REVIEW ARTICLE

Tobacco Harm Reduction: A Targeted Strategy for High-Risk Smokers in Tobacco Control

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Abstract

Tobacco harm reduction (THR) is an approach aimed at diminishing the adverse health effects of tobacco use by offering alternatives to combusted products. While complete abstinence remains the ideal outcome, a comprehensive understanding of THR may accelerate smoking reduction. This paper explores the role of THR in reducing smoking prevalence, its potential benefits, limitations, and concerns regarding public health impact. A narrative review of available literature and historical evidence was conducted to examine the principles of THR, its implications for smokers unable or unwilling to quit, and the associated ethical and public health considerations. Evidence suggests that absolute bans often promote black markets and illicit cigarette trade. For smokers who cannot achieve cessation, safer nicotine delivery alternatives may reduce morbidity and mortality. However, concerns exist about potential undermining of tobacco prevention efforts, particularly among adolescents, as well as the risk of widespread uptake among non-smokers. In addition, as alternative nicotine products are primarily manufactured by the tobacco industry, commercial interests strongly influence their promotion. THR may be considered at the individual level only when complete cessation is unachievable. Its use in tobacco control should be restricted to high-risk smokers, while safeguarding against the proliferation of nicotine use among non-smokers.

Key words: Nicotine, smoking, tobacco cessation, tobacco harm reduction

INTRODUCTION

The utilization of tobacco represents a formidable danger to both systemic and oral health, precipitating a diverse spectrum of diseases that may culminate in disability or death, attributable to its deleterious chemical components, and poses a considerable risk to public health within the Indian milieu. Epidemiological evidence indicates that the use of tobacco contributes to the untimely demise of an estimated one-third to one-half of its consumers, typically leading to a reduction in life expectancy of approximately 15 years.[1,2] "The burden of death and illness due to tobacco consumption in the United States is primarily attributed to cigarettes and other burned tobacco items; swiftly stopping their usage would greatly reduce this burden" according to the 2014 Surgeon General's Report.[3] The most effective strategy for alleviating the detrimental effects of smoking is unequivocally the total cessation of smoking and other tobacco products. However, the formidable nature of this addiction renders cessation immensely difficult. Consequently, in addition to promoting cessation, various effective tobacco control strategies are available, such as elevating the price of cigarettes, implementing anti-smoking media campaigns, and enforcing smoking bans; these interventions have significantly contributed to a marked decline in cigarette consumption.[3,4] Our understanding of the role of tobacco harm reduction (THR) in reducing the use of combusted tobacco products is comparatively limited. A comprehensive understanding of this concept may facilitate the enhancement of these strategies through the integration of a THR framework, potentially accelerating the reduction in smoking prevalence. Hence, this narrative review outlines the development of harm reduction in tobacco control, on-going debates around it, its potential applications in smoke cessation programs, its prospects for the future, and its importance for public health.

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Received: 20-08-2025
Revised: 24-09-2025
Accepted: 30-09-2025

WHAT IS THR?

"Tobacco harm reduction is defined as reducing harms and lowering overall mortality and morbidity, without entirely removing tobacco and nicotine use."[5] THR accepts alternative methods to lessen harm among tobacco users, even though total abstinence from tobacco or never starting to use tobacco is the ideal result. Harm reduction is a supplementary strategy that does not replace efforts to prevent tobacco use and assist in achieving cessation. All smokers, regardless of their desire or ability to stop using tobacco, are given the chance to lessen the negative effects of tobacco use, which has been recognized as a human rights issue.[6-9] Furthermore, because THR may help smokers who experience severe health inequities, it has been seen as a social justice problem. For example, smoking prevalence is higher among those with lesser educational attainment or those living below the poverty line than among the overall population.[10] This demographic exhibits heavier smoking patterns, demonstrates a similar likelihood of attempting to quit, yet is less likely to achieve successful cessation, and faces a heightened risk for lung cancer compared to smokers with higher socioeconomic status and educational attainment. A comparable situation is noted among smokers with mental health disorders.[11-13] Due to the high rates of smoking and the difficulties in quitting faced by these groups, availability of harm reduction products might serve as a method to reduce health inequalities. The role of THR in the wider framework of tobacco control continues to be a topic of significant discussion. Tobacco control community has split into two camps over the THR argument. One group has severe concerns about THR, while other group thinks that lower-risk products like e-cigarettes will cause a disruption in the cigarette business. An objective assessment of the facts based on statistics might be beneficial to the frequently emotive argument.[14]

WHY BANNING TOBACCO PRODUCTS DO NOT WORK?

The prohibition of both cigarettes and smoke-free nicotine products undermines public health objectives as it neglects the complexities inherent in addiction, consumer behavior, and harm reduction strategies. Historical evidence indicates that absolute bans lead to the emergence of black markets, unregulated products, and persistent consumption rather than cessation. Individuals who were more over incapable or reluctant to refrain from smoking are deprived of safer alternatives, thereby exacerbating illicit cigarette trade and hazardous do-it-yourself nicotine consumption. Rather than mitigating harm, such prohibitions eliminate regulated, lower-risk options, complicating the efforts of smokers to transition away from combustible tobacco. A harm reduction paradigm – providing safer alternatives while simultaneously discouraging smoking – has demonstrated markedly greater efficacy in diminishing smoking prevalence and associated health issues.[15,16]

WHY THERE IS A NEED FOR ALTERNATIVE PRODUCTS?

The necessity for alternative nicotine a product arises from the reality that not all smokers can or will successfully quit, and the provision of safer options significantly mitigates smoking-related morbidity and mortality. Conventional cessation strategies, such as nicotine patches and gums, exhibit limited effectiveness, whereas various harm reduction commodities – encompassing nicotine pouches e-cigarettes, and snus – present a pragmatic and less deleterious avenue for smokers to disengage from combustible tobacco. Nations like Sweden, where alternative products are extensively utilized, report the lowest smoking prevalence and smoking-related illnesses in Europe, thereby substantiating the notion that the provision of alternatives constitutes a more efficacious public health initiative relative to prohibition or abstinence-only strategies.[15,16]

NICOTINE – A MISUNDERSTOOD MOLECULE

Despite nicotine's potential to induce dependence, it does not instigate disease. The substance itself is not responsible for cancer, pulmonary disease, cardiovascular disease, or cerebrovascular accidents and has been safely utilized in medicinal applications to assist individuals in ceasing smoking for many years. The most pressing public health challenge is that nearly one-fifth of individuals consume nicotine through cigarette smoking. Unfortunately, pervasive myths regarding nicotine persist among both healthcare professionals and the general populace. Extensive research has long corroborated this assertion, and nicotine has been incorporated into pharmaceutical formulations for decades. Consequently, as a harm-reduction instrument, nicotine serves as an exceedingly valuable substitute for combustible tobacco.[16]

EVOLUTION OF THE PRODUCTS

History of low-tar and the low-nicotine yield cigarettes adds to the scepticism surrounding THR. Cigarette producers started producing low-yield cigarettes and actively marketing them when research showed a connection between smoking and a number of ailments. They used terms like "light," "ultra-light," and "mild" to classify cigarette sub-brands. Ventilated pores in the filter, designed to disperse the smoke, were incorporated into cigarette shapes. Smokers changed the way they smoked, adopting "compensatory" smoking, which includes smoking more

heavily, blocking the ventilation holes, and smoking more cigarettes overall. As a result, the decrease in machine yields did not correspond with a corresponding decrease in health risk. As research advanced, it was shown that, in contrast to their higher-yield counterparts, low-yield cigarettes did not significantly reduce exposure levels to nicotine and other toxicants.[17-21]

It was claimed that cigarette manufacturers had deceived the public into believing that "low tar," "light," and "ultralight" cigarettes were a means of reducing the harmful health effects of smoking and, therefore, a replacement for quitting, despite knowing for decades that these cigarettes offered no health advantages over full-flavored cigarettes.[4,22,23]

Around this period, the beneficial effects associated with harm reduction from snus, a form of smokeless tobacco (SLT) prevalent in Sweden, were being disseminated through scholarly publications. In both historical and contemporary contexts, Swedish snus has been shown to confer a diminished risk for certain malignancies, non-fatal cardiovascular conditions, and respiratory illnesses in comparison to conventional cigarettes.[4] The escalation in the utilization of snus has been largely ascribed to individuals who smoke employing snus as a cessation aid. In addition, it was shown that the chance of switching from snus to smoking was far lower than the chance of switching from non-smoking to smoking, supporting the claim that snus does not supposedly serve as a gateway product to smoking. Nonetheless, certain stakeholders in tobacco control express apprehensions due to the fact that snus is not devoid of risk, and the aggregate prevalence of tobacco consumption remains comparatively elevated in Sweden. The phenomenon known as the "Swedish Experience" prompted cigarette manufacturers in the United States to initiate the marketing of "snus" products.[4] It is essential to acknowledge that formulations of SLT products exhibit considerable variability (including the types of tobacco utilized and additional constituents), as do the concomitant health risks. Users of Swedish SLT products classified as snus, for example, had an incidence of cancer that is similar to that of non-users. But in a number of other countries, using SLT products is linked to a markedly increased risk of pancreatic, oesophageal, and oral cancers. This trend is particularly pronounced in India, where SLT-related oral cancer stands as a predominant cause of cancer-associated mortality among males, with occurrence rates ranking among the highest globally.[24-27]

It was seen as further deleterious situation where another new type of nicotine delivery device, which tobacco industry refers to as "Heat-Not-Burn" (HNB), is also gaining popularity, which is supported by the aggressive marketing tactics used by several well-known tobacco brands in the market. The HNB tobacco products are classified as non-combusted cigarettes that heat the tobacco using an electronic system instead of burning it. The HNB device uses technology similar to that of e-cigarettes, but instead of using e-solution or e-liquid, it uses dry and processed tobacco the main source of nicotine. However, it was claimed that 90–95% decrease in hazardous and possibly hazardous chemicals and toxicity linked to HNB products is not supported by empirical data.[28-30]

THR: A BENEFIT OR RISK?

Concerns have been articulated regarding the potential compromise of tobacco prevention initiatives, particularly among adolescents, as well as cessation endeavors and the overarching objective of eradicating all forms of tobacco use. In addition, inquiries have been raised about the necessity of harm reduction strategies in achieving a rapid decline in mortality and morbidity attributable to tobacco consumption. A key factor to acknowledge is that alternative nicotine delivery products are mainly manufactured by the tobacco industry, which has a significant financial motivation to distribute these products widely to a diverse range of people, including both smokers and non-smokers. The launch of numerous products seems to indicate an effort by cigarette companies to maintain tobacco consumption instead of reducing the risks tied to smoking.[4,31]

Spread of goods akin to e-cigarettes has led and created a wider gap between people who believe that e-cigarettes are a "disruptive" technology that might swap regular cigarettes and people who are worried that there might be more hazards associated with them than advantages.

The primary objective was to formulate a meticulously crafted strategic plan for tobacco control that would optimize public health advantages while mitigating tobacco-related detriments in the swiftly changing marketplace, simultaneously striving to favor the preservation of thousands of lives through facilitating admittance and cheering smokers who are either reluctant or unable to cease usage to engage with less harmful products, rather than solely focusing on shielding a new generation from tobacco dependence. In light of this contentious discourse, food and drug administration (FDA) unveiled an inclusive framework for nicotine and tobacco directive in 2017, which has encompassed the acknowledgment and clarification of the potential role that comparatively fewer detrimental tobacco products could assume in enhancing public health.[31]

Subsequently, there was a dramatic surge in the prevalence of e-cigarette utilization among adolescents. This escalation prompted U.S. Surgeon General, also FDA Commissioner regarding characterizing e-cigarette consumption as youth epidemic. Predominant apprehension regarding repercussions for e-cigarettes on young individuals began to overshadow concerns pertaining to adult smokers who were in pursuit of methods to diminish harm. Health and Human Services Secretary Alex Azar stated, "Today's action seeks

to achieve the appropriate public health equilibrium by allowing e-cigarettes to serve as a possible alternative for adults utilizing combustible tobacco, while also making sure these products do not lead to nicotine addiction among young people."[32]

"A study released in the American Journal of Public Health by 15 past presidents of the Society for Research on Nicotine and Tobacco (SRNT), an organization known for supporting anti-tobacco efforts, indicates that there is "substantial evidence" that e-cigarettes effectively help adults stop smoking. The researchers emphasize that vaping could save the lives of cigarette smokers and help alter societal perceptions of it.[33]

The collective urged for equilibrium in response to adverse media portrayals and political discourse that predominantly emphasize potential hazards of vaping among adolescents – representing the most explicit appeal from scholars till date, as noted by the University of Michigan. The SRNT stands as pre-eminent professional organization globally committed to the study for nicotine, tobacco, and their effects on public health. Promise of vaping as a means to enhance tobacco/smoking cessation has been considerably obscured by media narratives and also policy frameworks that concentrate on conceivable risks vaping poses to youth. Amplifications of these risks have led a significant portion of the American populace, including many smokers, to misguided conviction that vaping is equally or supplementary perilous as compared to traditional smoking.[34,35]

MOVING FORWARD IN THR

How can we reduce the onset of alternative nicotine delivery systems (ANDS) among young people and the associated possible gateway effect, while also maximizing the total cessation of combustible tobacco use, by employing less harmful ANDS, like medicinal nicotine for smokers who cannot or do not want to quit using nicotine? The solution to this query may lie in merging the concepts presented by Benowitz and Henningfield aimed at reducing nicotine levels in cigarettes (and preferably in other combusted products)[36] with Michael Russell's[37] recommendation that products should contain moderate nicotine while significantly decreasing tar levels.

FDA has characterized this methodology as a component of a holistic regulatory framework concerning tobacco and nicotine. Specifically, the FDA is "contemplating a scenario in which cigarettes and other tobacco products would no longer commence or perpetuate dependence or addiction," alongside a vision of a reality "where adults who continue to require or desire addiction in the form of nicotine would procure it from another or the less deleterious sources."[38]

Regulatory frameworks pertaining to SLT may also be evaluated based on their toxicity, attractiveness, potential for addiction, and strategies for marketing and promotion, with the objective of curtailing youth initiation of these products while simultaneously offering current smokers the opportunity to transition to a less harmful alternative.

Ultimately, the lowest level of harm is anticipated to be linked to nicotine products that are regulated by the FDA for medicinal purposes. However, the FDA has adopted a cautious stance toward the approval of any pharmaceutical agents that might possess appeal and pose competition to the addictive nature of cigarettes, leading to the development of only reasonably effectual medications and stagnation in inventive pharmacological therapies. Although pulmonary nicotine delivery systems are currently available for recreational use, a more efficient approval process for novel nicotine replacement therapies (NRTs) could make it easier to introduce them as therapeutic options for quitting smoking without sacrificing safety and efficacy standards. Compared to NRTs, e-cigarettes are more popular for quitting smoking, especially among young adults, which highlights the need for more appealing and efficient solutions.[39]

COMMUNICATION OF RELATIVE RISK

Distributing precise information regarding the comparative risks of various tobacco and nicotine products is crucial for the effectiveness of THR initiatives and has been regarded as a basic human right. Koslowski, for instance, has asserted that access to accurate health information for informed decision-making is a human right for children and adults alike. The values of justice and respect for people serve as the foundation for having access to such information.[8,40]

FUTURE PROSPECTS

Given that tobacco represents a contemporary epidemic, the incorporation of tobacco cessation into the foundational dental curriculum is imperative, and the fundamental training of all dental professionals must become mandatory. Furthermore, it is essential that other health practitioners also engage in training concerning tobacco cessation, with nicotine replacement therapy being accessible at every juncture of patient interaction with healthcare facilities.[41] A consensus exists within the tobacco control community that a primary objective is the expedited eradication of tobacco-related morbidity and mortality. Programs aimed at cessation must assess both the physical and psychological dependence on nicotine among adults to provide more effective counseling for individuals suffering from addiction. THR should be endorsed by practitioners at the individual level solely when complete cessation is unfeasible for the tobacco user. While permitting THR

as an essential part of a comprehensive tobacco control strategy at the societal level, it is vital to maintain focus on optimizing the regulation of combusted tobacco products and ANDS. We must acknowledge that many of the health professionals, tobacco control advocates, and legislators who support harm reduction have good intentions. Their emphasis on the smoker population leads them to perceive harm reduction as a practical method for mitigating the severe health repercussions associated with the tobacco epidemic. Nonetheless, the proliferation of nicotine-containing products among non-smokers is a matter of significant concern. As harm reduction is not suitable for the general population, its application in tobacco control should be restricted to a small group of high-risk smokers.[20] While the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) has played a crucial role in advancing global tobacco control initiatives, establishing a robust and trustworthy link between the enforcement of FCTC regulations and outcomes related to smoking rates and cigarette use has proven challenging. The FCTC empowers countries to determine their own regulations for e-cigarettes and other advanced nicotine items; it does not explicitly prohibit harm reduction strategies. Since the WHO has not supported THR, there are limited healthy alternatives accessible to the 1.3 billion smokers who face a high risk of premature death.[42-44] Researchers from nations such as Germany have recently begun advocating for modifications to the prevailing tobacco control policy, proposing the integration of harm reduction as a complementary approach, thereby offering more substantial support for individuals seeking to quit.[45]

CONCLUSION

Tobacco harm reduction, though not a replacement for complete cessation, represents a pragmatic and ethically important approach to reducing the devastating burden of smoking-related morbidity and mortality. when it is integrated with comprehensive tobacco control policies, accurate risk communication, and safeguards against youth consumption, it can provide high-risk smokers with safer alternatives while advancing broader public health goals.

ACKNOWLEDGMENT

Authors would like to thank research and innovation center of Riyadh Elm University for providing needed help and support.

Registration

This study is registered in research and innovation center of Riyadh Elm University, Riyadh, Saudi Arabia (FRP/2025/586).

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Source of Support: Nil. **Conflicts of Interest:** None declared.