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REVIEW ARTICLE

Smoking cessation treatment in primary care

Birincil bakımda sigarayı bırakma tedavisi

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Abstract

Tobacco use remains a major global public health challenge, contributing to preventable morbidity and mortality. Smoking is directly linked to cancers, cardiovascular diseases, chronic obstructive pulmonary disease, and diabetes, while emerging evidence suggests e-cigarettes and heated tobacco products may also harm respiratory and cardiovascular health. Smoking cessation significantly reduces these risks, offering immediate benefits (e.g., improved circulation within 20 minutes) and long-term advantages (e.g., reduced cancer risk). Effective cessation strategies include behavioral interventions like the 5As (Ask, Advise, Assess, Assist, Arrange) and 5Rs (Relevance, Risks, Rewards, Roadblocks, Repetition), alongside pharmacotherapy (e.g., varenicline, nicotine replacement therapy, bupropion). Combining counseling and medication enhances success rates. Special populations, such as cardiovascular disease patients and those with mental health disorders, require tailored approaches. National cessation programs, quitlines, and digital health tools further support quitting efforts. Healthcare providers play a critical role in promoting cessation through evidence-based, patient-centered interventions.

Keywords: Smoking cessation, tobacco use, nicotine dependence, pharmacotherapy, behavioral counseling.

Özet

Tütün kullanımı, önlenebilir morbidite ve mortaliteye katkıda bulunarak önemli bir küresel halk sağlığı sorunu olmaya devam etmektedir. Sigara içmek doğrudan kanserler, kardiyovasküler hastalıklar, kronik obstrüktif akciğer hastalığı ve diyabetle bağlantılıdır; ortaya çıkan kanıtlar, e-sigaraların ve ısıtılmış tütün ürünlerinin de solunum ve kardiyovasküler sağlığa zarar verebileceğini göstermektedir. Sigarayı bırakmak bu riskleri önemli ölçüde azaltır, anında faydalar (örn. 20 dakika içinde dolaşımın iyileşmesi) ve uzun vadeli avantajlar (örn. kanser riskinin azalması) sunar. Etkili bırakma stratejileri arasında 5A (Sor, Tavsiye Et, Değerlendir, Yardımcı Ol, Düzenle) ve 5R (İlgililik, Riskler, Ödüller, Engeller, Tekrar) gibi davranışsal müdahaleler ve farmakoterapi (örn. vareniklin, nikotin replasman tedavisi, bupropion) yer alır. Danışmanlık ve ilacı birleştirmek başarı oranlarını artırır. Kardiyovasküler hastalık hastaları ve ruhsal sağlık bozuklukları olanlar gibi özel popülasyonlar, kişiye özel yaklaşımlar gerektirir. Ulusal bırakma programları, bırakma hatları ve dijital sağlık araçları bırakma çabalarını daha da desteklemektedir. Sağlık hizmeti sağlayıcıları kanıta dayalı, hasta merkezli müdahaleler yoluyla bırakmayı teşvik etmede kritik bir rol oynarlar.

Anahtar Kelimeler: Sigarayı bırakma, tütün kullanımı, nikotin bağımlılığı, farmakoterapi, davranışsal danışmanlık.

INTRODUCTION

Tobacco use remains one of the most critical public health concerns, ranking among the foremost contributors to preventable mortality and morbidity both globally and within individual countries. Smoking was directly responsible for an estimated 58,000 deaths in 2019 (1). Although the overall smoking rate among adults aged 19 and older declined from 25.8% in 2012 to 17.7% by 2022, the reduction in male smoking rates has notably decelerated since 2008, while the prevalence among adult women has remained relatively consistent, ranging between 5% and 7% over the last two decades (2). In recent years, the emergence of alternative tobacco products—such as electronic cigarettes and heated tobacco devices—has contributed to a resurgence in tobacco use among both adolescents and adults. This shift has also led to an increase in dual usage, referring to individuals who consume more than one form of tobacco concurrently. Consequently, the combined rate of tobacco product use, inclusive of these newer forms, rose to 22.1% in 2022—exceeding the rate of traditional cigarette smoking by 4.4% (3). Due to this evolution in usage patterns, the term “tobacco use” is increasingly preferred over “smoking,” as it captures a broader spectrum of behaviors. Tobacco smoke contains over 4,000 harmful substances, including more than 60 known carcinogens and nicotine, a highly addictive compound. The effects of smoking are pervasive, adversely impacting nearly every organ system. It is a

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major risk factor for various cancers—including those of the lung, esophagus, stomach, and bladder—as well as for cardiovascular disease, chronic obstructive pulmonary disease, and diabetes (4). Moreover, alternative products such as e-cigarettes and heated tobacco also contain nicotine and other potentially harmful chemicals. Some ingredients—like solvents and flavoring agents—have not been fully studied, necessitating caution in their use. Increasing evidence links e-cigarette consumption to both respiratory and cardiovascular conditions (5,6) and combining these products with conventional cigarettes may amplify health risks. Quitting tobacco yields immediate and lasting health improvements, irrespective of age. Within just 20 minutes of cessation, reductions in heart rate and blood pressure can be observed. By two weeks, circulation and pulmonary function begin to recover. In the long term, smoking cessation significantly lowers the risk of developing numerous health conditions—including lung cancer, cardiovascular disease, and chronic respiratory illnesses—and contributes to decreased overall mortality. These benefits are particularly profound when cessation occurs at an earlier age; stopping before age 50 can halve the risk of premature death. Additionally, cessation enhances oral health, restores sensory functions like taste, and improves physical endurance—such as reduced shortness of breath during physical activity—making it advantageous to quit at any life stage.

SMOKING CESSATION APPROACHES

Relying solely on personal willpower to quit smoking is often insufficient, primarily due to the withdrawal symptoms and strong cravings that emerge when nicotine consumption is abruptly reduced or stopped. Research indicates that the success rate of quitting without any form of intervention remains low—only around 3% to 5% of smokers manage to quit independently, which underscores the critical need for structured and evidence-based smoking cessation support (7). The 2008 Smoking Cessation Treatment Guidelines issued by the U.S. Department of Health and Human Services classify smoking as a chronic condition, one that typically requires repeated treatment efforts and multiple attempts before successful cessation is achieved (8). These guidelines advocate for the use of pharmacological treatment in all patients who express a willingness to quit and highlight that combining such therapies with behavioral counseling significantly enhances cessation outcomes. The latest smoking cessation guidelines published by the World Health Organization (WHO) in June 2024 further emphasize the pivotal role of cessation counseling, intensive behavioral interventions, and pharmacotherapy. The WHO recommends that these cessation strategies be integrated as essential components of primary care services (9). This perspective shifts the focus from viewing smoking as merely a matter of individual resolve to recognizing it as a chronic health issue, thereby calling for systematic, ongoing clinical support. Consequently, in the absence of medical contraindications, it is advised that all smokers receive a combination of counseling and pharmacologic therapies to maximize the likelihood of successful cessation.

SMOKING CESSATION COUNSELING

Smoking cessation counseling typically begins with an evaluation of the individual's current tobacco use and their readiness to quit. This assessment allows for classification into four main scenarios, each requiring a tailored approach (10). First, individuals who actively use tobacco and express a willingness to quit should be offered appropriate cessation treatments. Second, for those who are current users but not yet prepared to quit, motivational interventions should be provided to enhance their readiness. Third, individuals who have successfully quit smoking should receive support focused on maintaining abstinence and preventing relapse. Finally, for individuals who have never used tobacco, counseling should reinforce and encourage the continuation of their non-smoking status.

5As (Ask, Advise, Assess, Assist, Arrange) & 5Rs (Relevance, Risks, Rewards, Roadblocks, Repetition)

The 5As counseling framework is a brief, structured intervention commonly used in primary care settings to support individuals who are motivated to quit smoking (10). This strategy comprises five key steps: (1) Ask about the patient's current smoking status, (2) Advise them to quit through clear and personalized recommendations, (3) Assess their readiness to make a quit attempt, (4) Assist those prepared to quit by

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providing appropriate support and resources, and (5) Arrange a follow-up to monitor progress and provide continued encouragement. Designed for time efficiency, the 5As model can typically be completed in under three minutes, although its components may be adapted or reordered based on the specific clinical context (11). For individuals who are not yet ready to quit, the 5Rs motivational counseling method can be employed to enhance their motivation. The 5Rs include: Relevance—helping patients understand why quitting is personally meaningful; Risks—educating them about the health dangers of continued smoking; Rewards—emphasizing the benefits of cessation; Roadblocks—identifying obstacles and offering strategies to overcome them; and Repetition—reinforcing these messages at each clinical encounter. This patient-centered approach has been shown to increase the likelihood of future quit attempts and foster long-term cessation success (12).

Very Brief Advice on Smoking (VBA), Brief Advice

VBA is a streamlined smoking cessation counseling approach developed by the United Kingdom's National Centre for Smoking Cessation and Training (13). Designed for rapid delivery—typically within 30 seconds—VBA follows a three-step structure: (1) Ask whether the patient currently smokes, (2) Advise them on the most effective evidence-based methods to quit, and (3) Act by connecting them with available cessation support. In the "act" stage, individuals expressing a willingness to quit are offered interventions such as pharmacological treatment and referrals to local cessation services, with follow-up assessments scheduled for future visits. For patients who are not yet ready to quit, educational information is shared, and the VBA process is revisited during subsequent clinical interactions. This counseling model is particularly well-suited to primary care environments where time, space, or resources for in-depth counseling may be limited. Despite its brevity, VBA fosters motivation through supportive, patient-centered dialogue. Notably, a Cochrane review concluded that brief smoking cessation advice—whether or not it includes detailed information about the harms of smoking—increases the likelihood of quitting by approximately 1.66 times and improves long-term abstinence rates at 12 months (14). As a result, many clinical guidelines recommend that healthcare professionals consistently offer brief smoking cessation advice to all patients who smoke during routine consultations (15).

SMOKING CESSATION PHARMACOTHERAPY

Pharmacological interventions play a crucial role in enhancing smoking cessation outcomes by alleviating nicotine withdrawal symptoms, reducing dependence, and lowering the risk of relapse (16). Among the medications approved by the U.S. Food and Drug Administration (FDA) for smoking cessation are varenicline, various forms of Nicotine Replacement Therapy (NRT), and sustained-release bupropion. In addition, cytisine—a smoking cessation agent with a long history of use in several countries—has recently been shown in comparative studies to exhibit efficacy comparable to that of varenicline (17).

Varenicline

Varenicline functions as a partial agonist at the α4β2 nicotinic acetylcholine receptors, meaning it both mildly activates these receptors to alleviate withdrawal symptoms and concurrently blocks nicotine-induced dopamine release, thereby diminishing the rewarding effects of smoking (18). A Cochrane review found that varenicline increased the likelihood of successful smoking cessation by a factor of 2.32 compared to placebo (95% confidence interval [CI]: 2.15–2.51) (19). As its therapeutic effects are not immediate, varenicline treatment is typically initiated one week prior to the target quit date. The standard dosage regimen includes: 0.5 mg once daily for the first three days, 0.5 mg twice daily on days 4 through 7, followed by 1 mg twice daily from day 8 onward, generally continued for 12 weeks. Beyond the standard protocol, alternative dosing strategies are available. These include long-term maintenance therapy (continuing for an additional 12 weeks after initial success), flexible quit dates (quitting anytime between days 8 and 35 of treatment), gradual reduction strategies for those not ready to quit immediately, low-dose therapy (0.5 mg twice daily), and high-dose therapy (up to 5 mg daily from day 12) (20). In maintenance therapy studies, individuals who continued varenicline beyond the initial 12 weeks had significantly better abstinence rates than those who were switched to placebo (21). Accordingly, clinical guidelines issued by the American Thoracic Society (ATS), the National

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Health Insurance Service, and the Korean Society for Smoking Cessation endorse extended varenicline use beyond 12 weeks, especially in individuals at elevated risk of relapse, citing both increased efficacy and cost-effectiveness (22,23). Although extended use up to one year may be considered for certain patients, dosages exceeding 2 mg daily are not officially approved. While a clinical trial found no added benefit from increasing the dose to 5 mg (24), a more recent randomized study demonstrated that elevating the dose from 2 mg to 3 mg in individuals who did not respond to the initial regimen significantly improved cessation outcomes compared to either maintaining 2 mg or switching to NRT (25). As such, deviation from standard dosing should be carefully guided by the latest clinical evidence. Common adverse effects of varenicline include nausea, headache, insomnia, abnormal dreams, drowsiness, and dizziness. Initiating treatment with a lower dose and titrating gradually may help mitigate these symptoms. In patients with severe renal impairment (estimated creatinine clearance <30 mL/min), treatment should begin at 0.5 mg once daily, with a maximum of 0.5 mg twice daily. For those undergoing hemodialysis, a daily dose of 0.5 mg is generally recommended. Dose adjustments are not required in patients with hepatic impairment.

Nicotine Replacement Therapy

NRT formulations available in Turkey include patches, gum, and lozenges, all of which can be obtained without a prescription. NRT alleviates withdrawal symptoms, the primary barrier to smoking cessation, by delivering nicotine through non-smoking routes. Patches provide a slow and sustained release of nicotine via the skin, while gum and lozenges act rapidly by releasing nicotine through the oral mucosa, with a shorter duration of action. Compared to a placebo, NRT increases the likelihood of smoking cessation by 1.55 times (95% CI, 1.49–1.61), and there is no significant difference in success rates among the different NRT formulations (patch, gum, lozenge) (26,27). NRT is generally initiated concurrently with the quit date, but a Cochrane meta-analysis revealed that starting NRT before the planned quit date yielded better smoking cessation outcomes (relative risk [RR], 1.25; 95% CI, 1.08–1.44) (27). Similar to varenicline, the typical treatment duration for NRT is 12 weeks, though it may be extended for an additional 12 weeks due to its high success rate (22,23). In Turkey, NRT is contraindicated in patients with recent cardiovascular or cerebrovascular disease (within the past 2 weeks), and patches are not recommended for individuals with chronic skin conditions such as psoriasis, eczema, or urticaria. Common side effects include palpitations, insomnia, headaches, increased blood pressure, nausea, localized skin reactions at the patch site (e.g., itching, redness), and digestive issues or oral irritation from gum and lozenges.

Sustained-release Bupropion

Sustained-release bupropion, initially approved as an antidepressant, has gained approval in various countries, including the United States, as a treatment for smoking cessation. This medication targets both dopamine and adrenergic systems by antagonizing nicotine receptors and inhibiting the reuptake of dopamine during smoking cessation, thus mitigating withdrawal symptoms (28). A Cochrane review published in 2023 indicated that bupropion increased smoking cessation success by 1.60 times compared to a placebo (29). Similar to varenicline, bupropion should be initiated 1-2 weeks before the planned quit date. The typical dosing schedule begins with 150 mg once daily for the first 3-6 days, followed by an increase to 150 mg twice daily. The minimum dosing interval is 8 hours, and the total daily dose should not exceed 300 mg. The recommended duration of treatment is at least 7 weeks, with the option to extend it up to 12 weeks. Since it is a sustained-release formulation, it should not be chewed or split. Caution is advised due to the potential risk of seizures, which increases with higher dosages. Bupropion is contraindicated in patients with a history of seizures, bipolar disorder, or central nervous system tumors. Common side effects include insomnia, headache, dizziness, nausea, and dry mouth.

Cytisine

Cytisine, a natural alkaloid found in plant seeds, functions similarly to varenicline by acting on nicotine acetylcholine receptors. It has been utilized for over 50 years as a smoking cessation aid in Eastern and Central Europe, as well as Central Asia (30). Cytisine demonstrated a 1.30-fold increase in smoking cessation success compared to a placebo (95% CI, 1.15–1.47) and is included in the WHO's smoking cessation guidelines, where it is strongly recommended with moderate certainty (19).

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Comparison of Medications and Combination Therapy

Numerous studies have demonstrated that varenicline is the most effective single medication for smoking cessation when compared to NRT and bupropion (19,31). As a result, guidelines recommend varenicline as the first-line treatment over nicotine patches or bupropion (23,32). Additionally, combining NRT forms, such as nicotine patches with gum or lozenges, has been found to yield higher success rates than using a single NRT form (27). Both the U.S. Preventive Services Task Force and the WHO acknowledge that combination NRT is more effective than monotherapy, with no significant difference observed compared to varenicline (9,19,33). Other combination therapies, including varenicline with NRT, bupropion with NRT, or bupropion with varenicline, are also possible but are supported by limited and conflicting research. These combination treatments may be considered for smokers with high daily cigarette consumption, significant nicotine dependence, or a history of unsuccessful cessation attempts. However, in all cases, smokers should receive detailed information regarding the efficacy, administration methods, and potential side effects of the treatments, with careful selection of medications based on personal preferences and medical history.

SPECIAL SITUATIONS

Cardiovascular Disease Patients

NRT is contraindicated for patients with cardiovascular and cerebrovascular diseases within two weeks. However, the American College of Cardiology allows the use of both NRT and varenicline in patients with stable cardiovascular disease and those hospitalized for acute coronary syndrome, as these treatments are considered effective for smoking cessation. Bupropion is also recognized as a viable option. Recent studies have demonstrated that varenicline is safe for use in smokers with cardiovascular and cerebrovascular diseases. Therefore, the available evidence suggests that smoking cessation medications are generally both effective and safe for smokers with cardiovascular disease (34,35,36).

Smokers with Mental Disorders

Studies have shown that patients with mental disorders have higher smoking rates and tend to smoke more than the general population (37). Clinical trials evaluating the safety and efficacy of smoking cessation medications in participants with mild to moderate psychiatric disorders revealed that the smoking cessation effects of varenicline, NRT, and bupropion in patients with mental disorders were similar to those in the general smoking population, with no significant differences in side effects between the medications (38). According to the Clinical Practice Guidelines for Smoking Cessation, when comparing varenicline and NRT in smokers with mental disorders, varenicline demonstrated a 1.38-fold higher smoking cessation success rate compared to NRT (95% CI, 1.27–1.50), with no significant differences in serious side effects (RR, 1.07; 95% CI, 1.00–1.15). However, smokers with a history of mental disorders are at a higher risk of experiencing neuropsychiatric side effects from smoking cessation. Therefore, extra caution should be taken to monitor side effects in this population (23,38).

Novel Tobacco Users

While some countries recognize e-cigarettes as a smoking cessation aid, there is insufficient evidence regarding the long-term safety and health impacts of novel tobacco products, including e-cigarettes and heated tobacco products. Additionally, when novel tobacco products are used for smoking cessation, users may become dual users of both traditional and novel tobacco products or continue to use novel tobacco products, leading to incomplete cessation of smoking (39). These users tend to have lower smoking cessation attempt rates compared to regular cigarette users. In fact, domestic studies have shown that over 40% of smokers are dual users and exhibit higher nicotine dependence than those who exclusively smoke traditional cigarettes (40). Therefore, using novel tobacco products as a smoking cessation method is not considered safe. It is recommended to provide general smoking cessation counseling and pharmacotherapy to both novel tobacco users and dual users, as quitting all tobacco products is most beneficial for health (33).

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Smokers Not Ready to Quit

Recent studies have shown that a considerable number of smokers attempt to quit without planning and continue to manage their cravings (41). The smoking cessation readiness of smokers, as identified through the 5As counseling strategy, is highly dynamic, influenced by various personal and situational factors (42). ATS has reported that initiating varenicline treatment in smokers who are not yet ready to quit shows a two-fold higher smoking cessation success rate (95% CI, 2.09–2.98) compared to waiting until they are ready (22). Although this approach may be unfamiliar to healthcare providers, it presents a potentially effective strategy for smoking cessation.

NON-PHARMACOLOGICAL TREATMENTS FOR SMOKING CESSATION

Non-pharmacological treatments are effective on their own for smoking cessation, but when combined with pharmacological treatments, they can further enhance smoking cessation success rates (8). Behavioral support therapy, a well-established non-pharmacological treatment, can be applied in various forms depending on the counseling type and delivery method. Individual face-to-face counseling, group counseling, telephone counseling, and financial incentives have been shown to significantly increase smoking cessation success rates, typically including advice on quitting smoking and information on cessation methods (9, 43). With the acceleration of modern technological advancements, digital health tools and strategies have gained prominence. The WHO has incorporated this into its smoking cessation guidelines, noting that digital interventions such as text messages, smartphone apps, artificial intelligence, and internet-based tools can serve as adjuncts or self-management tools for smoking cessation support (9). These methods may improve the accessibility of smoking cessation support and offer personalized interventions tailored to individual needs. Moreover, technology-based interventions can be efficiently utilized in underserved populations or resource-limited settings, potentially fostering greater equity in smoking cessation treatment. However, ethical considerations and data protection must be carefully addressed when using such technologies. Digital health approaches can complement traditional behavioral therapies or be used independently, forming a solid foundation for the ongoing development of smoking cessation treatments.

Smoking Cessation Support and Services

Various smoking cessation support programs and services are available in Turkey, and appropriately utilizing them can increase smoking cessation success rates and reduce the health burden caused by smoking (44).

Smoking Cessation Support Program

The National Health Insurance Service's smoking cessation support program offers smoking cessation counseling, medications, and nicotine replacement therapy subsidies to all citizens who wish to quit smoking. Implemented since 2015 under Article 14 of the National Health Insurance Act, the program aims to enhance smoking cessation success rates, prevent smoking-related diseases and deaths, and improve public health. The program is available at participating hospitals, clinics, public health centers, and pharmacies. Each cycle lasts 8–12 weeks, with up to three cycles supported per year. Upon completing the criteria for six counseling sessions or medication use, participants are eligible for a partial refund of the costs (45).

National Lung Cancer Screening

Lung cancer remains the leading cause of cancer-related deaths globally, and many countries, including Turkey, conduct screenings for high-risk groups based on age, smoking history, or other risk factors. Low-dose chest computed tomography (LDCT) is a well-established tool for lung cancer screening, and since 2019, South Korea has implemented national cancer screenings for smokers aged 54–74 years with a history of 30 pack-years or more. LDCT enables early diagnosis of lung cancer in high-risk populations, which contributes to reducing mortality (46,47). As smoking is the primary risk factor for lung cancer, smoking cessation is critical in preventing its development. Lung cancer screenings can serve as a "teachable moment" to highlight the importance of smoking cessation. However, if no abnormalities are found, smokers may perceive the

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results as a "license to smoke" and continue their habit. Therefore, after lung cancer screening, it is crucial to communicate the risks of smoking and the benefits of quitting. Encouraging smokers to make the decision to quit, even in the absence of abnormal findings, is vital. In such cases, offering pharmacotherapy and counseling to support smoking cessation is essential. Moreover, connecting smokers to national smoking cessation programs, such as public health center clinics, quitlines, and smoking cessation camps, can be highly effective in assisting their efforts to quit (48).

Quitline

Telephone-based smoking cessation counseling has demonstrated a higher success rate compared to traditional management approaches (49). Quitlines, which have been implemented in the U.S., New Zealand, and various European countries since the 1980s, have proven to be effective and essential. Recent efforts have focused on establishing collaborative frameworks to ensure the delivery of high-quality smoking cessation counseling. Counseling is available through various channels, including telephone, text message, and email. Quitlines offer several advantages, such as increased smoking cessation success rates, ease of access, confidentiality, personalized counseling, and relatively low economic cost.

CONCLUSION

Smoking cessation treatment is one of the most effective interventions through which primary care physicians can significantly enhance the health of their patients. Actively utilizing pharmacotherapy and counseling, in line with the latest smoking cessation guidelines and evidence, is essential to improving the success rate of smoking cessation. Effective treatment should be tailored to each patient's individual characteristics, with modern technologies, such as digital health tools, serving as valuable adjuncts. Primary care physicians should have a comprehensive understanding of smoking cessation resources and systems and actively leverage these to connect patients with appropriate support. Additionally, fostering an environment that encourages continuous monitoring, and support is key to achieving successful smoking cessation outcomes.

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