ECRONICON OPEN ACCESS

EC CARDIOLOGY
Review Article

Nicotine Addiction and Smoking Cessation Programs in Private Practice and the Public Health Sector: A Comprehensive and Practical Review of How Populations Become Addicted to Nicotine and Programs for Tobacco Smoking Cessation

Nicholas A Kerna[1,2]*, John V Flores[3,4], Hilary M Holets[3,4], Abdullah Hafid[5], Kevin D Pruitt[6,7], ND Victor Carsrud[8], Uzoamaka Nwokorie[9], Joseph Anderson II[10], Sahalia Rashid[11], Zeyad Albadri[12] and Dorathy Nwachukwu[13]

[1]*SMC–Medical Research, Thailand*
[2]*First InterHealth Group, Thailand*
[3]*Beverly Hills Wellness Surgical Institute, USA*
[4]*Orange Partners Surgicenter, USA*
[5]*Wayne State University, USA*
[6]*Kemet Medical Consultants, USA*
[7]*PBJ Medical Associates, USA*
[8]*Lakeline Wellness Center, USA*
[9]*University of Washington, USA*
[10]*International Institute of Original Medicine, USA*
[11]*All Saints University School of Medicine, Dominica*
[12]*Department of Clinical and Experimental Medicine, Faculty of Health Sciences, Linkoping University, Linkoping, Sweden*
[13]*Georgetown American University, Guayana*

***Corresponding Author:** Nicholas A Kerna, (mailing address) POB47 Phatphong, Suriwongse Road, Bangkok, Thailand 10500. Contact: medpublab+drkerna@gmail.com.

Received: July 11, 2021; **Published:** July 31, 2021

DOI: 10.31080/eccy.2021.08.00843

Abstract

Nicotine in tobacco increases dopamine release, which boosts mood and provides a sense of stress release. However, tobacco's availability in numerous forms for consumption makes it difficult to control addiction—even after programs promoting the aware-ness of its harm to people, society, and the economy. The influence of family and friends is considered a common reason for starting a nicotine habit. Thus, even though tobacco addiction is a global problem, it is challenging to tobacco's notable economic advantages with public health concerns. The following research provides a comprehensive overview of tobacco addiction, including its history, the current situation, its impact on society and the economy, international guidelines, in-clinic, public health smoking cessation re-gimes and programs, and government legislation to reduce tobacco use in the general population.

Keywords: *Addiction; Cancer; Cessation Programs; Nicotine; Public Health; Tobacco*

Abbreviations

5As: Ask, Advise, Assess, Assist, and Arrange; 5 Rs: Relevance, Risk, Rewards, Repetitions, and Roadblocks; ASSOCHAM: Indian Associated Chambers of Commerce and Industry; CAGE: Cut-Annoyed-Guilty-Eye; COPD: Chronic Obstructive Pulmonary Disease; CPAA: Cancer Patients AIDS Association; GATS: Global Adult Tobacco Survey; GYTS: Global Youth Tobacco Survey; HRIDAY-SHAN: Health-Related Information Dissemination Amongst Youth–Student Health Action Network; NRT: Nicotine Replacement Therapy; NTCP: National Tobacco Con-

trol Program; RNTCP: Revised National Tuberculosis Control Program; STU: Smokeless Tobacco Use (E-cigarettes); WHO: World Health Organization; WHO FCTC: WHO Framework Convention on Tobacco Control

Introduction

The harm of tobacco and its smoking byproducts are well recognized. According to the World Health Organization (WHO), about 100 million people lost their lives from tobacco use in the twentieth century. There may be more than 8 million annual deaths related to tobacco by 2030 [1]. The World Bank projected that almost 82,000–99,000 children and adolescents begin smoking every day and that approximately half of this population is likely to maintain the habit during adulthood [2]. A surveillance report concluded that 250 million children could die from tobacco-related diseases [3].

Tobacco addiction continues to persist despite the widespread awareness of its adverse effects. Its availability for consumption in multiple forms adds to the challenge of quitting. The smokeless form is more addictive than the regular type due to the release of nitrosamines.

Once a population has been introduced to tobacco, they develop a '"culture of dependence". Although the origin of tobacco use is recognized in Native American culture, nicotine was historically smoked, chewed, drunk, or used as snuff. The Iroquois and Cherokee Native Americans used tobacco for the cure of toothaches and earaches. It was also exchanged as gifts, offerings to God, and to improve fertility. In Europe, tobacco may have been advanced by the sailors returning from the Americas in the late 15th and early 16th centuries. Following this, by the 17th century, smoking and tobacco cultivation spread rapidly to India, China, Japan, Southeast Asia, the Middle East, and West Africa [4].

History

Humans have been using tobacco since 600 CE [5]. The Caribbeans introduced tobacco to Columbus, who brought it to Europe, while the Portuguese introduced it it to India [6]. Nicotine, the primary addictive agent, was isolated from tobacco leaves in 1828 CE [7]. Tobacco was smoked or consumed orally; rolled paper cigars and cigarettes were developed in the 19th century.

Tobacco is derived from the leaves of the genus Nicotiana, a plant of the nightshade family, originally found in North and South America. Evidence suggests that the Mayans smoked tobacco leaves during religious ceremonies during the first century before EC. Subsequently, the ceremonial use of tobacco spread to the native tribes of the Mississippi Valley as the Mayans migrated to the valley between 470 and 630 CE [8]. The excavation of archaeological sites, dating back to before 3500 CE, in Mexico and Peru has uncovered tobacco seeds [9]. Shamans of America also use tobacco for religious rites. Surprisingly, tobacco consumption was recommended to treat medical conditions , such as asthma, earache, intestinal irregularities, fever, sore eyes, depression, insect bites, and burns [10].

However, the experts and authorities became aware of the adverse effects of tobacco consumption. In the 16th century, King James I of England, Shah Abbas of Persia, and the Mughal emperor Jahangir of India were aware of the detrimental effects of tobacco consumption. Jahangir passed ordinances banning tobacco smoking. Khalil Pasha of Iran declared that “anybody caught smoking tobacco would have his lips cut and eyes taken out” [11,12].

Discussion

Current situation

Public health researchers have studied the tobacco's effects for decades. Unfortunately, the overall picture remains grim. Table 1 presents some of the global and national surveys on tobacco use.

According to the Global Youth Tobacco Survey (GYTS), 14.6% of the 24,000 students aged 13–15 were tobacco users in 2009 [12]. According to the Global Adult Tobacco Survey (GATS) 2009–2010, 34.6% of people aged < 15 years were current tobacco users. There were more smokeless tobacco (SLT) users (25.9%) than regular tobacco users (14%) [13]. The smokeless form of tobacco constitutes about one-fifth of world tobacco consumption. About 25.9% of adults use SLT [14]. The glaring percentages of tobacco users per global data indicate the severity of the situation. In middle-income families, the mean age at which a child starts smoking is 8.5 years, and 83% of users begin smoking before 18 years of age [15]. Another study in the United States, published in 2014, found a smoking prevalence of 7–15.9% among 2- to 15-year-old boys [16]. The 2003 Canadian Tobacco Use Monitoring Survey reported that 1.4 million (28% of young adults) individuals in Canada were current smokers. The prevalence of daily smoking increased as an adolescent smoker reached adulthood, growing from 8% to 22%. The survey also found that one-fifth of smokers started the habit even before 18 years of age [17].

Table 1: *Global and national surveys on tobacco use.*

Impact on the society

The association between socioeconomic conditions and tobacco consumption is well recognized. The habit is more profound among the poor and drains money from their income to care for tobacco-related habits. Tobacco users have to bear not only medical costs but also the associated morbidity and mortality. Furthermore, tar, nicotine, and nitrosamine, the active ingredients of tobacco, are highly carcinogenic [18].

A systematic review published in 2018 reported a significantly positive association of smokeless tobacoo use (STU) of e-cigarettes with oral and esophageal cancers. It included 80 studies from the Southeast Asian, East Mediterranean, and European regions. Studies from the European region have also reported a positive association of STU with pancreatic cancer [19]. WHO statistics on mortality from tobacco use are alarming. The global mortality rate is 8 million people per year, of which 7 million deaths are due to direct tobacco use and 1.2 million deaths are due to exposure to passive (second-hand) smoking [20].

According to the WHO, there were 100 million premature deaths associated with tobacco use in the 20th century worldwide. Furthermore, the organization warned that the number could reach 1 billion in the 21st century [21]. According to the Centers for Disease Control and Prevention (CDC), in the United States, premature deaths associated with tobacco use are > 480,000, leading to a minimum of $133 billion in direct medical care costs each year a $170 billion loss in productivity [22].

Cigarettes and other types of tobacco smoking are the main risk factors for chronic obstructive lung disease (COPD). In general, 90% of men and 80% of women die from smoking-induced lung carcinoma [23]. Passive smoking also contributes to the development of COPD [24]. About 600,000 people die each year from passive smoking, and about one-third of non-smoking adults are exposed to second-hand cigarette smoke. The Global Adult Tobacco Survey (GATS) found that 52% of adults are exposed to passive tobacco at home [13]. Passive smoking can cause cardiovascular diseases, lung cancer, asthma, and other respiratory diseases, as well as sudden infant death syndrome [25].

STU causes cancers of the lips, oral cavity, pharynx, and the digestive, respiratory, and intrathoracic organs. Furthermore, the amount and duration of tobacco use are directly correlated with oral cancer [26].

Common factors associated with the initiation of the cigarette smoking habit

The influence of family and friends is the most common factor driving the initiation of tobacco use. A longitudinal study found that parents or older siblings smoking increases the likelihood that a child or younger sibling follows the pattern [27].

In a tertiary care hospital-based in Delhi, India, among the 307 patients registered in the cardiology department, 48% were tobacco users. In addition, the family history of tobacco use was positive in an astounding 81% of patients [28]. A meta-analysis of 58 studies concluded that the relative odds that children would start smoking increased significantly if at least one of the parents or a sibling is a smoker [29]. If tobacco consumption begins in the adolescence molding stage, the habit is more likely to develop dependence [30]. Fetuses from mothers who are smokers demonstrate a craving for nicotine after birth, and the child tends to become a smoker as an adolescent [31].

Nicotine in tobacco provides a sense of relief from stress. Blood nicotine levels rise rapidly at the start of cigarette use, declining soon after. Nicotine increases dopamine release, which boosts mood and provides a sense of mild euphoria. As nicotine levels drop and euphoria drops, a smoker is psychologically and physiologically compelled to smoke the next cigarette [32].

Studies report psychological and physiological evidence of stress relief attributed to cigarette smoking [33]. Lawless., *et al*. (2015) conducted a retrospective study among 62 smokers, finding a strong positive association between perceived stress and nicotine withdrawal symptoms. They concluded that it is essential to relieving a smoker of stress to experience fewer withdrawal symptoms [34]. The metabolic rate is higher in smokers than in non-smokers, requiring people, especially women, to initiate and continue the habit during weight management [35].

Tobacco and its economic contribution

Global statistics show that 33 million people cultivate tobacco, and at least 50% work in producing, distributing, and selling tobacco products. In addition, 10 million people work in industries providing logistic support to these tobacco industries. Thus, for many countries, tobacco taxation is a significant revenue source [36]. Similarly, in the UK, the revenue from tobacco taxes during 202–2021 was 9.96 billion British pounds [37].

Economic loss due to tobacco consumption

There are arguments that tobacco contributes significantly to a country's economy regardless of the health consequences. However, this is not the reality. In the "tobacco block" (six states in the Southeast United States) only 1.6% of jobs are related to the tobacco industry. A US Department of Agriculture economist argued that tobacco plays only a minor role in states' economies in the United States [38].

However, it is also recognized that—in some countries—the number of people who depend on tobacco for their livelihood is significant. At the same time, people believe that tobacco causes a significant increase in health care costs, leading to a burden on the countries financial situation. In the United States, 6–8% of health care resources are used to treat tobacco-related diseases [39].

Legislation to control tobacco smoking

The WHO Framework Convention on Tobacco Control (WHO FCTC) aims to reduce tobacco consumption and to curtail tobacco-related diseases' mortality and morbidity burden. The World Health Assembly adopted the guideline in May 2003. The agency has developed national and international guidelines to help smokers quit the habit and non-smokers avoid the harmful habit [40]. The MPOWER package constitutes six tobacco control policies (Table 2).

• Monitoring tobacco use and prevention policies
• Protecting people from tobacco smoke
• Offering help to quit tobacco use
• Warning everyone about the dangers of tobacco
• Enforcement of a ban on tobacco advertising, promotion, and sponsorship
• Raising taxes on tobacco

Table 2: *Tobacco control policies listed in the MPOWER package [41].*

Figure 1. The 5As (ask, advise, assess, assist and arrange) and 5 Rs (relevance, risk, rewards, repetitions, and roadblocks) are part of the tobacco cessation program (Figure 1) [42].

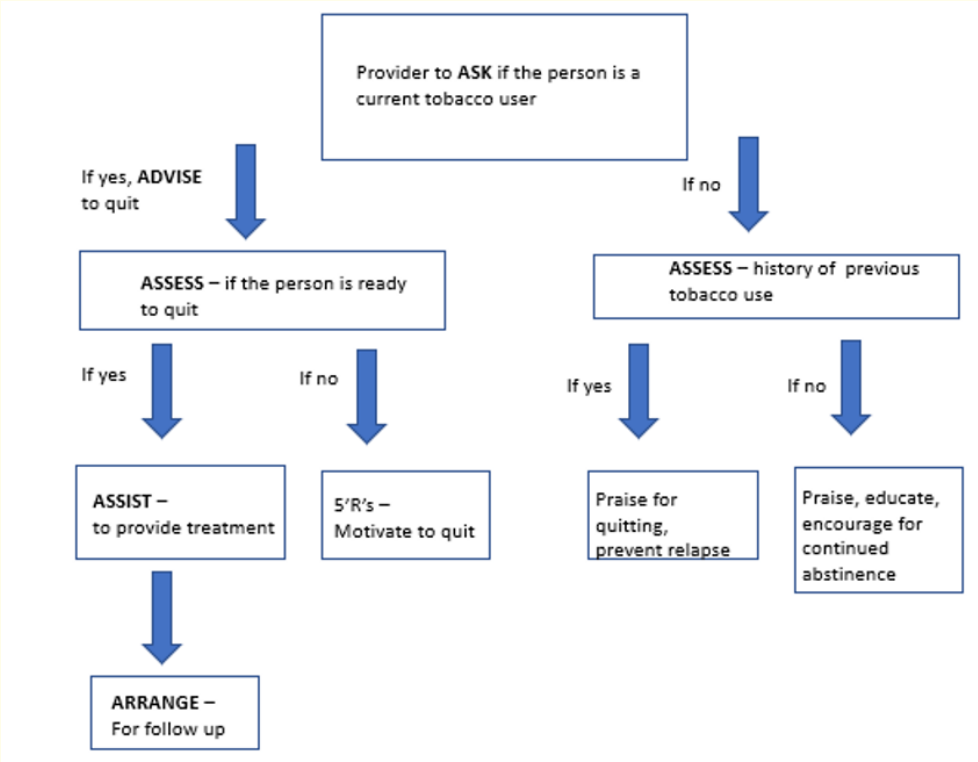

Figure 1: *Intervention algorithm for quitting tobacco – The 5As [70].*

Practical initiatives to curb tobacco consumption

It is deemed urgent to limit the threat of tobacco addiction. The reasons are many and do not include only the health of citizens. The cost of life, labor, and economic downfall is related to tobacco consumption and its harmful effects. There have been about 100 million premature deaths due to tobacco use in the 21st century, which may increase to about one billion in the future. The more alarming fact is that mortality will be higher among tobacco-addicted youth, who contribute substantially to the global economy [43]. Cigarette use can cause the premature death of 1 in 2 smokers, half of which occurs between 35 and 69 years of age [44].

A 10% increase in cigarette prices would result in a 2.5–5% reduction in its demand [45]. Jha., *et al*. (2000) reported that a 10% price increase would reduce smoking by 4% and 8% in high-income and low- and middle-income countries, respectively [46]. A report from China estimated that a 10% increase in cigarette prices would decrease consumption by up to 5.4% or 6.6% [47]. A 2010 study from India suggested that a 10% increase in *beedi* (see Supplementary Note) or cigarette prices could reduce consumption by 9.2% or 3.4%, respectively [48].

Australia follows an innovative practice, warning smokers of the dangers. Cigarettes have warnings related to deaths caused by smoking and its impact on health. Adolescents find such forms of advertisements helpful in keeping them away from cigarettes [49].

The national tobacco control program

Most countries have implemented nationwide tobacco control programs to prevent initiation, encourage quitting, reduce passive smoking, and control tobacco-related diseases and deaths. These programs include national and local campaigns, such as health communication interventions, tobacco use and dependence treatment interventions, guidelines, surveillance, and the compilation of statistical data. In 1999, the US CDC's Office of Smoking and Health launched the National Tobacco Control Program (NTCP) [50].

The UK's new tobacco control program aims to reduce 15-year-old smokers to 3%, adult smokers to 12%, and the disparity in smoking prevalence during pregnancy to 6% by the end of 2022 [51]. In the United States, the Tobacco Control Act authorizes the FDA to control tobacco products' manufacturing, distribution, and marketing. In addition, there are specific guidelines to restrict the marketing and sale of tobacco products among youths [52].

Interventions for tobacco cessation

It is necessary to assess the severity of nicotine dependence of an addicted individual before initiating tobacco cessation therapy. The Cut-Annoyed-Guilty-Eye (CAGE) questionnaire helps to screen people with addictive disorders. It has been revised to evaluate smoking behaviors [53].

Pharmacotherapy as an adjunct to behavioral therapy improves smoking cessation rates by 25–30%. These agents are categorized into two classes: drugs that decrease craving (e.g. bupropion, selegiline, and nortriptyline) and those that substitute nicotine (e.g. nicotine gum, patches, inhaler, spray, and lozenges). Nicotine replacement therapy (NRT) acts by decreasing craving and reducing withdrawal symptoms by providing a fixed supply of nicotine. However, relapse or non-compliance is not uncommon, emphasizing the importance of repeated contact counseling.

Contact counseling to support permanent smoking cessation is achieved by establishing community outreach clinics, providing interventions at schools, colleges, and workplaces, and mobilizing youth to help their peers. Interventions in workplaces have shown encouraging results and reasonable cessation rates [54].

Outreach initiatives are also distributed through telephone counseling, dedicated quitlines, and mobile and web-based programs [55]. Withdrawal symptoms are a deterrent to attempts to quit smoking. According to the DSM-5 criteria, typical withdrawal symptoms are irritability, anger, frustration, anxiety, depressed mood, difficulty concentrating, increased appetite, insomnia, and restlessness [56].

Nicotine withdrawal symptoms can be classified as affective, somatic, and cognitive symptoms. Of these, anxiety, anhedonia, depression, dysphoria, hyperalgesia, and irritability are affective symptoms. In addition, tremors, bradycardia, gastrointestinal discomfort, and increased appetite are considered somatic symptoms. Symptoms, such as difficulty concentrating and impaired memory, are considered cognitive symptoms [57].

The common NRTs are detailed in Table 3 (below). Certain NRTs require a physician's prescription. For example, in the United States, nicotine gum, lozenges, and patches are available over the counter, whereas inhalers and nasal sprays require a prescription [58].

Tobacco cessation programs can be achieved successfully through the availability of NRTs, the affordability of treatment, and supportive government policies. Since 1999, people seeking NRTs for smoking cessation have been reimbursed through the United Kingdom's National Health Service. The impact of this initiative has been overwhelming, and people seeking NRT increased from 25% in 1999 to 61% in 2002 [64] (Table 3).

NRT type	Mechanism of action and dosage	Adverse effects and precautions
Nicotine gums [58]	Nicotine gums: • Slowly increase plasma nicotine levels compared to a cigarette. • Reduce inhaled nicotine bolus, decreasing the addictive potential of tobacco use. • Recommended Dosage. • 2-mg gum pieces for those using < 25 cigarettes/day. • 4-mg gum pieces for those using > 25 cigarettes/day. • One gum piece every 1 - 2h for the first six weeks, followed by one gum piece every 2 - 4h for two weeks until week 7 - 9, and then one gum piece every 4 - 8h for another two weeks. • Coffee and fruit juices decrease nicotine absorption and should be avoided before and after gum use.	Mouth sores, upset stomach, and hiccups. Nicotine gums can produce physical dependence, and craving may not be completely relieved.
Nicotine lozenges [59]	*Nicotine lozenges*: • Available in 2 and 4 mg tablets. The higher-dose lozenge targets highly dependent smokers. • Deliver 25% more nicotine than nicotine gum.	Mouth sores, hiccups, nausea, sore throat, headache, heartburn, and dizziness

Transdermal patches [60]	Transdermal patches:
	• Are available as 16- or 24-hour delivery systems.
	• 24-h delivery system:
	  • For those who smoke > 10 cigarettes/day, the dosage is as follows: 21 mg patch/day for the first 6 weeks, 14 mg patch/day for the next 2 weeks, and 7 mg patch/day for another 2 weeks.
	  • For those who smoke < 10 cigarettes a day, the dose is as follows: 14 mg patch/day for the first 6 weeks, followed by 7 mg patch/day for another 2 weeks.
	• 16-h delivery system: the recommended dose is 15 mg patch/day or 6 weeks.
	The patches are easy to administer, require less frequent dosing, and may be combined with other NRTs.
		Skin irritation and sleep disturbances

Nasal solution [61]	Nasal solution • It is available in vials; a drop is to be applied into each nostril. • Demonstrates rapid and efficient absorption. • Helps to achieve maximum venous nicotine levels in 4-15 min. • Recommended dose: 1 - 2 doses/h for 8 weeks; a minimum of 8 doses/day and a maximum of 40 doses/day for 3 months. • It has to be tapered after weeks 9 – 14.	Runny nose and irritation, tear, sneezing, and rhinitis.

Sublingual tablets [64]	Sublingual tablets • Recommended dose: 2-mg tablets, 16 - 24/day (maximum of 30 tablets/day) for people with a high level of addiction. • Recommended dose: 8 - 12 tablets/day for 8 – 12 weeks for low-dependency individuals. • Gradual tapering is recommended.	Insomnia and sore mouth
E-cigarettes [65]	E-cigarettes • Produce a cigarette-like vapor that contains low levels of nicotine and a base liquid of propylene glycol, glycerol, and water. • The US FDA does not recommend the use of e-cigarettes.	
Bupropion [66]	Bupropion: • The FDA approves it as a first-line treatment for the cessation of tobacco use. • It may be used for people with/without depression, although more effective in people with depression. • The drug must be started while the habit is ongoing, with a target date to stop smoking in 2 weeks. • Recommended dose: 150 mg once a day for 3 days, then increased to 150 mg twice a day for 2 months. • Must be continued for 9-12 weeks.	Not to be used in individuals with a history of seizures, severe head trauma, and eating disorders.
Nortriptyline [67]	Nortriptyline: • It is used as a second-line medication for tobacco cessation. • Recommended dose: 75-100 mg/day for 8-12 weeks.	
Clonidine [68]	The drug reduces withdrawal symptoms caused by smoking cessation.	Dose-dependent dry mouth and sedation
Varenicline [69]	Varenicline: • It is used for long-term relapse prevention and dependence on smokeless tobacco. • It has to be initiated 1-2 weeks before the target quit date. • Recommended dose: 0.5 mg once a day for the first 3 days, 0.5 mg twice a day up to day 7, then 1 mg twice a day up to the end of week 12. The drug can be continued for another 12 weeks at 1 mg twice a day.	Nausea, headache, vomiting, flatulence, insomnia, and abnormal dreams

Table 3*: Nicotine replacement therapies: mechanism of action, dosage forms, and adverse events.*

Tobacco cessation set-ups

Tobacco cessation services can be established in hospitals and medical colleges. Various departments set up such services, especially those with a high possibility of encountering addicted patients, such as dentistry, medicine, surgery, ENT, psychiatry, community medicine, tuberculosis, and pulmonary diseases [71]. A dedicated counseling and treatment team may comprise trained physicians, counselors

or social workers, nurses, and pharmacists. WHO and national tobacco control guidelines can be distributed to organizations associated with healthcare professionals. A randomized trial by Roche., *et al*. (1996) found that medical students can help individuals quit tobacco use if provided specialized training on smoking cessation intervention skills [70,71].

Physicians can support smoking cessation only when the patient is willing and cooperative. Typically, general physicians may not have the expertise or time to help their patients quit smoking. Therefore, there is a need for specialized training on smoking cessation intervention during medical education or clinical practice, also recommended by the WHO.

Contraindications to NRT

The liver metabolism of certain drugs is influenced by NRTs (nicotine). NRTs may decrease serum levels of clozapine, olanzapine, imipramine, fluvoxamine, caffeine, theophylline, tacrine, propranolol, flecainide, and pentazocine. Cimetidine slows nicotine elimination, enhancing the effect of NRT [63].

The US Public Health Service prohibits NRTs for pregnant women and adolescents using STUs [82]. There is no conclusive evidence on the safety of NRTs in pregnancy. A meta-analysis, comprising five studies, reported on the lack of statistically significant differences between cohorts when studied for preterm birth, placental abruption, and birth weight. Three studies did not show differences in average birth weight, while two studies reported a risk of higher average birth weight with NRT. One study reported preterm delivery as an adverse effect of NRTs [72].

The transdermal patch has been classified as a Category C drug by the FDA [79]. Caution must be exercised when recommending NRTs to patients < 18 years of age and those with angina, reports of myocardial infarction in the past two weeks, and arrhythmia. Cautious use in pregnant women is also advised [65].

Conclusion

Several significant factors contribute to cigarette smoking and nicotine addiction. Thus, differing from past attempts to reduce nicotine consumption, current practices suggest a more individualized approach to the control of tobacco use and the prevention of adverse effects caused by such. There is a vast geographical disparity associated with tobacco use. However, the media and the tobacco manufacturing industry seem to have a close association (conspiracy) to keep this most unhealthy and socially detrimental habit prospering financially. Vivid advertisements influence young people, retain current tobacco users, and add new customers to the growing tobacco-consuming base. Therefore, tobacco control programs must be individualized, considering diverse personal and social factors, and provide well-designed public health care initiatives that address prevention for first-time users and cessation for those suffering from nicotine dependence and withdrawal.

Conflict of Interest Statement

The authors declare that this paper was written in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

Supplentary Note

Bidis (pronounced bee-dees and also known as beedis) are small, hand-rolled cigarettes made of tobacoo and wrapped in tendu or temburni leaf (Diospyros melanoxylon, a plant native to Asia). In India, *bidi* cigarettes are cheaper and more heavily consumed than traditional commercial cigarettes" [xx].

References

1. Laniado-Laborín R. “Smoking and Chronic Obstructive Pulmonary Disease (COPD). Parallel Epidemics of the 21st Century”. *International Journal of Environmental Research and Public Health* 6.1 (2009): 209-224. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2672326/

2. Jha P and Chaloupka FJ. “Curbing the Epidemic: Governments and the Economics of Tobacco Control. Washington DC: The World Bank (1999). https://tobaccocontrol.bmj.com/content/8/2/196

3. Warren CW., *et al*. "Tobacco use in youth: a surveillance report from the Global Youth Tobacco Survey Project". *Bulle-tin of World Health Organization* 78 (2000): 868-876. https://pubmed.ncbi.nlm.nih.gov/10994259/

4. Britannica Encyclopedia, A social and cultural history of smoking (2021).

5. Hughes JR. "Nicotine-related disorders". In: Sadock BJ, Sadock VI, editor. Kaplan and Sadock's Comprehensive Textbook of Psychiatry. 7. Philadelphia, Lippincott: Williams and Wilkins (2000).

6. Gupta VM and Sen P. "Tobacco: the addictive slow poison (editorial)". *Indian Journal of Public Health* 45 (2001): 75-81. https://pubmed.ncbi.nlm.nih.gov/11917325/

7. Greden JF. "Caffeine and tobacco dependence". In: Kaplan HI, Freedman AM, Sadock BJ, editor. Comprehensive Textbook of Psychiatry. 3. Baltimore: Williams and Wilkins (1980).

8. Mishra S and Mishra MB. "Tobacco: Its historical, cultural, oral, and periodontal health association". *Journal of International Society of Preventive and Community Dentistry* 3.1 (2013): 12-18. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3894096/

9. Luthra U., *et al*. "Tobacco control in India: Problems and solutions". In: Gupta PC, Hamner JE, Murti PR (eds). Control of tobac-co-related cancers and other diseases. International Symposium, 1990. Bombay: Oxford University Press (1992): 2417.

10. Devine TM Jordan Goodman. "Tobacco in history: The Cultures of dependence". *Scottish Economic and Social History* 5.1 (1995). https://www.routledge.com/Tobacco-in-History-The-Cultures-of-Dependence/Goodman/p/book/9780415116695

11. Chattopadhayya A. "Harmful effects of tobacco noticed in history". *Bulletin of Insti-tute of History of Medicine, Hyderabad* 23 (1993): 53-58. https://pubmed.ncbi.nlm.nih.gov/11639383/

12. Gajalakshmi V and Kanimozhi CV. "A Survey of 24,000 Students Aged 13–15 Years in In-dia: Global Youth Tobacco Survey 2006 and 2009". *Tobacco Use Insights* 3 (2010): 23-33. https://journals.sagepub.com/doi/full/10.1177/1179173X1000300001

13. Global Adult Tobacco Survey (GATS) India: 2009-2010 (2021).

14. GATS. Fact Sheet India: 2009–2010. Ministry of Health and Family Welfare, Gov-ernment of India; 2010 (2021).

15. Ahmed NU., *et al*. "Prevalence and correlates of initiation of smoking behavior among preteen black and white children". *Journal of the National Medical Association* 96 (2004): 200-208. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2594973/

16. Arrazola RA., *et al*. "Tobacco use among middle and high school students-United States, 2013". *Morbidity and Mortality Weekly Report* 63 (2014): 1021-1026. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6345a2.htm

17. Hammond D. "Smoking behaviour among young adults: beyond youth prevention". *Tobacco Control* 14 (2005): 181-185. https://pubmed.ncbi.nlm.nih.gov/15923468/

18. Ashley DL., *et al*. "Tobacco-specific nitrosamines in tobacco from US brand and non-U.S. brand cigarettes". *Nicotine and Tobacco Research* 5.3 (2003): 323-331. https://pubmed.ncbi.nlm.nih.gov/12791527/

19. Gupta S., *et al*. "Relationship between the type of smoke-less tobacco and risk of cancer: A systematic review". *Indian Journal of Medical Research* 148.1 (2018): 57-76. https://pubmed.ncbi.nlm.nih.gov/30264755/

20. WHO. Leading cause of death, illness, and impoverishment (2021). https://www.who.int/news-room/fact-sheets/detail/tobacco

21. WHO. The MPOWER package, warning about the dangers of tobacco. Geneva; WHO Report on The Global Tobacco Epidemic, 2011 (2021).

22. Xu X., *et al*. "Annual healthcare spend-ing attributable to cigarette smoking: an update". *American Journal of Preventive Medicine* 48.3 (2015): 326-333. https://pubmed.ncbi.nlm.nih.gov/25498551/

23. WHO. A global epidemic of addiction and disease. Tobacco: deadly in any form or disguise". *WHO Tobacco Free Initiative* (2021). https://www.who.int/health-topics/tobacco#tab=tab_1

24. Jindal SK., *et al*. "A multicentric study on the epidemiology of chronic obstructive pulmonary disease and its relationship with tobacco smoking and environmental tobacco smoke exposure". *The Indian Journal of Chest Diseases and Allied Sciences* 48.1 (2006): 23-29. https://pubmed.ncbi.nlm.nih.gov/16482948/

25. WHO. WHO Report on The Global Tobacco Epidemic, 2009. Implementing smoke-free environments". *Fresh and Alive Mpower* (2021). https://www.who.int/teams/health-promotion/tobacco-control/who-report-on-the-global-tobacco-epidemic-2019

26. Goud ML., *et al*. "Epidemiolog-ical Correlates between Consumption of Indian Chewing Tobacco and Oral Cancer". *European Journal of Epidemiology* 6.2 (1990): 219-222. https://pubmed.ncbi.nlm.nih.gov/2361546/

27. Vuolo M and Staff J. "Parent and Child Cigarette Use: A Longitudinal, Multigenerational Study". *Pediatrics* 132.3 (2013): e568-e577. https://pediatrics.aappublications.org/content/132/3/e568

28. Dwivedi S., *et al*. "The intergenerational transmission of tobacco habit: Role of parents and the family". *Journal of Family Medicine and Primary Care* 5.2 (2016): 373-377. https://www.researchgate.net/publication/309294978_The_intergenerational_transmission_of_tobacco_habit_Role_of_parents_and_the_family

29. Leonardi-Bee J., *et al*. "Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: a systematic review and meta-analysis". *Thorax* 66 (2011): 847e855. https://pubmed.ncbi.nlm.nih.gov/21325144/

30. Zickler P. "Early nicotine initiation increases the severity of addiction, vulnerability to some effects of cocaine". *National Institute on Drug Abuse* 19 (2004): 8. https://archives.drugabuse.gov/news-events/nida-notes/2004/07/early-nicotine-initiation-increases-severity-addiction-vulnerability-to-some-effects-cocaine

31. O'Callaghan FV., *et al*. "Prediction of adolescent smoking from family and social risk factors at 5 years, and maternal smok-ing in pregnancy and at 5 and 14 years". *Addiction* 101 (2006): 282-290. https://pubmed.ncbi.nlm.nih.gov/16445557/

32. Zhou FM., *et al*. "Endogenous nicotinic cholinergic activity regulates do-pamine release in the striatum". *Nature Neuroscience* 4.12 (2001): 1224-1229. https://www.nature.com/articles/nn769

33. Choi D and Ota S S. "Does cigarette smoking relieve stress? Evidence from the event-related potential (ERP)". *International Journal of Psychophysiology* 98.3 (2015): 470-476. https://www.researchgate.net/publication/283115082_Does_cigarette_smoking_relieve_stress_Evidence_from_the_event-related_potential_ERP

34. Lawless MH., *et al*. "Perceived stress and smoking-related behaviors and symptomatology in male and female smokers". *Addict Be-hav* 51 (2015): 80-83. https://pubmed.ncbi.nlm.nih.gov/26240941/

35. Brownell KD. "Dieting and the search for the perfect body: Where physiology and culture collide". *Behavior Therapy* 22 (1991): 1-12. https://www.sciencedirect.com/science/article/abs/pii/S0005789405802394

36. S Chapman. "Curbing the epidemic: governments and the economics of tobacco con-trol". *BMJ* 320.7228 (2000): 192. https://pubmed.ncbi.nlm.nih.gov/10634758/

37. Statista, Tobacco duty tax receipts in the United Kingdom from 2000/01 to 2020/21 (2021).

38. Gale F. "Tobacco dollars and jobs. Tobacco Situation and Outlook. US Department of Agriculture, Economic Research Service, TBS-239 (1997): 37-34.

39. Gale F. "Economic structure of tobacco-growing regions. Tobacco Situation and Out-look. US Department of Agriculture, Economic Research Service, TBS-241 (1998): 40-47.

40. WHO Framework Convention on Tobacco Control. World Health Organiza-tion (2003). http://apps.who.int/iris/bitstream/handle/10665/42811/9241591013.pdf;jsessionid=22932D45501661498DF4AF78F7AF7D20?sequence=1

41. Warner KE., *et al*. "The medical costs of smoking in the United States: estimates, their validity, and their implications". *Tobacco Control* 8 (1999): 290-300. https://pubmed.ncbi.nlm.nih.gov/10599574/

42. WHO. The MPOWER package, warning about the dangers of tobacco. Geneva; 2011". WHO Report on The Global Tobacco Epidemic (2021). https://apps.who.int/tobacco/global_report/2011/en/index.html

43. US Army Medical Command and The Veterans Health Administration. VA/DoD Clinical Practice Guideline for the management of Tobacco Use (2004).

44. WHO, Report on tobacco control in India (2021).

45. Peto R. "Smoking and death: The past 40 years and the next 40". *BMJ* 309 (1994): 9379. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2541135/

46. Chaloupka FJ and Warner KE. "The economics of smoking". In: Newhouse JP, Cuyler AJ, editors. The handbook of health economics. New York: North-Holland (2000). https://www.nber.org/papers/w7047

47. Jha P., *et al*. "The taxation of tobacco products". In: Jha P, Chaloupka FJ, editors. Tobacco control in developing coun-tries. Oxford: Oxford University Press (2000): 237-272. https://www.researchgate.net/publication/252543580_The_taxation_of_tobacco_products

48. Hu TW and Mao Z. "Effects of cigarette tax on cigarette consumption and the Chinese economy". *Tobacco Control* 11.2 (2002): 105-108. https://tobaccocontrol.bmj.com/content/11/2/105

49. John RM., *et al*. "The Economics of Tobacco and Tobacco Taxation in India. Paris: International Union Against Tuberculosis and Lung Disease (2010). https://www.tobaccofreekids.org/assets/global/pdfs/en/India_tobacco_taxes_report_en.pdf

50. Drovandi A., *et al*. "Australian School Student Percep-tions of Effective Anti-tobacco Health Warnings". *Front Public Health* 6 (2018): 297. https://www.researchgate.net/publication/328341467_Australian_School_Student_Perceptions_of_Effective_Anti-tobacco_Health_Warnings

51. The United States Centers for Disease Control and Prevention, Tobacco Control Programs (2021).

52. Gov.UK. Policy paper. Smoke-free generation: tobacco control plan for England (2021). https://www.gov.uk/government/publications/towards-a-smoke-free-generation-tobacco-control-plan-for-england

53. US FDA, Family Smoking Prevention and Tobacco Control Act - An Overview (2021). https://www.fda.gov/tobacco-products/rules-regulations-and-guidance/family-smoking-prevention-and-tobacco-control-act-overview

54. Lairson DR., *et al*. "Screening for patients with alcohol problems: severity of patients identified by the CAGE". *The Journal of Drug Education* 22.4 (1992): 337-352. https://pubmed.ncbi.nlm.nih.gov/1484331/

55. Mishra GA., *et al*. "Call centre employees and tobacco dependence: making a difference". *Indian Journal of Cancer* 47.1 (2010): 43-52. https://pubmed.ncbi.nlm.nih.gov/20622414/

56. Murthy P and Saddichha S. "Tobacco cessation services in India: recent developments and the need for expansion". *Indian Journal of Cancer* 47.1 (2010): 69-74. https://pubmed.ncbi.nlm.nih.gov/20622418/

57. American Psychiatric Association. Diagnostic and statistical manual of mental dis-orders: DSM 5". American Psychiatric Association; Washington (2013).

58. Heishman SJ., *et al*. "Meta-analysis of the acute effects of nico-tine and smoking on human performance". *Psychopharmacology* 210.4 (2010): 453-469. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3151730/

59. Heart attack, Medline plus (2021).

60. West R., *et al*. "Impact of UK policy initiatives on use of medicines to aid smoking cessation". *Tobacco Control* 14.3 (2005): 166-171. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1748027/

61. Jiloha RC. "Pharmacotherapy of smoking cessation". *Indian Journal of Psychiatry* 56.1 (2014): 87-95. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3927255/

62. Nicotine Lozenge, Web Med (2021).

63. Stead LF., *et al*. "Nicotine replacement therapy for smoking cessa-tion". *Cochrane Database of Systematic Reviews* 11 (2012): CD000146. https://pubmed.ncbi.nlm.nih.gov/23152200/

64. Glover ED., *et al*. "A com-parison of a nicotine sublingual tablet and placebo for smoking cessation". *Nicotine and Tobacco Research* 4 (2002): 441-450. https://pubmed.ncbi.nlm.nih.gov/12521403/

65. Tobacco Dependence Treatment Guidelines, National Tobacco Control Programme, Govt of India (2021). https://ntcp.nhp.gov.in/assets/document/Guideline-manuals/Tobacco-Dependence-Treatment-Guidelines.pdf

66. Prochazka AV., *et al*. "A randomized trial of nortriptyline for smoking cessation". *Archives of Internal Medicine* 158.18 (1998): 2035-2039. https://pubmed.ncbi.nlm.nih.gov/9778204/

67. Gourlay SG., *et al*. "Clonidine for smoking cessation". Cochrane Database of Systematic Reviews 3 (2004): CD000058. https://pubmed.ncbi.nlm.nih.gov/15266422/

68. Jain R., *et al*. "A Double-Blind Placebo-Controlled Randomized Trial of Varenicline for Smokeless Tobacco Dependence in India". *Nicotine and Tobacco Research* 16.1 (2014): 50-57. https://pubmed.ncbi.nlm.nih.gov/23946326/

69. Tobacco Cessation Centre, NIMHANS. 2009. Starting tobacco cessation services (2021).

70. Roche AM., *et al*. "Teaching smoking cessation skills to senior medical students: a block-randomized controlled trial of four different approaches". *Preventive Medicine* 25.3 (1996): 251-258. https://pubmed.ncbi.nlm.nih.gov/8781002/

71. Fiore MC., *et al*. "Treating Tobacco Use and Dependence-2008 Update. Rockville, Md, Public Health Services, US Department of Health and Human Ser-vices (2008). https://www.ncbi.nlm.nih.gov/books/NBK63952/

72. Myung S., *et al*. "Efficacy and safety of pharmacotherapy for smoking cessation among pregnant smokers: a meta-analysis". *BJOG: An International Journal of Obstetrics and Gynaecology* 119 (2012): 1029-1039. https://pubmed.ncbi.nlm.nih.gov/22780818/

73. Martin T. "ICOTINE USE THE INSIDE OF CIGARETTES The Risks of Smoking Bidi Cigarettes". 2021. Retrieved from: https://www.verywellmind.com/are-bidi-cigarettes-safe-to-smoke-2825285.

Volume 8 Issue 8 August 2021