Long-Term Results of Smoking Cessation Therapy

Sigarayı Bırakma Tedavisinin Uzun Dönem Sonuçları

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ABSTRACT Objective: The data for the long-term effectiveness of smoking cessation treatment are still inadequate in Turkey. This paper evaluates the long-term results of our smoking cessation clinic, which has been in service for 12 years, over a 10-year period. **Material and Methods:** Seven hundred forty-six patients who applied to our Smoking Cessation Clinic between April 1, 2000 and December 31, 2011 with complete data on their files were included in the study. Data were analyzed using Kaplan Meier survival analysis, the Log Rank test and the Chi-square test. Cox regression analysis was used for the factors affecting duration of non-smoking. **Results:** Among the 432 patients who agreed to take part in the cessation program, the success rate after 10 years was 33.2%. Although 46.8% of the patients who did not take part in the program quitted smoking spontaneously in the first year, the cessation rate declined to zero in the years that followed. Recurrence was 1.62 times (95% confidence interval 1.16-2.27) greater in men compared to women, 1.63 times (95% confidence interval 1.15-2.29) greater among the unemployed compared to the employed, and 1.54 times (95% confidence interval 1.81-2.19) greater among those with a low education level. **Conclusion:** The long-term outcomes of smoking cessation therapies, which require hard work of both the physician and the patient and also takes considerable time, reveal that these efforts are effective. Number of cigarettes smoked per day, education level, female gender and regular income were established as significant parameters in maintaining successful cessation.

Key Words: Tobacco; smoking cessation

ÖZET Amaç: Sigara bırakma tedavisinin uzun süreli etkinliğine dair ülkemize ait henüz yeterli veri yoktur. Bu makalede 12 yıldır hizmet vermekte olan sigara bırakma polikliniğimizin 10 yıllık süreyi kapsayan uzun dönem sonuçları değerlendirilmiştir. **Gereç ve Yöntemler:** Çalışmaya, Sigarayı Bırakma Polikliniğimize 1 Nisan 2000 ile 31 Aralık 2011 tarihleri arasında başvuran ve dosya bilgisi tam olan 746 hasta dahil edilmiştir. Veriler Kaplan Meier sağ kalım analizi, Log Rank test ve Ki-kare testi ile değerlendirilmiştir. Sigarasız kalma süresini etkiyen faktörler için Cox- regresyon analizi kullanılmıştır. **Bulgular:** On yılın sonunda bırakma programına katılmayı kabul eden 432 hastanın sigarasız kalma başarısı %33,2'dir. Programa katılmayan hastalar arasında ilk yılda kendi kendine sigara bırakanların oranı %46,8 olmasına karşın; bu bırakma oranı takip eden yılda sıfırlanmıştır. Erkeklerde, kadınlara göre 1,62 kat (%95 Güven aralığı 1,16-2,27); para getiren işi olmayanlarda, işi olanlara göre 1,63 kat (%95 Güven aralığı 1,15-2,29); eğitim düzeyi düşük olanlarda 1,54 kat (%95 Güven Aralığı 1,81-2,19) daha fazla nüks görülmektedir. **Sonuç:** Hem hekimin hem de hastanın yoğun emeğini gerektiren ve çok zamanını alan sigara bırakma tedavilerinin uzun süreli sonuçları, bu çabaların etkin olduğunu ortaya koymaktadır. Günlük içilen sigara sayısının, eğitim seviyesinin, kadın cinsiyetin ve düzenli gelirin, sigara bırakma başarısını sürdürmede önemli parametreler olduğu görülmüştür.

Anahtar Kelimeler: Tütün; sigarayı bırakma

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With its effects on health and the economic burden it imposes, tobacco represents a major health problem.[1-5] For that reason, in 2009 the World Health Organization announced the MPOWER plan of action against tobacco, consisting of six policies, and requested that this be implemented. These policies involve determining the prevalence of tobacco use and measures to prevent people starting consuming it, protection against tobacco smoke, smoking cessation therapies, raising awareness of the dangers of tobacco, preventing advertising, promotion and tobacco sponsorship and increased taxes on tobacco.[6] Although the most effective of these policies is increasing tax revenues from tobacco, initiatives aimed at quitting smoking also appear to be a cost-effective approach.[7]

Many smoking cessation clinics have opened in Turkey within the scope of the fight against tobacco in recent years. The smoking cessation clinic in our faculty has been operating for 12 years. Although there are many data concerning the long-term results of smoking cessation clinics in the international literature, Turkish data for their long-term effectiveness are limited.[8-13] This study was intended to establish the long-term effectiveness of smoking cessation therapy and the factors that may affect long-term success.

MATERIAL AND METHODS

Seven hundred forty-six patients who applied to our Smoking Cessation Clinic between April 1, 2000 and December 31, 2011 with complete data on their files were included in the study. We were able to contact 80.2% of patients who completed 10 years after the treatment, and 12 were found to have died. Seven patients with incomplete data on files were excluded. Local Ethical Committee approval was granted for the study.

Our clinic has been active since April 2000. The study was conducted jointly by the departments of Public Health and Chest Diseases. Public education and motivation are as important as pharmacological treatments in preventing recurrence. The Public Health Department contributes to educating and motivating patients on the effects of smoking and the benefits of quitting and to follow-up activities. Patient enrollment was performed with appointments on 1-day a week. At first enrollment, in addition to physical examination, patients were administered the Fagerstorm test, consisting of 6 questions evaluated on a score of 10, to identify their levels of nicotine dependency. Exhaled CO levels, height, weight, vital signs and a detailed history of smoking were also recorded. A MicroCO mobile CO monitor (Micro Medical Limited, Rochester, Kent, UK) was used to determine CO levels in expired air. A reading of more than 10 parts per million of CO was taken as being abnormal.[14]

In addition to patients' medical history, comorbidities and test results (pulmonary radiography, electrocardiogram, kidney and liver function tests) were recorded in detail. The first meeting with patient lasts approximately 30 min. Behavioral therapy, nicotine replacement therapy and other drug therapies are used in the cessation program.

Following a minimum of 2-3 sessions before the day of quitting, we talked to patients on the first day of smoking cessation, and on the 1st, 2nd and 4th weeks, preferably face-to-face, and if that was not possible, then on the telephone; then the patients were followe up monthly until the 3rd month. After that, patients were followed up at 3-month intervals in the first 2 years, and then with face-to-face meetings or over the telephone twice a year until 10 years had passed. The follow-ups consisted of meetings lasting 15-20 min, depending on the patient's condition. These meetings involved asking about the effectiveness and side-effects of pharmacotherapy if had been given any, discussing the patient's problems and suggesting solutions, and discussing any relapses and recommending solutions to these. We tried to determine the patients' latest smoking status in the light of the information provided by them and their expired CO levels.

STATISTICAL ANALYSIS

Data were analyzed using Kaplan Meier survival analysis, the Log Rank test and Cox regression analysis. Measurement data were expressed as

mean ± standard error in Log- rank test. Cox regression analysis was used for a model containing the affecting factors: remaining smoking-free, gender, education level, having a job bringing in an income, number of cigarettes smoked per day, age, complaints, drug use, additional disease, level of nicotine dependence and length of time spent as a smoker. The possible factors identified with univariate analyses were further entered into Cox regession analysis, with backward selection to determine independent predictors of survival. Among correlated factors with similar effects on survival, only those with clinical significance were included. The proportional hazards assumption and model fit was assessed by means of residual (Schoenfeld and Martingale) analysis ($p<0.001$). A 5% type-I error level was used to infer statistical significance, A p value < 0.05 was considered to indicate statistical significance. Data were analyzed using statistical software (SPSS version 13.01; serial number: 9069728).

RESULTS

Of our patients, 59.78% (n=446) were males and 40.22% (n=300) females, with a mean age of 38±12.41 years. Four hundred thirty-two patients were included in the smoking cessation program, and 314 did not participate. The demographic characteristics of participating and declining patients are separately. Primary school graduates represented 34.3% of our patients, and 37.3% of the patients were university graduates. The lowest age for starting smoking was 5 years, and the highest age 50 years. Mean nicotine dependency according to the Fagerstrom Test for Nicotine Dependence was 5.4±2.8. The most common reason for starting among those applying was affectation in 51.47% of the patients (Table 1). In terms of medical treatment, the most common prescription among the patients in the cessation program was the nicotine band, in 139 (32.17%) cases.

According to Kaplan Meier survival analysis results, the cessation rate among the program participants was 57.6% at the end of the first year, 39.7% after 5 years and 33.2% after 10 years. Although the rate among those not participating in the program and quitting on their own was 46.8% in the first year, this fell to zero in the following year. Success rates by year of the patients taking part in the program are shown in Table 2. No difference in 10-year success rates was determined between men and women (Log- rank test $p=0.442$). Mean length of cessation was 54.6 ± 5.3 (44.1-65.2) months for women and 53.8 ± 4.3 (45.3-62.3) for men.

Kaplan Meier analysis results regarding the factors influencing length of remaining smoking-free are shown in Table 3. Age was an important factor. Patients aged 40 and over were able to remain smoking-free longer than the 18-39 age group, and the difference was statistically significant (Table 3, $p<0.001$). Another interesting finding was that those smoking 21 or more cigarettes per day managed to remain cigarette-free for 69 ±7.1 months, and those smoking 20 or less for 49.6± 3.7 months ($p=0.034$). Those with no regular income resumed smoking sooner than those with a regular income (Table 3).

At Cox regression analysis of the factors influencing continued cessation, male gender, lack of income generating employment, a low level of education and number of cigarettes smoked a day were independent risk factors for resumption. Model fit was assessed by means of residual (Schoenfeld and Martingale) analysis ($p<0.001$). Males resumed smoking 1.62 times more than females (95% confidence interval 1.16-2.27) and the unemployed 1.63 times more than the employed (95% confidence interval 1.15-2.29), and low education level increased resumption by 1.54 times (95% confidence interval 1.81-2.19). Resumption of smoking declined by 0.98 times as the daily number of cigarettes smoked increased (95% confidence interval 0.96-0.99). Coefficients and confidence intervals for other factors included in the model are shown in Table 4.

CONCLUSION

Smoking cessation therapy is an approach that can be applied at every physician visit, not just in specialized clinics. In daily practice, every physician can perform brief clinical interventions of 3-5 min-

TABLE 1: Demographic and baseline characteristics of the patients.

	Not trying to quit	Trying to quit	Total
Gender			
Female	127 (42.3%)	173 (57.7%)	300 (40.22%)
Male	187 (41.9%)	259 (58.1%)	446 (59.78%)
Age	36.96±12.40	38.76±12.37	38±12.41
Education level			
Illiterate	2 (0.6%)	3 (0.7%)	5 (0.7%)
Literate	7 (2.2%)	6 (1.4%)	13 (1.7%)
Primary school	105 (33.5%)	133 (30.8%)	238 (31.9%)
High school	89 (28.3%)	123 (28.5%)	212 (28.4%)
University	111 (41.7%)	167 (45.4%)	278 (37.3%)
Age at commencing	15.63±4.56	15.65±5.14	15.64±4.90
Reasons for commencing			
Affectation	163 (51.91%)	221 (51.57%)	384 (51.47%)
Curiosity	86 (27.38%)	127 (29.39%)	213 (28.55%)
Stress-Unhappiness	41(13.05%)	58 (13.42%)	99 (13.27%)
Influence of friends	24 (7.64%)	35 (8.10%)	59 (7.90%)
To lose weight	1 (0.30%)	1 (0.23%)	2 (0.26%)
Other	22 (7%)	19 (4.39%)	41 (5.49%)
Nicotine addiction levels			
5 and below (Low-middle)	145 (46.2%)	220 (50.9%)	365 (48.9%)
6 and above (High-very high)	169 (53.8%)	212 (49.1%)	381 (51.1%)
Income-generating employment			
Yes	197 (62.7%)	304 (70.4%)	501 (67.2%)
No	117 (37.3%)	128 (29.6%)	245 (32.8%)
Numbers of cigarettes smoked			
≤10	60 (19.2%)	94 (21.8%)	154 (20.7%)
11-20	183 (58.5%)	236 (54.6%)	419(56.2%)
21-30	36 (11.5%)	54 (12.5%)	90 (12.1%)
31≥	34 (10.9%)	48 (11.1%)	82 (11%)
Additional disease			
Yes	139 (44.3%)	190 (44%)	329(44.1%)
No	175(55.7%)	242 (56%)	417 (55.9%)
Treatment			
No drug	286(91.6%)	247(57.17)	533(71.44%)
Nicotine band	18(5.73%)	139 (32.17%)	157(21.04%)
Nicotine gum	12(3.82%)	51(11.80%)	63(8.44%)
Bupropion	6(1.91%)	13(3%)	27(3.61%)
Varenicline	2(0.63%)	9(2.08%)	11(1.47%)
Other	1(0.31%)	2(0.46%)	3(0.40%)

Data are expressed as mean±SD.

utes, and intensive clinical interventions on the subject can be performed in specialized clinics (Brief Clinical Interventions and Intensive Clinical Interventions)[15]. Although our clinic is a tertiary, specialized smoking cessation center, since there is no chain of referral involved, it has experience of providing treatment for all patient groups, primary, secondary and tertiary.

TABLE 2: Smoking cessation success levels by years for patients and participants in the program.

Time free of smoking/years	Women (%)	Men (%)	Total (%)
1-year success level	63.7	52.5	57.6
2-year success level	52.8	45.7	48.5
3-year success level	43.3	42.9	43.0
4-year success level	40.9	42.9	42.0
5-year success level	38.0	41.0	39.7
6- year success level	36.3	37.4	36.9
7- year success level	36.3	37.4	36.9
8- year success level	36.3	37.4	35.6
9- year success level	36.3	35.0	35.6
10- year success level	30.3	35.0	33.2

One-year success levels of smoking cessation therapy vary between 20% and 35.5% in the international literature.[16-21] In studies from Turkey, the level ranges between 10 and 55.2%.[22-29] One study showed that intensive clinical interventions maintained over 5 years reduced mortality by 5%.[30] International long-term studies report cessation levels between 28% and 37%.[8-11] In the Lung Health study, 3,818 patients' 1- and 5-year cessation success rates were 34.4% and 37.5% (cross-sectional), respectively.[8] The number of long-term studies for Turkey is limited. One study involving the 5-year results for the Uludağ University Smoking Clinic Cessation reported a 40% cessation level in 296 patients at the end of 5 years.[12] In our long-term study results, our 1-year cessation level was 53.5%, and the 5-year level 34.6%.[13] The 1-year cessation rate was 57.6%, declining to 39.5% at 5 years and 33.2% by the tenth year. The number of physicians participating in the therapy, variation in physicians' areas of specialization, close and frequent follow-ups and a greater number of meetings are all known to have a serious impacts on success levels.[31,32] The main reasons why our long-term success rates were quite high, despite the relatively low levels of medical treatment were, in addition to those factors, the voluntary physicians serving in the clinic, easy access to physicians, attendance of the patient to the same physician(s) on every visit, frequent check-up visits and the use of combined therapy.

TABLE 3: Duration of smoking cessation according to different variables.

Variable	Survival Time (Smoke-free Months) 95% Confidence Interval Month Mean±SE	Log-rank p
Gender		
Female	54.6 ± 5.3 (44.1-65.2)	0.442
Male	53.8 ± 4.3 (45.3-62.3)	
Age		
18-39	42.1 ± 4.2 (33.7-50.5)	<0.001
40-49	69.1 ± 6.6 (56-82.1)	
50 ≥	63.5 ± 7.1 (49.4-77.6)	
Education		
Primary education (Illiterate/Literate-primary)	50.45 ± 5.6 (39.3-61.5)	0470
High school	53.1 ± 6.1 (41.1-65.1)	
University	58.3 ±5.56 (47.3-69.2)	
Number of cigarettes smoked		
0-20	49.6 ± 3.7 (42.2-57.1)	0.034
21 ≥	69 ± 7.1 (55-83.1)	
Additional disease		
Yes	58 ± 5.1 (47.9-68.1)	0.218
No	51.6 ± 4.4 (42.9-60.3)	
Nicotine addiction levels		
5 and below (Low-middle)	51.3 ± 3.9 (43.5-59.1)	0.676
6 and above (High-very high)	60.1 ± 5.9 (48.4-71.8)	
Pharmacotherapy		
Yes	57.9 ± 5.5 (47-68.8)	0.926
No	52.9 ± 4.2 (44.7-61.2)	
Income-generating employment		
Yes	62.9 ± 4 (55-70.8)	<0.001
No	28.4 ± 4.8 (19-37.9)	

TABLE 4: Factors affecting remaining free of smoking.

Variable	(95% confidence margin)	p
Male gender	1.62 (1.15-2.27)	0.005
Education level	1.54 (1.81-2.19)	0.017
Having income generating employment	1.63 (1.15-2.29)	0.006
Daily level of smoking	0.98 (0.96-0.99)	0.009
Age	0.99 (0.96-1.01)	0.326
Post-cessation additional complaints	0.91 (0.66-1.26)	0.568
Drug treatment	1.09 (0.80-1.49)	0.567
Presence of additional disease	0.89 (0.65-1.22)	0.483
Nicotine addiction levels	1.09 (0.99-1.20)	0.052
Years spent as a smoker	0.98 (0.96-1.00)	0.190

Several studies have determined high smoking levels among subjects with a low education level and have regarded this as an effective parameter in quitting.[33-37] In the Global Adult Tobacco Survey conducted in Turkey, a low level of education and a low socioeconomic level were shown to influence smoking.[38] Although not statistically significant, our results showed that patients with a primary level of education remained cigarette-free shorter when compared to those with higher education (50.45 ± 5.6 months compared to 58.3 ±5.56). In addition, on Cox regression analysis, as our patients' level of education decreased, they had 15.4-times greater rate of starting smoking (95% confidence interval 1.81-2.19).

In studies performed in Western countries, incidence of cigarette smoking decreases as income level increases.[39-43] In most European countries, it has been determined that individuals with a low socioeconomic level and who smoke also have lower education levels.[43-46] Similar findings also apply to Turkey.[13, 38] In our study, the group applying for smoking cessation had a more regular source of income, and they had a higher cessation success rate compared to those not having such an income.

Gender is an important factor in smoking cessation.[32,47,48] Among the reasons why women have a lower level of quitting are factors such as hormonal changes, worries over weight and a tendency to depression.[47] However, there are also publications stating that gender is not significant.[15,49] In support of this, while there was no statistical difference in our clinic's 5-year findings, men quit smoking more and for longer periods compared to women. In our 10-year results, in complete contrast, male gender was determined to increase the risk of resuming smoking.[13] Therefore, it will be logical for each patient to be given a unique and appropriate treatment plan smoking cessation initiatives.

Diseases and complications caused by tobacco are known to increase with duration and amount of smoking. Incidence of smoking among elderly patients, therefore declines in comparison to the young.[50] Although we were unable to show a statistically significant effect of age on the length of cessation, interestingly, our patients aged 40 and above did succeed in remaining free of smoking longer than younger patients. In the same way, those smoking more than 20 cigarettes a day were able to remain free of cigarettes longer than those smoking less. Therefore, we may conclude that as duration and number increase, individuals become more desirous to quit.

It is essential that pharmacotherapy be supported by behavioral therapy in smoking cessation treatment. In a meta-analysis of 18 studies, studies involving pharmacotherapy alone were compared with those reinforced by behavioral therapy, and cessation levels were greater in combined therapies (27.6% compared to 21.7%).[15] We administered behavioral therapy to all our patients. Drug therapy was employed at a level of 28.56%. Bearing in mind that 51.1% of our patients had high nicotine dependence, this level is quite low. Despite the low drug levels, success is high with intense work and close follow-ups.

In conclusion, we suppose that smoking cessation therapies are effective in the long term. In the light of both our 5-year and 10-year results, aside from duration and type of intervention, we determined that education level, gender and socioeconomic level are important factors in smoking cessation success.

REFERENCES

1. Peto R. Smoking and death: the past 40 years and the next 40. BMJ 1994;309(6959): 937-9.
2. US Department of Health and Human Services. The health benefits of smoking cessation: a report of the surgeon General Atlanta (GA). US Department of Health and Human Services. Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office of Smoking and Health. DHHS Publication No. (CDC) 90-8416, 1990.
3. Anthonisen NR, Connett JE, Murray RP, for the Lung Health Study Research Group. Smoking and lung function of lung health study participants after 11 years. Am J Respir Crit Care Med 2002;166(5): 675-9.

4. Center for Disease Control and Prevention. Annual smoking-attributable mortality, years of potential life lost, and economic costs-United States, 1995-1999. MMWR 2002; 51(14):300-3.
5. The World Bank Group. Curbing the epidemic: governments and the economics of tobacco control. Developments in practice. Tob Control 1999;8(2):196-201.
6. World Health Organization. WHO report on the global tobacco epidemic, 2008: the MPOWER package. Geneva, Switzerland: World Health Organization; 2011. p.329.
7. Tsevat J. Impact and cost-effectiveness of smoking interventions. Am J Med 1992;15;93(1A):43-7.
8. Scanlon PD, Connett JE, Waller LA, Altose MD, Bailey WC, Buist AS, et al; for the Group Research Study Health Lung. Smoking cessation and lung function in mild-to-moderate chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2000;161(2 Pt1):381-90.
9. Asthana A, Piper ME, McBride PE, Ward A, Fiore MC, Baker TB, et al. Long-term effects of smoking and smoking cessation on exercise stress testing: three-year outcomes from a randomized clinical trial. Am Heart J 2012;163(1):81-7.
10. Centers for Disease Control and Prevention (CDC). Quitting smoking among adults-United States, 2001-2010. MMWR Morb Mortal Wkly Rep 2011;60(44):1513-9.
11. Fix BV, Hyland A, Rivard C, McNeill A, Fong GT, Borland R, et al. Usage Patterns of Stop Smoking Medications in Australia, Canada, the United Kingdom, and the United States: findings from the 2006–2008 International Tobacco Control (ITC) Four Country Survey. Int J Environ Res Public Health 2011; 8(1):222-33.
12. Uzaslan EK, Özyardımcı N, Karadağ M, Gürdal Yüksel E, Gözü RO, Ege E. The physician's intervention in smoking cessation: results of the five years of smoking cessation clinic (SCC). Ann Med Sci 2000; 9(1):63-9.
13. Öztuna F, Çan G, Özlü T. Five-year outcomes for a smoking cessation clinic. Respirology 2007;12(6):911-5.
14. Jarvis MJ, Russell MA, Saloojee Y. Expired air carbon monoxide: a simple breath test of tobacco smoke intake. Br Med J 1980; 281(6238):484-5.
15. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. Treating tobacco use and dependence: 2008 update U.S. Public Health Service Clinical Practice Guideline executive summary. Respir Care 2008;53(9):1217-22.
16. Wood-Baker R. Outcome of a smoking cessation programme run in a routine hospital setting. Intern Med J 2002;32(1-2):24-8.
17. Soulier-Parmeggiani L, Griscom S, Bongard O, Avvanzino R, Bounameaux H. One-year results of a smoking-cessation programme. Schweiz Med Wochenschr 1999;129(10): 395-8.
18. Kennedy DT, Giles JT, Chang ZG, Small RE, Edwards JH. Results of a smoking cessation clinic in community pharmacy practice. J Am Pharm Assoc 2002;42(1):51-6.
19. Jorenby DE, Leischow SJ, Nides MA, Rennard SI, Johnston JA, Hughes AR, et al. A controlled trial of sustained-release bupropion, a nicotine patch, or both for smoking cessation. N Engl J Med 1999;340(9):685-91.
20. Hjalmarson A, Nilsson F, Sjostrom L, Wiklund O. The nicotine inhaler in smoking cessation. Arch Intern Med 1997;157(15): 1721-8.
21. Sachs DP, Säwe U, Leischow SJ. Effectiveness of a 16-hour transdermal nicotine patch in a medical practice setting, without intensive group counseling. Arch Intern Med 1993;153(16):1881-90.
22. Demir T, Tutluoğlu B, Koç N, Bilgin L. [One-year follow up results of smoking cessation outpatient clinic]. Tuberk Toraks 2004;52(1):63-8.
23. Özyardımcı N, Gürdal YE, Kunt AE, Gözü RO, Ege E. [One-year smoking cessation outpatients Clinic Results Of Pulmonary Disease Department's Uludag University Faculty Medicine]. Tuberk Toraks 1994;42(3):188-94.
24. Uyar M, Filiz A, Bayram N, Elbek O, Herken H, Topcu A, et al. Randomized trial of smoking cessation. Medication versus motivation. Saudi Med J 2007;28(6):922-6.
25. Çan G, Öztuna F, Özlü T. [The evaluation of outpatient smoking cessation clinic results]. Tuberk Toraks 2004;52(1):69-74 .
26. Akkaya A, Öztürk Ö, Çobanoğlu H, Bircan HA, Şimsek S¸ Şahin U. Evaluation of patients followed up in a cigarette cessation clinic. Respirology 2006;11(3):311-6.
27. Önen ZP, Şen E, Gülbay BE, Oztürk A, Öznur AY, Acıcan T, et al. [Comparing the effectiveness of different treatment modalities on the smoking cessation rates]. Tuberk Toraks 2010;58(4):385-92.
28. Aytemur Solak Z, Gündüz Telli C, Erdinç E. [Results of smoking cessation treatment]. Toraks Dergisi 2003;4(1):73-7.
29. Aytemur Solak Z, Pişmişoğlu B, Kılınç O, Pişmişoğlu E, Hacıevliyagil S, Karaman C. [Intensive clinic intervention plus psychodrama in smoking cessation and effects on cessation outcome]. Turkiye Klinikleri J Med Sci 2012;32(3):630-7.
30. Anthonisen NR, Skeans MA, Wise RA, Manfreda J, Kanner RE, Connett JE; Lung Health Study Research Group. The effects of a smoking cessation intervention on 14.5-year mortality: a randomized clinical trial. Ann Intern Med 2005;142(4):233-9.
31. Anderson JE, Jorenby DE, Scott WJ, Fiore MC. Treating tobacco use and dependence: an evidence-based clinical practice guideline for tobacco cessation. Chest 2002;121(3): 932-41.
32. Scott P, Marlow RRT, Stoller JK. Smoking cessation. Respir Care 2003;48(12):1238-56.
33. Kaleta D, Makowiec-Dąbrowska T, Dziankowska-Zaborszczyk E, Fronczak A. Prevalence and socio-demographic correlates of daily cigarette smoking in Poland: Results from the Global Adult Tobacco Survey (2009-2010). Int J Occup Med Environ Health 2012;25(2):126-36.
34. Wetter DW, Cofta-Gunn L, Irvin JE, Fouladi RT, Wright K, Daza P, et al. What accounts for the association of education and smoking cessation? Prev Med 2005;40(4):452-60.
35. Palipudi KM, Gupta PC, Sinha DN, Andes LJ, Asma S, McAfee T; on behalf of the GATS Collaborative Group. Social Determinants of Health and Tobacco Use in Thirteen Low and Middle Income Countries: Evidence from Global Adult Tobacco Survey. PLoS One 2012;7(3).1-9.
36. Nagelhout GE, de Korte-de Boer D, Kunst AE, van der Meer RM, de Vries H, van Gelder BM, et al. Trends in socioeconomic inequalities in smoking prevalence, consumption, initiation, and cessation between 2001 and 2008 in the Netherlands. Findings from a national population survey. BMC Public Health 2012;12(1):303.
37. Schaap MM, Kunst AE, Leinsalu M, Regidor E, Ekholm O, Dzurova D, et al. Effect of nationwide tobacco control policies on smoking cessation in high and low educated groups in 18 European countries. Tob Control 2008;17(4):248-55.
38. Turkey Demographic and Health Survey 2003. Suggested citation: Hacettepe University Institute of Population Studies. Ministry of Health General Directorate of Mother and Child Health and Family Planning. State Planning Organization and European Union. Ankara, Turkey: 2004. p.1-217.
39. Birch S, Jerrett M, Eyles J. Heterogeneity in the determinants of health and illness: the example of socioeconomic status and smoking. Soc Sci Med 2000;51(2):307-17.
40. Lopez AD, Collishaw NE, Piha T. A descriptive model of the cigarette epidemic in developed countries. Tob Control 1994;3(3): 242-7.

41. Leinsalu M, Kaposvári C, Kunst AE. Is income or employment a stronger predictor of smoking than education in economically less developed countries? A cross-sectional study in Hungary. BMC Public Health 2011;13(11): 2-10.

42. Huisman M, Kunst AE, Mackenbach JP. Inequalities in the prevalence of smoking in the European Union: comparing education and income. Prev Med 2005;40(6):756-64.

43. Pierce JP, Fiore MC, Novotny TE, Hatziandreu EJ, Davis RM. Trends in cigarette smoking in the United States; educational differences are increasing. JAMA 1989;26(1): 56-60.

44. Hu TW, Lin Z, Keeler TE. Teenage smoking, attempts to quit, and school performance. Am J Public Health 1998;88(6):940-3.

45. Azevedo A, Machado AP, Barros H. Tobacco smoking among Portuguese high-school students. Bull World Health Organ 1999;77(6): 509-14.

46. Fergusson DM, Lynskey MT, Horwood LJ. The role of peer affiliations, social, family and individual factors in continuities in cigarette smoking between childhood and adolescence. Addiction 1995;90(5):647-59.

47. Perkins KA. Sex differences in nicotine versus nonnicotine reinforcement as determinants of tobacco smoking. Exp Clin Psychopharmacol 1996;4(2):166-77.

48. Wetter DW, Kenford SL, Smith SS, Fiore MC, Jorenby DE, Baker TB. Gender differences in smoking. J Consult Clin Psychol 1999; 67(4):555-62.

49. Vangeli E, Stapleton J, Smit ES, Borland R, West R. Predictors of attempts to stop smoking and their success in adult general population samples: a systematic review. Addiction 2011;106(12):2110-21.

50. Gooneratne NS, Patel NP, Corcoran A. Chronic obstructive pulmonary disease diagnosis and management in older adults. J Am Geriatr Soc 2010;58(6):1153-62.