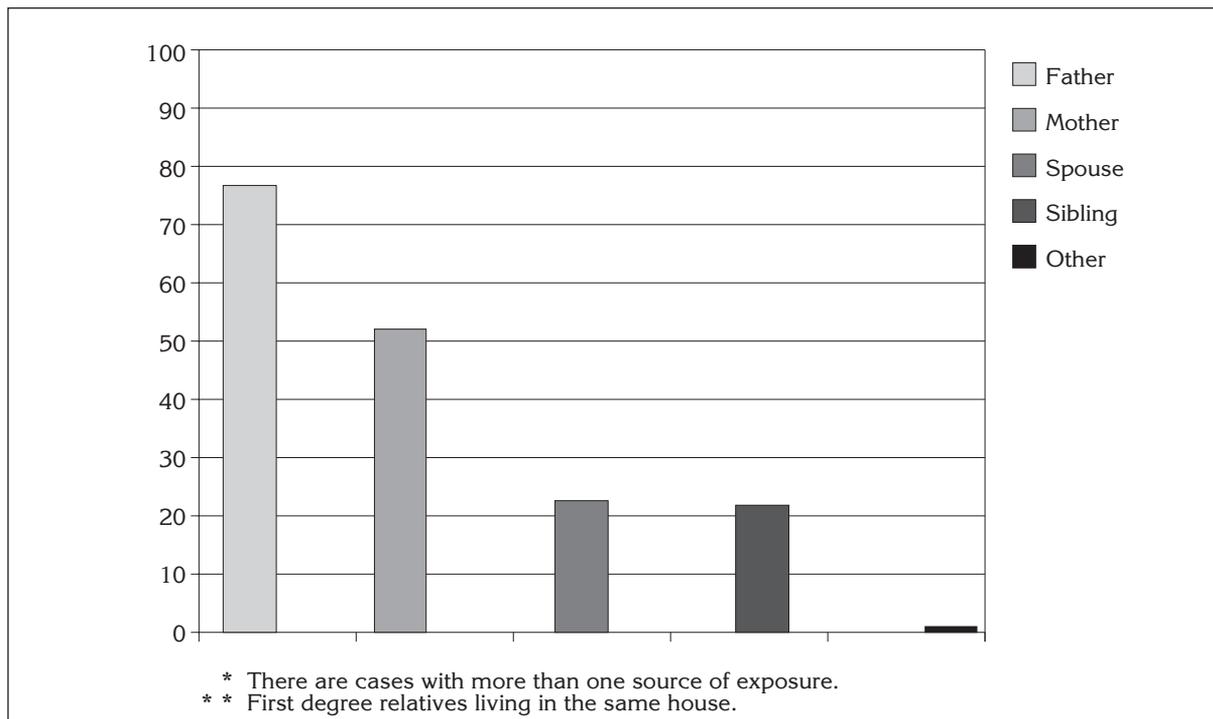


Figure 2. Indoor sources of environmental tobacco smoke exposure.

Table 4. Evaluation of characteristics of case and control groups related to environmental tobacco smoke exposure.

Environmental tobacco smoke exposure	Case (n= 101)		Control (n= 68)		p	OR	CI
	n	%	n	%			
<b>Environmental exposure</b>							
Yes	96	95	65	95.6	1.000	0.8	0.2-3.8
No	5	5.0	3	4.4			
<b>Indoor smoking</b>							
Yes	85	84.2	62	91.2	0.273	0.5	0.2-1.4
No	16	15.8	6	8.8			
<b>Maternal smoking</b>							
Yes	33	32.7	10	14.7	<b>0.009</b>	<b>2.8</b>	<b>1.2-6.1</b>
No	68	67.3	58	85.3			
<b>Paternal smoking</b>							
Yes	70	69.3	53	77.9	0.289	0.6	0.3-1.3
No	31	30.7	15	22.1			

the risk of not being able to stop smoking by 2.8 times ( $p= 0.009$ ,  $OR= 2.8$ ,  $CI= 1.2-6.1$ ). Table 4 shows characteristics of case and control groups in terms of environmental tobacco smoke exposure.

The numbers of people causing ETS exposure by smoking indoors before starting to smoke were  $1.78 \pm 0.90$  in case group and  $1.52 \pm 0.64$  in control group, and the difference between was found significant ( $p= 0.044$ ).

## DISCUSSION

Many studies have been carried out both in our country and in the world about environmental tobacco exposure and the accompanying health problems. Around 40% of children in America and Canada live together with at least one smoker in houses where regular smoking takes place (4,7,8). The study of Boyacı and colleagues indicated that at least one person smokes in household of 70% of children and it was reported that 75% of children are exposed to environmental tobacco smoke throughout the country (9). ETS exposure rate at the age of 18 and above is 87.5% within the whole group in our study and this rate is higher than those obtained in previous studies. This is an important indication of health problems that may develop in relation to both current and future situation of smoking and environmental tobacco smoke in our country.

The analysis for determining whether there is significant difference between cigarette quitting rates following therapy of those exposed to and not exposed to smoke from tobacco products that others use before starting to smoke could not be performed as the number of patients in the group without environmental tobacco smoke exposure is too small.

House is the most important environment for children and non-smoking spouses in ETS exposure (8,10,11). Various studies have indicated that there is a probability of decrease in adolescent smoking with restriction of indoor smoking (10,12,13). According to results of our study, ETS exposure is the highest in houses. Houses and workplaces are considered as the most prominent environments for passive smoking following evaluations of those places as per the spent time. Workplaces are the most important environments in terms of cigarette smoke exposure outside home (14).

In studies, especially parental smoking was found to be associated with increasing risk of children being smokers in following periods (8). However, the effect of parental smoking on cigarette quitting has been investigated in very few studies. Monso et al. have determined that parents being cigarette addicts have no effect on

cigarette quitting success of children (15). Although the most prevalent indoor source of exposure is father according to our study, father being a smoker has no effect on failure to stop smoking. On the other hand, mother being a smoker is associated with failure to stop smoking. This may be explained by the fact that time spent with father at home is shorter than time spent with mother. Especially maternal smoking is important in terms of exposure of children and babies (7). Mothers are smokers in 52 of 197 patients (22.6%) determined to have indoor ETS exposure by questionnaire in our study. Considering the significant increase in smoking rates of women which is indicated by studies, the importance of this matter will be revealed more explicitly (16,17). Training of mothers, and women indeed, is of great importance due to future risk of being a smoker and negative effects on cigarette quitting therapies.

Apart from the existence of indoor ETS exposure before starting to smoke, the number of people smoking at home is among the variables affecting cigarette quitting (18). We have determined in our study that the increase in the number of smokers at home is significantly associated with the risk of not being able to stop smoking. One of the main steps towards prevention of ETS exposure related problems seems to be the prevention of smoking at home, mother to be the first.

## CONCLUSION

As a result of the outcomes of our study, we may conclude that ETS exposure has negative effects on cigarette quitting therapies besides such effects on lung cancer and coronary artery disease which lead to serious morbidity and mortality. Indoor ETS exposure bears great importance. Therefore, families should be informed of the importance of this matter with great care during training meetings on smoking. Training should be provided in care of health institutions, schools, national campaigns and press-publication institutions in an aim to prevent indoor exposure and especially exposure caused by mothers.

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