

*Opšti pregledi /  
General reviews*

PUŠENJE I ZNAČAJ MOTIVACIJE U  
ODVIKAVANJU OD PUŠENJA  
SMOKING AND THE IMPORTANCE OF  
MOTIVATION IN QUITTING SMOKING

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**Ključne reči**

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**Abstract**

Smoking represents an important public health problem due to its negative impact on the health of each individual. This harmful habit is present in all age groups, and smokers are increasingly adopting other forms of tobacco consumption besides standard cigarettes. In clinical practice, a large number of non-pharmacological methods are used in smoking cessation initiatives, but their success is largely determined by the smokers' motivation and commitment to the process. A wide range of scales have been developed to assess smokers' motivation to quit smoking. These tools should be adopted in the primary health-care settings to assess and promote patients' motivation to quit smoking, as well as to make them aware of the importance of a healthy lifestyle. This evaluation should be followed by teamwork, focusing on the support and empowerment of smokers and their families, thus increasing the chance of achieving the goal of smoking cessation and long-term abstinence.

**INTRODUCTION**

Smoking is one of the most preventable causes of death from non-communicable diseases<sup>[1,2]</sup> as well as a significant public health burden due to its harmful impact on the health of each individual. Nicotine addiction is present in increasingly younger age groups, and most of those individuals continue smoking in adulthood<sup>[3,4]</sup>. Numerous studies have shown that smoking also increases the cancer risk<sup>[5,6]</sup>. Given its harmful effect on the respiratory system, high prevalence of asthma, chronic obstructive pulmonary disease, and lung cancer<sup>[7-9]</sup> is noted among smokers. Similarly, many of subjects hospitalized due to cardiologic or respiratory health problems consume cigarettes<sup>[10]</sup>. However, smoking also causes damage to other organ systems, especially in individuals already suffering from certain diseases and conditions<sup>[11-13]</sup>. According to the available evidence, current smokers report symptoms of anxiety and depression more often than non-smokers, allowing researchers to establish a positive correlation between smoking and anxiety, depression, and overall psychological stress<sup>[14]</sup>.

*The importance of motivation and other non-pharmacological measures in smoking cessation*

Motivation is essential for quitting smoking, as it drives a person's behavior and decision-making in all aspects of life<sup>[15,16]</sup>. Thus, it is considered one of the key non-pharmacological measures in the strategies aimed at smoking cessation. As a part of their meta-analysis conducted in 2023, Nian T et al. examined pertinent literature focusing on the application of non-pharmacological measures for smoking cessation. The authors identified 145 different non-pharmacological measures, 20 of which were interventions designed to support smokers in quitting. The most frequently used interventions were behavior education, professional counseling, and non-nicotine electronic cigarettes (e-cigarettes). Based on the reported findings, the authors concluded that counseling and behavioral support were effective in increasing the smoking cessation rates, but the degree of their efficacy was dependent on the characteristics of the support provided<sup>[17]</sup>.

The currently available non-pharmacological measures aimed at smoking cessation include immediate support for

smokers, telephone support, printed materials, websites, and e-health approaches, among others, and these strategies are often used in combination<sup>[18,19]</sup>. However, these approaches are rarely incorporated into the daily work of medical professionals, especially at the level of primary health care. This short coming is highlighted by a study conducted in South Africa, where 22.4% of the population is estimated to consume cigarettes. Yet, among the surveyed smokers, only 40% of those that had previously tried to quit smoking relied on counseling/pharmacotherapy in the process of smoking cessation<sup>[20]</sup>. Similar findings were reported by Šagrić Č et al. in 2006, whose survey of 280 final-year students of medicine and economics (current and former smokers) revealed that 12.1% of current smokers would seek the help of a counseling center to quit smoking, while this type of help was used by only 2.4% of ex-smokers<sup>[21]</sup>.

Smoking cessation success can be influenced by numerous factors<sup>[18,22,23]</sup>. According to a study conducted in Romania in 2018, 512 smokers (41.2% of the surveyed sample) had no intention to quit smoking, citing “enjoying smoking” (86.1%), and relying on cigarettes to “reduce stress” (65.9%) or “staying alert” (46.3%) as the reasons for continuing with this harmful habit<sup>[24]</sup>. Similar results were obtained in a study conducted in Germany that included 12,161 last-year smokers (i.e., current smokers and recent ex-smokers who quit within the preceding 12 months), as only 18.6% of the surveyed individuals had attempted to quit, and 15.2% of the cohort had successfully stopped smoking<sup>[25]</sup>. When 280 students surveyed by Šagrić Č et al. were asked about their attitudes toward quitting, 49.4% of current smokers stated that they had never made such an attempt, while 32% of current and 26.3% of ex-smokers cited concern for their health in the future as the main reason for quitting<sup>[21]</sup>. In a study conducted among 3,195 smokers from six European Union (EU) countries, factors associated with smoking cessation were analyzed before and after the introduction of the European Tobacco Products Directive in 2016. Following the introduction of this directive, 415 respondents (13% of the sample) stopped smoking, mostly citing health concerns, the price of cigarettes, and being an example to children as the reason for quitting. Predictors associated with smoking cessation were: secondary or higher education of respondents, lower number of cigarettes smoked per day, prior attempts to quit smoking, lower level of perceived addiction, plans to quit smoking, and presence of comorbidities<sup>[26]</sup>.

Some of the predisposing factors related to high motivation to quit smoking are health education about smoking, awareness about the disadvantages of smoking, smoke-free policies, health workers' advice, warnings about the dangers of smoking, high cigarette prices, and negative emotions related to smoking<sup>[27]</sup>. However, these factors are not universally effective, as highlighted by a study conducted among eight EU Member States, where an attempt to quit smoking in the last 12 months was most frequently reported by respondents from the Netherlands (33.0%) and UK (29.3%) and least often by those from Hungary (11.5%), Greece (14.7%), Poland (16.7%), and Germany (16.7%). With the exception of UK (35.9%), majority (56–84%) of the surveyed individuals attempted to quit smoking without

additional help, and the factors associated with trying to quit smoking were: younger age, higher education and income, and presence of smoking-related illnesses<sup>[28]</sup>.

While these findings are beneficial, further research is needed to identify the most effective strategies for smoking cessation. In these investigations, focus should be given to smokers with little or no contact with health services and/or in whom conventional cessation support has been ineffective<sup>[29]</sup>. It is also important to recognize that the degree of motivation to quit smoking can be different among users of flavored and other types of cigarettes<sup>[30,31]</sup>. Exposure to e-cigarette use by others may also influence the decision to quit smoking. Indeed, regular exposure to other people using e-cigarettes has been associated with an increased likelihood of prior quitting attempts as well as higher current motivation to quit smoking. However, after adjustment for the current use of e-cigarettes by the respondents, this association was no longer significant<sup>[32]</sup>. In 2004, Pešić I et al. surveyed 285 smokers who wanted to quit smoking with professional help (61.4% of whom were women), aiming to elucidate the cessation success rate as well as the factors that contributed to this outcome. The average age of the sample was 42.8 years and the average degree of nicotine addiction on the Fagerstrom Test for Nicotine Dependence (FTND) was 7.78. Quitting was attempted by 68.1% of smokers, whereby 59.8% successfully quit (and were abstinent for at least 12 months at the time of the study), while 40.2% relapsed. The most common motives for quitting were: health concerns and the desire to protect one's health, saving money, family pressure, improving fitness, social environment, societal pressure, being tired of addiction, wanting to be a positive example for children, pregnancy and reproduction concerns, presence of smoking-related diseases, fears, culture, morality, ethics, and religion<sup>[33]</sup>.

The FTND is often used to assess the level of nicotine dependence. This six-item scale evaluates the extent of nicotine addiction by assessing the timing of the first cigarette of the day, the capacity to refrain from smoking in places designated as smoke-free, the most difficult cigarette to give up during the day, the number of cigarettes consumed daily, the difference in the number of cigarettes smoked in the morning and during the rest of the day, and the capacity to refrain from smoking during illness<sup>[34]</sup>.

Although various scales are used to assess the degree of motivation to quit smoking, the Khimji-Watts test is very popular in research and practice as it is short and easy to implement. It includes the following three questions, and the responses are used to determine a person's motivation: (a) Is it important for you to quit smoking? (b) What influence have others had on that decision? and (c) What chance of success would you give yourself if you tried to quit?<sup>[35]</sup>. The Richmond test is also frequently applied, whereby responses to the following four questions are scored to determine the degree of motivation: (i) Would you like to quit smoking if you could do it easily? (ii) Do you really want to quit smoking? (iii) Do you think that you can quit smoking in the following two weeks? and (iv) Do you think that you will still be a smoker in six months?<sup>[10,35,36]</sup>. This test can be administered in isolation or in combination with other tests such as the Henri Mondor Paris Motivation Test (HMPMT) which consists of 15 items<sup>[35]</sup>.

In a study conducted in Germany spanning the 2016–2021 period and involving 18,969 smokers, the results on the Motivation To Stop Scale (MTSS) were analyzed. This scale requires a response on a 7-point scale with Level 1 signifying the lowest level of motivation and Level 7 the highest. The mean MTSS score was 2.04 (SD=1.37) and exhibited a slight downward trend over time. Recent quit attempts and current e-cigarette use were found to be associated with greater motivation to quit [37]. In their study conducted in 2014, Khalil R.B. and colleagues focused on hospitalized and non-hospitalized smokers, and found that hospitalized participants were significantly more motivated to quit smoking according to the Richmond test score [10]. Several authors also noted that special attention in support of smoking cessation should be given to persons who report symptoms of stress, depression, and anxiety as they may perceive that these states are alleviated by smoking [14].

In primary healthcare settings, daily multidisciplinary work with smokers is required, whereby focus should be given to education related to the health problems associated with smoking, along with encouragement, empowerment, and motivation to quit smoking. It is also necessary to more frequently use the available scales for assessing the level of nicotine addiction. Appropriate scales should also be utilized for assessing the patient's motivation to quit smoking as well as for monitoring fluctuations in motivation over time. Smokers should be viewed in a wider context, aiming

to mitigate the factors that contribute to smoking while emphasizing those that will encourage smoking cessation and maintaining abstinence.

### CONCLUSION

Within primary health care, it is necessary to assess and encourage patients' motivation to quit smoking, to make them aware of the importance of a healthy lifestyle, and to adopt a multidisciplinary approach that, upon evaluation, focuses on the support and empowerment of smokers and their families, as this will increase the chance of achieving the goal of smoking cessation.

### CONFLICT OF INTEREST

*The authors state that they did not have any conflict of interest when conducting this research and processing the results.*

### Sažetak

Pušenje predstavlja važan javno-zdravstveni problem, zbog negativnog uticaja na zdravlje svakog pojedinca. Prisutno je u svim starosnim grupama, a pušači osim standardnih cigareta koriste i druge vidove konzumiranja duvana. U kliničkoj praksi u odvikavanju od pušenja koristi se veoma veliki broj nefarmakoloških metoda, ali je u ovom procesu veoma važna motivacija pušača. Razvijen je veliki broj skala pomoću kojih se procenjuje motivacija pušača za odvikavanje od pušenja. U okviru primarne zdravstvene zaštite neophodno je proceniti i podsticati motivaciju pacijenta za odvikavanje od pušenja, osvestiti važnost zdravih stilova života. Timskim radom, evaluacijom, podrškom i osnaživanjem pušača i njegove porodice, šansa za postizanje cilja se povećava.

### LITERATURA

1. WHO. WHO report on the global tobacco epidemic, 2017: monitoring tobacco use and prevention policies. Geneva: World Health Organization; 2017.[Internet]. Available from: [https://www.who.int/tobacco/global\\_report/2017/en](https://www.who.int/tobacco/global_report/2017/en).
2. Jafari A, Rajabi A, Gholian-Aval M, Peyman N, Mahdizadeh M, Tehrani H. National, regional, and global prevalence of cigarette smoking among women/females in the general population: a systematic review and meta-analysis. *Environ Health Prev Med*. 2021;26(1):5.
3. Čanković S, Ukropina S, Mijatović Jovanović V, Tamaš T, Nićiforović Šurković O, Čanković D. Prevalencija pušenja duvana i elektronskih cigareta među učenicima srednjih škola u Novom Sadu. *Medicinski pregled*. 2018;71(11-12):349-54.
4. Petrović V, Čurčić L, Rožek Mitrović T, Višnjjevac D. Pušenje cigareta adolescenata sa osvrtom na porodični uticaj na razvoj ove navike. *Timočki medicinski glasnik*. 2017;42(1):12-7.
5. Wu W, Zhang R, Jin Y, Lu Y, Lu Z, Li T et al. Cancer trends and risk factors in China over the past 30 years (1990-2019). *J Cancer*. 2023;14(10):1935-45.
6. Caliri AW, Tommasi S, Besaratinia A. Relationships among smoking, oxidative stress, inflammation, macromolecular damage, and cancer. *Mutat Res Rev Mutat Res*. 2021;787:108365.
7. Noguchi S, Ishimaru T, Fujino Y, Yatera K, Tabuchi T. Association of cigarette smoking with increased use of heated tobacco products in middle-aged and older adults with self-reported chronic obstructive pulmonary disease, asthma, and asthma-COPD overlap in Japan, 2022: the JASTIS study. *BMC Pulm Med*. 2023;23(1):365.
8. Djekic Malbasa J, Kovacevic T, Zaric B, Dugandzija T, Nikolin B, Radovanovic D et al. Decade of lung cancer in Serbia: tobacco abuse and gender differences. *Eur Rev Med Pharmacol Sci*. 2023;27(7):3105-16.
9. Malignant tumors in Republic of Serbia 2019. Serbian cancer registry. Institute of Public Health of Serbia "Dr Milan Jovanović Batut" 2021.[Internet]. Available from: <https://www.batut.org.rs/download/publikacije/maligniTumoriURepubliciSrbiji2019.pdf>
10. Khalil RB, Aoun-Bacha Z, Hlais S, Richa S. Smokers' knowledge about smoking-related health problems in Lebanon. *Subst Use Misuse*. 2014;49(3):270-6.
11. Ishikawa Y, Terao C. The Impact of Cigarette Smoking on Risk of Rheumatoid Arthritis: A Narrative Review. *Cells*. 2020;9(2):475.
12. Shiri R, Karppinen J, Leino-Arjas P, Solovieva S, Viikari-Juntura E. The association between smoking and low back pain: a meta-analysis. *Am J Med* 2010;123:35.

13. LaRowe LR, Ditre JW. Pain, nicotine, and tobacco smoking: current state of the science. *Pain*. 2020;161(8):1688-93.
14. Kastaun S, Brose LS, Scholz E, Viechtbauer W, Kotz D. Mental Health Symptoms and Associations with Tobacco Smoking, Dependence, Motivation, and Attempts to Quit: Findings from a Population Survey in Germany (DEBRA Study). *Eur Addict Res*. 2022;28(4):287-96.
15. Bacha ZA, Layoun N, Khayat G, Allit S. Factors associated with smoking cessation success in Lebanon. *Pharm Pract (Granada)*. 2018 ;16(1):1111.
16. Sari IW. The Effect of Peer Group Support on Motivation to Quit Smoking Among Adolescents. *Journal of Health Sciences*,2022; 15(02):120-5.
17. Nian T, Guo K, Liu W, Deng X, Hu X, Xu M et al. Non-pharmacological interventions for smoking cessation: analysis of systematic reviews and meta-analyses. *BMC Med*. 2023;21(1):378.
18. Jackson SE, Kotz D, West R, Brown J. Moderators of real-world effectiveness of smoking cessation aids: a population study. *Addiction*. 2019;114(9):1627-38.
19. Maiwald P, Bischoff M, Lindinger P, Tinsel I, Sehlbrede M, Fichtner UA et al. The Effect of Interactivity, Tailoring, and Use Intensity on the Effectiveness of an Internet-Based Smoking Cessation Intervention Over a 12-Month Period: Randomized Controlled Trial. *J Med Internet Res*. 2023;25:47463.
20. Agaku I, Egbe C, Ayo-Yusuf O. Utilisation of smoking cessation aids among South African adult smokers: findings from a national survey of 18 208 South African adults. *Fam Med Community Health*. 2021;9(1):000637.
21. Šagrić Č, Radulović O, Bašić S, Bogdanović M, Marković R, Tasić A. Odkikavanje od pušenja u studentskoj populaciji. *Acta medica Medianae*. 2006;45(2):34-40.
22. Peña S, Ilmarinen K, Kestilä L, Ruokolainen O, Ollila H, Parikka S et al. Changes in prevalence and sociodemographic correlates of tobacco and nicotine use in Finland during the COVID-19 pandemic. *Eur J Public Health*. 2023;33(5):844-50.
23. Jackson SE, Cox S, Shahab L, Brown J. Prevalence of use and real-world effectiveness of smoking cessation aids during the COVID-19 pandemic: a representative study of smokers in England. *Addiction*. 2022;117(9):2504-14.
24. Hussain S, Sreeramreddy CT. Smoking cessation behaviors and reasons for use of electronic cigarettes and heated tobacco products among Romanian adults. *Sci Rep*. 2022;12(1):5446.
25. Kastaun S, Brown J, Kotz D. Association between income and education with quit attempts, use of cessation aids, and short-term success in tobacco smokers: A social gradient analysis from a population-based cross-sectional household survey in Germany (DEBRA study). *Addict Behav*. 2020;111:106553.
26. Girvalaki C, Filippidis FT, Kyriakos CN, Driezen P, Herbec A, Mons U et al; The EUREST-PLUS Consortium OBO. Perceptions, Predictors of and Motivation for Quitting among Smokers from Six European Countries from 2016 to 2018: Findings from EUREST-PLUS ITC Europe Surveys. *Int J Environ Res Public Health*. 2020;17(17):6263.
27. Dhumal GG, Pednekar MS, Gupta PC, Sansone GC, Quah AC, Bansal-Travers M et al. Quit history, intentions to quit, and reasons for considering quitting among tobacco users in India: findings from the Tobacco Control Policy Evaluation India Wave 1 Survey. *Indian J Cancer*. 2014;51(1):39-45.
28. Papadakis S, Katsounou P, Kyriakos CN, Balmford J, Tzavara C, Girvalaki C et al; EUREST-PLUS consortium. Quitting behaviours and cessation methods used in eight European Countries in 2018: findings from the EUREST-PLUS ITC Europe Surveys. *Eur J Public Health*. 2020;30(3):26-33.
29. Lund M, Lund I. Smoking cessation aids and strategies: a population-based survey of former and current smokers in Norway. *BMC Public Health*. 2022;22(1):631.
30. Herbec A, Zatoński M, Zatoński WA, Janik-Koncewicz K, Mons U, Fong GT et al; EUREST-PLUS consortium. Dependence, plans to quit, quitting self-efficacy and past cessation behaviours among menthol and other flavoured cigarette users in Europe: The EUREST-PLUS ITC Europe Surveys. *Tob Induc Dis*. 2019;16:19.
31. El Asmar ML, Laverty AA, Vardavas CI, Filippidis FT. How do Europeans quit using tobacco, e-cigarettes and heated tobacco products? A cross-sectional analysis in 28 European countries. *BMJ Open*. 2022;12(4):059068.
32. Jackson SE, Beard E, Michie S, Shahab L, Raupach T, West R, Brown J. Are smokers who are regularly exposed to e-cigarette use by others more or less motivated to stop or to make a quit attempt? A cross-sectional and longitudinal survey. *BMC Med*. 2018;16(1):206.
33. Pešić I, Danilović M, Šćekić Š, Gvozdenović B. Motivacija za odkikavanje od pušenja i uspešnost odkikavanja. *Pneumon*, 2004:41.
34. Heatherton TF, Kozlowski LT, Frecker R C, Fagerstrom KO. The Fagerstrom test for nicotine dependence: A revision of the Fagerstrom Tolerance Questionnaire. *British Journal on Addiction*, 1991;86: 1119–27.
35. de Granda-Orive JI, Pascual-Lledó JF, Asensio-Sánchez S, Solano-Reina S, García-Rueda M, Martínez-Muñiz MÁ et al. Is the motivation to quit smoking greater if the smoker is going to quit smoking of their own free will or when advised by a health professional? *Tob Induc Dis*. 2022;20:47.
36. Richmond R, Kehoe L, Webster I. Multivariate models for predicting abstinence following intervention to stop smoking by general practitioners. *Addiction* 1993;88:1127–35.
37. Borchardt B, Kastaun S, Pashutina Y, Viechtbauer W, Kotz D. Motivation to stop smoking in the German population between 2016 - 2021 and associated factors: results from a repeated cross-sectional representative population survey (German Study on Tobacco Use, DEBRA study). *BMJ Open*. 2023;13(5):068198.