

## Could We Prevent Tobacco Products in Young Populations?

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The well-documented detrimental effects of tobacco on children and adolescents make it imperative to prevent tobacco use in young populations, which is a critical public health objective. Youth are particularly susceptible to nicotine's addictive properties, and they are more susceptible to developing an addiction to tobacco products if they begin using them at a young age, according to research. The reduction of tobacco use among young people can be achieved by implementing evidence-based strategies, including increasing the minimum legal age for purchasing tobacco products, increasing taxation on these products, restricting marketing aimed at youth, and facilitating comprehensive school-based prevention programs, etc. Furthermore, prevention initiatives may be further bolstered by initiatives to encourage smoke-free environments and offer access to smoking cessation resources. In order to effectively prevent tobacco use in young populations and promote healthier outcomes for future generations, it is necessary to target various levels of intervention and involve multiple sectors, including healthcare professionals, educators, policymakers, and community leaders.

**Keywords:** Tobacco Products; Prevention; Young Population; Health Care; Smoking Cessation

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**D**ESPITE efforts to reduce its consumption, tobacco use continues to be a significant public health issue on a global scale (Erhabor et al., 2023; Gil et al., 2024; Ridgway et al., 2015). The prevalence of tobacco use among youthful populations is a particularly concerning aspect (Ahluwalia et al., 2020; Loddenkemper & Kreuter, 2014; Urgent action needed to protect children and prevent the uptake of e-cigarettes., 2024; Warren et al., 2002). The developing minds and bodies of young people render them particularly vulnerable

to the detrimental effects of tobacco products. It is crucial to prevent tobacco use among young people in order to safeguard their health and well-being; however, this presents substantial obstacles.

It has been demonstrated that increasing taxes on tobacco products is an effective strategy for preventing young individuals from developing smoking practice (Adams, 2009)s. Research has demonstrated that the consumption rates of cigarettes and other tobacco products decrease as a result of increased prices,

particularly among youthful individuals who are more price sensitive (Ding, 2003; Geboers et al., 2023; Paraje et al., 2024; Ross & Chaloupka, 2003). Not only does this discourage young individuals from adopting the habit by raising the cost of these hazardous substances, but it also generates revenue that can be allocated to public health initiatives and anti-smoking campaigns (Di et al., 2022; Rayes et al., 2023). Additionally, a significant economic burden that smoking imposes on healthcare systems as a result of related ailments and diseases can be alleviated by imposing a higher tax on tobacco products (Ahmad & Franz, 2007; Contreary et al., 2015; Han et al., 2024). Thus, the implementation of a tobacco tax increase is a proactive and strategic approach to the promotion of public health and the reduction of smoking rates among young people.

Pervasive marketing to prevent tobacco products in young populations is another crucial aspect of public health campaigns aimed at reducing tobacco use among youth (Vardavas, 2010). The marketing strategies employed should utilize a comprehensive approach, including targeted advertising messages across multiple platforms such as social media, television, and print media (Farrelly, 2003; Lim et al., 2024; Wagoner et al., 2019; Zhao et al., 2015). Incorporating persuasive messaging highlights the negative health consequences of smoking, the addictive nature of nicotine, and the financial burden associated with tobacco use can effectively deter young individuals from starting or continuing to smoke (Farrelly, 2003; Farrelly et al., 2017). Additionally, partnerships with schools, community organizations, and healthcare providers can further enhance the reach and impact of these marketing efforts. By actively engaging with young populations through informative and compelling marketing campaigns, we can significantly reduce the prevalence of tobacco use among youth and create a healthier future generation (Ganz & Delnevo, 2020; Hamill et al., 2013).

It is necessary to restrict the use of illicit purchasing methods to prevent the consumption of tobacco products by young individuals to protect public health and decrease the prevalence of smoking among adolescents (Malta et al., 2022; Oliver et al., 2023; Da Silva Reis Dos Santos Ferreira & De Freitas Paúl Reis Torgal, 2010; Sun et al., 2022; Szklo & Cavalcante, 2018). Illicit purchasing, whether through illegal sales or proxy buyers, undermines current regulations intended to reduce tobacco use among young people. Stringent age verification protocols and increased penalties for violations are just a few of the strict enforcement measures that can be implemented to discourage young individuals from obtaining tobacco products through illegal channels (DiFranza, 2011; Lee et al., 2016; Mott et al., 2024). Furthermore, educational campaigns that are directed at both adolescents and retailers can increase awareness of the legal repercussions of selling tobacco to minors and raise awareness of the dangers of underage smoking (Forster & Wolfson, 1998; Lal et al., 2012; Medicine, 1994; Winickoff et al., 2014). Policymakers can protect vulnerable populations from the detrimental consequences of tobacco use and foster a healthier future for the younger generation by effectively restricting illicit purchasing methods.

Peer pressure has a big impact on preventing the use of tobacco products among young people. According to research, adolescents' friends and coworkers have a significant influence

on their smoking behaviors (Haas & Schaefer, 2014; Kobus, 2003; Mott et al., 2024; Simons - Morton & Farhat, 2010; White et al., 2005; Zavala - Arciniega et al., 2024). Peers can assist in discouraging their friends from experimenting with or using tobacco products by promoting anti-tobacco messages and establishing positive examples (Ennett et al., 2008). Social norms within peer groups can also influence the attitudes of individuals toward smoking, and it is more probable that young people will adopt healthier behaviors if their companions do the same (Hoffman et al., 2006; Liu et al., 2017; Tragesser et al., 2006). Effective strategies for preventing the initiation of smoking among adolescents include educating young populations about the hazards of tobacco use and empowering them to resist peer pressure. Peers have the capacity to establish a supportive environment that encourages young individuals to adopt tobacco-free lifestyles by serving as reliable sources of information and encouragement (Ciobanu et al., 2023; Guidelines for School Health Programs to Prevent Tobacco Use and Addiction, 1994).

It is essential to foster socioeconomic equality to prevent the use of tobacco products by young populations. Individuals from lower socioeconomic backgrounds are more susceptible to the use of tobacco products as a result of a variety of factors, such as tension, peer pressure, and inadequate access to education and resources (Atikah et al., 2019; Barreto et al., 2013; Garrett et al., 2014). By addressing the underlying inequalities in society, such as poverty and a lack of opportunities, it is possible to create a more equitable playing field for all people (Jagtap et al., 2013). Increasing access to education and employment opportunities through policy changes, as well as implementing focused campaigns to raise awareness about the risks of tobacco use in vulnerable communities, can accomplish this (Borland, 2013; Mentis, 2017; Vidrine et al., 2009). We can foster a healthier environment for youthful populations and decrease the prevalence of tobacco use among this demographic by promoting socioeconomic equality.

It is crucial that we prioritize the support of parents in their efforts to cease smoking to prevent the use of tobacco products among young people. Children whose parents smoke are more likely to try smoking themselves, thereby perpetuating the cycle of nicotine addiction and associated health risks (Chen et al., 2024; Harvey & Chadi, 2016; Mott et al., 2024; Sims, 2009). The prevalence of tobacco use among adolescents can be effectively reduced, and their long-term health outcomes can be improved by offering resources such as nicotine replacement therapy, counseling, and support groups that are specifically designed for parents. In addition, educating parents about the hazards of secondhand smoke exposure to their children can serve as an additional incentive for them to cease smoking and establish a smoke-free environment in their residences and other locations where children may be present (Tanski & Wilson, 2011; Winickoff et al., 2008). To successfully implement smoking cessation programs that are specifically designed for parents, it is imperative that healthcare professionals and community organizations collaborate. This will ultimately cultivate a healthier future generation that is free of tobacco-related diseases.

To effectively discourage this vulnerable demographic from beginning tobacco use, comprehensive educational initiatives must emphasize the health hazards associated with smok-

ing, such as lung cancer, heart disease, and respiratory ailments (Loddenkemper & Kreuter, 2014; Youths et al., 1994). Educators must ensure that they provide precise information regarding the addictive properties of nicotine and the detrimental effects it can have on one's physical appearance and overall health (Alqahtani et al., 2023; Benowitz, 2008; Benowitz, 2010; Costantino et al., 2024; Torabi & Nakornkhet, 1996; Wu et al., 2023). Furthermore, interactive programs that incorporate real-life scenarios and peer-to-peer discussions can be effective in enhancing confidence in resisting peer pressure and altering attitudes toward tobacco use (Herrmann & McWhirter, 1997). Empowering young people with knowledge and skill-building techniques can contribute to the development of a generation of non-smokers who are informed about the hazards of tobacco products and capable of making well-informed health decisions (Loddenkemper & Kreuter, 2014; Ukwayi et al., 2012).

Advertising campaigns that are specifically designed for adolescents normalize smoking behaviors and establish an allure surrounding tobacco consumption (Vardavas, 2010), thereby increasing its appeal to impressionable youth. The likelihood of young individuals initiating or becoming addicted to smoking can be substantially reduced by restricting the promotion and accessibility of these products (Friend et al., 2001; Youths et al., 1994). The exposure and availability of these harmful substances to juveniles can be mitigated by enforcing more stringent regulations on the sale of tobacco products and limiting the use

of online sales and distribution channels (Chen et al., 2024; Mott et al., 2024). Policymakers and stakeholders need to prioritize the health and well-being of our youth by implementing measures that restrict the marketing strategies employed by tobacco companies and prevent easy access to their products (Henriksen, 2012).

In conclusion, the prevention of tobacco use in juvenile populations is a complex and difficult endeavor; however, it is crucial for the wellbeing and health of these populations. Addressing the marketing and accessibility of tobacco products, peer pressure, social determinants, education, and policy interventions can help create a supportive environment that encourages young people to make healthier decisions. It is vital that we maintain our commitment to the prevention of tobacco use in young populations and collaborate to establish a tobacco-free future for the next generation. Of course, addressing the issue of tobacco use among young populations requires a multifaceted approach that encompasses education, policy changes, community involvement, and innovative solutions. By building on the successes achieved thus far and overcoming the challenges ahead, we can work towards a future where young people are empowered to make healthier choices and tobacco products become a thing of the past in their lives. Together, we can create a world where the next generation is free from the harms of tobacco addiction, ensuring a brighter and healthier tomorrow for all. ■

## References

- Adams, M. (2009). Preventing Children's Tobacco Consumption. *The Economist's Voice*, 6(6). DOI: <https://doi.org/10.2202/1553-3832.1525>
- Ahluwalia, I. B., Wilson, K., & Gorzkowski, J. (2020). Protecting Youth from Tobacco Around the Globe: Evidence to Practice. *Pediatrics*, 146(4), e20201585. DOI: <https://doi.org/10.1542/peds.2020-1585>
- Ahmad, S., & Franz, G. A. (2007). Raising taxes to reduce smoking prevalence in the US: A simulation of the anticipated health and economic impacts. *Public Health*, 122(1), 3-10. DOI: <https://doi.org/10.1016/j.puhe.2007.02.020>
- Alqahtani, J. S., Aldhahir, A. M., Alanazi, Z., Alsulami, E. Z., Alsulaimani, M. A., Alqarni, A. A., Alqahtani, A. S., AlAyadi, A. Y., Alnasser, M., Aldraiwiesh, I. A., Alghamdi, S. M., Almarkhan, H. M., Alsulayyim, A. S., AlRabeeah, S. M., & AlAhmari, M. D. (2023). Impact of Smoking Status and Nicotine Dependence on Academic Performance of Health Sciences Students. *Substance Abuse and Rehabilitation*, 14, 13-24. DOI: <https://doi.org/10.2147/sar.s393062>
- Atikah, A. H. N., Wee, L. H., Zakiah, M. S. N., Chan, C. M. H., Haniki, N. M. M., Swinderjit, J. S., & Siau, C. S. (2019). Factors associated with different smoking statuses among Malaysian adolescent smokers: a cross-sectional study. *BMC Public Health*, 19(S4), 579. DOI: <https://doi.org/10.1186/s12889-019-6857-3>
- Barreto, S. M., De Figueiredo, R. C., & Giatti, L. (2013). Socioeconomic inequalities in youth smoking in Brazil. *BMJ Open*, 3(12), e003538. DOI: <https://doi.org/10.1136/bmjopen-2013-003538>
- Benowitz, N. L. (2008). Pharmacology of Nicotine: Addiction, Smoking-Induced Disease, and Therapeutics. *The Annual Review of Pharmacology and Toxicology*, 49(1), 57-71. DOI: <https://doi.org/10.1146/annurev.pharmtox.48.113006.094742>
- Benowitz, N. L. (2010). Nicotine Addiction. *New England Journal of Medicine*, 362(24), 2295-2303. DOI: <https://doi.org/10.1056/nejmra0809890>
- Borland, R. (2013). Minimising the harm from nicotine use: finding the right regulatory framework. *Tobacco Control*, 22(suppl 1), i6-i9. DOI: <https://doi.org/10.1136/tobaccocontrol-2012-050843>
- Chen, D. T., Grigg, J., & Filippidis, F. T. (2024). European Respiratory Society statement on novel nicotine and tobacco products, their role in tobacco control and "harm reduction." *European Respiratory Journal*, 63(2), 2301808. DOI: <https://doi.org/10.1183/13993003.01808-2023>
- Ciobanu, A., Tarasenko, Y., & Lebedeva, E. (2023). Global Youth Tobacco Survey: prevalence of tobacco use in countries of the WHO European Region. *Tobacco Prevention & Cessation*, 9(Supplement 2), A107. DOI: <https://doi.org/10.18332/tpc/172834>
- Contreary, K. A., Chattopadhyay, S. K., Hopkins, D. P., Chaloupka, F. J., Forster, J. L., Grimshaw, V.,

- Holmes, C. B., Goetzl, R. Z., & Fielding, J. E. (2015). Economic Impact of Tobacco Price Increases Through Taxation. *American Journal of Preventive Medicine*, 49(5), 800-808. DOI: <https://doi.org/10.1016/j.amepre.2015.04.026>
- Costantino, S., Torre, A., Randazzese, S. F., Mollica, S. A., Motta, F., Busceti, D., Ferrante, F., Caminiti, L., Crisafulli, G., & Manti, S. (2024). Association between Second-Hand Exposure to E-Cigarettes at Home and Exacerbations in Children with Asthma. *Children*, 11(3), 356. DOI: <https://doi.org/10.3390/children11030356>
- Da Silva Reis Dos Santos Ferreira, M. M., & De Freitas Paúl Reis Torgal, M. C. L. (2010). Tobacco and Alcohol Consumption among Adolescents. *Revista Latino-Americana De Enfermagem*, 18(2), 255-261. DOI: <https://doi.org/10.1590/s0104-11692010000200017>
- Di, X., Liu, S., Xie, H., Zeng, X., Meng, Z., & Xiao, L. (2022). Cigarette availability and affordability among Chinese youth smokers: Findings from the 2019 China Youth Tobacco Survey. *Tobacco Induced Diseases*, 20, 1-11. DOI: <https://doi.org/10.18332/tid/152511>
- DiFranza, J. R. (2011). Which interventions against the sale of tobacco to minors can be expected to reduce smoking? *Tobacco Control*, 21(4), 436-442. DOI: <https://doi.org/10.1136/tobaccocontrol-2011-050145>
- Ding, A. (2003). Youth are more sensitive to price changes in cigarettes than adults. *The Yale Journal of Biology and Medicine*, 76(3), 115-124. <https://pubmed.ncbi.nlm.nih.gov/15369626>
- Ennett, S. T., Faris, R., Hipp, J., Foshee, V. A., Bauman, K. E., Hussong, A., & Cai, L. (2008). Peer Smoking, Other Peer Attributes, and Adolescent Cigarette Smoking: A Social Network Analysis. *Prevention Science*, 9(2), 88-98. DOI: <https://doi.org/10.1007/s1121-008-0087-8>
- Erhabor, J., Boakye, E., Osuji, N., Obisesan, O., Osei, A. D., Mirbolouk, H., Stokes, A. C., Dzaye, O., El-Shahawy, O., Rodriguez, C. J., Hirsch, G. A., Benjamin, E. J., DeFilippis, A. P., Robertson, R. M., Bhatnagar, A., & Blaha, M. J. (2023). Psychosocial stressors and current e-cigarette use in the youth risk behavior survey. *BMC Public Health*, 23(1), 1080. DOI: <https://doi.org/10.1186/s12889-023-16031-w>
- Farrelly, M. C. (2003). Youth tobacco prevention mass media campaigns: past, present, and future directions. *Tobacco Control*, 12(90001), 35i-347. DOI: [https://doi.org/10.1136/tc.12.suppl\\_1.i35](https://doi.org/10.1136/tc.12.suppl_1.i35)
- Farrelly, M. C., Duke, J. C., Nonnemaker, J., MacMonegle, A. J., Alexander, T. N., Zhao, X., Delahanty, J. C., Rao, P., & Allen, J. A. (2017). Association Between the Real Cost Media Campaign and Smoking Initiation Among Youths — United States, 2014-2016. *MMWR Morbidity and Mortality Weekly Report*, 66(02), 47-50. DOI: <https://doi.org/10.15585/mmwr.mm6602a2>
- Forster, J. L., & Wolfson, M. (1998). YOUTH ACCESS TO TOBACCO: Policies and Politics. *Annual Review of Public Health*, 19(1), 203-235. DOI: <https://doi.org/10.1146/annurev.publhealth.19.1.203>
- Friend, K., Carmona, M., Wilbur, P., & Levy, D. (2001). Youths' Social Sources of Cigarettes: The Limits of Youth-Access Policies. *Contemporary Drug Problems*, 28(3), 507-526. DOI: <https://doi.org/10.1177/009145090102800309>
- Ganz, O., & Delnevo, C. D. (2020). Young Adults as a Tobacco Control Priority Population in the US. *JAMA Network Open*, 3(10), e2019365. DOI: <https://doi.org/10.1001/jamanetworkopen.2020.19365>
- Garrett, B. E., Dube, S. R., Babb, S., & McAfee, T. (2014). Addressing the Social Determinants of Health to Reduce Tobacco-Related Disparities. *Nicotine & Tobacco Research*, 17(8), 892-897. DOI: <https://doi.org/10.1093/ntr/ntu266>
- Geboers, C., Candel, M. J. J. M., Nagelhout, G. E., De Vries, H., Van Den Putte, B., Fong, G. T., & Willemsen, M. C. (2023). Smokers' strategies to reduce tobacco spending: self-reported use and differences across subgroups. Findings from the International Tobacco Control (ITC) Netherlands Survey. *BMC Public Health*, 23(1), 738. DOI: <https://doi.org/10.1186/s12889-023-15678-9>
- Gil, G. F., Anderson, J. A., Aravkin, A., Bhangdia, K., Carr, S., Dai, X., Flor, L. S., Hay, S. I., Malloy, M. J., McLaughlin, S. A., Mullany, E. C., Murray, C. J. L., O'Connell, E. M., Okereke, C., Sorensen, R. J. D., Whisnant, J., Zheng, P., & Gakidou, E. (2024). Health effects associated with chewing tobacco: A Burden of Proof study. *Nature Communications*, 15(1), 1082. DOI: <https://doi.org/10.1038/s41467-024-45074-9>
- Guidelines for School Health Programs to Prevent Tobacco Use and Addiction. (1994). *Journal of School Health*, 64(9), 353-360. DOI: <https://doi.org/10.1111/j.1746-1561.1994.tb06204.x>
- Haas, S. A., & Schaefer, D. R. (2014). With a Little Help from My Friends? Asymmetrical Social Influence on Adolescent Smoking Initiation and Cessation. *Journal of Health and Social Behavior*, 55(2), 126-143. DOI: <https://doi.org/10.1177/0022146514532817>
- Hamill, S., Turk, T., Murukutla, N., Ghamrawy, M., & Mullin, S. (2013). I 'like' MPOWER: using Facebook, online ads and new media to mobilise tobacco control communities in low-income and middle-income countries. *Tobacco Control*, 24(3), 306-312. DOI: <https://doi.org/10.1136/tobaccocontrol-2012-050946>
- Han, J., Mottaleb, K. A., Ng'ombe, J. N., & Durand - Morat, A. (2024). Does sin tax on the legal market facilitate the illicit market? An ex - ante assessment on the US cannabis market. *Journal of the Agricultural and Applied Economics Association*, 3(2), 330-345. DOI: <https://doi.org/10.1002/jaa2.114>
- Harvey, J., & Chadi, N. (2016). Preventing smoking in children and adolescents: Recommendations for practice and policy. *Paediatrics & Child Health*, 21(4), 209-214. DOI: <https://doi.org/10.1093/pch/21.4.209>
- Henriksen, L. (2012). Comprehensive tobacco marketing restrictions: promotion, packaging, price and place. *Tobacco Control*, 21(2), 147-153. DOI: <https://doi.org/10.1136/tobaccocontrol-2011-050416>
- Herrmann, D. S., & McWhirter, J. J. (1997). Refusal and Resistance Skills for Children and Adolescents: A Selected Review. *Journal of Counseling & Development*, 75(3), 177-187. DOI: <https://doi.org/10.1002/j.1556-6676.1997.tb02331.x>
- Hoffman, B. R., Sussman, S., Unger, J. B., & Valente, T. W. (2006). Peer Influences on Adolescent Cigarette Smoking: A Theoretical Review of the Literature.

- Substance Use & Misuse, 41(1), 103-155. DOI: <https://doi.org/10.1080/10826080500368892>
- Jagtap, S., Larsson, A., & Kandachar, P. (2013). Design and development of products and services at the Base of the Pyramid: a review of issues and solutions. *International Journal of Sustainable Society*, 5(3), 207. DOI: <https://doi.org/10.1504/ijssoc.2013.054712>
- Kobus, K. (2003). Peers and adolescent smoking. *Addiction*, 98(s1), 37-55. DOI: <https://doi.org/10.1046/j.1360-0443.98.s1.4.x>
- Lal, P., Wilson, N. C., Srivastava, S., & Millett, C. (2012). Should the Legal Age for the Purchase of Tobacco Be Increased to 21 Years? *Global Heart*, 7(2), 183. DOI: <https://doi.org/10.1016/j.gheart.2012.04.001>
- Lee, J. G. L., Gregory, K. R., Baker, H. M., Ranney, L. M., & Goldstein, A. O. (2016). "May I Buy a Pack of Marlboros, Please?" A Systematic Review of Evidence to Improve the Validity and Impact of Youth Undercover Buy Inspections. *PLoS ONE*, 11(4), e0153152. DOI: <https://doi.org/10.1371/journal.pone.0153152>
- Lim, C. C., Rutherford, B., Gartner, C., McClure-Thomas, C., Foo, S., Su, F., Scheurer, R., Sebayang, S., Chan, G., Stjepanović, D., Fausiah, F., Farassania, G., & Leung, J. (2024). A systematic review of second-hand smoking mass media campaigns (2002-2022). *BMC Public Health*, 24(1). DOI: <https://doi.org/10.1186/s12889-024-18222-5>
- Liu, J., Zhao, S., Chen, X., Falk, E., & Albarracín, D. (2017). The influence of peer behavior as a function of social and cultural closeness: A meta-analysis of normative influence on adolescent smoking initiation and continuation. *Psychological Bulletin*, 143(10), 1082-1115. DOI: <https://doi.org/10.1037/bul0000113>
- Loddenkemper, R., & Kreuter, M. (2014). The Tobacco Epidemic. In *Progress in respiratory research/Progress in research in emphysema and chronic bronchitis/Progress in respiration research*. DOI: <https://doi.org/10.1159/isbn.978-3-318-02657-3>
- Lynch, B. S., & Bonnie, R. J. (1994). *Toward a youth-centered prevention policy. Growing up Tobacco Free - NCBI Bookshelf*. <https://www.ncbi.nlm.nih.gov/books/NBK236758/>
- Malta, D. C., Gomes, C. S., Alves, F. T. A., De Oliveira, P. P. V., De Freitas, P. C., & Andreazzi, M. (2022). The use of cigarettes, hookahs, electronic cigarettes, and other tobacco indicators among Brazilian schoolchildren: data from National School Health Survey 2019. *Revista Brasileira De Epidemiologia*, 25, e220014. DOI: <https://doi.org/10.1590/1980-549720220014>
- Medicine, I. O. (1994). *Growing Up Tobacco Free*. In *National Academies Press eBooks*. DOI: <https://doi.org/10.17226/4757>
- Mentis, A. (2017). Social determinants of tobacco use: towards an equity lens approach. *Tobacco Prevention & Cessation*, 3(March), 7. DOI: <https://doi.org/10.18332/tpc/68836>
- Mott, H., Leatherdale, S. T., & Cole, A. G. (2024). Exploring the association between the proximity to and density around schools of retailers selling IQOS products and youth use of heated tobacco products: evidence from the 2020-2021 COMPASS study. *Health Promotion and Chronic Disease Prevention in Canada*, 44(1), 1-8. DOI: <https://doi.org/10.24095/hpcdp.44.1.01>
- Oliver, B. E., Jones, S. E., Hops, E. D., Ashley, C. L., Miech, R., & Mpofo, J. J. (2023). Electronic Vapor Product Use Among High School Students — Youth Risk Behavior Survey, United States, 2021. *MMWR Supplements*, 72(1), 93-99. DOI: <https://doi.org/10.15585/mmwr.su7201a11>
- Paraje, G., Muñoz, M. F., Wu, D. C., & Jha, P. (2024). Reductions in smoking due to ratification of the Framework Convention for Tobacco Control in 171 countries. *Nature Medicine*, 30(3), 683-689. DOI: <https://doi.org/10.1038/s41591-024-02806-0>
- Rayes, B. T., Alalwan, A., AbuDujain, N. M., Darraj, A., Alammari, M. A., & Jradi, H. (2023). Prevalence, Trends, and Harm Perception Associated with E-Cigarettes and Vaping among Adolescents in Saudi Arabia. *Archives of Clinical and Biomedical Research*, 7(2), 147-156. DOI: <https://doi.org/10.26502/acbr.50170327>
- Ridgway, E., Chaussard, M., Lee, K. A., Kirksey-Jones, C., Ramanandraibe, N., Fouad, H., Caixeta, R., Khoury, R., Sinha, D., & Rarick, J. (2015). Change in Tobacco Use Among 13-15 Year Olds Worldwide between 1999 and 2012—findings from the Global Youth Tobacco Survey. *International Journal of Epidemiology*, 44(suppl\_1), i32. DOI: <https://doi.org/10.1093/ije/dyv097.105>
- Ross, H., & Chaloupka, F. J. (2003). The effect of cigarette prices on youth smoking. *Health Economics*, 12(3), 217-230. DOI: <https://doi.org/10.1002/hec.709>
- Simons-Morton, B. G., & Farhat, T. (2010). Recent Findings on Peer Group Influences on Adolescent Smoking. *The Journal of Primary Prevention*, 31(4), 191-208. DOI: <https://doi.org/10.1007/s10935-010-0220-x>
- Sims, T. H. (2009). Tobacco as a Substance of Abuse. *PEDIATRICS*, 124(5), e1045-e1053. DOI: <https://doi.org/10.1542/peds.2009-2121>
- Sun, J., Xi, B., Ma, C., Li, Z., Zhao, M., & Bovet, P. (2022). Cigarette access and purchase patterns among adolescent smokers aged 12-16 years in 140 countries/territories, Global Youth Tobacco Survey 2010-2018. *Journal of Global Health*, 12, 04101. DOI: <https://doi.org/10.7189/jogh.12.04101>
- Szklo, A. S., & Cavalcante, T. M. (2018). Noncompliance with the law prohibiting the sale of cigarettes to minors in Brazil: an inconvenient truth. *Jornal Brasileiro De Pneumologia*, 44(5), 398-404. DOI: <https://doi.org/10.1590/s1806-37562017000000359>
- Tanski, S. E., & Wilson, K. M. (2011). Children and Secondhand Smoke: Clear Evidence for Action. *Pediatrics*, 129(1), 170-171. DOI: <https://doi.org/10.1542/peds.2011-3190>
- Torabi, M. R., & Nakornkhet, N. (1996). Smoking among Teenagers: Educational Recommendations and Resources. *Journal of Health Education*, 27(sup1), S40-S43. DOI: <https://doi.org/10.1080/10556699.1996.10603246>
- Tragesser, S. L., Aloise-Young, P. A., & Swaim, R. C. (2006). Peer Influence, Images of Smokers, and Beliefs about Smoking among Preadolescent Nonsmokers. *Social Development*, 15(2), 311-325. DOI: <https://doi.org/10.1046/j.1467-9507.2006.00343.x>
- Ukwayi, J. K., Eja, O. F., & Unwanede, C. C. (2012). Peer

- Pressure and Tobacco Smoking among Undergraduate Students of the University of Calabar, Cross River State. *Higher Education Studies*, 2(3), 92-101. DOI: <https://doi.org/10.5539/hes.v2n3p92>
- Urgent action needed to protect children and prevent the uptake of e-cigarettes. (2024). *Saudi Medical Journal*, 45(2), 217-218.
- Vardavas, C. (2010). Key points in preventing tobacco use among adolescents. *Tobacco Induced Diseases*, 8(1), 1. DOI: <https://doi.org/10.1186/1617-9625-8-1>
- Vidrine, J. I., Reitzel, L. R., & Wetter, D. W. (2009). The role of tobacco in cancer health disparities. *Current Oncology Reports*, 11(6), 475-481. DOI: <https://doi.org/10.1007/s11912-009-0064-9>
- Wagoner, K. G., Reboussin, D. M., King, J. L., Orlan, E., Ross, J. C., & Sutfin, E. L. (2019). Who Is Exposed to E-Cigarette Advertising and Where? Differences between Adolescents, Young Adults and Older Adults. *International Journal of Environmental Research and Public Health*, 16(14), 2533. DOI: <https://doi.org/10.3390/ijerph16142533>
- Warren, C., Yach, D., Da Costa E Silva, V. L., Riley, L., Prevention, M., Henson, R., Asma, S., Blanton, C., Caraballo, R., Horton, R., Kahn, D., Lea, V., Lee, J., Lord, L., Staras, S., Tablidilo, M., Zinner, L., Chauvin, J., Nue, L., . . . Marcus, S. (2002). Tobacco use among youth: A cross country comparison. *Tobacco Control*, 11(3), 252-270. DOI: <https://doi.org/10.1136/tc.11.3.252>
- White, M. M., Gilpin, E. A., Emery, S. L., & Pierce, J. P. (2005). Facilitating Adolescent Smoking: Who Provides the Cigarettes? *American Journal of Health Promotion*, 19(5), 355-360. DOI: <https://doi.org/10.4278/0890-1171-19.5.355>
- Winickoff, J. P., Hartman, L., Chen, M. L., Gottlieb, M., Nabi-Burza, E., & DiFranza, J. R. (2014). Retail Impact of Raising Tobacco Sales Age to 21 Years. *American Journal of Public Health*, 104(11), e18-e21. DOI: <https://doi.org/10.2105/ajph.2014.302174>
- Winickoff, J. P., Park, E. R., Hipple, B. J., Berkowitz, A., Vieira, C., Friebely, J., Healey, E. A., & Rigotti, N. A. (2008). Clinical Effort Against Secondhand Smoke Exposure: Development of Framework and Intervention. *PEDIATRICS*, 122(2), e363-e375. DOI: <https://doi.org/10.1542/peds.2008-0478>
- Wu, G., Gong, S., He, Y., & Liu, D. (2023). Smoking is associated with elevated blood level of volatile organic compounds: a population-based analysis of NHANES 2017-2018. *Archives of Public Health*, 81(1), 55. DOI: <https://doi.org/10.1186/s13690-023-01070-x>
- Zavala-Arciniega, L., Hirschtick, J. L., Meza, R., & Fleischer, N. L. (2024). Dual and polytobacco use disparities at the intersection of age, sex, race and ethnicity, and income among US adults. Results from the 2018-2019 TUS-CPS. *Preventive Medicine Reports*, 39, 102631. DOI: <https://doi.org/10.1016/j.pmedr.2024.102631>
- Zhao, L., Palipudi, K. M., Ramanandraibe, N., & Asma, S. (2015). Cigarette smoking and cigarette marketing exposure among students in selected African countries: Findings from the Global Youth Tobacco Survey. *Preventive Medicine*, 91, S35-S39. DOI: <https://doi.org/10.1016/j.yjpm.2015.12.015>

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