RESEARCH ARTICLE

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# Tobacco Advertisements Near Schools and Its Association with Smoking Behaviour Students in North Sumatera Province, Indonesia

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## Abstract

**Backgorunds:** In Indonesia, outdoor tobacco advertising remains widespread, particularly in urban settings, with strategic placement near educational institutions. Such proximity significantly increases adolescents' exposure to tobacco marketing, potentially influencing their smoking behaviors. **Objectives:** This study aimed to evaluate the density, quantity, and size of outdoor tobacco advertisements near schools in Medan City, and to examine their association with students' smoking behavior. **Methods:** A total of 3,820 students from 160 schools in Medan City were included in this cross-sectional study. This study conducted interviews using structured questionnaires and measured coordinates using the GPS Waypoints mobile phone application. Spatial analyses were conducted using QGIS version 3.19 to map the distribution of advertisements within 500- and 1000-meter buffer zones around schools. Behavioral data were analyzed using JASP version 19, employing logistic regression to assess the relationship between advertising exposure and smoking behavior with CI 95%. **Results:** A total of 437 students (11.4%) reported smoking; most students (81.3%) were exposed to tobacco advertisements near educational institutions, with banners (62.1%) and posters (11.4%) being the most common forms of advertisement. Students were much more likely to smoke when they thought cigarettes were affordable (OR=12.51; CI: 4.87–32.13), socially acceptable (OR=8.49; CI: 3.67–19.63), and influenced by their peers (OR=16.34; CI: 7.48–35.72). **Conclusions:** Cigarette companies are actively promoting cigarettes using outdoor advertisements in Medan City. Cigarette companies actively promote their products by placing banners and posters around schools within a 500-meter radius. Research has proven a correlation between students' exposure to tobacco advertisements and their smoking behavior.

**Keywords:** Tobacco Advertisements- School- Smoking- Students.

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## Introduction

Several Southeast Asian countries, including Thailand and Malaysia, have enacted comprehensive bans on tobacco advertising. Brunei Darussalam and Singapore have gone further by implementing point-of-sale display bans, prohibiting the visibility of tobacco products in retail settings [1]. Indonesia, despite ranking second globally in adult male smoking, has not ratified the Framework Convention on Tobacco Control, which has been endorsed by eight other nations [2, 3]. The lack of ratification underscores the fragmented and inconsistent nature of tobacco control policy implementation at the national level [4].

Globally, the prevalence of adolescent smoking has increased across various nations. The World Health Organization estimates that around 60.3 million individuals, or 36% of Indonesia's population, smoke. The World Health Organization predicts that if tobacco control efforts do not improve, the percentage of smokers will increase to 45% of the 96.8 million population by 2025 [5]. In Indonesia, the prevalence of cigarette consumption remains alarmingly high [6]. Data from 2018 indicated that 67% of men aged ≥ 15 years were smokers. In particular, the smoking rate among teenage males aged 13–14 years was 35.5% in 2019 [7]. Smoking remains prevalent in school grounds and outdoor spaces, with 60% of adolescents experiencing secondhand smoke exposure at home [8] .

Teenagers are in a developmental stage marked by high curiosity, identity exploration, and susceptibility to peer influence. These psychosocial characteristics often

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lead them to experiment with new experiences including smoking as a symbol of autonomy, social acceptance, and perceived maturity [9,10].

The cigarette industry uses tobacco advertising to promote its products. Exposure to outdoor cigarette advertising increases the likelihood of adolescent smoking initiation, particularly in urban environments where such advertising is more prevalent [11,12]. Adolescent smoking behavior increases when exposed to cigarette advertising, promotions, and sponsorship [13] The prohibition of tobacco advertising and promotion can significantly reduce exposure to the effects of tobacco marketing, which has been linked to increased adolescent smoking rates [13]. Prohibiting advertising and promoting tobacco products can potentially reduce exposure to these marketing strategies.

The continued proliferation of tobacco advertising especially within 500 meters of schools suggests that without national-level policy harmonization and strict enforcement, the impact of local regulations remains minimal (Figure1). Findings from previous research in countries such as the United States, United Kingdom, Germany, and Spain confirm that the presence of outdoor tobacco advertising near schools is directly associated with increased smoking initiation among adolescents [14, 15]. Tobacco advertisements attract young individuals and stimulate their desire to smoke Exposure to cigarette commercials further reinforces students' smoking intentions by engaging their sensory faculties, thereby intensifying their urge to smoke [10, 16].

Indonesia's tobacco control measures are insufficient, as evidenced by the fact that only 10% of the 514 districts and cities have prohibited outdoor tobacco advertising [7, 17];. However, the effectiveness of enforcement varies, as some districts continue to permit such advertisements, while 90% of the districts have not yet implemented restrictions on tobacco advertising [18]. At the national level, no comprehensive law explicitly bans tobacco advertisements in outdoor public spaces. Instead, tobacco control regulations are devolved to local governments, resulting in a patchwork of implementation and enforcement [19]. However, enforcement is inconsistent, and advertisements often remain visible near educational institutions.

The North Sumatra Province, Indonesia, is known for its high smoking prevalence among individuals aged ≥ 10 years. The average number of cigarettes consumed per person per day in North Sumatra was 14.9 in 2013; it experienced a marginal decline to 14.7 in 2018. The high smoking prevalence in North Sumatra is strongly linked to cultural and social norms that normalize and promote smoking, particularly among adolescents. Several communities in the region have upheld traditions that encourage smoking, contributing to their widespread social acceptance. Medan City Regional Regulation No. 3/2014 prohibits outdoor cigarette advertisements in designated smoke-free areas [19]. Consequently, this policy has led to the proliferation of outdoor cigarette advertisements throughout Medan City, particularly in close proximity to educational institutions, including senior and junior high schools.

This study aims to fill the research gap by quantifying the density, number, and proximity of outdoor tobacco advertisements near schools in Medan City, Indonesia, and examining their association with students' smoking behavior. It also seeks to contextualize the persuasive messaging embedded within such advertisements and its influence on youth smoking through a public health communication lens.

## Materials and Methods

This study employed an observational explanatory research design to analyze the density of cigarette advertisements around schools and their association with students' smoking behavior in Medan City. Medan City is one of the largest cities in Indonesia and has a high prevalence of adolescent smoking. Since 2014, it has been one of the first cities in North Sumatra Province to implement smoke-free area regulations. With its high population density and substantial number of adolescent smokers, Medan City has become a target market for aggressive cigarette advertising and promotion. As one of Indonesia's most prominent urban centers, the city experiences intense tobacco marketing efforts, further reinforcing the prevalence of smoking among its residents.

The research will be conducted in schools across Medan City, which was selected as the study area because of its implementation of a regional smoke-free area regulation in North Sumatra Province. The study will be conducted in junior high schools, senior high schools, and universities in Medan City. The research was conducted from August 2023 to November 2023. The study population comprised 72,376 high school students and 221 high schools in Medan. The sample for this research included 3,820 respondents drawn from 150 schools in Medan City. Students will be interviewed at the school during recess for 20–30 minutes.

This research will gather primary data through structured interviews using questionnaires administered to junior and senior high school students in Medan. The study collected data on the locations of schools and the prevalence of cigarette advertisements in the vicinity of these educational institutions.

The dependent variables were the perception of smoking behavior and smoking behavior in the past 14 days. Independent variables, such as "cigarettes are affordable", "smoking is cool", "smoking is a symbol of friendship", "smoking is harmful to health", "smoking is prohibited", "friends smoke", and "fathers smoke".

The authors assembled four teams of research enumerators and conducted training sessions to ensure the accuracy of data collection. Enumerators surveyed the entire study area on foot or by motorcycle, collected GPS coordinates, outdoor tobacco advertisement (OTA) photographs, and data on facilities frequented by children and adolescents. Data were collected using an Android-based application called Google Forms. To delineate the study boundaries, the enumerators used Google Maps and employed GPS waypoints to obtain precise coordinates. Field coordinators and area supervisors (SIPs and EAs) verified the collected data and the daily coverage. The

quality control team performed randomized reviews of the GPS coordinates (GPS Waypoints) transmitted from the mobile application to the server, ensuring the accuracy and validity of the location data and recorded information.

This study recorded the geographical coordinates of both schools and outdoor cigarette advertisements in their vicinity. The collected coordinate data were analyzed using QGIS 3.19 to map the spatial relationship between schools and outdoor cigarette advertisements. This study assessed the density of cigarette advertisements near schools by using reference distances of 500 and 1,000 meters from the school's location (Figures 1,2). The study designated the main entrance of the school as the reference point for the coordinates. It acquired a map of Medan from an Indonesian government agency's website, specifically https://tanahair.indonesia.go.id/portal-web/.

This study assessed the number and size of outdoor cigarette advertisements in schools. This study collected data on students' perceptions of outdoor cigarette advertising near schools and their levels of interest in these advertisements. The study examined smoking intentions and behaviors, including smoking frequency, number of cigarettes consumed daily over the past three days, and details of where and when cigarettes were purchased during this period. Odds ratios (OR) and 95% confidence intervals (CI) were calculated using logistic regression to determine the strength of associations between independent variables and smoking behavior. The spatial distribution of outdoor advertisements and student smoking behavior in Medan was analyzed using JASP version 19.

The author secured a research permit from the Medan City Government before initiating the study. The Universitas Islam Negeri Sumatera Utara granted ethical clearance for this study. The study was approved by Universitas Islam Sumatera Utara Ethics Committee (No.81/EC/KEPK.UISU). Prior to data collection, informed consent was obtained from all participants and their guardians, in accordance with ethical research standards involving students.

## Results

*Table 1*

A total of 3,821 students participated in this study, 81.3% of whom reported seeing cigarette advertisements in their educational setting. Students' perceptions of cigarette advertisements varied as follows: 1.5% perceived cigarettes as affordable, 2.2% considered smoking to be cool, 0.8% believed that smoking was something boys should do, 1.1% viewed smoking as a symbol of friendship, 61.9% recognized that tobacco products are harmful to health, and 6.8% thought that smoking was illegal.

The findings also indicated that 32.1% of students had friends who smoked, while 52.3% had fathers who smoked. Regarding educational level, 58.7% of the participants were junior high school students, while 41.3% were high school students. The study further revealed that 4.7% of the students expressed an interest in smoking, while 5.6% had smoked within the past 14 days.

Table 1. Outdoor Tobacco Advertisements and Smoking Behaviour in Medan City

| Categories (N=3.821) | f | % |
|---|---|---|
| Tobacco adv in educational around | | |
| Yes | 130 | 81.3 |
| Perception of Tobacco Advertisements | | |
| Low price of cigarettes | 57 | 1.5 |
| Smoking is cool | 84 | 2.2 |
| Boys must smoke | 32 | 0.8 |
| Smoking is a symbol of friendship | 43 | 1.1 |
| Cigarettes are dangerous to health | 2,365 | 61.9 |
| Cigarettes are prohibited. | 261 | 6.8 |
| Friends smoking. | 1,227 | 32.1 |
| Father smoking. | 2,000 | 52.3 |
| Education by Type | | |
| High School | 1,579 | 41.3 |
| Junior Hight School | 2,242 | 58.7 |
| Perceptions of Smoking Behavior. | | |
| Interest in smoking | 181 | 4.7 |
| Not Interested in smoking | 3,640 | 95.3 |
| Smoking Behavior | | |
| Smoking | 213 | 5.6 |
| Not Smoking | 3,608 | 94.4 |

*Table 2*

The variable low price of cigarettes exhibited the highest odds of increasing the propensity to smoke across all demographic groups, with a particularly pronounced effect among males (OR=12.51, CI: 4.87-32.13) compared to females (OR=8.00, CI: 3.73-17.04). This indicates

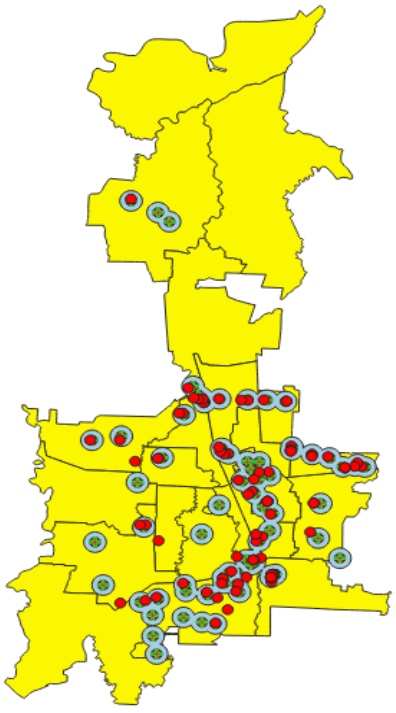

Figure 1. Density of Tobacco Advertising around Schools with 500-Meter Buffer in Medan City

Tabel 2. The Association of Perceptions of Tobacco Advertising and Smoking Behavior of Friends and Family to the Perceptions and Smoking Behavior of Students

| Variable (N=3821) | P (Sign) | Odds ratios (95%CI) | Odds ratios (95%CI) | | P (Sign) | Odds ratios (95%CI) | |
|---|---|---|---|---|---|---|---|
| | | | Senior High School | Junior High School | | Male | Female |
| Perception of Smoking Behavior | | | | | | | |
| Low price of cigarettes | <0.001 | 9.32 | 7.57 (3.26-17.58) | 12.71 (5.52-29.23) | <0.001 | 12.51(4.87-32.13) | 8 (3.73-17.04) |
| Smoking is cool | <0.001 | 6.94 | 6.15(3.12-12.11) | 8.49 (3.67-19.63) | <0.001 | 5.58(1.82-17.11) | 7.26(3.98-13.23) |
| Boys must smoke | <0.001 | 8.22 | 9.34 (3.44-25.34) | 6.96(1.89-25.61) | <0.001 | 2.98(0.36-24.32) | 10.53(4.37-25.33) |
| Smoking is a symbol of friendship | <0.001 | 12.97 | 13.89(6.47-29.82) | 10.39(3.16-34.12) | <0.001 | 8.42(2.62-27.03) | 16.34(7.48-35.72) |
| Cigarettes are dangerous to health | <0.001 | 0.44 | 0.43(0.3-0.63) | 0.46(0.28-0.78) | <0.001 | 0.6(0.35-1.04) | 0.39(0.27-0.56) |
| Cigarettes are prohibited. | 0.681 | 0.87 | 0.99(0.42-2.3) | 0.84(0.33-2.15) | 0.681 | 1.04(1.03-1.05) | 1.03(0.13-7.81) |
| Friends smoking. | 0.002 | 1.6 | 1.41(0.95-2.07) | 2.18(1.31-3.64) | 0.002 | 1.25(0.71-2.19) | 1.79(1.25-2.58) |
| Father smoking. | 0.062 | 1.16 | 1.43(0.99-2.07) | 0.87(0.52-1.44) | 0.062 | 0.96(0.56-1.66) | 1.53(1.05-2.21) |
| Smoking Behavior in the past 14 Days | | | | | | | |
| Low price of cigarettes | 0.632 | 1.28 | 1.12(0.26-4.77) | 1.64(0.38-7.03) | 0.632 | 2.92(0.84-10.12) | 0.47(0.06-3.52) |
| Smoking is cool | 0.526 | 1.31 | 0.6(0.14-2.5) | 3.03(1.03-8.87) | 0.526 | 0.85(0.11-6.44) | 1.45(0.57-3.69) |
| Boys must smoke | 0.544 | 0.54 | 0.85(0.11-6.47) | 1.04(1.03-1.05) | 0.544 | 1.05(1.04-1.07) | 0.74(0.1-5.56) |
| Smoking is a symbol of friendship | 0.687 | 1.27 | 0.51(0.07-3.82) | 3.72(0.81-16.98) | 0.687 | 1.2(0.15-9.23) | 1.31(0.3-5.62) |
| Cigarettes are dangerous to health | 0.2 | 0.83 | 0.95(0.67-1.35) | 0.63(0.38-1.02) | 0.2 | 0.64(0.39-1.03) | 0.94(0.67-1.34) |
| Cigarettes are prohibited. | 0.878 | 0.95 | 1.26(0.62-2.55) | 0.75(0.29-1.90) | 0.878 | 1.06(0.41-2.7) | 0.9(0.45-1.81) |
| Friends smoking. | 0.005 | 1.49 | 1.5(1.06-2.14) | 1.63(1.0-2.64) | 0.005 | 1.4(0.86-2.29) | 1.54(1.09-2.18) |
| Father smoking. | 0.62 | 1.07 | 1.14(0.81-1.60) | 1.05(0.64-1.72) | 0.62 | 1.23(0.75-2.00) | 0.99(0.71-1.40) |
| N | | 3821 | 2242 | 1579 | | 1329 | 2492 |

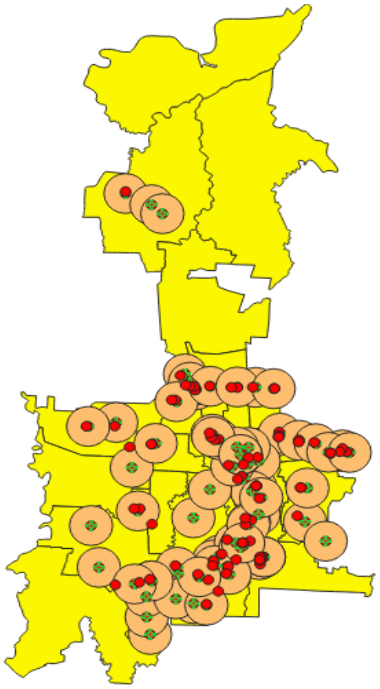

Figure 2. Density of Tobacco Advertising Around Schools with 1000-meter Buffer in Medan City

that males are more inclined to smoke when cigarette prices are reduced. The perception that "smoking is cool" was more prevalent among junior high school students (OR=8.49, CI: 3.67-19.63) than high school students (OR=6.15, CI: 3.12-12.11), suggesting that younger adolescents are more susceptible to this belief. In the female group, the idea that "boys must smoke" had the highest odds ratio (OR=10.53, CI: 4.37–25.33). This is intriguing because it suggests that smoking norms may have a bigger effect on women than on men. The belief that "smoking is a symbol of friendship" was most pronounced among females (OR=16.34, CI: 7.48-35.72), indicating that cigarettes may serve as a more significant social symbol for females than for males.

The perception that "cigarettes are dangerous to health" had an odds ratio below 1 across all groups, suggesting that this belief reduces the likelihood of smoking. This effect was particularly significant among females (OR=0.39, CI: 0.27-0.56) compared to males (OR=0.60, CI: 0.35-1.04), indicating that females are more attuned to the health risks associated with smoking. The odds ratio for the variable "cigarette prohibition" was close to 1, suggesting that it does not significantly influence smoking behavior. The influence of "friends smoking" was notably high, especially among junior high school students (OR=2.18, CI: 1.31-3.64) and females (OR=1.79, CI: 1.25-2.58), suggesting that peer influence is more pronounced in these groups. The factor "father smoking" demonstrated that paternal secondhand smoke had a greater impact on females (OR=1.53, CI: 1.05-2.21) than on males.

Particularly among junior high school students, there is a strong correlation between the perception that smoking is "cool" and smoking behavior (OR = 3.03, 95% CI: 1.03-8.87). This suggests that younger adolescents are more vulnerable to social perceptions of smoking as a desirable behavior. Smoking as a symbol of friendship exhibited the highest association with smoking among males (OR = 3.72; 95% CI: 0.81–16.98), although the wide confidence interval indicates variability in the data. All groups were much more likely to smoke if they had friends who had smoked. This was especially true for junior high school students (OR = 1.5, 95% CI: 1.06-2.14), males (OR = 1.63, 95% CI: 1.0-2.64), and females (OR = 1.54, 95% CI: 1.09-2.18). This shows how peer pressure affects the smoking habits of teenagers. The perception that cigarettes are hazardous to health was associated with a reduced likelihood of smoking across all groups, particularly among males (OR = 0.63, 95% CI: 0.38-1.02) and females (OR = 0.94, 95% CI: 0.67-1.34). There was no strong link between the belief that cigarettes are illegal and smoking. The odds ratios (ORs) ranged from 0.75 to 1.26, which suggests that laws may not be sufficient to stop people from smoking. Fathers' smoking habits were not significantly linked to their sons' smoking habits, as the odds ratios stayed close to 1 in all groups (1.05–1.23).

## Discussion

Tobacco advertising encompasses the promotion of tobacco products through various media channels, including television, online platforms, and outdoor venues. The packaging of tobacco products, including brand names, logos, colors, slogans, descriptions, and images, is crucial to the tobacco industry's marketing strategy, as it negatively influences users' beliefs and perceptions about the harms of these products [15]. Cigarette advertisements on both offline and online platforms significantly influence adolescents' smoking habits, indirectly influencing their purchasing intentions by creating a favorable perception that may shape their purchasing decisions [20].

Cigarette advertisements in Indonesia often blend local cultural values, religious symbols, and gender-specific appeals to target adolescent smokers [21, 22]. These ads use slogans such as "Laki-laki sejati" (real man) and images of independence to normalize smoking among young males [23]. Designers craft these messages to resonate with the developmental process of youth's identity.

Advertisements function through the peripheral route of persuasion, targeting adolescents' emotions, social identity, and attitudes rather than rational processing [24]. Youth, as low-involvement audiences, tend to respond to cues like images, colors, and slogans rather than message content [25]. This mechanism explains why visual and spatial cigarette ads near schools can powerfully stimulate smoking behavior.

The influence of tobacco advertising on adolescent smoking behavior can be analyzed using Skinner's stimulus-organism-response (S-O-R) theory [26]. Within this framework, cigarette advertisements act as external stimuli (S) that engage with the internal cognitive and emotional states (O) of adolescents, such as curiosity or social anxiety. This interaction ultimately results in a behavioral response (R), like the initiation of smoking.

Factors such as visual proximity, frequency of exposure, and the emotional appeal of these advertisements enhance the stimulus-response relationship, especially in school zones where young people are exposed to these messages regularly.

Tobacco advertisements that make people think that cigarettes are cheap (OR=12.51, CI: 4.87–32.13), that smoking is cool (OR=8.49, CI: 3.67–19.63), that boys are expected to smoke (OR=10.53, CI: 4.37–25.33), and that smoking is a sign of friendship (OR=16.34, CI: 7.48–35.72), all make students much more likely to smoke. Tobacco advertisements influence adolescents' perceptions of cigarettes, with never-smokers showing a diminished perception of risks compared to control advertisements [9, 10].

Spatial proximity is a significant factor: advertisements placed within 500 meters of schools lead to higher visual exposure and more frequent cognitive reinforcement, particularly among youth who walk to and from school. Research by Megatsari (2019) and Astuti (2019) confirmed that closer proximity to outdoor cigarette advertisements significantly increases smoking experimentation among adolescents [27, 28].

Students are more likely to initiate smoking and acquire cigarettes when exposed to cigarette advertising, suggesting that tobacco control strategies should prioritize regulating cigarette marketing. Students are more likely to smoke in the future if they believe that tobacco will provide good time, gain approval, and have a pleasant taste [29, 30].

Outdoor tobacco advertising demonstrates greater efficacy among adolescents, particularly in urban settings, than other advertising modalities, such as digital or television media. This effectiveness is attributed to its persistent passive visibility and strategic spatial placement in proximity to schools, markets, and locations frequented by youth [31] . In contrast to television or online advertisements, which necessitate deliberate engagement, outdoor advertisements serve as ambient stimuli integrated into the physical environment and are encountered repeatedly in daily routines [32] . This exposure contributes to the subconscious normalization of smoking behaviors.

Advertising can make young people more likely to smoke because they are more open to and interested in it [33, 34]. This is especially true in areas with many people and low income. This phenomenon is particularly pronounced in areas with a high advertisement density. An increase in smoking behavior among adolescents is strongly correlated with exposure to cigarette advertising, promotions, and sponsorship [34]. Given the significant influence of cigarette advertising on smoking initiation and prevalence, stringent tobacco advertising regulations in Indonesia are imperative to mitigate this impact [10]. Adolescents exposed to a high number of advertisements within a school zone had 1.6 times higher odds of smoking than those with low exposure [16].

Positive perceptions of cigarette advertisements suggest that when individuals find these advertisements appealing, they perceive the actors or models featured in them as embodying attributes, such as masculinity, coolness, and confidence [35] . By educating adolescents that cigarette advertisements are merely a variety of cigarette product promotions in the cigarette industry, we can reduce adolescent smoking behavior [36]. Adolescent self-concept influences behavior, including smoking habits and self-esteem. Exposure to cigarette advertisements can alter adolescents' perceptions of smoking behavior, impacting friendship, masculinity, and peer self-recognition [28]. Adolescent smoking behavior can be understood as a form of symbolic expression representing attributes such as maturity, strength, leadership, and attractiveness to peers of the opposite sex. Adolescents perceive smoking as a means to reject societal norms, affirm their membership within a group, symbolize liberation from parental authority, and perceive themselves as more mature than their peers [36, 37] .

Cities without bans display large- and medium-sized outdoor tobacco advertisements near educational facilities, with large billboards and video boards being particularly effective in reinforcing advertising messages among young audiences [27, 38] . Cigarette advertisements are strategically placed near primary and secondary schools, and major tobacco companies target youth through aggressive marketing strategies [13, 39] .

Regulating tobacco advertisements to reduce adolescent exposure may mitigate the potential detrimental effects on never-smokers' perceptions of smoking [18, 40]. To enhance engagement and communication with policymakers, tobacco control advocates should strengthen network cohesion and inform other community groups about tobacco advertisement bans [15,41].

In conclusion, this study demonstrated a clear and statistically significant association between the density and proximity of outdoor tobacco advertisements near schools and increased smoking behavior among adolescents in Medan City. The spatial presence of banners and posters within 500 m of educational institutions contributes to heightened exposure, shaping adolescent perceptions that smoking is affordable, socially acceptable, and a symbol of peer connection. These perceptions, reinforced by visual stimuli and peer influence, substantially increase the likelihood of smoking initiation, particularly among junior high school students.

Tobacco advertising influences people in ways that do not involve deep thinking, as explained by communication theories such as the elaboration likelihood model. The way these ads are placed, along with young people's emotional sensitivity and strong response to visuals, illustrates the importance of strict tobacco control rules, such as limiting where these ads can be shown.

Therefore, comprehensive regulation of outdoor tobacco advertising especially in school zones is imperative to disrupt the psychosocial drivers of adolescent smokers. Interventions should also integrate health education strategies that raise awareness of manipulative marketing tactics while promoting youth resilience against the tobacco industry's influence..

## Author Contribution Statement

Declarations on the writers' contributions: The research was conceptualized by RKR and PAS RS, DA, PYS,. Data collection was conducted by RKR, PAS, AA and AP. A data analysis was conducted by RKR and PYS. The paper was written by RKR and PAS, with the contributions of AP, SA, DA and RS. The final version of the work was approved by all authors.

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*Ethical Approval*

The study was approved by Universitas Islam Sumatera Utara Ethics Committee (No.81/EC/KEPK.UISU).

*Conflict of Interest*

The author declare that there are no conflicts of interest.

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