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Factors related to smoking behaviour among adolescent girls

Siti Solihat Holida*, Meisya Lupianti, Lia Yuliana

Universitas Bale Bandung

Corresponding author: *E-mail: ssolihat044@gmail.com

Abstract

Background: Smoking behaviour among adolescent girls is a growing public health concern, influenced by peers, parental guidance, and social environment. These factors play a critical role in shaping norms and smoking habits.

Purpose: To determine the factors related to smoking behavior among adolescent girls.

Methods: A cross-sectional design was used with a total population of 76 female adolescents. Data were collected using a structured online questionnaire via Google Forms, measuring smoking behaviour and the influence of peers, parents, and social environment. Univariable analysis described respondent characteristics, while bivariate analysis using the Chi-square test examined the association between variables, with a significance level of $p < 0.05$.

Results: The study found that 53.9% of respondents were active smokers. Bivariate analysis indicated that peer influence ($p = 0.031$) and social environment ($p = 0.009$) were significantly associated with smoking behaviour, whereas parental influence was not statistically significant ($p = 0.131$). Adolescents with influential peers and a permissive social environment were more likely to smoke.

Conclusion: Smoking behaviour among female adolescents is significantly influenced by peers and social environment, while parental influence shows no significant association in this age group. Preventive interventions should focus on strengthening positive social influences and controlling environmental factors to reduce the risk of smoking among adolescent girls.

Keywords: Adolescent Girls; Parental Influence; Peer Influence; Smoking Behaviour; Social Environment.

INTRODUCTION

The phenomenon of tobacco and nicotine product use among adolescent girls is gaining increasing attention at the global level. In recent decades, trends show that the gap in smoking prevalence between adolescent boys and girls is narrowing, along with changes in the form and patterns of nicotine consumption. A World Health Organization (WHO) report confirms that although the prevalence of conventional smoking among adolescents tends to decline in some countries, the use of alternative nicotine products, such as e-cigarettes, is actually increasing, including among adolescent girls. Modern nicotine products are often

perceived as safer, attractively designed, and easily accessible, thereby increasing adolescent girls' vulnerability to initiating nicotine use (Holdaway, 2024). Various international studies show that although adolescent boys still dominate the use of tobacco products and e-cigarettes, the proportion of adolescent girls remains significant and shows an increasing trend. A global meta-analysis reveals that adolescent girls have a particular vulnerability to e-cigarette use, mainly due to the appeal of the flavors, packaging, and modern image associated with these products (Cibro, 2022). In developed countries such as the United States, data from the Centers for

Disease Control and Prevention (CDC) for the 2022–2023 period shows that tobacco product use among adolescent girls continues, with e-cigarettes being the most widely used product. In fact, in some European countries, the prevalence of smoking among 15-year-old adolescent girls is reported to be equal to or higher than that of adolescent boys, reflecting a new dynamic in the adolescent nicotine epidemic (Schneller, Kasza, Hammond, Bansal-Travers, O'Connor, & Hyland, 2022).

Empirical findings in the United States also reinforce this phenomenon. A longitudinal study on e-cigarette use among adolescents aged 13–18 years showed an increase in prevalence of use among adolescent girls from year to year, with figures at certain periods equalling or even exceeding those of adolescent boys (Bronfenbrenner, 2019). This confirms that the use of modern nicotine products by adolescent girls is not a marginal phenomenon, but rather a public health issue that requires serious attention. In Southeast Asia, a relatively similar trend has also been reported. The ASEAN Tobacco Control Atlas shows that although the prevalence of smoking among adolescents aged 13–15 years tends to decline in some countries, e-cigarette use is actually increasing, including among adolescent girls (Tryastuti & Widyaningsih, 2022). The shift from conventional cigarettes to electronic cigarettes puts adolescent girls in a more vulnerable position, as these products are often considered more socially acceptable, come in a variety of flavors, and do not carry the same stigma as conventional cigarettes. In Indonesia, tobacco use among adolescents remains a serious problem. The 2023 Indonesian Health Survey (SKI) reported that 7.4% of the population aged 10–18 years are active smokers. Data from the Global Youth Tobacco Survey (GYTS) also shows an increase in the prevalence of teenage smokers aged 13–15 years from 18.3% in 2016 to 19.2% in 2019. In addition, the use of e-cigarettes among adolescents in Indonesia continues to increase, indicating a change in nicotine consumption patterns that has the potential to increase health risks, including among adolescent girls. In West Java Province, the prevalence of smokers aged 15–24 years reportedly decreased from 15.74% in 2020 to 13.99% in 2022. However, data on smoking

prevalence among adolescent girls has not been presented separately by gender and age group. A study of smoking behaviour determinants in West Java shows that women are less likely to smoke than men, but does not provide a specific picture of adolescent girls (Nogueira-Arjona, Shannon, Kehayes, Sherry, Keough, & Stewart, 2019). The limitation of disaggregated data indicates that there is still a lack of attention to smoking behaviour among adolescent girls at the regional level.

At the district level, similar conditions were also found. Several studies on adolescent smoking behaviour in Bandung District showed a fairly high prevalence of smokers, but most did not analyse the data based on gender (Musniati, Sari, & Hamdan, 2021). As a result, information on factors related to smoking behaviour among adolescent girls is still limited, especially in the local context. A preliminary study conducted in April 2025 in RW 07, Ciheulang Village, Ciparay District, showed that smoking behaviour among adolescent girls is influenced by various factors, including peer influence, a residential environment that is permissive towards smoking, and smoking habits within the family. These findings are in line with various studies that state that individual, family, peer, school environment, and media and digital marketing exposure factors play an important role in shaping adolescent girls' smoking behaviour (Putri, Tambunan, & Manan, 2021).

RESEARCH METHOD

This quantitative study used an observational analytical approach with a cross-sectional design. This design was chosen to analyse the relationship between peer factors, parental influence, and social environment with smoking behaviour among adolescent girls, as a cross-sectional design allows for the measurement of all variables at a single point in time. The study was conducted in RW 07, Ciheulang Village, Ciparay District, Bandung Regency, from April to May 2025. The study population consisted of all female adolescents aged 15–18 years residing in the area, totalling 76 people. Given the relatively small population size, total sampling was used (Creswell & Creswell, 2017). Thus, all members of the population became research respondents. The research variables consisted of dependent and independent variables.

Siti Solihat Holida*, Meisya Lupianti, Lia Yuliana

Universitas Bale Bandung

Corresponding author: *E-mail: ssolihat044@gmail.com

Doi: 10.56922/mhc.v4i5.2176

The dependent variable in this study was smoking behaviour among adolescents aged 15–18 years, defined as the activity of burning and inhaling tobacco. Smoking status was categorized into two groups: still smoking and not smoking. These categories were used to facilitate the analysis of the relationship between smoking behaviour and the factors that influence it. Meanwhile, the independent variables included peer factors, parental influence, and social environment. Peer factors included the influence of peers who interacted directly with adolescents, including invitations, pressure, or social acceptance of smoking behaviour. Parental influence includes role modelling, supervision, communication, and education about the dangers of smoking. The social environment includes social norms, exposure to smoking behaviour around adolescents, and the availability of cigarettes.

Based on previous studies, these three independent factors have been consistently shown to play an important role in determining adolescent smoking behaviour. These findings emphasize the importance of understanding the interaction between peers, parental roles, and the social environment in order to design effective smoking prevention interventions for adolescents. The independent variables in this study were measured using a closed-ended online questionnaire via Google Form, which was compiled based on a review of the literature and previous studies. Each question item used a 1–3 ordinal Likert scale, with categories 1 = Never, 2 = Sometimes, and 3 = Often. The scores of all items were summed to categorize the level of influence as low, moderate, or high, in accordance with the guidelines for measuring social behaviour in adolescents. Meanwhile, the dependent variable, namely smoking behaviour, was measured using a previously validated instrument. This instrument includes questions about the frequency and intensity of smoking, as well as the social context that influences this behaviour. All instruments have been tested for validity and reliability prior to use in this study, with a Cronbach's alpha value ≥ 0.70 , indicating adequate internal consistency (DeVellis & Thorpe, 2021).

This approach ensures that both independent and dependent variables are measured systematically, objectively, and reliably, so that the

analysis results can reflect a valid relationship between social factors and smoking behaviour in adolescents. Data collection was conducted online using a Google Form-based questionnaire, which was completed independently by respondents. Before completing the questionnaire, the researcher provided an explanation of the study's purpose, procedures, participation rights, and the confidentiality of respondents' identities. Participation in this study was voluntary, and all respondents provided informed consent after understanding the research procedures. The implementation of this informed consent procedure adhered to international health research ethics guidelines, as stipulated by the World Medical Association, which emphasize the protection of research participants' rights, safety, and confidentiality. Thus, the entire data collection process ensured ethical aspects, safety, and respect for respondents' autonomy.

Data analysis was performed using statistical software to ensure accuracy and efficiency of data processing. Univariate analysis was used to describe respondent characteristics, including the distribution of age, gender, and education level, as well as the distribution of each research variable. The results of the univariate analysis helped understand the respondent profile and the initial picture of the variables studied. Next, bivariate analysis was used to examine the relationship between the independent and dependent variables. The statistical test used was the Chi-square test, or Fisher's exact test if there were cells with expected frequencies less than five, in accordance with categorical data analysis guidelines (Field, 2024). The significance level was set at $p < 0.05$, so that the results obtained could be used to statistically assess the relationship between variables with a sufficient level of confidence. This analytical approach allowed researchers to systematically and reliably evaluate the influence of peers, parents, and the social environment on adolescent smoking behaviour. This study has received approval from the Institute for Research and Community Service (LPPM) of Bale University, Bandung. All respondents participated voluntarily after receiving an explanation of the purpose, benefits, and procedures of the study, and their identities were strictly confidential.

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RESEARCH RESULTS

Table 1. Distribution of Respondent Characteristics (N= 76)

Variable	Results	P-Value
Age (Mean±SD)(Range)(Year)(n/%)	(16.5±1.0)(15-18)	
15-16	38/50.0	
17-18	38/50.0	
Smoking Behaviour (n/%)		
Non-Smoker	35/46.1	
Smoker	41/53.9	
Parental Influence (n/%)		
Poor	18/23.7	0.131
Moderate	15/19.7	
Heavy	43/56.6	
Peer Influence (n/%)		
Poor	21/27.6	0.131
Moderate	21/27.6	
Heavy	34/44.7	
Social Environment (n/%)		
Poor	21/27.6	0.009
Moderate	21/27.6	
Heavy	34/44.7	

Table presents the characteristics of the respondents. The mean age of participants was 16.5±1.0 years, with an age range of 15–18 years. Half of the respondents were aged 15–16 years and the other half were 17–18 years. More than half of the respondents reported smoking behaviour (53.9%), while 46.1% did not smoke. Regarding parental influence, most respondents were in the high category (56.6%), followed by low (23.7%) and moderate influence (19.7%), with no significant association ($p=0.131$). Peer influence was predominantly high (44.7%), while low and moderate influences were equally distributed (27.6% each), also showing no significant association ($p=0.131$). In contrast, social environment factors showed a significant association ($p=0.009$), with the majority of respondents categorized as having a high social environmental influence (44.7%).

DISCUSSION

The analysis showed a significant relationship between peers and smoking behaviour ($p = 0.031$), where adolescents with influential peers had a very high proportion of smokers (94.1%) compared to less influential peers (21.4%). This is consistent with Social Learning Theory, which emphasizes that behaviour is learned through observation, imitation, and social reinforcement. Peers are the main agents in the formation of new behaviours as adolescents seek acceptance and group identity (Lutfiah, 2025).

Previous research also shows peer influence as a strong predictor of smoking behaviour in adolescent girls. This finding adds to the local context, where the intensity of social interactions among adolescent girls is quite high, making peers a dominant risk factor, stronger than parental influence. This provides empirical evidence that smoking prevention interventions should target peer groups as units of behaviour change, not just individuals or families.

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The social environment was also significantly associated with smoking behaviour ($p = 0.009$). All adolescents in influential social environments were known to smoke (100%), while only 16.7% in less influential environments smoked. According to ecological theory, the social environment shapes behavioural norms, access to resources, and social pressure. This finding supports the theory that a permissive social environment toward smoking increases the risk of smoking because adolescents perceive this behaviour as an accepted norm (Miech, Johnston, O'Malley, Bachman, & Patrick, 2019).

Previous research in Indonesia has shown that exposure to tobacco advertising and product promotions is associated with increased smoking behaviour among adolescents. One national study, based on the Global Youth Tobacco Survey (GYTS), reported that adolescents exposed to various forms of tobacco advertising, promotion, and sponsorship were more likely to start smoking than those not exposed (Megatsari, Astutik, Gandeswari, Sebayang, Nadhiroh, & Martini, 2023). Furthermore, other research has shown that exposure to cigarette advertising in the home and school environment is associated with adolescent smoking behaviour (Safitri, Damayanti, & Murtadho, 2025). Overall, this research indicates that peers and the social environment are significant determinants of smoking behaviour in adolescent girls, while parental influence is insignificant. These findings emphasize that smoking prevention interventions should focus on: peer-led interventions; strengthening anti-smoking social norms in the local environment; and parental involvement as a supportive factor, but not as a sole factor. These findings provide a novel contribution by specifically identifying local contexts and highlighting the importance of community-based prevention strategies that consider peer interactions and the social environment, a previously rarely studied context at the neighbourhood or village level.

CONCLUSION

Smoking behaviour among adolescent girls is quite high, with more than half of respondents still actively smoking. Bivariate analysis showed that peer influence and social environment were significantly associated with smoking behaviour, while parental influence showed no significant association. Adolescents with influential peers and a

social environment permissive of smoking tended to have higher smoking behaviour. These findings emphasize the importance of interventions that consider social and environmental influences in preventing smoking in adolescent girls, although the role of parents remains relevant in shaping norms and self-control.

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