

Spill The Tea, Not The Smoke: A Critical Review of Innovative Interventions For The Dual Tobacco And Environmental Crisis in Indonesia

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ABSTRACT

The high prevalence of tobacco causes a dual crisis (health and environment) in Indonesia. Currently, tobacco control interventions are only echoed focusing on the dangers of cigarette smoke to health, not touching on the issue of sustainability to environmental impacts. The purpose of the research is to find out the challenges, innovations and strategies in dealing with the tobacco crisis. A systematic literature review using Google Scholar, PubMed, Scopus, and Garuda Portal databases which is limited to published articles from January 2015 – June 2025. The search strategy uses a combination of keywords with Boolean (AND/OR) operators. The search selection uses inclusion and exclusion criteria. The selection process uses the PRISMA guide. A trend of programs that combine digital technology and ecological awareness has been found, but its scalability is still limited. A paradigm shift towards relevant integrated programs for young people is needed to effectively address this crisis.

Keywords : Behavior Change, Environmental Impact Of Cigarettes, Innovative Interventions, Public Health, Tobacco Control

INTRODUCTION

Indonesia is currently in the grip of an alarming tobacco epidemic. With a very high prevalence of smokers, especially among men and adolescents, the country faces massive public health challenges. This condition not only causes hundreds of thousands of deaths every year due to various chronic diseases, but also causes economic losses of up to hundreds of trillions of rupiah that burden the state (Ministry of Health of the Republic of Indonesia, 2023).

However, the narrative of the dangers of cigarettes is often incomplete because it focuses only on human health. The second and equally damaging crisis is the massive environmental impact, from deforestation for tobacco plantations to the pollution of trillions of cigarette butts every year. Cigarette butts themselves are toxic plastic waste that pollutes soil and waters, releasing microplastics and harmful chemicals into the ecosystem (UNEP, 2023).

Although these two crises are interrelated, tobacco control programs in Indonesia have historically tended to run partially and were less innovative, so the impact began to be saturated (Sari, 2023). Especially for young generations like Gen Z, who are known to have high environmental awareness, this one-dimensional approach is a missed opportunity. Failure to link the dangers of cigarettes with sustainability issues makes anti-smoking messages less effective (Deloitte Global, 2024). The purpose of the research is to find out the challenges, innovations and strategies in dealing with the tobacco crisis.

METHODS

This study uses *the Systematic Literature Review* (SLR) approach. This method was chosen because of its structured, transparent, and replicable approach to identify, evaluate, and synthesize all research evidence relevant to the established research questions (Snyder, 2019).

Literature searches were conducted electronically on several databases including Google Scholar, PubMed, Scopus, and Garuda Portal. The search process was limited to articles published in the period of January 2015 to June 2025 to capture the most relevant interventions to the latest developments. The search strategy uses a combination of keywords with Boolean operators (AND/OR), with a series of key keywords such as: ("*tobacco control*" OR "*smoking cessation*") AND ("*environmental impact*") AND ("*innovative intervention*" OR "*digital campaign*" OR "*Gen Z*").

To ensure the relevance of the study, a series of selection criteria were strictly applied. Included studies (inclusion criteria) if they are empirical research or other systematic reviews, have a primary focus on tobacco control programs that integrate health and environmental aspects, are published in English or Indonesian, and are fully accessible. On the other hand, studies were excluded (exclusion criteria) if they were opinion or editorials, addressed only one aspect (health or environment), or focused on purely pharmacotherapeutic interventions without a behavioural component.

The study selection process follows the workflow recommended by the PRISMA guide (Page et al., 2021), starting from the title and abstract screening stage, which is then followed by a feasibility assessment based on a full text reading. Articles that successfully passed all selection stages were then analyzed using the Thematic Analysis method (Braun & Clarke, 2006). The analyzed of the research is to find out the challenges, innovations and strategies in dealing with the tobacco crisis

RESULTS

Of the total 25 articles analyzed, published between 2020 and 2025, there were 5 articles that were relevant to answer the research objectives.

Table 3.1 Summary of Representative Studies on Integrated Smoking Interventions

No.	Author & Year	Country	Types of Interventions	Key Findings & Conclusions
1.	Chen & Weng (2025)	Taiwan	"EcoQuit" Gamification App: Combines daily smoking cessation goals with virtual and real cigarette butt waste cleanups.	Adolescent participation rates are high. Users reported a 65% increase in dual awareness (health & environment) and an average decrease in cigarette consumption of 4 cigarettes/day.
2.	Johnson et al. (2023)	Australia	Social Media Campaigns: Using environmental <i>influencers</i> to promote cigarette butt-free beaches and the microplastic impacts of cigarettes.	The campaign's reach reaches 2 million young audiences. Correlation found significant link between campaign exposure and decreased smoking intention among non-smokers

3.	Garcia & Santos (2022)	Brazil	Community Puntung Recycling Program: Establish a puntung collection point whose results are processed into handicrafts by the local youth community.	Managed to collect 500 kg of cigarette butts in 6 months. Effectively improves cohesion social and positive perceptions of environmental action, although the direct impact on reducing the prevalence of smokers has not been measured.
4.	Sari & Abdullah (2024)	Indonesia	Integrated Education in Schools: Learning modules for high school students that link the impacts of tobacco plantation deforestation to respiratory diseases.	Students' knowledge of the holistic impact of cigarettes increased significantly ($p<0.05$). However, changes in long-term smoking behavior still need to be studied further.
5.	Miller, R. (2023)	Canada	Analysis EPR Policy: Analyze policy proposals <i>Extended Producer Responsibility</i> where the tobacco industry is required to finance the cleaning of puntung waste.	The analysis shows the potential for a reduction in butt waste by up to 70% and could fund an anti-smoking campaign from industry fines, making it a powerful upstream intervention.

Based on table 1, the research results found 3 key themes, namely challenges, innovation and tobacco control strategies.

DISCUSSION

A. Key Theme 1: Common Research Challenges and Gaps

Although various innovations showed promising results, some common challenges were identified in most studies. The main challenge is **long-term impact measurement**. Many studies (such as Sari & Abdullah, 2024) have shown an increase in knowledge or intention, but have difficulty tracking actual changes in smoking behavior over a period of more than one year. In addition, scalability is another issue; programs that are successful in a single community (Garcia & Santos, 2022) are not necessarily easily replicated on a national scale due to cultural and resource differences. Good individual knowledge about smoking is not necessarily followed by behavior from that individual, and changes in each individual's behavior require a process and do not happen immediately. The most significant research gap is the lack of studies comparing *cost-effectiveness* between these different types of interventions

B. Key Theme 2: Utilization of Digital Technology for Hybrid Education

One of the most dominant themes that emerges from the literature is the use of digital technology as the main medium to reach the younger generation. Interventions are no longer passive, but interactive and combine virtual with real action. As shown by the study by Chen & Weng (2025), the use of *gamification* has been shown to be effective in increasing engagement due to the presence of elements of competition and rewards. Similarly, social

media campaigns as analyzed by Johnson et al. (2023) succeeded in instilling a new social norm that considers cigarette butt waste to be uncool and destructive by taking advantage of a wide range of *influencers*. A digital approach with content that is easily digestible and culturally relevant, successfully translates complex issues for Gen Z. In addition, by presenting a model, individuals will observe, imitate and internalize this behavior.

C. Key Theme 3: Community-Based Intervention Models and the Circular Economy

A second strong theme is the shift from a *top-down approach* to a bottom-up community-based intervention. This model emphasizes the empowerment of local communities as agents of change. A study by Garcia & Santos (2022) shows that butt recycling programs not only serve to reduce waste, but also create small-scale economic opportunities and strengthen social ties. This approach changes the perception from what was originally just a "problem" to an "opportunity". According to Miller (2023), reducing cigarette butt waste can fund anti-smoking campaigns, making it an effective intervention.

CONCLUSION

This literature review concludes that there has been a paradigm shift in approaches to tobacco control, from conventional models that focus solely on health, to innovative integrated intervention models. These new approaches can be grouped into three main models: digital and technology-based interventions, community-based programs and physical environments, and changes at the structural policy level. However, these promising innovations still face similar challenges, especially due to the lack of evidence of long-term impact on behavioural change and difficulties in scaling programmes from the local to the national level.

Based on these conclusions, several suggestions were formulated. In terms of practical and policy implications, the government is advised to start moving from one-dimensional campaigns towards support for integrated pilot projects, including seriously examining the implementation of the *Extended Producer Responsibility* (EPR) policy in the tobacco industry. For health practitioners and NGOs, a "hybrid" approach that combines digital campaigns with community action on the ground is highly recommended, involving young people directly in the *co-design* of programs to make the results more relevant

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