



## Sustainable Impact of Health Education Minimizing Smoking Habit Among Adolescent: A Retrospective Study Focusing on Indonesian Students

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### Abstract

Smoking is associated with increased mortality, especially in adolescence, it is seen as a serious public health issue globally. Smoking rates are alarmingly high, especially among 15-year-olds. Adolescent smoking is a major threat to public health in many low- and middle-income countries as well as Indonesia. The aim of this review to find out the different perspective of health education on adolescent smoking in worldwide as well as in Indonesia. Adolescent tobacco use in Indonesia was linked to both sociodemographic and behavioral factors, such as having friends, peers, parents, siblings who were smokers, family dynamics, accessibility, availability, and affordability of tobacco products, social factors, and cigarette advertising. Sociodemographic factors included age, sex, family structure, pocket money, parents' education, attitude, positive perception of the mental health effects of tobacco consumption, and belief that smoking was functional. In this review it is established that education programs provide teenagers with the necessary knowledge to make educated choices and embrace healthier lives by increasing their awareness of the negative impacts of smoking.

**Keywords:** *adolescent smoking, health education, smoking habit*

### Introduction

Worldwide, smoking is seen as a major public health problem due to its correlation with higher mortality, particularly among teenagers. Since smoking is one of the main factors linked to increased mortality, healthcare planners are working hard to reduce cigarette consumption by developing and putting into practice appropriate strategies. Smoking is widely regarded as a serious public health concern (Ehsani-Chimeh *et al.*, 2020; Allen *et al.*, 2018). According to recent data the most recent Health Behaviour in School-aged Children (HBSC) survey, which focuses on the health and well-being of adolescents, has shown that smoking rates are alarmingly high, especially among 15-year-olds. 15% of teenagers in this age range say they have smoked a cigarette at least once in the previous 30 days, and almost one-third (27 percent of girls and 29 percent of boys) say they have attempted smoking (WHO, 2020).

From a geographical perspective, studies have shown that the prevalence of smoking among young people in suburban regions is greater than that of young people in municipalities that are directly under the jurisdiction of the central government and in provincial capitals. The fact that there are significant differences in social culture, economic development level, and civilization level in suburban areas when compared to municipalities directly under the central government and provincial capitals is evidence that regional factors have a significant impact on youth tobacco use. Furthermore, adolescents who live in areas with lower socioeconomic levels are more likely to use substances that

are addictive (Lin *et al.*, 2023). A lack of a solid choice against smoking is what is meant by the term "smoking susceptibility." This lack of a decision often begins at the preparation and/or initiation phases of smoking habit, and it is a major predictor of smoking experimentation throughout the adolescent years. On the other hand, there is a lack of comprehensive documentation about the current worldwide frequency and trends in smoking susceptibility among teenagers (Liu *et al.*, 2024; Liang *et al.*, 2022). Nearly eighty percent of those who have ever smoked cigarettes on a regular basis did so for the first time before they became eighteen years old (Nuyts *et al.*, 2018; Chen *et al.*, 2017). Furthermore, adult smokers began throughout childhood and adolescence, and it is believed that focusing preventive efforts on groups at risk should be a top priority (Lee *et al.*, 2021).

According to recent data a major population of Indonesia are smoker including large no of adolescent (Megatsari *et al.*, 2023). In Indonesia, 20.3% of all students—36.2% of males and 4.3% of girls—use tobacco in either smokeless or smoked form. Of those who use tobacco products now, 18.3% smoke cigarettes. Over half of females (58.3%) smoke less than one cigarette per day, compared to 35.6% who smoke one stick daily. For 43.2% of those who have smoked, the age at which they first started is between 12 and 13 years old (WHO. 2015). Indonesia's Global Youth Tobacco Survey (GYTS) from 2014 revealed that 20.3% of students aged 13 to 15 used tobacco products in any way, 19.4% smoked tobacco, 18.3% smoked cigarettes, and 2.1% used smokeless tobacco (WHO. 2015). There seems to be a growing trend among smokers. Therefore, it is crucial to emphasize a preventive effort that works. Research has shown that teens who start smoking between the ages of 10 and 14 are more likely to keep smoking for the following two years. What's more, teenage smoking habits are a good indicator of future smoking status (Sargent *et al.*, 2017). These numbers need to be taken seriously since teenagers are a valuable asset for the workforce of the future.

## **Discussion**

Adolescent smoking is caused by several things. Students who enter high school between the ages of 12 and 13 are more likely to start smoking because they begin to think that smoking would help them cope with the rules and social dynamics of school (O'Loughlin *et al.* 2017). Despite several studies showing that smoking lowers self-esteem and self-image among those with severe addiction, the students maintain that smoking aids in adapting to the physical, cognitive, and emotional changes occurring (Fithria *et al.* 2018). Adolescents' belief that smoking may eradicate their unpleasant emotions was a risk factor for quitting, and earlier research confirmed that smoking addiction is linked to depression (Garey *et al.* 2017). Teens are susceptible to harmful social impacts from cigarette commercial groups, according to a prior study; hence, it is essential to boost their self-confidence to lessen their sensitivity (Duncan *et al.* 2018). Prior research indicated that school-based smoking prevention initiatives in Indonesia had a positive effect on the smoking rates of teenagers (Tahlil, *et al.* 2013; Ekawati *et al.* 2024). The aim of this review to find out the different perspective of health education on adolescent smoking in worldwide as well as in Indonesia.

### *Prevalence of Smoking among Indonesian Adolescents*

In the neighborhood, smoking is seen to be a social habit. Teenagers believe it to be appropriate and in line with social standards. In Mexico, smoking was often seen as a socially acceptable behavior for males (Fithria *et al.*, 2021; Bird *et al.* 2016). According to a different research, prevention is unlikely to be successful when smoking has been accepted in social networks, particularly among family and friends (Blok *et al.*, 2017). It seems that Muslim youths in Indonesia feel the same way about smoking as teenagers in other nations. Since smoking is seen as a socially acceptable habit, they typically smoke. This is consistent with other studies that found teens were sensitive to their smoking buddies both inside and beyond their larger social networks. Young folks and smoking have a unique interaction. They think smoking may improve their interactions with others (Ennett *et al.*, 2008; Glenn *et al.* 2017). Teens' contradictory attitudes on smoking are influenced by their knowledge of the risks associated with it. On the other hand, warning labels have the short-term potential to discourage smoking. Because teens are a particularly susceptible age group and are swayed by a variety of good and negative factors, it is crucial to educate the public about the health risks associated with smoking.

Despite the fact that smoking has no direct, immediate health impacts, some teenagers nevertheless indulge in this habit (Glock *et al.*, 2012).

#### Overview of Smoking Trends

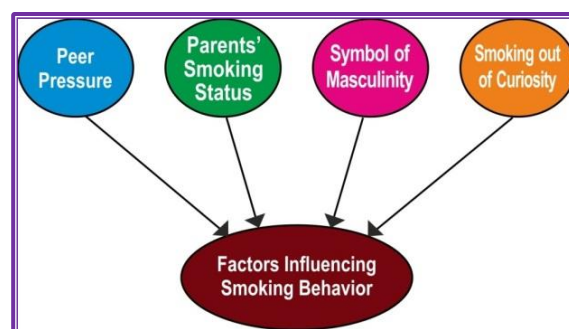
A third of the 60 million adult Indonesians were current smokers, up from 34.7% in 2007, 36.5% in 2013, and 33.8% in 2018. Despite not having signed the Framework Convention on Tobacco Control (FCTC), the Indonesian government has been putting tobacco control policies into action (Wahidin & Hidayat, 2021).

In spite of the general knowledge that smoking leads to severe health problems, cigarettes nonetheless dominate the tobacco market in Indonesia. Based on retail volume, Indonesia continues to be the world's second-largest market for cigarettes. In Indonesia, it was predicted that tobacco usage contributed to about 290,000 fatalities in 2019. This is responsible for 22% of all non-communicable fatalities and 17% of all deaths nationwide. Additionally, the report revealed that among teenagers between the ages of 13 and 15, 35.6% of males and 3.5% of girls smoked tobacco, accounting for 19.2% of all pupils. Approximately 77% of tobacco users said they could purchase cigarettes from a shop, store, street seller, or kiosk, and 61% said their age did not hinder them from doing so (Foundation for a Smoke Free World, 2022). In Indonesia, it is still typical to sell single cigarette sticks, which lowers the cost of cigarettes even more. Particularly among teenagers, this method of buying can promote smoking experimentation. However, premium brands of cigarettes continue to hold a sizable portion of the market, indicating that many Indonesian customers still regard these goods to be reasonably priced (Zheng *et al.* 2018). In Indonesia, 28.6% of people who were 15 years of age or older smoked in 2023. The government of Indonesia raised taxes in 2020 in an effort to reduce the country's high smoking rate (Hanadian Nurhayati-Wolff, 2024).

#### Factors Influencing Smoking Behavior

The main causes of smoking initiation were peer pressure, stress, enjoyment, and surrounding influences. According to reports, stress, pleasure, peer pressure, and social pressure are the main causes of smoking start among teenagers and instructors. These results highlight the significant effect of environmental factors and stress, which are unavoidable in contemporary life (Binnal *et al.*, 2013; Al-Naggar *et al.*, 2012; Bhojani *et al.*, 2009).

Peer pressure is characterized as the process by which peers convince or sway a teenager to adopt a habit. But because of the close relationships and want to be like their friends, teenagers are acknowledged and are seen as belonging to the group. Because their parents have served as role models for making decisions, teenagers who have smoker parents are more likely to think that smoking is appropriate. Teenagers in Aceh have a tendency to emulate their guardians' actions. The definition of masculinity includes features or attributes that are considered typical of males, such as being muscular and attractive. This definition probably applies to many cultures; youths in Aceh understand the significance of masculinity. Finally Teenagers in Aceh exhibit intense interest about everything throughout their adolescent years, including smoking cigarettes. Adolescence is a time of transformation (Fithria *et al.*, 2021).



**Figure 1:** Inhibiting factors of smoking

### *Health Education Intervention*

Changes in intermediate outcomes, or effect, are more immediate measures of the efficacy of health education interventions than improving health status, which is the ultimate purpose of these programs. It is common to believe that there is a conceptual or theoretical connection between health status and health education interventions since these treatments operate via intermediate outcomes. An extensive range of activities may be conceptualized and arranged using heuristic devices, such as the phrase "health education intervention strategy" (Steckler *et al.*, 1995). Students' great interest in educationally conceptualized programs that include technology into their design is shown by another study that revealed the health education smoking prevention intervention contains tactics and strategies that impact the perceived behavioral control variable (Angeli *et al.*, 2024). One strategy for tobacco smoking prevention program should be the community-based health promotion program, since it has a beneficial influence on preventing teenage smoking (Tahlil *et al.*, 2023). Tobacco was the most commonly used drug after alcohol in the Survey on Drug Use in Secondary Education in Spain (ESTUDES 2018), which included a representative sample of teenagers aged 14 to 18. Of them, 41.3% had smoked at some point in their lives, 26.7% had used tobacco in the 30 days prior to the survey, and 9.8% had used it daily in the previous month. These percentages were all higher than those found in the 2016 poll that came before (Carrión-Valero *et al.*, 2023).

Numerous programs have been suggested to discourage teenage smoking, with varying techniques, contents, and delivery methods; nonetheless, the data supporting their efficacy is mostly equivocal. The "information deficit or rationale model" served as the foundation for early education initiatives in juvenile tobacco control. These programs informed young people about the dangers of tobacco use and its detrimental effects, usually in an effort to generate anxiety and worry. According to social learning theory, the sociopsychological tactic of deterrence is centered on keeping kids from ever lighting up, and teenage smoking is seen to be a learnt habit that is picked up via social interactions and reinforcement (Barrueco *et al.*, 2007; MacPherson *et al.*, 1980; Bandura & Walters, 1977; Evans, 1976).

### *Health Education Intervention in Indonesia*

There is little data on how Indonesian teenagers view tobacco regulation in schools. Future anti-smoking teaching in schools should include interactive sessions in addition to didactic methods that emphasize the negative effects of smoking in order to solve this problem. Students may actively contribute to the construction of their knowledge of the repercussions of smoking by participating in interactive conversations. Efforts should also be made to improve the way tobacco control policies are implemented in schools and expand their application to off-campus settings (Rosilawati *et al.*, 2024). The Ministry of Health (MoH) is spearheading an effort to help stop teen tobacco use in three East Javan areas, including Malang District, with assistance from UNICEF and other partners. The program is implemented in cooperation with local and regional partners, such as the Health Office, Education Office, Religious Affairs Department, and Children's Forum. It consists of routine screening activities. This endeavor is compliant with Regulation No. 64/2015 of the Ministry of Education and Culture, which delineates the steps local governments have pledged to do in order to create smoke-free schools in East Java. These include laws prohibiting the sale of tobacco goods on school property, the exhibition of smoking-related objects, and the promotion of tobacco advertising. They also prohibit the selling of candy-shaped cigarettes or any other products that mimic tobacco products. Additionally, schools are required to provide assistance and counseling to students who smoke, as well as smoking cessation treatments and referrals to community health clinics (Puskesmas) when necessary for additional help in quitting. Although according to research that evaluated the intervention of outlawing smoking in public places, 67.4% of teenagers disregarded the rule (Umniyatun *et al.*, 2019).

### *Assessment of Health Education Impact*

The impact of health education on adolescent smoking is always good and supported by many studies. Like one study found that students' great interest in educationally conceptualized programs

that include technology into their design, and they imply that the health education smoking prevention intervention contains tactics and strategies that impact the perceived behavioral control variable (Angeli *et al.*, 2024). Assessment of Health Education program improved the intervention group's knowledge on normative social influence, informational social impact, and smoking's repercussions, with the first three categories showing more improvement than the others. In addition, a brief decline in cigarette use and a rise in self-worth were seen (Stathopoulos *et al.*, 2013). The results presented here, along with those of a community intervention trial of a school-based program for smoking prevention based in six European countries (ESFA), suggest that it would be premature to give up on smoking prevention interventions in schools, even though systematic reviews have found conflicting evidence regarding the effectiveness of school-based approaches (Thomas *et al.*, 2013; Wiehe *et al.*, 2005; De Vries *et al.*, 2006). Beside all above, another study recommended that incorporating the family and community into the program is a better idea than limiting it to the schools. Additionally, extending the intervention period might lead to increased program efficacy. While truancy stands out as a strong predictor of smoking habit, variables connected to school have a limited impact on smoking behavior (Rosilawati *et al.*, 2024). The multi-personal model that was created in one research with the help of parents and teachers was workable, and the teacher-led intervention was easy to put into practice. Students who got the multi-personal intervention showed a 4.7% drop in smoker prevalence and a 4.6% rise in non-smoker prevalence after a year. By including the home context of the adolescent into the preventive model and integrating parents, we expanded efforts to the family setting to prevent the start of tobacco use and highlighted the role that parents play as role models (Carrión-Valero *et al.*, 2023). Since smoking prevention operations are mandated by law in many countries, the question is not whether or not these efforts should be made, but rather how best to carry them out.

#### *Factors Affecting the Effectiveness of Health Education*

Factors affecting the effectiveness of health education in addressing adolescent smoking in schools can vary, but some common considerations include:

**Timing of Interventions:** For health education initiatives to be most successful, they should target teenagers before they start smoking. Early action is essential. A review study suggested that long- and short-term benefits of school-based smoking prevention programs seem to be plausible, according to the more comprehensive meta-analyses. The results indicate that school-based programs to prevent smoking can be very effective in the long run if they are: 1) interactive social influences or social skills programs; 2) consist of at least 15 sessions, some of which go up to the ninth grade; and 3) result in notable short-term benefits. If the therapies are discontinued or removed, the benefits do eventually wane, but this is true of all interventions (Flay, 2009).

**Relevance and Engagement:** Adolescents' unique needs and interests should be taken into account when designing health education programs to keep them interested and focused. Many health education initiatives are marketed as successful even in the absence of strong assessment data. The American Academy of Family Physicians' "Tar Wars" campaign for primary school pupils is one smoking control initiative in this area. Volunteer doctors or medical students visit fourth and fifth grade classes to provide an engaging 45-minute lesson on the immediate, picture-based effects of tobacco smoking. Before all of this, the usual classroom instructor teaches the children that, despite popular belief, tobacco smokers are not the majority. A poster contest follows the guest presentation. According to a quasi-experimental study, this program alters knowledge in the near term (Cain *et al.*, 2006).

**Peer Influence:** Peer pressure has a big effect on smoking habit. Social norms around smoking and peer pressure should be included in health education. Teens who smoke have shown to respond well to peer teaching as a behavioral modification strategy. The authors fervently contend that one of the best strategies for modifying adolescent tobacco use behavior is peer education (Bilgiç & Günay, 2018).

**Family Environment:** Adolescent smoking habit is significantly influenced by the family environment. It might be advantageous to include families in health education initiatives. One study found that there were differences between smokers and non-smokers in terms of the norms around smoking, the proportion of adult male smokers, and in particular, the pressures that come with smoking from friends, the father, older brothers, and older cousins and uncles. Most smokers from both urban and rural regions, but fewer teens who did not smoke, said that they knew of at least one friend or family member who smokes (Mutaz et al., 2020).

**Access to Tobacco Products:** The effectiveness of health education initiatives may be weakened by easy availability to tobacco products. Cigarette is easily available in Indonesia comparing to other countries so supply and sales regulations are crucial. Tobacco products are more available to young teenagers with less disposable cash due to their price. Cigarette prices are low enough to encourage the idea that smoking is a cheap habit, which encourages young people to start smoking. However, the lack of age limitations and the lax use of age verification procedures encourage the accessibility of tobacco goods. Young teenagers may buy cigarettes without having to show identity in numerous places (Effendi et al., 2021). Vendors often disregard the minimum age regulations for tobacco sales, making it simple for minors to get smokes. In the meanwhile, Indonesia's tobacco business actively promotes its goods, often focusing on youth via tactics that link smoking to manhood, independence, and social standing. To entice young customers, tobacco corporations sponsor events and use a variety of promotional strategies. These marketing campaigns shape young teenagers' views about tobacco use by presenting smoking as attractive and normal (Triyana & White, 2022).



**Figure 2:** Factors related to efficacy of Health Education

**Quality of Education:** The efficacy of the health education program may be impacted by its legitimacy, caliber, and the credentials of the instructors. Compared to students who do not get instruction, peer educators taught by the researcher and her team in the Youth Friendly Center Smoking Quit Program significantly support and enhance university students' cognitive and behavioral change processes for quitting smoking. 94% of students who complete the smoking cessation program succeed in doing so; students who voluntarily apply to receive professional support; students who voluntarily attend the treatment program for six months; strong feedback and communication; and students who receive social support all depend on the program being strengthened with peer education. Students

appreciated the smoking cessation program because it fostered leadership and role model qualities, particularly via peer education (Orsal & Ergun, 2021).

**Psychosocial Factors:** The effectiveness of health education in avoiding smoking may also be influenced by the beliefs, attitudes, and mental health of adolescents. As found in previous study that supportive social and familial environments play a significant role in preventing smoking. Preventive measures that are both universal and selective, together with an increase in protective factors in general health promotion programs, may help lower tobacco use in this group before issues arise. Additionally, because peer and partner smoking were the empirically characterized social environment in our research, interventions in community and educational contexts that target peer groups and even young couples may potentially be successful (García-Rodríguez *et al.*, 2011).

Adolescent smoking behaviors may be reduced by health education because it increases awareness, imparts information, and fosters skills that enable youth to make choices about their health that are well-informed. Malaysia had easy access to commercial cigarette suppliers. Since tobacco may already be sold in any shop in the nation, store owners are free to engage in the tobacco product industry without any limitations. Laws pertaining to the distribution and sale of cigarettes may have an impact on teenage tobacco usage and restrict juvenile access to tobacco. Licensing tobacco shops might assist achieve this; furthermore, creating a licensing system for the selling of cigarettes would be a useful regulatory measure. Social networking and telemedicine adaptation are both urgently needed (Puspitasari *et al.*, 2023). Every shop that sells tobacco under this system would need to apply for a specific license in order to do so. The government would be able to keep a closer eye on teenage tobacco availability, marketing exposure, store density, and retailer location with this policy. In order to comply with rules, licensees operating under such a licensing scheme would have to confirm the age of cigarette buyers by presenting evidence of identification and age. Moreover, more efforts should be made to promote health in order to inform retailers about the regulations that now prohibit selling cigarettes to minors (Lim *et al.*, 2018) this is line with our review. In order to educate media literacy and change people's views of the actual incidence of teen smoking, school-based media literacy curricula outperform traditional educational programs (Primack *et al.*, 2014) School authority and Government should focus on this matter.

Effective preventive methods are clearly needed, since the frequency of smoking among young people in Indonesia is a serious problem. As with previous research, this study highlights the significance of focusing on early teenagers, especially those between the ages of 11 and 15, as this is the crucial time when smoking habit tends to increase and become ingrained in their lives (Rosilawati *et al.*, 2024). Further study should carefully design an appropriate service for teenagers to help them stop smoking and work with parents and schools, given the high significance of the issue, the effects of smoking on adolescents, and the major health hazards that smoking poses for them in the future (Ekawati *et al.*, 2024). Overall, the study's results are consistent with previous research, highlighting the importance of peer pressure, the positive effects of school-related variables, and the need for all-encompassing tobacco control strategies.

### **Limitations**

However, this study has several limitations too. As this is a review article we depend on online published data only. While Indonesia has initiated efforts to monitor youth tobacco use, there are significant challenges and limitations in the current surveillance system. We have not focused on that area may further research need to light up in that point.

### **Conclusion**

This retrospective research concludes by showing the important role health education has in reducing smoking among Indonesian students. Health education programs provide teenagers with the necessary knowledge to make educated choices and embrace healthier lives by increasing their awareness of the negative impacts of smoking. The study's findings add to our understanding of

smoking prevention tactics and highlight the need of putting in place all-encompassing health education initiatives aimed at youth.

Scientific publications must publish findings on practical preventative methods as the smoking pandemic still poses a hazard to public health. This research, which focuses on how health education can reduce teenage smoking, offers insightful information to public health experts, educators, and policymakers in Indonesia and other nations dealing with comparable issues. By working together, we can encourage a healthy society and ensure that our children grow up without smoking.

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### Conflict of Interests

Authors declares no conflict of interests.

### Reference

- Allen, S. I., Foulds, J., Wasserman, E., Veldheer, S., Hrabovsky, S., Yingst, J., & Liu, G. (2018). Peer reviewed: Tobacco use among middle and high school students in Pennsylvania. *Preventing Chronic Disease*, 15. <https://doi.org/10.5888/pcd15.170289>
- Al-Naggar, R. A., Jawad, A. A., & Bobryshev, Y. V. (2012). Prevalence of cigarette smoking and associated factors among secondary school teachers in Malaysia. *Asian Pacific Journal of Cancer Prevention*, 13(11), 5539-5543. <https://doi.org/10.7314/APJCP.2012.13.11.5539>
- Angeli, M., Hassandra, M., Krommidas, C., Morres, I., & Theodorakis, Y. (2024). Assessing the Impact of a Health Education Anti-Smoking Program for Students: A Follow-Up Investigation. *Children*, 11(4), 387. <https://doi.org/10.3390/children11040387>
- Angeli, M., Hassandra, M., Krommidas, C., Morres, I., & Theodorakis, Y. (2024). Assessing the Impact of a Health Education Anti-Smoking Program for Students: A Follow-Up Investigation. *Children*, 11(4), 387. <https://doi.org/10.3390/children11040387>
- Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood cliffs.
- Barrueco, M., Cruz, G. G., Torrecilla, M., Trullén, A. P., & Moreno, C. B. (2007). Valor de la intervención breve y los tratamientos farmacológicos para dejar de fumar en adolescentes. *Archivos de Bronconeumología*, 43(6), 334-339. [https://doi.org/10.1016/s1579-2129\(07\)60079-2](https://doi.org/10.1016/s1579-2129(07)60079-2)
- Bhojani, U. M., Chander, S. J., & Devadasan, N. (2009). Tobacco use and related factors among pre-university students in a college in Bangalore, India. *National Medical Journal of India*, 22(6), 294-297. <http://imsear.hellis.org/bitstream/123456789/139083/1/nmji2009v22n6p294.pdf>
- Bilgiç, N., & Günay, T. (2018). Evaluation of effectiveness of peer education on smoking behavior among high school students. *Saudi medical journal*, 39(1), 74. <https://doi.org/10.15537/smj.2018.1.21774>
- Binnal, A., Rajesh, G., Ahmed, J., Denny, C., & Nayak, S. U. (2013). Insights into smoking and its cessation among current smokers in India. *Asian Pacific Journal of Cancer Prevention*, 14(5), 2811-2818. <https://doi.org/10.7314/APJCP.2013.14.5.2811>
- Bird, Y., Staines-Orozco, H., & Moraros, J. (2016). Adolescents' smoking experiences, family structure, parental smoking and socio-economic status in Ciudad Juárez, Mexico. *International journal for equity in health*, 15, 1-9. <https://doi.org/10.1186/s12939-016-0323-y>
- Blok, D. J., de Vlas, S. J., van Empelen, P., & van Lenthe, F. J. (2017). The role of smoking in social networks on smoking cessation and relapse among adults: a longitudinal study. *Preventive medicine*, 99, 105-110. <https://doi.org/10.1016/j.ypmed.2017.02.012>
- Breathe easy: East Java pursues smoke-free schools. UNICEF Indonesia. 29 November 2023. Available at: <https://www.unicef.org/indonesia/health/stories/east-java-pursues-smoke-free-schools>
- Cain, J. J., Dickinson, W. P., Fernald, D., Bublitz, C., Dickinson, L. M., & West, D. (2006). Family physicians and youth tobacco-free education: outcomes of the Colorado Tar Wars program. *The Journal of the American Board of Family Medicine*, 19(6), 579-589. <https://doi.org/10.3122/jabfm.19.6.579>



- Carrión-Valero, F., Ribera-Osca, J. A., Martín-Moreno, J. M., & Martín-Gorgojo, A. (2023). Prevention of tobacco use in an adolescent population through a multi-personal intervention model. *Tobacco Prevention & Cessation*, 9. <https://doi.org/10.18332/tpc/175065>
- Carrión-Valero, F., Ribera-Osca, J. A., Martín-Moreno, J. M., & Martín-Gorgojo, A. (2023). Prevention of tobacco use in an adolescent population through a multi-personal intervention model. *Tobacco Prevention & Cessation*, 9. <https://doi.org/10.18332/tpc/175065>
- Chen, X., Yu, B., & Wang, Y. (2017). Initiation of electronic cigarette use by age among youth in the US. *American journal of preventive medicine*, 53(3), 396-399. <https://doi.org/10.1016/j.amepre.2017.02.011>
- De Vries, H., Dijk, F., Wetzels, J., Mudde, A., Kremers, S., Ariza, C., ... & Candel, M. (2006). The European Smoking prevention Framework Approach (ESFA): effects after 24 and 30 months. *Health Education Research*, 21(1), 116-132. <https://doi.org/10.1093/her/cyh048>
- Duncan, L. R., Pearson, E. S., & Maddison, R. (2018). Smoking prevention in children and adolescents: A systematic review of individualized interventions. *Patient education and counseling*, 101(3), 375-388. <https://doi.org/10.1016/j.pec.2017.09.011>.
- Effendi, D., Nugroho, A. P., Nantabah, Z. K., Laksono, A. D., & Handayani, L. (2021). Determinants of tobacco use among adolescents and young adults in Indonesia: An analysis of IFLS-5 data. *Indian Journal of Forensic Medicine & Toxicology*, 15(3), 2765. <https://doi.org/10.1016/j.jhealeco.2022.102620>
- Ehsani-Chimeh, E., Sajadi, H. S., Behzadifar, M., Aghaei, M., Badrizadeh, A., Behzadifar, M., & Bragazzi, N. L. (2020). Current and former smokers among adolescents aged 12–17 years in Iran: a systematic review and meta-analysis. *BMC public health*, 20, 1-15. <https://doi.org/10.1186/s12889-020-8255-2>
- Ekawati, F. M., Novitasari, D. A., Putri, D. A. D., Fitriyani, N., & Ihyauddin, Z. (2024). Rural Indonesian adolescents' smoking behaviours during the COVID-19 pandemic: rapid survey and cotinine test of school-attend adolescents in Gunung Kidul, Yogyakarta. *Scientific Reports*, 14(1), 2208. <https://doi.org/10.1038/s41598-023-50123-2>
- Ekawati, F. M., Novitasari, D. A., Putri, D. A. D., Fitriyani, N., & Ihyauddin, Z. (2024). Rural Indonesian adolescents' smoking behaviours during the COVID-19 pandemic: rapid survey and cotinine test of school-attend adolescents in Gunung Kidul, Yogyakarta. *Scientific Reports*, 14(1), 2208. <https://doi.org/10.1038/s41598-023-50123-2>
- 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, 88-98. <https://doi.org/10.1007/s11121-008-0087-8>
- Evans, R. I. (1976). Smoking in children: Developing a social psychological strategy of deterrence. *Preventive Medicine*, 5(1), 122-127. [https://doi.org/10.1016/0091-7435\(76\)90015-3](https://doi.org/10.1016/0091-7435(76)90015-3)
- Fithria, F., Adlim, M., Jannah, S. R., & Tahlil, T. (2021). Indonesian adolescents' perspectives on smoking habits: a qualitative study. *BMC Public Health*, 21, 1-8. <https://doi.org/10.1186/s12889-020-10090-z>
- Fithria, F., Adlim, M., Jannah, S. R., & Tahlil, T. (2021). Indonesian adolescents' perspectives on smoking habits: a qualitative study. *BMC Public Health*, 21, 1-8. <https://doi.org/10.1186/s12889-020-10090-z>
- Fithria, F., Tahlil, T., Adlim, A., Jannah, S. R., Darmawati, D., & Armada, C. D. (2018). Psychological well-being among adolescent smokers. *Proceeding of AIC: Health and Life Sciences*, 8(1), 25–33.
- Flay, B. R. (2009). The promise of long-term effectiveness of school-based smoking prevention programs: a critical review of reviews. *Tobacco Induced Diseases*, 5, 1-12. <https://doi.org/10.1186/1617-9625-5-7>
- Foundation for a Smoke Free World. (2022). *Indonesia Country Report*. Foundation for a Smoke Free World. <https://www.smokefreeworld.org/wp-content/uploads/2022/07/Indonesia-Country-Report-July-2022-FINAL.pdf>
- García-Rodríguez, O., Suárez-Vázquez, R., Santonja-Gómez, F. J., Secades-Villa, R., & Sánchez-Hervás, E. (2011). Psychosocial risk factors for adolescent smoking: A school-based study. *International journal of clinical and health psychology*, 11(1), 23-33.
- Garey, L., Taha, S. A., Kauffman, B. Y., Manning, K. F., Neighbors, C., Schmidt, N. B., & Zvolensky, M. J. (2017). Treatment non-response: associations with smoking expectancies among treatment-seeking smokers. *Addictive behaviors*, 73, 172-177. <https://doi.org/10.1016/j.addbeh.2017.05.013>.
- Glenn, N. M., Lapalme, J., McCready, G., & Frohlich, K. L. (2017). Young adults' experiences of neighbourhood smoking-related norms and practices: a qualitative study exploring place-based social inequalities in smoking. *Social science & medicine*, 189, 17-24. <https://doi.org/10.1016/j.socscimed.2017.07.021>
- Global Youth Tobacco Survey (GYTS) Indonesia Report, 2014. Indonesia: 2014.

- Glock, S., Unz, D., & Kovacs, C. (2012). Beyond fear appeals: Contradicting positive smoking outcome expectancies to influence smokers' implicit attitudes, perception, and behavior. *Addictive behaviors*, 37(4), 548-551. <https://doi.org/10.1016/j.addbeh.2011.11.032>
- Hanadian Nurhayati-Wolff. (2024). *Smoking rate in Indonesia 2015-2023*. Hanadian Nurhayati-Wolff. <https://www.statista.com/statistics/955144/indonesia-smoking-rate/>
- Lee, Y. T., Huang, Y. H., Tsai, F. J., Liu, H. C., Sun, F. J., Tsai, Y. J., & Liu, S. I. (2021). Prevalence and psychosocial risk factors associated with current cigarette smoking and hazardous alcohol drinking among adolescents in Taiwan. *Journal of the Formosan Medical Association*, 120(1), 265-274. <https://doi.org/10.1016/j.jfma.2020.05.003>
- Liang, Y. C., Liao, J. Y., Lee, C. T. C., & Liu, C. M. (2022, March). Influence of personal, environmental, and community factors on cigarette smoking in adolescents: a population-based study from Taiwan. In *Healthcare*, 10(3). <https://doi.org/10.3390/healthcare10030534>
- Lim, K. H., Teh, C. H., Heng, P. P., Pan, S., Ling, M. Y., Yusoff, M. F. M., ... & Lim, H. L. (2018). Source of cigarettes among youth smokers in Malaysia: Findings from the tobacco and e-cigarette survey among Malaysian school adolescents (TECMA). *Tobacco induced diseases*, 16. <https://doi.org/10.18332/tid/96297>
- Lin, M., Chu, M., Li, X., Ma, H., Fang, Z., Mao, L., ... & Chiang, Y. C. (2023). Factors influencing adolescent experimental and current smoking behaviors based on social cognitive theory: A cross-sectional study in Xiamen. *Frontiers in Public Health*, 11, <https://doi.org/10.3389/fpubh.2023.1093264>.
- Liu, H., Qi, Q., Duan, Y., Cui, Y., Chen, Y., & Zhou, C. (2024). Smoking Susceptibility and Trends Among Nonsmoking Adolescents: An International Study. *Pediatrics*, 153(3). <https://doi.org/10.1542/peds.2023-062360>
- MacPherson BV, Ashikaga T, Dickstein MS, Jones RP. (1980). Evaluation of a respiratory health education program. *Journal of School Health*, 50(10), 564-567. <https://doi.org/10.1111/j.1746-1561.1980.tb02057.x>
- Megatsari, H., Astutik, E., Gandeswari, K., Sebayang, S. K., Nadhiroh, S. R., & Martini, S. (2023). Tobacco advertising, promotion, sponsorship and youth smoking behavior: The Indonesian 2019 Global Youth Tobacco Survey (GYTS). *Tobacco Induced Diseases*, 21.
- Mutaz, M., De Vries, N., Cheung, K. L., & De Vries, H. (2020). Towards a better understanding of factors affecting smoking uptake among Saudi male adolescents: A qualitative study. *Tobacco prevention & cessation*, 6. <https://doi.org/10.18332/tpc/120000>
- Nuyts, P. A., Kuipers, M. A., Willemsen, M. C., & Kunst, A. E. (2018). Trends in age of smoking initiation in the Netherlands: a shift towards older ages?. *Addiction*, 113(3), 524-532. <https://doi.org/10.1111/add.14057>
- O'Loughlin, J., O'Loughlin, E. K., Wellman, R. J., Sylvestre, M. P., Dugas, E. N., Chagnon, M., ... & McGrath, J. J. (2017). Predictors of cigarette smoking initiation in early, middle, and late adolescence. *Journal of Adolescent Health*, 61(3), 363-370. <https://doi.org/10.1016/j.jadohealth.2016.12.026>.
- Orsal, O., & Ergun, A. (2021). The effect of peer education on decision-making, smoking-promoting factors, self-efficacy, addiction, and behavior change in the process of quitting smoking of young people. *Risk Management and Healthcare Policy*, 925-945. <https://doi.org/10.2147/RMHP.S280393>
- Owen, A. J., Maulida, S. B., Zomer, E., & Liew, D. (2019). Productivity burden of smoking in Australia: a life table modelling study. *Tobacco control*, 28(3), 297-304. <https://doi.org/10.1136/tobaccocontrol-2018-054263>
- Primack, B. A., Douglas, E. L., Land, S. R., Miller, E., & Fine, M. J. (2014). Comparison of media literacy and usual education to prevent tobacco use: A cluster-randomized trial. *Journal of School Health*, 84(2), 106-115. <https://doi.org/10.1111/josh.12130>
- Puspitasari, I., Listyorini, M. W., Prima, A., Minarningtyas, A., Achiroh, M. S., Islam, D., & Poddar, S. (2023). Relationship Between COVID-19 Preventive Measures and Adolescent Anxiety Levels During the Transition Period. *Age (Year)*, *Malaysian Journal of Medicine and Health Sciences* (2023) 19(SUPP9): 162-165. <https://doi.org/10.47836/mjmhs.19.s9.24>
- Rosilawati, Y., Rafique, Z., & Sudiwijaya, E. (2024). Tobacco use among in-school young adolescents in Indonesia: Exploring availability, affordability, and accessibility. *Plos one*, 19(3), <https://doi.org/10.1371/journal.pone.0301291>
- Rosilawati, Y., Rafique, Z., & Sudiwijaya, E. (2024). Tobacco use among in-school young adolescents in Indonesia: Exploring availability, affordability, and accessibility. *Plos one*, 19(3), <https://doi.org/10.1371/journal.pone.0301291>
- Rosilawati, Y., Rafique, Z., & Sudiwijaya, E. (2024). Tobacco use among in-school young adolescents in Indonesia: Exploring availability, affordability, and accessibility. *Plos one*, 19(3), <https://doi.org/10.1371/journal.pone.0301291>

- Sargent, J. D., Gabrielli, J., Budney, A., Soneji, S., & Wills, T. A. (2017). Adolescent smoking experimentation as a predictor of daily cigarette smoking. *Drug and alcohol dependence*, 175, 55-59. <https://doi.org/10.1016/j.drugalcdep.2017.01.038>
- Stathopoulos, T., & Sourtzi, P. (2013). Evaluation of a health education programme for the prevention of smoking in secondary education students. *Health Science Journal*, 7(1), 68.
- Steckler, A., Allegrante, J. P., Altman, D., Brown, R., Burdine, J. N., Goodman, R. M., & Jorgensen, C. (1995). Health education intervention strategies: Recommendations for future research. *Health education quarterly*, 22(3), 307-328. <https://doi.org/10.1177/109019819402200305>
- Tahlil, T. (2023). The Effects of A Community-based Health Program on Adolescents' Smoking Prevention-A Quasi-Experimental Study. *International Journal of Nursing Education*, 15(1). <https://doi.org/10.37506/ijone.v15i1.18982>
- Tahlil, T., Woodman, R. J., Coveney, J., & Ward, P. R. (2013). The impact of education programs on smoking prevention: a randomized controlled trial among 11 to 14 year olds in Aceh, Indonesia. *BMC public health*, 13, 1-11. <https://doi.org/10.1186/1471-2458-13-367>
- Thomas, R. E., McLellan, J., & Perera, R. (2013). School-based programmes for preventing smoking. *Evidence-Based Child Health: A Cochrane Review Journal*, 8(5), 1616-2040. <https://doi.org/10.1002/ebch.1937>
- Triyana, M., & White, J. S. (2022). Non-monetary incentives for tobacco prevention among youth in Indonesia. *Journal of Health Economics*, 83, 102620.. <https://doi.org/10.1016/j.jhealeco.2022.102620>
- Umniyatun, Y., Nurmansyah, M. I., Maisya, I. B., & Al Aufa, B. (2019). Analisis Kebijakan dan Program Pencegahan Perilaku Merokok pada Sekolah Muhammadiyah di Kota Depok. *Media Penelitian dan Pengembangan Kesehatan*, 29(2), 123-134.
- Wahidin, M., & Hidayat, M. S. (2021). Overview of Tobacco Control Program in Indonesia, 2018. *Tobacco Induced Diseases*, 19(1). <https://doi.org/10.18332/tid/141077>
- Wiehe, S. E., Garrison, M. M., Christakis, D. A., Ebel, B. E., & Rivara, F. P. (2005). A systematic review of school-based smoking prevention trials with long-term follow-up. *Journal of adolescent health*, 36(3), 162-169. <https://doi.org/10.1016/j.jadohealth.2004.12.003>
- World Health Organization. (2020). *Smoking still a core challenge for child and adolescent health reveals WHO report*. World Health Organization. <https://www.who.int/europe/news/item/05-06-2020-smoking-still-a-core-challenge-for-child-and-adolescent-health-reveals-who-report>
- World Health Organization. Regional Office for South-East Asia. (2015). *Global Youth Tobacco Survey (GYTS) Indonesia Report, 2014*. WHO Regional Office for South-East Asia. <https://iris.who.int/handle/10665/205148>
- Zheng, R., Marquez, P. V., Ahsan, A., Hu, X., & Wang, Y. (2018). Cigarette Affordability in Indonesia. <https://documents1.worldbank.org/curated/en/486661527230462156/pdf/126585-WP-PUBLIC-P154568-WBGCigaretteAffordabilityIndonesiaFinalweb.pdf>