



Understanding Adolescent Smoking Behavior in ‘Cigarette City’ Kudus, Indonesia: An Ecological Perspective

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Abstract

Adolescent smoking behavior is a significant public health issue worldwide, including in Indonesia. Despite anti-smoking campaigns being implemented, the number of adolescent smokers has not reduced, especially in Kudus, Indonesia, known as the “cigarette city” where numerous cigarette industries operate. This study aims to understand the dynamic interactions between adolescents and their surrounding environments. We conducted ethnographic fieldwork in the Gringsing District, Kudus, for five months. In addition to participant observations, we conducted interviews with 18 adolescents, 11 pairs of parents, 3 adolescent fathers or mothers, five religious figures, three community leaders, and two cultural figures. Five themes emerged from the thematic analysis, including: from trying to get used to it, ways to overcome temptation to smoke, allowing smoking if employed, violation of prohibition at school, and penetration of cigarette culture. The findings indicate a dynamic interaction among adolescents and their broader family, peer, school, and socio-cultural environments. We analyzed the findings using Bronfenbrenner’s ecological theory. We conclude that adolescent smoking behavior in the ‘cigarette city’ of Kudus is influenced by the entrenched cigarette industry, which permeates societal norms, values, cultural traditions, and everyday behaviors, including those of adolescents.

INTRODUCTION

Adolescent smoking behavior is a significant public health issue in both Indonesia and globally. According to the World Health Organization (WHO), smoking at a young age increases the risk of various chronic illnesses, including lung cancer, cardiovascular disease, and respiratory disorders (Kurbana et al., 2024; WHO, 2019). WHO has undertaken multiple initiatives to curb smoking worldwide, such as regularly monitoring prevalence rates. In 2022, the global prevalence of cigarette use among individuals aged 15 years and older was estimated at 20.9%, down from 26.4% in 2010. Despite this decline,

the figure remains well short of the WHO target of a 30% reduction in global smoking prevalence (WHO, 2024).

WHO data also indicate that Southeast Asian countries have a higher smoking prevalence than most other regions (WHO, 2024). In Indonesia, the 2023 Indonesian Health Survey conducted by the Ministry of Health reported approximately 70 million active smokers (Tarmizi, 2024). Of these, 7.4% were aged 10–18 years. The largest proportion of smokers was in the 15–19 age group (56.5%), followed by the 10–14 age group (18.4%). The predominant cigarette types used by adolescents were filter cigarettes

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and e-cigarettes, with the latter showing a marked increase over the past four years. According to the Global Adult Tobacco Survey, e-cigarette use among adolescent smokers rose from 0.3% in 2019 to 3% in 2022 (Tarmizi, 2024). Similarly, Marice et al. (Marice et al., 2022) reported that 49.64% of 832 active smokers also used e-cigarettes.

Various efforts have been undertaken to reduce smoking prevalence. Since 1987, the WHO has organized World No Tobacco Day to raise global awareness of the health hazards of tobacco use. Many countries have also implemented smoke-free laws, which have proven effective in reducing adolescent smoking (Hawkins et al., 2016). In Indonesia, regulatory measures include Government Regulation No. 81 of 1999 on Cigarette Security for Health, Minister of Education and Culture Regulation No. 64 of 2015 on Smoke-Free Areas in Schools, and Fatwa of the Muhammadiyah Tarjih and Tajdid Council No. 6/SM/MTT/III/2010, which prohibits smoking. Muhammadiyah has also extended its fatwa prohibiting electronic cigarettes (Fatwa Majelis Tarjih dan Tajdid Pimpinan Pusat Muhammadiyah 2010). Furthermore, reducing smoking among 10–18-year-olds is a specific indicator in Indonesia's National Medium-Term Development Plan 2020–2024.

Despite these initiatives, the decline in smoking rates has been slow, largely due to the powerful influence of cigarette production and advertising. The tobacco industry in Indonesia remains a major economic force, particularly in Kudus, a city widely recognized as “the cigarette city.”

Identity of Kudus City

Kudus is a regency in Central Java Province, Indonesia, located on the north coast of Java Island, approximately 60 km from Semarang, the provincial capital. The regency comprises nine sub-districts, 123 villages, and nine urban villages (Pemerintah Kabupaten Kudus, 2016). Kudus has two prominent identities: a religious identity, as the “City of Santri” due to the presence of thousands of Islamic boarding school (pesantren) students (*santri*), and a trade identity, known as the “Cigarette City” because of its extensive cigarette industry. The city is also famous for producing *jenang*—a traditional sweet made from sticky rice—popularly known as *Jenang Kudus*.

The name “Kudus” derives from the Arabic *Al-Quds*, meaning “Jerusalem” in Islamic tradition. Historically, Kudus was a significant center for the spread of Islam in Java and Indonesia. In

the 15th century, two prominent Islamic scholars, Sunan Kudus and Sunan Muria, lived in the city. Sunan Kudus built the Al-Manar Mosque, modeled after a Jerusalem mosque and featuring a unique blend of Islamic and Hindu architectural styles. The Hindu-style Kudus Tower remains a prominent landmark in religious tourism (Pemerintah Kabupaten Kudus, 2016). Today, Kudus hosts 86 Islamic boarding schools, reinforcing its identity as the City of Santri.

The cigarette industry has had a significant economic and social impact on Kudus. According to the Central Statistics Agency (2022), the population aged 15 years and older totaled 501,443 of whom 252,804 (50%) were employed in the industrial sector. This includes tobacco processing, electricity and gas supply, mining, waste management, recycling, and construction. In 2022, Kudus had 229 large and medium manufacturing industries, of which 73 were tobacco processing industries; the remaining 156 were engaged in food, textiles, apparel, paper, rubber, furniture, and printing. Production of hand-rolled cigarettes has risen annually, from 21,954,111,360 sticks in 2020 to 26,125,257,120 sticks in 2021—a 19% increase.

Cigarette companies also play a prominent role in the education sector. One company, for example, runs a Corporate Social Responsibility (CSR) program that supports vocational high schools. Of the 29 high schools in Kudus, 11 (37%) receive assistance with facility upgrades and infrastructure improvements. According to an interview with the author of Indonesia from Nationalism to Cultural Heritage (2014), such donations aim to sustain the companies' long-term operations. The influence of the cigarette industry also extends to school policies on smoking bans (A'isah et al., 2024; Aisah & Ridha, 2017) and adolescent attitudes toward tobacco. Even adolescents who do not smoke often express positive attitudes toward cigarettes (Aisah et al., 2023). In 2023, the smoking rate among individuals aged 15–24 in Kudus reached 19.85%, up from 16.11% in 2022 (BPS Kudus, 2022a, 2022b).

Adolescents and Smoking Behavior

Adolescence is a developmental stage marked by significant cognitive, psychosocial, and behavioral changes. According to Piaget, early adolescents enter the formal operational stage, enabling abstract thought and systematic problem-solving (Rice & Dolgin, 2008). This cognitive shift coincides with increased decision-making responsibilities (Santrock, 2007) and the consolidation of personal and social identity (Choudhu-

ry et al., 2006). During this period, adolescents become more self-aware, sensitive to peer and societal opinions, and increasingly independent from parental control.

Smoking initiation often occurs during adolescence. Studies indicate that the majority of smokers begin before the age of 18, typically between 13 and 19 years (Khan et al., 2017). While many experiments were conducted out of curiosity without intending to become regular users (Baker & Webb Hooper, 2013; Piasecki et al., 2000), social and environmental influences often facilitate progression to habitual smoking. Key determinants include peer and family smoking behaviors, cigarette accessibility, affordability, and targeted advertising (Riyanti et al., 2022; Rukmi, 2019).

Research consistently identifies multiple interacting factors influencing adolescent smoking, including personal, social, and environmental factors. Wium & Wold (2009) and Lovato et al. (2010) examined the influence of school, leisure, and family contexts on adolescent smoking. They found that individual-related factors (attitudes toward smoking and perceived behavioral control) and leisure activities (time spent with friends in the evenings) were the strongest predictors of smoking behavior. School and family influences were fully mediated by these individual and leisure factors. Lovato et al. (2010) also emphasized that supportive school environments, such as high cigarette prices, tobacco prevention education, and smoking ban policies, can help reduce adolescent smoking rates.

International studies confirm similar patterns across developed and developing countries. However, additional risk factors, such as poverty, academic failure, and weak school engagement, are more prominent in low- and middle-income settings (Al-Sadat et al., 2010). School-based tobacco prevention programs, high cigarette prices, and strict smoking bans have been shown to reduce adolescent smoking rates (C. Y. Lovato et al., 2010; Wium & Wold, 2009), yet in many contexts, including Indonesia, such measures face challenges due to strong tobacco industry influence and persistent cultural acceptance of smoking.

Ecological System Theory

In this research, we use ecological system theory to understand adolescence smoking behavior because most psychological theories focus primarily on the individual. In contrast, Bronfenbrenner's ecological system theory emphasizes the influence of environmental contexts (El Zaatari & Maalouf, 2022). This theory

has evolved through three phases. In the first phase, Bronfenbrenner identified four systems shaping individual development: the microsystem (immediate environment), mesosystem (connections between microsystems), exosystem (indirect environment), and macrosystem (cultural and societal influences). In the second phase, he highlighted the active role individuals play in shaping their own development, particularly through biological factors. Although the term bioecological system theory emerged during this stage, many researchers continue to use the original term. In the third phase, the theory became more comprehensive through the PPCT model (Process–Person–Context–Time), incorporating the chronosystem to represent the dimension of time, which includes significant life transitions and historical events. From this perspective, individuals are shaped by multiple contextual factors, ranging from proximal forces in daily environments to more distal and abstract influences. Importantly, habitats are seen not as static settings, but as processes of interaction and influence (El Zaatari & Maalouf, 2022).

By emphasizing the interaction among different systems in shaping human behavior, ecological system theory has been widely applied to diverse developmental topics, including media and youth development (Johnson, 2010), identity development (Lawrence, 2021), childcare practices among teenage mothers (Twintoh et al., 2021), childhood resilience (Antony, 2022), students' sense of belonging in school (El Zaatari & Maalouf, 2022), developmental impacts of multiple forms of violence (Bergagna & Tartaglia, 2019), and juvenile justice system interventions (Sheerin et al., 2023).

The study most relevant to the present research was conducted by Wium & Wold (2009), who applied ecological system theory to adolescent smoking behavior. Drawing data from the Control of Adolescent Smoking (CAS) project and the WHO's Health Behaviour in School-aged Children (HBSC) survey, they examined the effects of school, leisure, and family factors. While each factor was individually associated with smoking, in an ecological context, personal and leisure factors emerged as the most reliable predictors. School and family influences were entirely mediated by these individual and leisure factors.

Following Wium & Wold's (2009) approach, the present study also applies ecological systems theory, focusing on a small-scale context: Kudus City, Indonesia. Unlike the cross-national quantitative survey, our research aims to use a qualitative ethnographic method to explore the

dynamic interactions between adolescent smoking behavior and the surrounding family, social, economic, and cultural environments in Kudus City, Indonesia. The findings of this study are anticipated to provide a deeper contextual knowledge of the factors shaping adolescent smoking behavior, thereby informing the development of culturally sensitive and context-specific tobacco control interventions.

METHOD

This study employed an ethnographic approach to understanding adolescent smoking behavior within the context of everyday life in Kudus. This anthropological method is suitable for systematic research on the socio-cultural environment and its role in shaping adolescent smoking behavior (Fetterman, 1989). A key characteristic of the ethnographic method is participant observation (Atkinson & Martyn, 2007; Naidoo, 2012; Schensul et al., 1999). The first author conducted fieldwork in the Gringsing District (Pseudonym), Kudus City, Indonesia, for five months, from April 2024 to August 2024. This site was chosen due to its status as one of the largest hubs of the cigarette industry in Kudus. The Ethics Committee of the Faculty of Psychology, Universitas Gadjah Mada, has approved and issued Ethical Clearance with the number 2846/UN1/FPSi. 1.3/SD/PT.01.04/2024.

Through this ethnographic approach, we interviewed adolescents and their families to gain insight into their behavior, attitudes, and understanding of cigarette smoking. The participant recruitment process began by contacting six high schools for a broader survey on student smoking behavior. These schools were purposively selected from a total of 12 upper secondary schools in Gebog District based on their location within a 5 km radius of the cigarette industry center to capture the influence of a high-exposure sociocultural environment. The selected schools also represent diverse institutional types (public, private foundation-based, and religion-based), allowing for variation in context. Following the initial fieldwork, we conducted additional visits to complete data collection. The first author interviewed 18 adolescents, including 10 active smokers and 8 non-smokers, with all participants providing written informed consent, and parental consent obtained for those under 18 years old (Table 1).

The interview guideline used in this study was developed based on relevant theoretical frameworks and prior empirical studies on adolescent smoking behavior. Although the guideline was not subjected to a formal pilot study, its con-

tent validity was ensured through expert review. Two experts in psychology and qualitative research evaluated the clarity, relevance, and cultural appropriateness of the questions. Their feedback was used to refine the wording, sequencing, and probing strategies to ensure that the questions were comprehensible and capable of eliciting in-depth responses from participants.

The employment data in Table 1 and interview observations indicate that the participants and their families came from lower-middle-class socioeconomic backgrounds. Table 2 below presents the positions of the community leaders interviewed. Participants representing religious figures, community leaders, and cultural figures were recruited using a purposive sampling strategy, complemented by snowball sampling. Individuals were recruited based on their recognized social roles, influence, and active involvement in community life, particularly in relation to adolescents. Initial participants were identified through key informants and gatekeepers during early stages of fieldwork, ensuring access to individuals with culturally embedded knowledge and authority. The selection criteria emphasized participants who had regular interaction with adolescents and were perceived as shaping local norms and practices, including those related to smoking behavior. This approach enabled the study to capture in-depth, contextually grounded insights into the socio-cultural dynamics of adolescent smoking in the Kretek City setting.

The interviews took place in various locations, including participants' homes, schools, the researcher's home, street food stalls, and mosques. We interviewed family members after obtaining the adolescents' permission. By interviewing participants and their families in their home environments, the researcher also observed the broader social context in which they lived. In addition to interviews with adolescents, we conducted interviews with 11 pairs of parents and six fathers or mothers individually. Interviews were also conducted with five religious figures, three community leaders, and two cultural figures. To analyze the data, we used a thematic data analysis.

We analyzed the data using the six-step thematic analysis framework outlined by Kushnir (2025), which includes familiarizing with the data, coding, generating themes, reviewing themes, defining and naming themes, and writing up. While Braun and Clarke's (2006) seminal model remains the foundational reference for thematic analysis, Kushnir's synthesis of studies from 2014–2024 offers an updated and more systema-

Table 1. Demographics of Participants and Their Families

Smoking Status	Initials	Gender	School	Parent's Occupation	Family Smoking Status
Adolescent smoker	Rafa	Male	Islamic School	Construction laborer and tobacco industry worker	Father is a smoker
	Riz	Male	Vocational High School	Driver and casual laborer/ domestic worker	Father has quit smoking
	Rez	Male	Vocational High School	Food vendor at the market	Father is a smoker
	Ilhan	Male	Islamic School	Construction laborer/ homemaker	Father is a non-smoker
	Arjan	Male	Public School	Construction laborer and tobacco industry worker	Father and his brothers are smoker
	Aldi	Male	Islamic School	Farmer/ tobacco industry worker	Father is a smoker
	Nadin	Female	Public School	Tobacco trading business / worker in a fish processing factory	Father is a smoker
	Nanik	Female	Public School	Driver/tobacco industry worker	Father is a smoker
	Faiz	Male	Islamic School	Worker at a cigarette packaging printing company	Father is a smoker
	Na-mung	Male	Public School	Construction laborer / home-based food vendor	Father is a smoker
Non-smoking adolescent	Alan	Male	Islamic School	A tobacco warehouse attendant at a cigarette manufacturing company / A laborer at a printing company (a subsidiary of a tobacco company)	Father is a non-smoker
	Trio	Male	Islamic School	Home based food vendor	Father has quit smoking
	Iqlab	Male	Public School	Driver/a kitchen worker	Father does not smoke at home
	Hanim	Female	Public School	Contraction labor/ home based food vendor	Father is a smoker
	Sisi	Female	Islamic School	Deceased / A sanitation worker in the tobacco industry	Father is smoker
	Nadira	Female	Public School	A construction worker in a tobacco company subsidiary / A babysitter	Father is a smoker
	Davina	Female	Vocational High School	Self-employed / An employee at the head office of a cigarette company	Father is a smoker
	Najla	Female	Public School	A construction laborer / A laborer in a cigarette manufacturing company	Father is a smoker

Table 2. Participants: Religious Figures, Community Leaders, and Cultural Figures

Religious Leaders (Pseudonym)	Role
Phase	Head of the Muslimat organization in Jensa Village
Abdul	Head of NU M Islamic Boarding School, Jensa Village
Hamdan	Member of the PPM Tadjdid and Tarjih Council
Michael	Muhammadiyah Branch Leadership of Gringsing District
Shodiq	Muhammadiyah Branch Leadership of Gringsing District
Karis	Head of RT Village in Gringsing Sub-District
Rahman	Head of RW in Kd Village, Gringsing District
Jesus	Muhammadiyah Youth in Gringsing District
Xafi	Local Resident and Author of a History Book
Nava	Museum Guide

tic framework, making it particularly relevant for contemporary qualitative research. Based on this study, Kushnir (2025) outlined a six-step thematic analysis framework, which includes (1) familiarizing with the data, (2) coding, (3) generating themes, (4) reviewing themes, (5) defining and naming themes, and (6) writing up.

RESULTS AND DISCUSSION

In presenting the results of this study, we first outline the characteristics of the adolescent participants and their families, followed by a description of themes.

(1) Characteristics of Adolescents

The characteristics of adolescents are described in more detail in three groups: adolescent smokers, adolescents who have quit smoking, and adolescents who have never smoked. The following sections provide detailed descriptions:

(a) Characteristics of Teenagers Who Smoke

Smoking participants described their relationships with their parents as closed, while relationships with their peers were more open. Teenagers who actively smoked enjoyed activities with friends, both school-related and outside of school. They participated in extracurricular activities such as mountain climbing, theater, and karate. Outside school, they preferred gathering with friends to play online games or simply hang out.

Teenagers who smoke also exhibited low motivation for academic activities. For instance, one female smoker expressed a lack of motivation to complete her schoolwork. One of the informants said.

"I never study, and if there is homework, I cheat [from friends]" (Nanik, smoking adolescent girl, p. 14).

Some teenagers faced challenges at school due to low motivation to learn, leading to absen-

teeism. The mother of participant, Arjan, mentioned that his teacher visited their home because he had not attended school for several days. His teacher noted that some of his friends were either skipping school to go to the mall or sleeping in the prayer room. Participant Ilhan felt unappreciated by his teacher for his non-academic achievements and regretted his school choice, feeling left behind by his classmates.

These teenagers tended to have a short-term outlook. For example, Rafa stated that smoking brings pleasure and provides an opportunity to socialize with friends. Despite his parents suffering from lung disease due to smoking, Rafa was unafraid to smoke. He also disregarded the smoking ban at his school, based on a religious organization's fatwa, expressing no intention to stop.

(b) Characteristics of Teenagers Who Have Never Smoked

In the non-smoking group, we differentiated between male and female adolescents. Non-smoking male adolescents exhibited a realistic view of smoking. For example, Alan stated that smoking is acceptable in designated areas to avoid disturbing others. He acknowledged that smoking has become a necessity for smokers, likening it to.

"... it to the need for food: ... it has become a necessity for smokers... just like [the need to eat] rice" (Alan: p.18).

Meanwhile, Iqlab considered smoking normal for adolescents in Kudus, stating,

"... there are many cigarette industries here, so it is normal... we should not force other people's will... they have their own rights" (Iqlab and His Mother: p.1).

Teenagers in this group were self-aware and chose not to smoke, prioritizing their health. Iqlab expressed,

"... I want to be healthy and not get sick" (Iqlab

and His Mother: p.1).

Economic reasons also influenced their decision not to smoke; Alan noted,

"Cigarettes are expensive; one sachet costs 25 thousand" (TR: p.2).

Non-smoking male teenagers preferred spending time at home, showing little interest in hanging out or playing online games with friends. Besides school, their activities included helping with family chores and actively participating in youth activities at the mosque. Their interactions with parents were positive, leading to an impression of being "obedient" in their parents' eyes. This impression was also reflected in their interactions with researchers.

Non-smoking teenage girls believe that smoking is normal for boys but not for girls. They associated smoking with "naughty" behavior in both genders and girls. Additionally, smoking made those around them uncomfortable. These non-smoking teenage girls had no desire to smoke, as they were not used to seeing girls smoke in their environment.

(2) Description of Themes

Five themes emerged from the thematic analysis, representing individual, family, school and community levels. Table 3 below presents the themes and subthemes identified as the main findings of this study.

(a) From trying to getting used to it

This theme explores how adolescence begins to involve smoking. Most male participants began smoking after trying it out of curiosity, often influenced by friends who smoked or were invited to smoke. Two female participants, Nadin and Nanik, started smoking after being encouraged by their siblings. Three participants began smoking in elementary school (Arjan, Reza, and Rafa), four in junior high school (Ilhan, Riz, Nadin, and Nanik), and one in senior high school (Faiz). None of them started smoking at home; all began outside. One female participant started smoking outside the Islamic boarding school while still enrolled there.

Until the time of the interviews, the teenagers were still actively smoking. They purchased cigarettes with pocket money provided by their parents (Rafa, Riz, Rez, and Faiz), while one participant bought them independently through work (Ilhan). Others received cigarettes from friends (Nanik, Rafa, and Arjun) or family (Nanik and Arjun).

Some parents of the participants working in cigarette companies appeared to encourage and facilitate their children's smoking. For instance, Nadin said that her parents worked in

a cigarette company and encouraged her to try smoking, although her mother later scolded her.

Teenagers whose parents did not grant permission typically smoked outside the home, away from parental supervision. However, participant Ilhan was allowed to smoke at home, with his father encouraging him to invite friends over to smoke. Ilhan's father stated during an interview:

"In fact, I am happy; it is okay... your friend comes over... was invited here... I gave him coffee, it is okay." (Interview with Ilhan's Father: p.66)

Teenage smokers maintained their smoking behavior for various reasons, including smoking as a regular activity when socializing with friends (Rafa, Riza, Rezi, Ilhan, and ARJ), seeking calmness after smoking (Rez and Faiz), and using cigarettes to combat drowsiness (Rafa and Riz). Some teenagers began to feel the negative effects of smoking, such as shortness of breath and coughing (Rez, Rafa, and Arjun). They attempted to overcome these negative impacts by temporarily stopping smoking, drinking water, or switching to electronic cigarettes, but ultimately continued to smoke (Rez, Rafa, and Arjun).

(b) Ways to overcome the temptation to smoke

This theme emerged from adolescents who have never smoked. All non-smoking teenagers had family and friends who smoked. Alan understands that many people around her smoke. Even when her own siblings smoke and emit smoke near her, Alan considers it to be joking behavior. She stated,

"... I know it is just a joke" (Alan: p.21).

In contrast, Hanim, who observed her father smoking, reminded him of the dangers of cigarettes, but he continues to smoke.

When encountering others smoking outside their families, teenagers in this group exhibited varied responses. Some displayed indifference (as shown by Hanim, Nadira, and Najla). Meanwhile, a non-smoking male teenager, Alan, attempted to remind them gently. He said,

"If it were my friend who did it, I would say, 'Oi, that is rude,' but in a tone that is not too serious" (Alan: p.22).

Most female teenagers in this group did not care when friends smoked, although they sometimes expressed discomfort. For instance, when asked how she felt when seeing someone smoke, Najla replied,

"I do not care... Let him feel hurt" (Najla, P.78).

This group of teenagers reported that their friends had never offered them cigarettes, as their activities did not involve long gatherings with friends who smoke to chat for a long time or hang

Table 3. Thematic Structure of Findings

Main Themes	Subthemes from Findings
From trying to get used to it	Imitating peers Smoking initiation during junior high school Smoking to improve concentration
Ways to overcome the temptation to smoke	Negotiating values Behavioral diversion strategies Anticipating smoking risks Alternate stress coping
Allowing smoking if employed	Ambiguity of smoking prohibition Accepting smoking behavior after adulthood or employment Facilitating smoking within the family
Violation of smoking	Weak enforcement of school smoking policies Teachers smoking practices at school Positive attitudes toward smoking among teachers
Penetration of cigarette culture	Social normalization of smoking Cigarettes in religious and social rituals Massive cigarette advertising Tobacco industry involvement in community life: Legitimization of Kudus as the “Kretek City.”

out together. However, Trio had been tempted to smoke and had been offered cigarettes. Nevertheless, when offered, Trio firmly rejected, stating,

“... I am forbidden by my mother” (Trio: p.17).

(c) Allowing smoking if employed

This theme emerged among the parents of adolescence who smoked. Most parents of teenage smokers reported a lack of open communication with their children. Participant Ilhan mentioned that he was not open with his mother because she had been working abroad for an extended period. In contrast, participant Arjan felt distant from his parents because he was one of nine siblings, which divided their attention among them.

Generally, parents expressed anger upon discovering their children smoking. However, teenagers often continued to smoke in secret outside the home. For example, Riza’s father stated:

“If I am angry, he will definitely vent his emotions through smoking. He will definitely smoke more when I am angry with him. The way he smokes is in secret. His outlet is in the form of smoking behavior that is difficult to stop, which is addictive” (Rez’s father: P.25)

While parents initially tried to express anger, over time, they began to accept their children’s smoking. Some parents even acknowledged that it is natural for boys to smoke. Riz’s mother commented,

“I never smoke, but they say men are better at smoking than eating. This means he (Rez) is more comfortable smoking than eating” (Rez’s

mother: P.7).

Some parents attempted to gently discourage their children from smoking, understanding the emotional instability of teenagers. For instance, Ilhan and Rez’s parents advised them against smoking but did so without force. Ilhan’s father stated,

“[I] still forbid, remind every day, every time, but it is just a reminder; you cannot smoke” (Father and Mother Ilhan: P.59).

Some parents suggested that smoking was permissible once their children began working. Teenage participant Aldi reported that he was still often scolded by his parents for smoking, stating,

“My parents said that it is allowed if you are already working.”

(Aldi: P.40).

Participant RZA noted,

“Yes, according to my mother, if you are already working, you can buy it yourself” (Riz: p.87).

Similarly, Faiz’s father stated,

“If you do not smoke, you cannot smoke anymore; you have to go to school” (Faiz’s father: p.12).

Likewise, Rez’s mother said:

“I suggest you do not smoke because you are still in school. You can smoke if you are already working.... You can smoke if you are already working. You can smoke but not as a hobby” (Rez’s mother: p.12).

Arjan’s father forbade him from smoking due to health and economic concerns, saying,

“You cannot smoke. Smoking is bad for your

health, and smoking is wasteful; now cigarettes are expensive, a cigarette is 25 thousand, for rice 2" (Arjan's father: p.17).

Parents' advice against smoking seems to be largely ignored by teenagers, as among the nine smokers, five fathers are still active smokers. This is particularly true for those whose parents work in the cigarette industry, as their children often receive cigarettes from their parents' products.

In families of non-smoking teenagers, parents generally do not force their children not to smoke. They provide their sons with freedom to choose. Parents of non-smoking teenage girls firmly assert that smoking is unnatural behavior. Hanim's father said:

"Hanim is still in school... she is a girl, still young... girls rarely smoke" (Hanim's Father: P.2).

Similarly, Nadin's mother remarked,

"It is not common for us to smoke" (Nadira's mother, P.18).

(d) Violated prohibitions at school

The six schools participating in this study implemented smoking bans for students through conduct rules communicated verbally and in writing, displayed on school walls. One school collaborated with the police to organize socialization events alongside a no-drug campaign. The school enforced strict sanctions, including warnings, running laps around the school field, or increased memorization of the Qur'an.

However, the presence of the cigarette industry has influenced the enforcement of school smoking bans. The Department of Education, responsible for monitoring school smoking regulations, has not done so effectively. They have delegated anti-smoking campaigns to the Department of Health, which has included these activities in anti-drug programs due to discomfort in addressing smoking, considering that schools also receive assistance from cigarette companies. Some schools even allow students to smoke on the condition that they do so without wearing school uniforms or other school identifiers.

Schools receiving assistance from the cigarette industry generally do not enforce smoking bans strictly. This includes private schools under religious foundations, especially Muhammadiyah. The Central Leadership of Muhammadiyah has called for stricter enforcement of school smoking bans. Although the smoking ban policy has been implemented through posters and socialization efforts directed at students and parents, as well as punishments such as shaving the heads of students who smoke, enforcement has been lax.

This leniency may be attributed to the financial support these schools receive from the cigarette industry. Researchers found that in nearly all schools, teachers smoke on campus. Ironically, one school displayed a large no-smoking poster in the parking area, yet several students reported that many of their peers smoked there.

To ensure the success of the smoking ban, the role of teachers and school staff is crucial. For instance, students from one school reported feeling unconcerned about smoking at school because they observed their teachers engaging in the same behavior. The majority reported seeing their teachers smoke during school hours, after school, and outside of school. These students refrained from confronting their teachers about it, yet they still felt reluctant. Nevertheless, these students saw that smoking had become a habitual practice.

(e) Penetration of cigarette culture

The sociocultural environment of the Kudus community is closely intertwined with cigarettes. This is evident in the tradition of 'nyumbang' (giving donations). In Javanese society, particularly in rural areas, this tradition continues, aiming to alleviate the burdens of families celebrating events such as weddings, circumcisions, and funerals. While donations are typically in cash, in Kudus, donations of cigarettes are considered special and valued more than cash or staple foods. Mr. Rahman, a community leader, explained, "... People who receive cigarette donations, their status is 'debt' and must pay with the same brand of cigarettes. If not paid, it will be talked about" (Rahman-Kedungsari: 11-11). This 'debt' mechanism perpetuates the tradition of cigarette donations across generations, reinforced by social sanctions in the form of gossip if the tradition is not adhered to.

Furthermore, cigarettes are used as offerings at various community events, such as routine *tahlilan* (joint prayers), gotong royong (community service), meetings, and as treats for construction workers and weddings.

On a broader scale, cigarettes have become a cultural heritage closely associated with teenagers. This is exemplified by the existence of a traditional dance known as the cigarette dance, which depicts the work of cigarette laborers (usually women) involved in the cigarette-making process, from selecting tobacco to delivering finished products to male foremen for inspection. Additionally, the Kudus City Government has established a museum that serves as a destination for school students for educational outings (study tours).

Although various smoking bans are en-

forced by schools and religious figures, the environment that supports teenage smoking seems stronger. Many people view smoking as “normal.” Several symbols serve as implicit endorsements of smoking within the community, such as the presence of ashtrays on living room tables at home, in schools, and in city government agencies.

The most fundamental factor contributing to the existence of a ‘cigarette culture’ in the Kudus community is the presence of the cigarette industry. In the area where this research was conducted, a sizable cigarette industry has been established for 70 years. Initially a family business, it became a corporation in 2021. This industry plays a significant role in the surrounding community, participating in weddings, religious studies, and death ceremonies for family members of industry workers. During these events, the community often receives souvenirs in the form of cigarettes. The cigarette industry also provides substantial funding for community activities, including social, religious, and cultural events. Residents frequently seek assistance from the cigarette industry for collaborative activities, which typically involve distributing cigarettes to neighborhood administrators for communal use.

The societal conditions described above apply not only to adults but also to teenagers, who are actively involved in social activities that center around cigarettes. Almost all teenage participants perceive smoking as normal. If family regulations prohibit smoking due to the expense of cigarettes, teenagers can easily obtain them for free in their environment.

The results of this study provide a comprehensive overview of adolescent smoking behavior in the “cigarette” city of Kudus, Indonesia. It begins with a detailed description of the characteristics of adolescents concerning cigarettes, including those who smoke, those who have quit, and those who have never smoked. The study also clarifies the context of adolescent smoking behavior within family, school, and broader socio-economic-cultural frameworks. The environment in which adolescents live is characterized by the rapid development of a cigarette industry, which can be best understood through *Bronfenbrenner’s ecological system theory* of human development, which explains how the environment influences individual development through various interrelated systems (Rosa & Tudge, 2013).

Adolescent Smoking Behavior from the Perspective of Ecological Theory

At the center of Bronfenbrenner’s theory is the individual adolescent. This study identified

several personal characteristics related to smoking behavior. Adolescents who smoke tend to exhibit low motivation for learning and academic achievement, while their bonds with peers are notably strong. This dynamic is further reinforced by teachers who undervalue non-academic achievements. Adolescents who have smoked and subsequently quit have almost the same characteristics as those who have never smoked. These adolescents are often described by their parents as obedient, motivated learners who have navigated family challenges and are viewed positively by their parents. These findings align with research by Lovato (2013), which found that personal characteristics such as self-control, social skills, self-esteem, and emotional stress influence smoking behavior. For instance, participant Alan continued to smoke due to a lack of appreciation from his teacher. In contrast, participant Ilhan demonstrated high motivation for learning, which helped him resist the urge to hang out with peers, suggesting complexity in the social context of adolescent smoking and a need for a theory to account for it.

Microsystem and Mesosystem

In Bronfenbrenner’s ecological theory, the microsystem refers to the immediate environment where individuals live, including home, school, and workplaces, where face-to-face interactions occur. The mesosystem encompasses the relationships between two or more microsystems in which individuals actively participate (Rosa & Tudge, 2013). In this study, the microsystem comprises the family and school environments, and the mesosystem is the interaction between these microsystems.

The family environment serves as a microsystem for adolescents. An interesting finding from this study is that, while parents and schools prohibit smoking, enforcement of these prohibitions is not strong. Most parents of adolescents often express the sentiment, “smoking is allowed if you are working,” reflecting their own smoking habits. This creates a model of smoking behavior for adolescents. When parents prohibit smoking while they themselves smoke, the message becomes ambiguous. Parents fear that their children will emulate their smoking behavior, as adolescents tend to observe the smoking habits of parents, siblings, and peers (Bektas et al., 2010; Laland & Rendell, 2019). Parents and family members are responsible for modeling healthy, smoke-free behaviors (Scalici & Schulz, 2017).

The effectiveness of parental messages and strategies to prevent or stop smoking behavior is

influenced by the quality of the parent-adolescent relationship and adolescents' perceptions of their relationships with their parents (Maggi et al., 2014). Another finding indicates suboptimal communication between parents and adolescents who smoke. Some adolescents smoke due to a lack of parental attention, often exacerbated by having multiple siblings that divert parental focus. Additionally, some adolescents have parents who work abroad for extended periods, leading to a lack of closeness even after they reunite.

The quality of the parent-child relationship is crucial in determining how adolescents interpret their home environment and the messages they receive about smoking. Adolescents who report a good relationship with their parents are more likely to perceive their parents as having a positive influence on their smoking behavior, regardless of the parents' smoking status (Maggi et al., 2014). The two non-smoking boys in this study enjoyed strong relationships with their parents, who did not smoke at home, although one parent did smoke at community events. This positive relationship enabled the adolescents to accept their parents' anti-smoking messages.

According to Bronfenbrenner's theory (1979), the family plays a very important role in shaping adolescent behavior and attitudes. Numerous studies have shown that parenting styles, sibling relationships, and the examples set by older family members significantly influence adolescent attitudes and behaviors (Maggi et al., 2014; Nargiso et al., 2012; Scalici & Schulz, 2017). Parents who smoke or fail to exert sufficient control over their children's behavior tend to have children who are more likely to experiment with smoking (Maggi et al., 2014). Conversely, families that provide good education about the negative impacts of smoking and support adolescents in adopting a healthy lifestyle can mitigate the risk of smoking behavior (Scalici & Schulz, 2017).

Ambiguous family environmental conditions regarding smoking are also evident in the school environment, which serves as a second microsystem for adolescents. Schools have employed various methods to disseminate information about the prohibition of smoking, both verbally and in writing. However, there is a lack of a clear objection. Some teachers even observed smoking at school. This is a bad model for banning smoking in schools.

Exosystem

The exosystem refers to ecological environments in which individuals are not directly

present and do not actively participate, yet may still be influenced by them, both formally and informally (Bronfenbrenner, 1979). Teenagers' smoking behavior in Kudus is influenced not only by family but also by unique dynamics among teenage smokers. Most teenage smokers begin smoking because of friends' invitations. Social interactions among teenagers extend beyond their parents and family (Robards & Bennett, 2013). The social environment surrounding them, such as friends at school, neighbors, and the broader community, also plays a role in the development of adolescent behavior. Research in South Korea indicates that the likelihood of someone smoking increases when they are in a smoking environment (Hidayati & Arianti, 2024). Many teenagers prioritize acceptance from their peers over adherence to parental advice (Choudhury et al., 2006). This concept of social development is evident in adolescent smoking behavior.

According to Elman et al. (2023), smoking behavior arises from the need for acceptance and direct social benefits within society. Teenagers seek acceptance from their friends, making smoking a tool for social integration. When teenagers perceive that their peers and society approve of smoking, they are more likely to smoke to fulfill their need for acceptance and social integration (Elman et al., 2023).

Included in the exosystem are events at parents' workplaces that impact children at home (Vélez-Agosto et al., 2017). The data from this study indicate that adolescents are exposed to cigarettes at home because their parents work in the cigarette industry. Companies often provide cigarettes as gifts to employees, which parents bring home. Additionally, cigarette companies sponsor various community activities, making cigarettes accessible not only to adults but also to teenagers.

Macrosystem and Chronosystem

Macrosystems encompass cultural institutions and subcultures, including economic, social, educational, legal, and political systems. The cigarette industry, which plays a significant role in community life and, along with Islamic culture and historical heritage in Kudus City, shapes the norms and values that teenagers inherit (Margana et al., 2014; Yuristiadhi, 2014). This study found that many cultural and religious activities receive support from the cigarette industry, with teenagers in Kudus City actively participating in these events.

The abundance of cigarette factories in Kudus City makes free cigarettes more readily available, particularly for people living near them,

compared to other cities. It was observed that the cigarette industry in the Gingsir sub-district maintains a close relationship with the community, often involving them in family events hosted by cigarette owners. The ease of obtaining free cigarettes from community events fosters a positive attitude toward smoking among teenagers in Kudus. Both smokers and non-smokers among teenagers tend to hold favorable views toward cigarettes (Aisah et al., 2023). Furthermore, 93.3% of respondents expressed a “reasonable” understanding of the smoking habits of the Kudus City community, citing the ease of obtaining cigarettes as a significant factor (Aisah et al., 2024). Teenagers living in an environment that supports smoking, where the opinions and behaviors of peers and parents align with smoking, are more likely to smoke than those in a normative environment that discourages it (Scalici & Schulz, 2017).

Teenagers in Kudus City are also exposed to cigarette advertisements not only through billboards but also in various public spaces. Numerous symbols of the cigarette industry, such as street names, gate names, and children’s entertainment venues, are prominently displayed. In schools, smoking-related symbols are present, either through cigarette industry logos or through the smoking behavior of teachers (A’isah et al., 2024). A survey by Prabandari and Dewi (2016) revealed that most teenage respondents had a low perception of cigarette advertisements. However, those with a high perception of such advertisements were nearly five times more likely to start smoking.

Smoking behavior among adolescent girls is another noteworthy finding in this study. Some parents and community leaders hold a negative stigma against women who smoke, even in environments dominated by the cigarette industry. This study highlights the normalization of smoking among men, with some asserting that cigarettes are a basic need for men. Research by Nurhalina (2019) indicates that the high prevalence of male smokers is attributed to the perception that smoking is synonymous with masculinity; thus, men who do not smoke may face societal stereotypes. Conversely, adolescent girls view smoking as a symbol of a cool attitude, a symbol of rebellion, and a way to get pleasure. The two female teenagers who smoked in this study exhibited similar patterns, albeit with different motivations. One smoked to cope with familial discomfort and low academic achievement, while the other sought relief from the stress associated with her studies at an Islamic boarding school.

The main limitation of the study is that it can be considered *an insider ethnography*, as the first author is part of the community. In fact, being part of the community has unique strengths. The researcher gained deeper access, richer data, trust, and a nuanced understanding. However, it still comes with certain limitations. Sometimes, she loses critical distance because of familiarity with the situations. Balancing dual roles (community member and researcher) sometime cause tension. Participants being interviewed behaved differently, knowing that the researcher was part of them and an observer.

The tobacco industry operates across multiple levels, from the microsystem to the chronosystem. At the microsystem and mesosystem levels, adolescents have easy access to cigarettes, both at affordable prices and for free. At the exosystem level, the industry shapes prevailing social norms. In contrast, at the macro- and chronosystem levels, it contributes to the construction of Kudus’s cultural identity as the ‘Kretek City,’ historically legitimized. Figure 1 illustrates that the tobacco industry is the most influential actor within the ecological system of adolescents in Kudus.

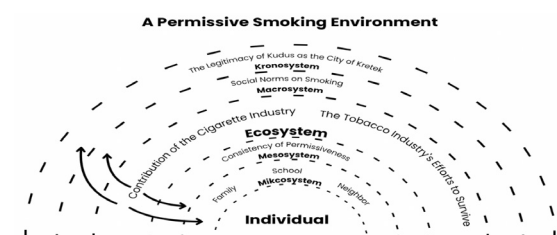


Figure 1. An Ecological Systems Perspective on Adolescents in Kudus

This finding aligns with the networked approach in Ecological Systems Theory proposed by Neal & Neal (2013), which conceptualizes ecological systems as interconnected networks rather than merely nested structures. In this context, the tobacco industry functions as a connecting actor (node) that simultaneously intervenes across multiple systems (Landman et al., 2002; Sebr   & Glantz, 2007). Consequently, its influence on adolescent smoking behavior is not linear but emerges through dynamic, reciprocal, and interrelated interactions across different ecological levels.

CONCLUSION

This study concludes that adolescent smoking behavior in Kudus, as a “Kretek City,” is shaped by dynamic interactions between perso-

nal factors and multiple ecological systems, including family, peers, schools, community, and the tobacco industry. Adolescents who smoke are influenced by parental smoking models, ambiguous anti-smoking messages within families, strong peer pressure, permissive social norms, and the widespread normalization of smoking in everyday social and cultural life. The presence of smoking role models, such as teachers and religious leaders, along with easy access to cigarettes and the tobacco industry's involvement in community and religious activities, further reinforces positive attitudes toward smoking among adolescents. In contrast, non-smoking adolescents tend to maintain supportive family relationships, stronger self-regulation, and alternative coping strategies that help them resist smoking despite living in a permissive smoking environment.

Recommendation

This study recommends the development of multi-system interventions that address not only adolescents as individuals, but also families, schools, community leaders, and structural regulations in tobacco industry regions. Strengthening consistent anti-smoking communication within families, improving school-based smoking policy enforcement, limiting adolescents' access to cigarettes, and reducing the social normalization of smoking through cultural and community activities are important steps to prevent adolescent smoking behavior in tobacco-producing areas such as Kudus.

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AUTHOR CONTRIBUTIONS

Anita Aisah: conceptualization, Methodology, investigation, Data curation, Writing—original Draft. Subandi: conceptualization, Methodology, Validation, Formal analysis, Writing—Review & editing, supervision. Yuli Fajar Susetyo: conceptualization, Methodology, Validation, Writing—Review & editing, supervision

DECLARATION OF GENERATIVE AI

This manuscript received limited assistance from an AI-based language tool (Quillbot and

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DECLARATION OF COMPETING INTEREST

No potential conflict of interest was reported by the author(s).

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