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THE ASSOCIATION  
BETWEEN LOOSE CIGARETTE  
PURCHASE AND THE  
FREQUENCY, INTENSITY, AND  
INITIATION OF CIGARETTE USE  
AMONG ADOLESCENTS:  
A MIXED-METHODS STUDY  
IN INDONESIA

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# Executive summary

**Introduction:** Affordability is acknowledged to be one of the challenges in reducing tobacco consumption among Indonesian adolescents. Cigarettes are conveniently accessible for adolescents because they are cheap and widely distributed as individual sticks known as loose cigarettes. A single cigarette stick was sold as cheap as 1,000 Indonesian Rupiah (IDR) (0.07 US Dollar [USD]) in 2019. Additionally, up to 85% of Indonesian informal retailers reported selling loose cigarettes.

**Data and methods:** To the best of our knowledge, this is the first study on loose cigarette purchase and cigarette use among youth conducted in Indonesia. Initially, we analyzed secondary data from a national survey, the 2019 Global Youth Tobacco Survey (GYTS), to examine the association of loose cigarette purchase with smoking frequency and intensity and nicotine dependence. Following that, we arranged qualitative data collection based on quantitative findings and focus group discussions (FGD) involving school-age adolescents were conducted. The latter process aimed to explore students' experiences in purchasing loose cigarettes and how it affected their smoking initiation and current cigarette consumption. A total of 49 eligible students agreed to participate in FGD and later they were divided into 12 FGD groups.

**Findings:** Our study found that the majority of students bought loose cigarettes when trying cigarettes for the first time and in the past 30 days. Quantitative findings demonstrated that purchasing loose cigarettes in the past 30 days was significantly correlated with nondaily smoking, consuming five or fewer cigarette sticks per day, and having lower nicotine dependence.

This smoking pattern among adolescents could be interpreted that loose cigarette users in our study were in the experimentation phase based on five stages of nicotine addiction. Unlike adults in whom irregular smoking may be a relatively stable pattern, students who consumed tobacco infrequently with few cigarette sticks per day possessed higher risk to escalate becoming regular smokers in the near future. Moreover, nondaily and low-intensity cigarette consumption was significantly associated with increased risk of all-cause mortality.

Our qualitative findings further reported that affordability and accessibility were the main reasons that encouraged current student smokers opting for loose cigarettes over other cigarette types. In student's perception, the extensive selling of loose cigarettes persuaded them to buy tobacco products more frequently. Consequently, students spent at least half of their weekly pocket money on tobacco products, ranging from IDR 30,000 - IDR 200,000 (USD 2 - USD 13)<sup>1</sup> per week. Finally, our study highlighted that only few students in this study were being requested to show their identity card or experienced rejection when purchasing loose cigarettes.

**Implications:** Our findings may serve as evidence to support the enactment of banning loose cigarette sales. Furthermore, restrictions on loose cigarette sales must be followed by law enforcement and should be complemented by other tobacco control measures, such as regulation on minimum cigarette sticks per pack, significant increase of tobacco excise tax, and simplification of tobacco tax tiers.

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<sup>1</sup> USD 1 ≈ IDR 15,432 as on November 28th, 2023 at the time of report writing





# Introduction

The 2019 GYTS found that 4 in 10 Indonesian students aged 13-15 years had tried tobacco products, while one fifth of students are current tobacco users (1). This proportion is disproportionately higher compared to the global prevalence of smoking uptake in the same age group which peaked at 6% (2). Along with these concerning facts, The Indonesia Ministry of Health predicted that prevalence of youth smoking would not decline in the near future unless comprehensive and strict measures are enacted (3).

Cigarette affordability is one of the challenges in reducing tobacco consumption among Indonesian adolescents (4,5). Due to the relatively low price and enormous sale of the loose cigarettes, tobacco products are still affordable even for adolescents. Some studies on loose cigarette sales in Indonesia highlighted that loose cigarettes were sold with the lowest price at IDR 1,000 (USD 0.07) in 2019 while the majority of students received pocket money more than IDR 50,000 per week in the same year (USD 3.5)<sup>2</sup> (1,6,7). Loose cigarettes, which refer to the individually sold cigarette sticks removed from its pack, are prominently traded in lower income countries, including Indonesia where up to 85% of Indonesian informal retailers sold loose cigarettes (6,8,9). Recent evidence from the 2019 GYTS also suggested there was an increasing trend of loose cigarette purchase among Indonesian students from 11% to 13% between 2014 and 2019 (1).

A number of studies has been conducted to investigate the relationship between loose

cigarette purchase and smoking behaviour including smoking frequency and intensity. It is now well established from a variety of studies that purchasing loose cigarettes were more likely to be reported among those who are nondaily smokers compared to the smokers who smoked daily (10-13).

Another paper from South Africa further found that loose cigarette consumption was a factor that substantially influenced smoking intensity (14). The study mentioned that preference for buying loose cigarettes was associated with adults who consumed less cigarettes. Buying loose cigarettes may also be correlated with addiction to nicotine as previous research reported that the availability of loose cigarettes triggered the urge to consume cigarettes among young adults who smoked occasionally (10,11). However, no study up to now has been reported on the relationship between loose cigarette purchase and nicotine dependence.

The notion regarding loose cigarettes purchase and smoking behaviour was also supported by the findings from qualitative studies conducted in developed countries. Existing evidence highlighted dominant reasons for buying loose cigarettes were: the accessibility; limited budget; and effort to limit tobacco consumption (15,16).

Through a number of studies that have been published, we noted that study on loose cigarette purchase and cigarette use among youth has received scant attention in the research literature. One systematic review supported this notion by reporting the absence

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<sup>2</sup> 1 USD = IDR 13,883 as on December 31th, 2019 around release date of the report



of empirical investigations into loose cigarette use and smoking initiation at an early age (17). Moreover, the majority of research on buying loose cigarettes and smoking behaviour only focused on the adult population. We considered investigation on loose cigarette purchase and smoking behaviour at an earlier age is prominent to be conducted as tobacco use on youth has lifelong consequences affecting cigarette uptake at their older age (18,19). Lastly, recent studies majorly has been conducted in developed countries such as the United States, Australia, and other European countries (10,12,15,20–23) where loose cigarette sale has been prohibited, unlike in Indonesia.

Furthermore, studies on loose cigarette purchase that had been done In Indonesia mostly dealt with retailers selling loose cigarettes and examined the density of such stores in the vicinity of school environments (7,24–28). These studies also covered a limited and specific area including a province or a specific city (24,27,28). Therefore, emphasizing a national-scale study could provide a more comprehensive picture by better representing the population.

Our study employed a mixed method to examine the relationship of loose cigarette purchase with frequency, intensity, and initiation of cigarette smoking among adolescents in Indonesia. For the quantitative methods, we investigated the association between loose cigarette purchase and smoking frequency, intensity, and nicotine dependence. In addition, our qualitative study aimed to explore students' experiences in purchasing loose cigarettes and how it affected their smoking initiation and current cigarette consumption. To the best of our knowledge, this is the first mixed-methods study on loose cigarette purchase and cigarette use among youth conducted in Indonesia. The findings of such study is important to provide deeper understanding on loose cigarette purchase and its related factors and to recommend stronger tobacco control policies for the adolescents In Indonesia.





# Data and methods

This study employed a mixed methods sequential explanatory design commenced from analyzing quantitative data, then using quantitative results to arrange data collection and analysis for subsequent qualitative study. Quantitative research was conducted using secondary data from a national survey which only featured one question pertaining to loose cigarettes purchase in the past 30 days. Following that, we conducted FGD involving school-age adolescents to collect qualitative data. The latter process is essential to provide a comprehensive explanation of the quantitative findings. In the final phase, the results from both quantitative and qualitative research were integrated.

## Quantitative study

### Data

This study utilized individual information obtained from the 2019 Global Youth Tobacco Survey (GYTS), a nationally representative cross-sectional school-based survey conducted by the National Health Research and Development (NHRD, Balitbangkes), under the coordination of the Ministry of Health (29). The GYTS collects extensive information related to tobacco consumption among students aged 11 to 17.

The sample was selected using a two-stage cluster sampling approach. In the first stage, schools were selected using probability proportionate to size (PPS) based on the school enrollment size. Subsequently, in the second stage, within each selected school, classes were randomly chosen, and all students in the selected classes participated in the survey (1).

Sample size calculations were carried out using standard methods by the Centers for Disease Control and Prevention (CDC), a part of the US Department of Health and Human Services. The study encompassed 150 schools distributed across 30 provinces and three regions—Java, Sumatera, and others.

In each region, 25 junior high schools and 25 high schools were randomly selected, with a class assigned to each school using a random number. The sample size at each school varied based on the number of classes and students, and all students in the selected classes participated in the survey, receiving and responding to distributed questionnaires and answer sheets (1,30). Further details of the GYTS survey methods and data can be obtained in the CDC website: <https://nccd.cdc.gov/GTSSDataSurveyResources/Ancillary/DataReports.aspx>

### Measures

The focus of this study was smoking behavior of adolescents, identified by three indicators: smoking frequency; smoking intensity; and nicotine dependence. Frequency and intensity a specified by the number of days they smoked in the past 30 days ( $\geq 20$  days; 6-19 days; 3-5 days; 1-2 days) and respondents' daily cigarette consumption in the past 30 days (more than five cigarettes; two to five cigarettes; one cigarette; less than one cigarette). Additionally, nicotine dependence was evaluated through responses to whether respondents smoke or feel the urge to smoke tobacco first thing in the morning (yes or no).





The definitions for each variable were aligned with the questions in the attached questionnaire and the definitions used in prior research (31).

The main independent variable in this study was loose cigarette purchase, determined by respondents' responses regarding how they purchased cigarettes in the last 30 days. Respondents' answers were then grouped into two categories: students who purchased loose cigarettes and those who bought cigarettes in forms other than loose cigarettes (packs/cartons/purchased tobacco and rolled their own).

Several potential covariates were also analyzed in this study, encompassing predisposing factors, enabling factors, and reinforcing factors (32). In this study, predisposing factors were defined as elements that motivate and direct behavior. These factors included perceptions related to the dangers of smoking (agree or disagree) and perceptions related to the dangers of exposure to cigarette smoke (agree or disagree).

Enabling factors were those that facilitate or allow a behavior, encompassing: the price of a loose cigarettes purchased by respondents (less than IDR 1,000; IDR 1,000 - IDR 2,500; more than IDR 2,500), the last place respondents bought cigarettes (bought in a store or shop, from a street vendor, got from someone else, or another way), and the ability to purchase cigarettes near school (yes or no).

Reinforcing factors were considered as elements that strengthen or encourage individuals to engage in a behavior consistently, including parental smoking (yes or no); having witnessed teachers smoking in the school building such as in classroom; teacher's room, toilets, or others rooms in

school (yes or no); exposure to tobacco advertising through various media such as TV, radio, news, social media, billboards, posters, banners, etc. and events such as sports events, music concerts, community events, etc. (yes or no); and lack of exposure to tobacco control information through mass media, the internet, activities, information given in class (yes or no).

The control variables in this study consisted of age, gender, weekly pocket money (don't have any spending money, less than IDR 11,000, IDR 11,000 - IDR 20,000, IDR 21,000 - IDR 30,000, IDR 31,000 - IDR 40,000, IDR 41,000 - IDR 50,000, more than IDR 50,000), attempted to quit (yes or no), and duration of smoking in years.

### **Statistical analysis**

From a total of 9,992 students sampled in GYTS, only 785 individuals<sup>3</sup> were deemed eligible for the analyses. We excluded those who were not current smokers and those who had missing responses for all variables used in this study. The characteristics of the samples were described overall and categorized by respondents' cigarette buying preference, distinguishing between loose cigarettes and other forms like packs, cartons, and rolled tobacco. Ordered logistic regression was employed to examine the association between loose cigarette consumption and the odds of smoking frequency and intensity. Additionally, binary logistic regression was applied to assess the associations between loose cigarette and nicotine dependence. All regressions were controlled for sociodemographic, smoking duration, attempt to quit, predisposing, enabling, as well as reinforcing factors. The analyses were conducted using STATA 17 software, and estimation results were considered as significant at a p-value < 0.05.

<sup>3</sup> 741 individuals for the nicotine dependence analysis model.



## Qualitative study

### Study design and samples

Qualitative data collection was carried out using FGD. The study location was conducted in South Jakarta because it has the highest prevalence of young smokers aged 10-18 years old (3%) in DKI Jakarta Province based on the 2021 National Socioeconomic Survey (SUSENAS) March round. The FGD involved junior and senior high school students who were chosen from specific subdistricts. We deliberately opted for subdistricts that weren't located in business districts and housed numerous public junior and high schools. This selection aimed to ensure a sufficient number of participants meeting the criteria and willing to participate. Public schools were preferred due to their larger student population and diverse backgrounds compared to private schools. The selection of schools was then done through simple random sampling.

The research team visited each school two to three times. On the first visit, we introduced the research proposal to school management and gained information about the process of research permission in the school. Schools that permitted the data collection had been visited for the second time as the research team met class representatives to describe the conduct of research in general, research purpose, and the recruitment of FGD participants.

To recruit FGD participants, we asked the class representatives to share the online screening form to their peers through verbal announcement, brochures, and online messaging application.

The screening form consisted of questions related to the identity of students, including name, gender, age, class, living status, and contact number; and smoking behaviour, including age of smoking initiation, type of cigarette purchased, current smoking status, and loose cigarette consumption. During the recruitment process, we also did snow-balling by asking recommendations either to the class representatives or to the FGD candidates who already passed through the screening.

The inclusion criteria of FGD participants were: ever or current smoker; often buying loose cigarettes; living with parents; and willing to participate. Otherwise, students who used electronic cigarettes only were excluded. We sent FGD invitations to the potential FGD participants using the contact number attached on the online screening form. For the students who agreed to participate, a pictorial FGD guideline and online informed consent that must be signed by the students and the parents were being sent. Researcher also communicated with the students to ensure they understand the aim of the study, FGD procedure, and the confidentiality of their identity and their opinions as FGD participants.

Before the data collection, the research team conducted pilot test by recruiting five students in order to obtain initial ideas on FGD's set of questions and data analysis. We also arranged online research training for members of the research team to confirm the FGD protocols were applicable and everyone shared the common understanding.



### **Data collection**

We conducted FGD in two junior high schools and one senior high school between August and September 2023. The FGD groups were determined to be exclusive based on school (junior/senior high school), students' gender (male/female), smoking status (current smoker/ever smoked) and smoking experience (perceived smoking as a routine for less than six months/ perceived smoking as a routine for six months and more). For example, group 1 consisted of four male students who were current smokers and perceived smoking as a habit for six months or more. In this setting, we expected the students to feel more comfortable in expressing their thoughts without hesitancy. We also restricted the number of students in one group up to five participants, thus each student had more opportunity and had sufficient time to share ideas. Lastly, we avoided putting students who hang out together in the same group to sustain their focus and open discussion (33). Each group is led by a moderator to lead the discussion and an assistant to take a note on important quotes.

Each FGD was conducted at schools and lasted for 30 to 60 minutes. The FGD began with an ice breaking game to create a relaxed environment for students. During the discussion, moderators attempted to gain information about smoking initiation, current smoking behaviour, nicotine dependance, the availability of loose cigarettes and its impact on student's smoking behaviour, cost of smoking, experience on buying loose cigarettes,

perception of the harm of loose cigarettes consumption, and perception of pictorial health warning (PHW). Complete list of questions during the FGD is attached on [Appendix 1](#). The discussions were audio-recorded and transcribed verbatim. At the end, all participating students received a lunch box and a voucher as much as IDR 100,000 (approximately USD 6.5) as monetary compensation.

### **Qualitative analysis**

The data were extracted in Microsoft Excel after verbatim transcription was completed. The data extraction was accomplished by four researchers (SN, GM, SA, and R). We used thematic analysis with an inductive approach to produce codes that are solely reflective of the content of the data. The steps of data analysis consisted of: reading the transcripts and highlighting the meaningful quotes related to the research problem; compiling the statements from students based on their smoking status; generating initial codes; combining or generating the codes into potential sub-themes; defining and naming themes. All of the steps were conducted by three researchers (SN, GM, SA).

To ensure the study's credibility, the research team applied prolonged engagement, investigator triangulation, and persistent observation. We provided the details on FGD participants and the research process for transferability judgement. We also selected students from various educational levels and with diverse smoking experiences (34–36).



## Integration & interpretation

The quantitative and qualitative datasets were initially analyzed independently. The outcomes of the quantitative data analysis guided the development of the qualitative research protocol. Subsequently, the findings from the qualitative research can be utilized for triangulation, providing clarification for certain findings in the quantitative analysis and addressing any data gaps. This methodology is chosen considering the limitations in coverage of the specific topic in the quantitative research, which relies on secondary data, while the qualitative research, based on primary data, is anticipated to expand the scope and elucidate existing findings. During the interpretation phase, the triangulated results will be classified into supporting outcomes (convergence), complementary outcomes, and conflicting outcomes (dissonance) (37).

## Ethical considerations

For the conduct of mixed method study, ethics approval was issued by the Institute of Research and Community Service, Atma Jaya Catholic University of Indonesia on May 3rd, 2023 (No.0004S/III/PPPE.PM.10.05/05/2023). In addition, we also obtained a recommendation letter to conduct research activities in the South Jakarta area issued by the Department of Investment and Integrated One-stop Service on July 3rd, 2023 (No.3/AF.1b/2/TM.23.04/e/2023).





# Result

## Quantitative findings

Table 1 presented the characteristics of the students who smoked in the past 30 days. We included data from 741 students whose mean age was 15 years old (standard deviation [SD] 1.7) and the majority of students were male (95%).

Of the students, more than half reported buying loose cigarettes in the past 30 days (66%). Among those who reported buying loose cigarettes, 38% smoked 1-2 days in a month and 36% usually consumed one cigarette in a day. One third of students have nicotine dependence (30%) with smoking duration on average three years.

Furthermore, students who smoked loose cigarettes were aware of the detriment of smoking as well as the exposure to tobacco smoke from others (95% and 92%, respectively). Additionally, this group exhibited a slightly shorter smoking duration (2.72 years) compared to their counterparts who smoked cigarettes in other forms (3.08 years). The majority of students bought the loose cigarette at a price around IDR 1,000 - IDR 2,500 (80%) in a store or shop (64%). Nearly half of the students were able to purchase the cigarettes from sellers located a short distance from the school (45%). Most students also saw teachers smoking in the school building and were exposed to the advertisement of tobacco products (95% and 71%, respectively).

# Table 1

## Characteristics of students who smoked in the past 30 days

Dependent Variable	Total (n=741)	Non-loose cigarette buyer (n=253)	Loose cigarette buyer (n=488)
Frequency			
1 to 2 days	34.82%	29.25%	37.70%
3 to 5 days	16.19%	14.23%	17.21%
6 to 19 days	23.35%	21.74%	24.18%
>=20 days	25.64%	34.78%	20.90%
Intensity			
Less than 1 cigarette per day	18.76%	13.44%	21.52%
1 cigarette per day	33.33%	28.06%	36.07%
2 to 5 cigarettes per day	34.01%	33.99%	34.02%
More than 5 cigarettes per day	13.90%	24.51%	8.40%
Nicotine dependence (=1 if Yes)	34.01%	41.90%	29.92%
<b>Independent Variable</b>			
<b>Sociodemographic</b>			
Age, mean (SD) <sup>a</sup>	14.85 (1.70)	14.97 (1.70)	14.78 (1.70)
Male <sup>b</sup>	95.41%	96.05%	95.08%
Weekly pocket money			
Don't have any spending money	6.07%	5.93%	6.15%
Less than IDR 11,000	21.32%	17.79%	23.16%
IDR 11,000 - 20,000	21.9%	19.76%	21.93%
IDR 21,000 - 30,000	9.58%	9.49%	9.63%
IDR 31,000 - 40,000	7.02%	7.11%	6.97%
IDR 41,000 - 50,000	9.99%	11.46%	9.22%
More than IDR 50,000	24.83%	28.46%	22.95%
<b>Smoking behaviour</b>			
Smoking duration, mean (SD)	2.84 (2.35)	3.08 (2.52)	2.72 (2.58)
Attempted to quit	78.68%	73.91%	81.15%
<b>Predisposing factors</b>			
Second-hand smoke is harmful	93.66%	91.70%	94.67%
Smoking is harmful	88.66%	83.00%	91.60%
<b>Enabling factors</b>			
Cigarette price			
Less than IDR 1,000	17.95%	17.39%	18.24%
IDR 1,000 - 2,500	79.22%	78.66%	79.51%
More than IDR 2,500	2.83%	3.95%	2.25%
Place to get cigarette			
Bought them in a store or shop	65.59%	68.77%	63.93%
Bought them from a street vendor	16.06%	11.07%	18.65%
Got from someone else or other way	18.35%	20.16%	17.42%
Cigarette near school	44.94%	47.04%	43.85%
<b>Reinforcing factors</b>			
Parents smoke	48.58%	49.01%	48.36%
Saw teachers smoking	71.93%	73.52%	71.11%
Exposed to any cigarette advertisement	95.28%	96.05%	94.88%
Didn't expose to any anti-tobacco efforts	1.75%	2.37%	1.43%

Note:

<sup>a</sup>SD (standard deviation)

<sup>b</sup>The statistics on the second to the last row present figures within the column category. For instance, 95.08% of the respondents who are loose cigarette buyers were male.



Table 2 shows multivariate analysis examining the association between the cigarette buying preference with smoking behaviour among Indonesian youth. Purchasing loose cigarettes demonstrated a positive association with smoking 20 days or less in the past month (adjusted odd ratio [AOR] = 1.55, 95% CI = 1.14 - 2.09) and smoking five or less sticks a day (AOR = 2.05, 95% CI = 1.52 - 2.75). Loose cigarettes consumption was also significantly correlated with lower nicotine dependence (AOR = 1.58, 95% CI = 1.13 - 2.20). This estimation result indicated that adolescents who purchase loose cigarettes might be in the early stage of smoking as they demonstrated a low frequency and intensity of smoking along with low nicotine dependence.

In terms of enabling and reinforcing factors, the presence of cigarettes around school exhibited a negative association with smoking 20 days or less in the past month (AOR = 0.54, 95% CI = 0.40 - 0.72) and smoking five or less sticks a day (AOR = 0.58, 95% CI = 0.43 - 0.78). However, no significant association was found with nicotine dependence. Sociodemographic characteristics and variables related to smoking, such as age, gender, attempts to quit, and smoking duration were identified having association with smoking behaviour. While older age, longer smoking duration, and being male were negatively associated with lower smoking frequency and intensity, attempting to quit was positively associated with lower cigarette use.







# Table 2



## Correlates of purchasing loose cigarettes and smoking behaviour

	Smoking frequency <sup>a</sup> AOR (95% CI)	Smoking intensity <sup>b</sup> AOR (95% CI)	Nicotine dependence <sup>c</sup> AOR (95% CI)
Buying preference			
Buying others (packs, carton, rolled tobacco)	Ref.	Ref.	Ref.
Buying loose cigarettes	1.55** (1.14 - 2.09)	2.05** (1.52 - 2.75)	1.58** (1.13 - 2.20)
<b>Sociodemographic</b>			
Age	0.80** (0.73 - 0.87)	0.85** (0.78 - 0.93)	0.93 (0.84 - 1.03)
Gender			
Female	Ref.	Ref.	Ref.
Male	0.14** (0.05 - 0.36)	0.32** (0.16 - 0.62)	1.47 (0.68 - 3.14)
Weekly pocket money			
Don't have any spending money	Ref.	Ref.	Ref.
Less than IDR 11,000	0.99 (0.52 - 1.88)	0.90 (0.46 - 1.76)	1.00 (0.46 - 2.17)
IDR 11,000 - 20,000	1.01 (0.54 - 1.89)	0.75 (0.39 - 1.46)	1.15 (0.52 - 2.51)
IDR 21,000 - 30,000	0.79 (0.38 - 1.61)	0.86 (0.41 - 1.80)	0.67 (0.29 - 1.58)
IDR 31,000 - 40,000	0.65 (0.30 - 1.41)	0.75 (0.33 - 1.58)	1.07 (0.42 - 2.70)
IDR 41,000 - 50,000	0.43* (0.22 - 0.87)	0.50 (0.23 - 1.07)	1.13 (0.47 - 2.73)
More than IDR 50,000	0.53* (0.28 - 0.98)	0.58 (0.30 - 1.13)	1.07 (0.49 - 2.33)
<b>Smoking behaviour</b>			
Smoking duration	0.88** (0.82 - 0.95)	0.83** (0.78 - 0.90)	0.93* (0.87 - 0.99)
Attempted to quit	2.25** (1.57 - 3.20)	1.77** (1.28 - 2.46)	1.97** (1.35 - 2.85)
<b>Predisposing factors</b>			
Second-hand smoke is harmful			
Disagree	Ref.	Ref.	Ref.
Agree	0.74 (0.41 - 1.33)	0.90 (0.51 - 1.58)	1.23 (0.64 - 2.16)
Smoking is harmful			
Disagree	Ref.	Ref.	Ref.
Agree	0.66 (0.39 - 1.10)	0.93 (0.62 - 1.38)	1.3 (0.78 - 2.16)
<b>Enabling factors</b>			
Cigarette price			
Less than IDR 1,000	Ref.	Ref.	Ref.
IDR 1,000 - 2,500	0.57** (0.37 - 0.86)	0.81 (0.57 - 1.16)	0.92 (0.58 - 1.46)
More than IDR 2,500	0.39** (0.18 - 0.78)	0.46 (0.20 - 1.06)	0.51 (0.19 - 1.33)
Place to get cigarette			
Bought them in a store or shop	Ref.	Ref.	Ref.
Bought them from a street vendor	1.07 (0.74 - 1.55)	1.12 (0.78 - 1.63)	0.79 (0.51 - 1.21)
Got from someone else or other way	2.56** (1.67 - 3.92)	2.63** (1.77 - 3.90)	1.54 (0.94 - 2.51)
Cigarette near school			
No	Ref.	Ref.	Ref.
Yes	0.54** (0.40 - 0.72)	0.58** (0.43 - 0.78)	0.76 (0.54 - 1.05)
<b>Reinforcing factors</b>			
Parents smoke			
No	Ref.	Ref.	Ref.
Yes	0.93 (0.70 - 1.23)	0.95 (0.72 - 1.25)	1.01 (0.73 - 1.39)
Saw teachers smoking			
No	Ref.	Ref.	Ref.
Yes	0.60** (0.44 - 0.82)	0.70* (0.52 - 0.95)	0.74 (0.51 - 1.08)
Exposed to any cigarette advertisement			
No	Ref.	Ref.	Ref.
Yes	1.16 (0.58 - 2.31)	1.09 (0.63 - 1.88)	0.66 (0.26 - 1.67)
Didn't expose to any anti-tobacco efforts			
No	Ref.	Ref.	Ref.
Yes	0.76 (0.21 - 2.70)	1.10 (0.40 - 2.99)	1.12 (0.29 - 4.41)
<b>Observations (n)</b>	785	785	741

Note:

\* p < 0.05

\*\* p < 0.01

Ref. is a reference group  
AOR, adjusted odd ratio

CI, confidence interval

<sup>a</sup>smoke more than 5 cigarettes as reference group

<sup>b</sup>smoke more than 20 days as reference group

<sup>c</sup>have experienced nicotine dependence as reference group



# Result

## Qualitative findings

Whilst details of the recruitment process were attached on Appendix 2, a total of 49 eligible students agreed to participate in FGD. We had 12 groups in total which consisted of 9 groups of male current smoker, 1 group of female current smoker, and 2 groups of female who had ever smoked. Following the aim of study, the majority of participants were current smokers (n=32, 65.3%), whereas a few had ever tried cigarettes even one puff (n=10, 20.4%). However, 7 students (14.3%) confessed during the FGD that they had quit smoking in the past 30 days or more. These students were still allowed to join the FGD but limitedly answered topics related to their circumstances.

Students were 14.86 years old on average, ranging from 12-18 years old. Most participants were male (n=37, 76%) and studied in junior high school (n=34, 69.4%). More than half of students have consumed their first cigarette since elementary school (n=28, 57.1%). Students received weekly pocket money ranging from IDR 10,000 - IDR 350,000 (USD 0.7 - USD 23) with median IDR 105,000 and mean IDR 107,978 (USD 7). Only a few of current smokers consumed tobacco products more frequently in the morning and did feel disturbed to refrain from smoking in the places where smoking is forbidden (n=6, 19.4%; n=14, 46.6%, respectively).

Table 3 showed the characteristics of participants in detail.



## Table 3

### Characteristics of students who participated in the FGD

Characteristic	Category	Distribution n (%)
<b>All</b>		49 (100%)
Age, mean (SD)		14.86 (1.4)
Gender	Female	12 (24%)
	Male	37 (76%)
Education	Junior High School	34 (69.4%)
	High School	15 (30.6%)
Weekly pocket money	< IDR 105,000	19 (41.3%)
	≥ IDR 105,000	27 (58.7%)
Weekly pocket money, mean (SD)		IDR 107,978 (IDR 66,272)
Smoking Status	Daily Smoker	22 (44.9%)
	Non Daily Smoker	10 (20.4%)
	Ex-Smoker	7 (14.3%)
	Ever Smoker	10 (20.4%)
Age of initiation	Elementary school (6-12 years old)	28 (57.1%)
	Junior High School (13-16 years old)	21 (42.9%)
Smoking cravings after waking in the morning	Ever	6 (19.4%)
	Never	25 (80.6%)
Perceived not to smoke in smoke free areas	Difficult	14 (46.6%)
	Easy	16 (53.3%)



After thematic analysis using FGD's transcription, we highlighted four arising themes as follows:

**Theme 1.**

**Loose cigarette sale facilitated smoking initiation among students, particularly those whose resource is limited**

Most students participated in FGD consumed loose cigarettes during the first attempt of smoking, particularly among those who had weekly pocket money lower than their peers (under IDR 105,000 or USD 7 per week). One student described the experience of buying loose cigarette with their peers for the first time:



I would try (cigarettes anyway) but I would not start in elementary school, maybe in middle school or high school because I had less pocket money in elementary school, right?

[C2P2]



Another student said they would not try cigarettes if they were not sold in stick form.



I used my money, together with friends... to buy loose cigarettes

[A1P3]



No (I would not try smoking), if cigarettes were not sold in sticks, you could not smoke only one or two, you have to buy (a pack)

[C1P1]



Other than that, students who have tried smoking since in the primary school had initiated cigarette use on a tight budget and could not afford the cigarette packs. A student expressed that he probably wouldn't try tobacco products in the younger age if cigarettes were not sold in sticks due to limited pocket money.





## Theme 2.

### **Loose cigarette was the main preference for current student smokers and it tempted them to keep buying cigarettes**

During the past 30 days, students mainly bought loose cigarettes rather than the packs. Cigarette packs were purchased only when hanging out with friends or when having excess pocket money. Regarding tobacco consumption, the majority of students who smoked puffed on cigarettes almost everyday and bought around 1 to 5 cigarette sticks on the day they smoked. They usually consumed cigarettes right after school time ended, when hanging out with friends, in the evening, or during leisure times. A student described he usually smoked in his spare time:



**For instance, after returning from school, I smoked. In the evening, I would consume another (cigarette) stick. That is all. Around three (cigarette) sticks in a day**

[A1P1]



In student's perception, the extensive selling of loose cigarettes affected their smoking behaviour in the way allowing them to buy the sticks repeatedly resulted in higher nicotine dependence.



**Loose cigarette made me addicted to the cigarettes because it (the availability) tempted me to consume more and more**

[A3L3]



Furthermore, one student expressed how the availability of loose cigarette also hampered his effort to quit smoking:



**(The availability of loosies has been significantly affected me... (Stick cigarette also) has tempted me to keep consuming the cigarette, even though I tried (to cut down the consumption).**

**I am struggling to quit smoking...**

[B3L2]





### Theme 3.

#### **Loose cigarette was affordable and accessible, yet led to substantial amount of spending**

Main reason for students to buy loose cigarettes was the price. Almost everyone agreed that individual cigarette sticks sold at the store were cheap, ranging from IDR 1,000 - IDR 2,500 (USD 0.07 - USD 0.16). Students who usually consumed a few sticks in a day described that buying loose cigarettes was more convenient for them. Student's perceptions regarding the price of loose cigarettes were:

Even though the price was cheap, many students bought loose cigarettes repeatedly and spent half or more of their weekly pocket money on tobacco products, ranging from IDR 30,000 - IDR 200,000 (USD 2 - 13) in a week. These ideas were generated from the following statements:



**(I spent) IDR 40,000 per week (for buying cigarettes, it's more than my weekly pocket money, IDR 25,000)**  
[A3L5]



**Yes, it is because of the money, when we craved cigarettes but the money is a little, we just bought the loosies...**  
[C2P2]

**... because in a day I received IDR 10,000 as pocket money, I need to save money if I want to buy the packs (so I just bought the loosies)**  
[C2P4]

Lastly, access was another reason for students to purchase loose cigarettes. Students easily found loose cigarettes being sold in stores located near their schools or living area. The stores were mainly unregulated by the government or widely known as informal retailers.





Most students had never been requested to show their identity card or been asked about their age when buying cigarettes. Almost everyone also never experienced restrictions or rejection when purchasing cigarettes at the stores. This was confirmed by following statement:



**Never (even when I wore my school uniform) unless I bought cigarettes at the convenience store (formal retailers). Because I wore my school uniform**  
[C3L4]



#### **Theme 4.**

#### **Ban of loose cigarette sale would change smoking behaviour**

Despite the prohibition of loose cigarette sales in the foreseeable future, only a few students considered changing their smoking behaviour towards smoking cessation or reducing cigarette consumption. This finding related to the statement from two students:



**I will reduce my cigarette consumption (if the loose cigarette are banned), there are no more loose, so it's hard to buy**  
[B1P1]

**I will not buy (cigarettes anymore) and I will save the money for other needs**  
[B1P5]



On the other hand, many students mentioned that they will continue smoking by seeking cheaper packs or by using hand-rolled cigarettes that were presumably more affordable. Other than that, some participants mentioned either they will rely on their peers to buy cigarettes together, switch to the electronic cigarettes, or any means were considered to consume tobacco products. Statement from students who insisted to continue smoking as followed:



**It may impact some people, but not me. I had tried to cease smoking in the past and it only lasted for 2 hours**  
[C2P1]



# Table 4

## Illustration of identifying themes and forming categories from verbatim transcripts

Theme	Categories	Description
Loose cigarette sale facilitated smoking initiation among students, particularly those whose resource is limited	Type of cigarette first purchased <sup>a</sup>	Most students started smoking using loose cigarettes (34/41 <sup>b</sup> , 83%)
		Most students who had weekly pocket money under IDR 105,000 using loose cigarettes during first attempt of smoking (12/19, 63%)
Loose cigarette was the main preference for current student smokers and tempted them to keep buying cigarettes	Type of cigarette purchased in the past 30 days	Most student smokers purchased loose cigarettes in the last 30 days (24/32, 75%)
		Most daily smokers bought loose cigarettes in the last 30 days (17/22, 77%)
		Most nondaily smokers bought loose cigarettes in the last 30 days (7/10, 70%)
	Frequency of loose cigarette purchased in the last 30 days	Most student smokers bought loose cigarettes almost everyday in the last 30 days (22/32, 69%)
	Intensity of loose cigarette consumed in the last 30 days	Most students smokers consumed 1-5 cigarettes per day in the last 30 days (21/31, 68%)
Influence of loose cigarette availability	Most student smokers perceived the availability of loose cigarette tempting them to keep buying cigarettes (17/23, 74%)	
Loose cigarette was affordable and accessible, yet led to substantial amount of spending	Reasons to purchase loose cigarettes <sup>a</sup>	Most student smokers purchased loose cigarettes because the price is cheap, around IDR 1,000 - 2,500 (USD 0.07 - 0.16) (25/38, 66%)
		Some student smokers purchased loose cigarettes because they consumed only few cigarettes in a week (8/38, 21%)
		Few student smokers purchased loose cigarettes because it is convenient to buy and widely available (5/38, 13%)
	Considerable spending of loose cigarette	Many student smokers spent more than half of weekly pocket money to buy loose cigarettes in a week (12/32, 38%)
	Places to purchase loose cigarettes	Most student smokers often bought loose cigarettes at stores in the last 30 days (20/28, 71%)
Screening when purchasing loose cigarettes		Most student smokers have never had the experience of being asked for their identity card or being asked by a seller when buying loose cigarettes (24/42, 57%)
		Most student smokers have never been refused when buying loose cigarettes (41/47, 87%)
Ban of loose cigarette sale would change smoking behaviour	Quit smoking <sup>a</sup>	Few student smokers would stop smoking conventional cigarettes (4/34, 12%)
	Reduce smoking <sup>a</sup>	Few student smokers would reduce cigarette consumption (6/34, 18%)
	Sharing with friends <sup>a</sup>	Few student smokers would continue smoking by sharing with friends or when having excess pocket money (5/34, 15%)
	Switch to electronic cigarette <sup>a</sup>	Few student smokers would switch to electronic cigarettes (4/34, 12%)
	Continue smoking other types <sup>a</sup>	Most student smokers would continue smoking other types of cigarettes such as: roll-your-own cigarettes, packed cigarettes, and cigarettes with lower prices (15/34, 44%)

Note:

<sup>a</sup> this topic allowed students to give multiple answers

<sup>b</sup> numerator refers to the number of students delivered specific answer and denominator refers to total number of students answered the questions



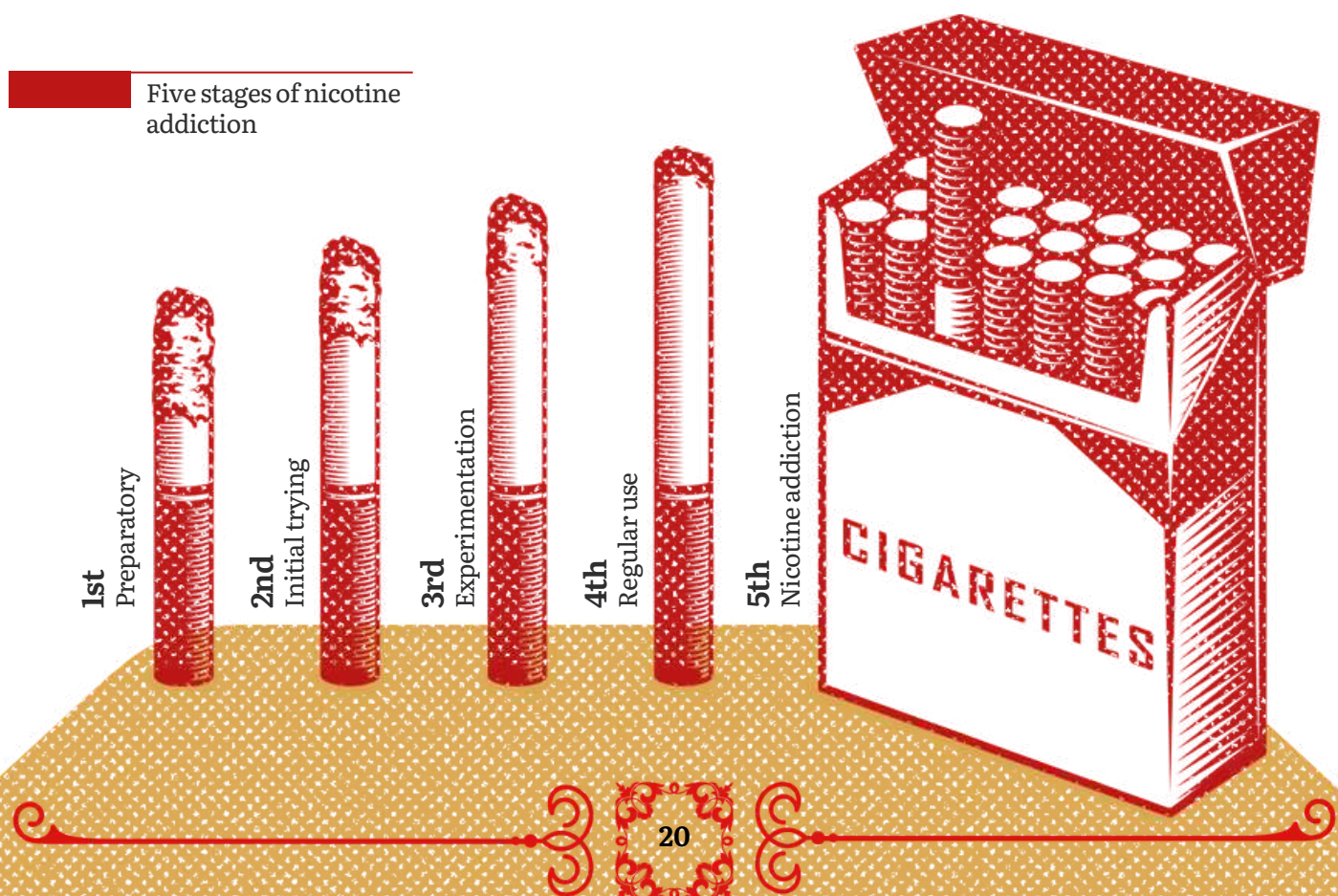


# Discussions

Present study showed that approximately 70% of students bought loose cigarettes during the first attempt of smoking and within the past 30 days. These findings were consistent between the 2019 GYTS data and primary data collected during FGD. Our results also reflected the results of previous studies from many countries that captured the prevalence of loose cigarettes purchasing: 62% of students in Myanmar (38); at least one third of adults in five low-middle income countries (Bangladesh, Kenya, India, Thailand, Zamb) (39); and 85% of young adults in the USA (40).

Employing a logistic regression analysis, this study found buying loose cigarettes in the past 30 days were significantly associated with being nondaily smokers and consuming five or less cigarette sticks a day, which were in line with prior evidence among adults (10–13,40–42).

Moreover, quantitative results also showed that last purchase of loose cigarettes was more likely to be reported among students with lower nicotine dependence. Smoking irregularly over an extended period, consuming five or fewer sticks a day, and having low nicotine dependence among youth could be interpreted that loose cigarette users in our study are in the experimentation phase based on five stages of nicotine addiction (43). This theory explains that the development of nicotine addiction has been indicated as a series of five stages: preparatory; initial trying; experimentation; regular use; and nicotine addiction. Compared to the adults in whom irregular smoking may be a relatively stable pattern, adolescents who smoked irregularly and consumed fewer cigarette sticks per day possessed higher risk to escalate becoming regular smokers in the near future. Typically, youth smokers would develop nicotine addiction in 3 years after smoking initiation (11,43).





Our findings that suggested the role of loose cigarettes in the early smoking phase were substantiated by the trend of cigarette consumption demonstrated in the 2021 Global Adult Tobacco Survey (GATS) (Appendix 3). Younger population was prone to consume loose cigarettes and the trend gradually decreased in the older population as consumption of cigarette packs and number of daily consumption were rising. These trends depicted the majority of the population kept consuming loose cigarettes until they reached a higher addiction stage and buying cigarette sticks did not fulfill their daily consumption anymore, thus they switched to the cigarette packs (14).

Furthermore, a population-based study in the United States demonstrated the risk of all-cause mortality in nondaily smokers was significantly higher compared to their never smoked counterparts (44,45). Another study added that even low-intensity cigarette consumption substantially correlated with mortality risk (46). In this case, the present study disputed the findings from prior studies that suggested the possible benefits of loose cigarette consumption as a harm reduction strategy to cease smoking. The efficacy of using loose cigarettes to quit smoking remains unclear (10,11,13), whereas the threat of health-related risks are evident.

Our quantitative findings were also supported by the results of qualitative analysis that revealed the role of purchasing loose cigarettes in smoking initiation, particularly among students with lower weekly pocket money. Affordable loose cigarettes allowed lower income groups with limited purchasing power to consume cigarettes, without paying full price of a pack that was relatively more costly (39,47).

In addition, our study revealed that high affordability along with the ease of access were the main reasons for students to keep purchasing loose cigarettes during their recent purchase.

Despite buying loose cigarettes one at a time may seem economically favorable in the short-term, former studies have emphasized that purchasing loose cigarettes could still incur high expenses in the long run due to the higher cost per stick when sold individually (40,48). Our qualitative findings revealed that students often allocate a significant portion, sometimes exceeding half of their pocket money to purchase loose cigarettes- ranging from IDR 30,000 - IDR 200,000 (USD 2 - USD 13) in a week. Remarkably, this expenditure is equivalent to half of the average weekly per capita expenditure of Indonesian population in March 2023.<sup>4</sup>

<sup>4</sup> The average per capita expenditure per month in Indonesia for March 2023 is IDR 1,451,870 (USD 94.08) or IDR 362,297 per week (USD 23.48), as reported by the Central Bureau of Statistics (Badan Pusat Statistik)



It is plausible to happen since students in our study perceived being persuaded to buy the sticks repeatedly due to the widespread of loose cigarette sales. Compared to other countries, this amount is also significantly higher than average cost of purchasing cigarettes per week among adolescents in Nigeria (USD 0.85) and Eastern Nepal (USD 0.26). The variation in these numbers with our findings might arise from differences in sampling methods as both of the studies utilized more representative samples to the adolescent population in specific age groups.

Our findings which revealed that purchasing loose cigarettes was relatively accessible for students were consistent with recent studies identifying a great number of retailers selling cigarettes easily found around school areas (7). The majority of sellers, particularly the informal retailers, admitted selling cigarettes to young people (24,38). Only few students in this study were being requested to show their ID card and it may affect their perception of the ease of loose cigarette access as well (49).

These findings may serve as evidence that the enforcement of age restriction (18 years old or older) to buy cigarettes in Indonesia has not been done as expected.

In conclusion, loose cigarette purchase among adolescents was massive. Students who purchased loose cigarettes were significantly correlated with the smoking experimentation stage compared to those who bought other types of cigarettes. Our quantitative findings were supported by the qualitative data that demonstrated the role of loose cigarettes during smoking initiation in young people. Regarding cigarette purchase in the past 30 days, most students also preferred loose cigarettes over other types of cigarettes because they were cheap and easy to get. Buying loose cigarettes one at a time was considered inexpensive, yet it encouraged students to keep buying cigarettes frequently. In the end, students spent a substantial amount of money to fulfill their addiction to nicotine.





## Implication to policy

While 87 countries worldwide have prohibited the sale of loose cigarettes, Indonesia is one of few countries in Southeast Asia that still does not regulate the distribution of loose cigarettes (50). Our study corroborated the plan of the Indonesian government to ban the sale of loose cigarettes because it has undermined tobacco control policies by providing cheaper cigarette options and allowing under-aged students to buy the cigarettes in the informal retailers (9). Moreover, prohibiting sale of loose cigarettes might serve as a barrier for students who intended to try cigarettes and might reduce cigarette consumption among adolescents who smoked by limiting access to the cheaper option of tobacco products. One review study underlined that every intervention to disrupt supply-side of tobacco products, including restriction of loose cigarette sales, has been correlated with decrement of youth smoking (51).

However, enacting the law alone would not be sufficient in the absence of effective enforcement. For instance, the prevalence of loose cigarette consumption soared among adolescents in Myanmar (62%) despite the fact that sales of loose cigarettes have been outlawed in the country (38). Almost all shops surveyed in Kenya also still sold loose cigarettes regardless of the sale restriction (39). Thus, a ban of loose cigarette sale must be followed by law enforcement, such as routine monitoring and clear statement of punishment for the violation (52).

The enforcement also should extend to educating the public and retailers about the regulation and conduct of restrictions in buying cigarettes for people whose age under the minimum purchase age (53). Beyond that, requiring stores or retailers to be licensed in order to be able distribute tobacco products may also be useful in reducing informal sales (54,55).

Along with the ban of loose cigarette sale, The World Health Organization (WHO)'s Framework Convention on Tobacco Control (FCTC) also recommended regulating minimum number of sticks a cigarette pack should contain, which is 20 sticks (56). Small cigarette packs have been acknowledged as one of the strategies from tobacco industry to maintain product sales by providing cheaper alternatives (57). Previous investigation demonstrated that the affordability of small cigarette packs would encourage adolescents to smoke (17). Lastly, the government must ensure tobacco products are not affordable by increasing the tobacco taxes significantly, by at least 25% annually, which would induce higher retail prices while simplifying the tax tiers to two: one tier for machine-made cigarettes and another for hand-made cigarettes (58).



## Strengths and limitations

This study contributed to our understanding of loose cigarette purchase among Indonesian adolescents that is still limited. Quantitative findings clarified the relationship between buying loose cigarettes and smoking experimentation. We also qualitatively explored the role of loose cigarette on smoking initiation, current consumption, and expense to buy the products. In addition, FGD participants in this study mainly consisted of smokers, loose cigarette buyers, and male – these characteristics reflected the population of adolescent smokers in Indonesia. This study may serve as an empirical evidence to advocate the prohibition of selling loose cigarettes in Indonesia.

To interpret this study findings, several limitations should be acknowledged. First, it is noteworthy that preference to buy loose cigarettes was derived from the type of last cigarette bought in the past 30 days and students were permitted to choose only one response.

In this case, student's preference for loose cigarettes might not portray the behaviour in reality –students could have switched between packs, loose cigarettes, or other types within this timeframe– thus the results of this study should be interpreted with caution. Second, the cross-sectional nature of the quantitative study did not allow present study to confirm the causal relationship and the result might be inverse. For instance, students who smoked irregularly and consumed five or less cigarette sticks per day might have significantly higher odds of buying loose cigarettes compared to those who smoked regularly and consumed more than five cigarette sticks per day. A longitudinal study is needed to more sufficiently investigate whether the loose cigarette actually causes young people to initiate and to continue smoking. Third, data from 2019 GYTS and FGD were at risk of recall bias since the students assessed themselves retrospectively. Lastly, both studies were conducted in the schools where students were likely to give socially acceptable answers rather than being truthful.



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A large, ornate, horizontal decorative frame with a light beige background and a dark brown border. The frame features intricate scrollwork and floral motifs. The word "Appendix" is centered within the frame in a bold, dark red serif font.

**Appendix**

# Appendix 1

Table A1 . List of questions for current smokers

Theme	Question	Probing
Smoking initiation	<b>We begin by remembering the past</b>	
	How old were you when you tried a cigarette for the first time?	
	Tell us about the experience of trying cigarette for the first time	Where did you try cigarettes for the first time? (school, home, shop, hangout). How did you get cigarettes for the first time? (buy yourself, share with friends, or take other people's cigarettes?)
	Tell us the reason why you decided to try smoking in the past? e.g. friends, stress, or others	
	What aspects of the cigarette itself attracted you? e.g. good taste, easy to get, or others	
	What type of cigarettes did you buy when you tried smoking? e.g. packs, loose cigarettes, roll-your-own, or others	<b>For students who bought loose cigarettes when trying cigarettes for the first time:</b> Would you insist to try cigarettes in the past if they were only sold in packs? And elaborate the reasons
	Tell us your progressive process towards regular use of tobacco products? When did you start smoking regularly? "regular" referred to the cigarette consumption at least once in a year and this pattern was repeated	
Smoking behavior	<b>Now let's talk about your current smoking behaviour</b>	
	During the past 30 days, what type of cigarettes did you buy last time? e.g. sticks, packets, cartons or rolling papers	
	Why do you prefer loose cigarettes to other cigarette types?	<b>Offer examples if the respondent looks confused:</b> Cheap, limited pocket money; Easy to get; Easy to hide; Many people around smoke cigarettes; Obtained cigarettes from a friend
	Tell us the reasons of changes or being loyal while comparing the type of cigarette you bought in the past and your current consumption	Did you buy the same cigarette type during smoking initiation compared to your last purchase?
	<b>During the past 30 days</b> , where did you buy tobacco most frequently?	
	<b>During the past 30 days</b> , on how many days did you smoke cigarettes? <b>During the past 30 days</b> , how many cigarettes did you usually smoke per day?	
Loose cigarette availability and smoking behavior	Does the availability of loose cigarettes have an impact on your smoking behavior?	
	Will your smoking behavior be affected if the sale of loose cigarettes is banned?	Will you smoke less often or want to quit? Will you switch to other tobacco products, such as roll-your-own or electronic cigarettes?
Nicotine dependence	When do you smoke mostly?	What situations trigger you to smoke?
	Do you ever smoke tobacco or feel like smoking tobacco first thing in the morning?	<b>If the respondent answers "yes", then ask:</b> Does it happen often? Do you smoke more often 1 hour after waking up than at other times?
	Is it difficult for you to quit smoking for a while in the places where smoking is prohibited?	
Spending on loose cigarettes	How much do you pay when you buy a cigarette stick?	
	What do you think about the price of a loose cigarette's price? Is a loose cigarette cheap?	
	<b>During an average week</b> , how much pocket money do you receive?	
	<b>During an average week</b> , how much do you spend on cigarettes?	
Smoking behavior	What brand of loose cigarette did you usually smoke?	
	Do you always buy the same brand?	
	What are the reasons for such behavior? e.g. because the brand has a cool image, because of the price, because of the taste	
	Have you been requested to show an identity card when buying loose cigarettes? or is there any screening system that prevents under-aged teens from buying cigarettes?	
Experience of buying loose cigarettes	Have you ever been refused by a seller when buying loose cigarettes?	
	Do you think using loose cigarettes is safer for your health compared to using cigarette packs? Please elaborate	
Perceived dangers associated with loose cigarette consumption	Do you think using loose cigarettes is safer for your health compared to using cigarette packs? Please elaborate	
	Do you often see pictorial health warnings when buying loose cigarettes?	
Perception of pictorial health warnings	Do pictorial health warnings influence your decision to quit smoking or to continue buying loose cigarettes? Please elaborate	



Table A2 . List of questions for ever smokers

Theme	Question	Probing
Perception of cigarette use	Tell us your opinion regarding smoking!	First thing in your mind when hearing word 'smoking' Opinion about smoking
Smoking initiation	<b>Let's remember the past</b>	
	How old were you when you tried a cigarette for the first time?	
	Tell us about the experience of trying cigarette for the first time	Where did you try cigarettes for the first time? (school, home, shop, hangout); How did you get cigarettes for the first time? (buy yourself, share with friends, or take other people's cigarettes?)
	Tell us the reason why you decided to try smoking in the past? e.g. friends, stress, or others	
	What aspects of the cigarette itself attracted you? e.g. good taste, easy to get, or others	
	What type of cigarettes did you buy when you tried smoking? e.g. packs, loose cigarettes, roll-your-own, or others	<b>For students who bought loose cigarettes when trying cigarettes for the first time:</b> Would you insist on trying cigarettes in the past if they were only sold in packs? And elaborate the reasons
Perception of loose cigarettes	Have you ever seen cigarettes sold as an individual stick?	
	Does the availability of loose cigarettes have an impact on your intention to try smoking?	
	In your opinion, is it easy or difficult to access loose cigarettes?	
	What do you think about the price of loose cigarettes?	
	Do your smoking peers often buy loose cigarettes?	
	Why do adolescents buy and use loose cigarettes e.g. cheap, limited pocket money, or others	
	Have you ever been offered a loose cigarette?	<b>If the respondents answer "yes":</b> Who offered you?
	Where do you often see people buying loose cigarettes?	
Experience of buying loose cigarettes	Have you ever bought a loose cigarette for someone else?	<b>If the respondents answer "yes":</b> Have you been requested to show an identity card when buying loose cigarettes? or is there any screening system that prevents under-aged teens from buying cigarettes?
	Have you ever been refused by a seller when buying loose cigarettes?	
	Do you know about a law that prohibited retailers from selling cigarettes to children under 18 years old?	
	Do you think using loose cigarettes is safer for your health compared to using cigarette packs? Please elaborate	





## Appendix 2

Up to 1,157 students completed the online screening form. Survey demonstrated that 131 students ever tried tobacco products and most of them consumed the loosies as their first cigarette (n=92, 70.23%). Moreover, 90 students (7.78%) consumed cigarettes in the past 30 days and the purchase of loose cigarettes is the most common within this group (n=66, 73.33%). The flow of recruitment process depicted below:

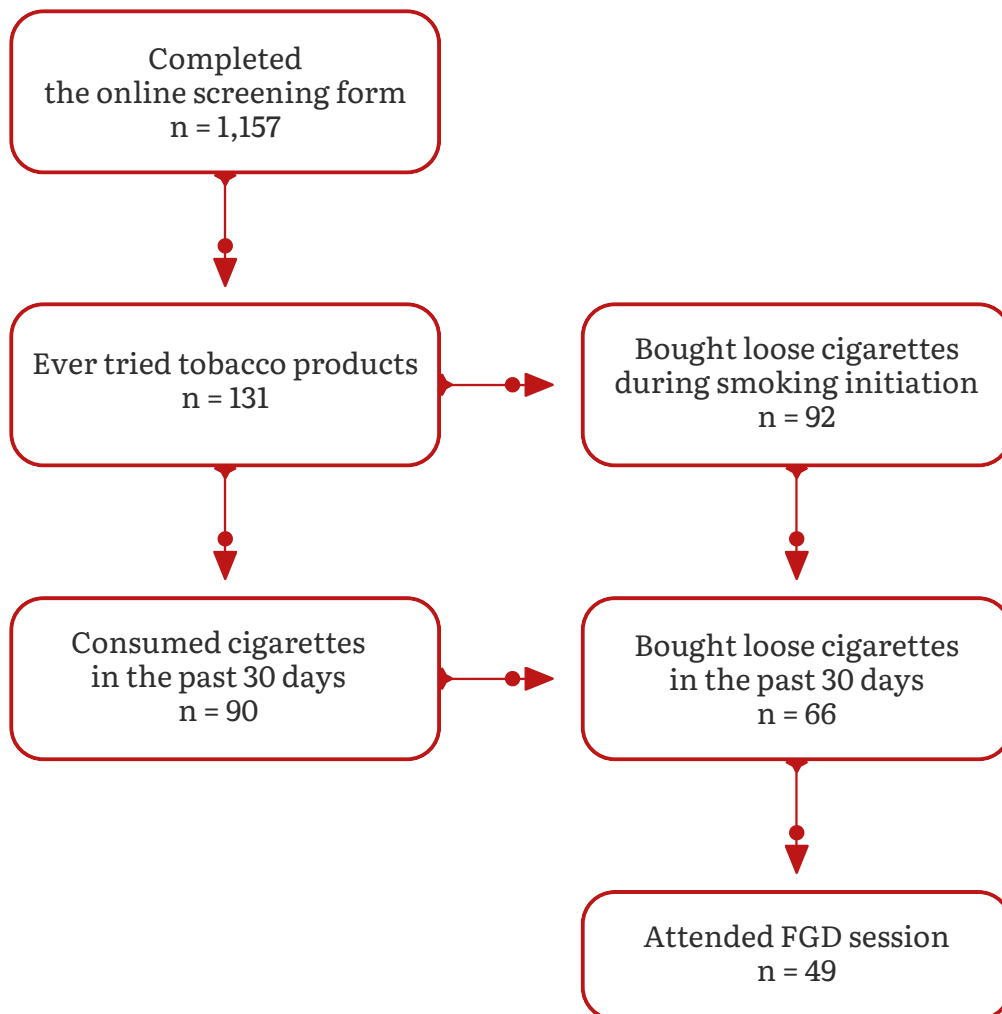


Figure A1. Flow diagram of FGD participants



### Appendix 3

We generated two figures below based on our elaboration of the 2021 GATS.

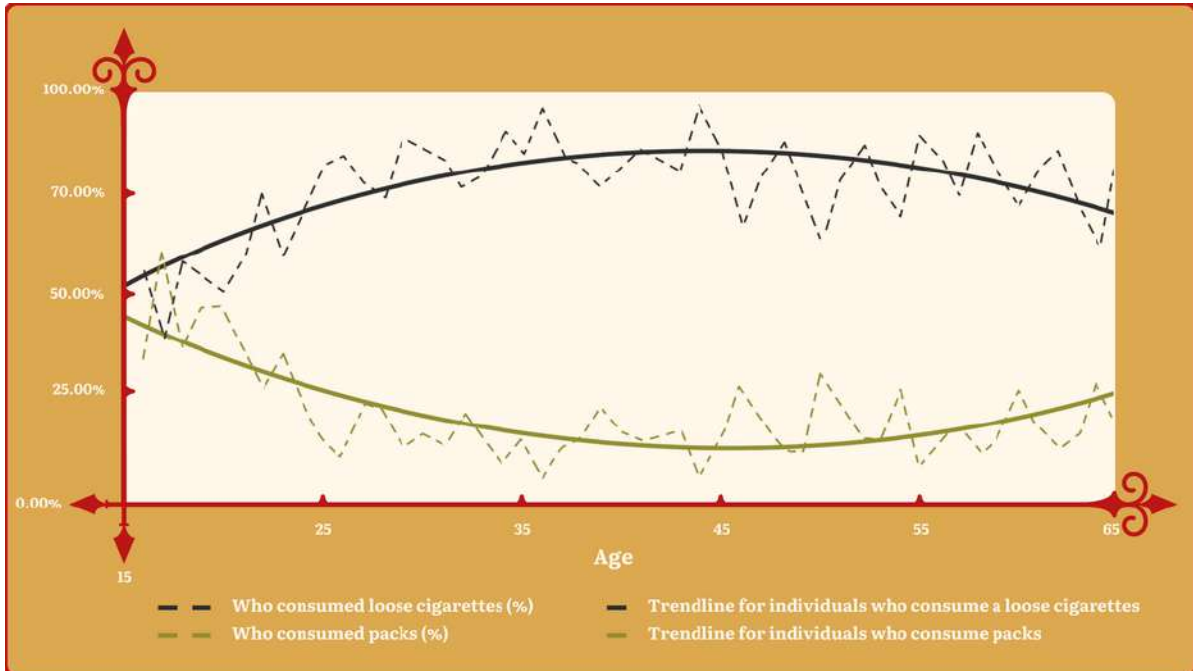


Figure A2. Trendline of consumption of loose cigarettes and cigarette packs across age (n = 1,992)

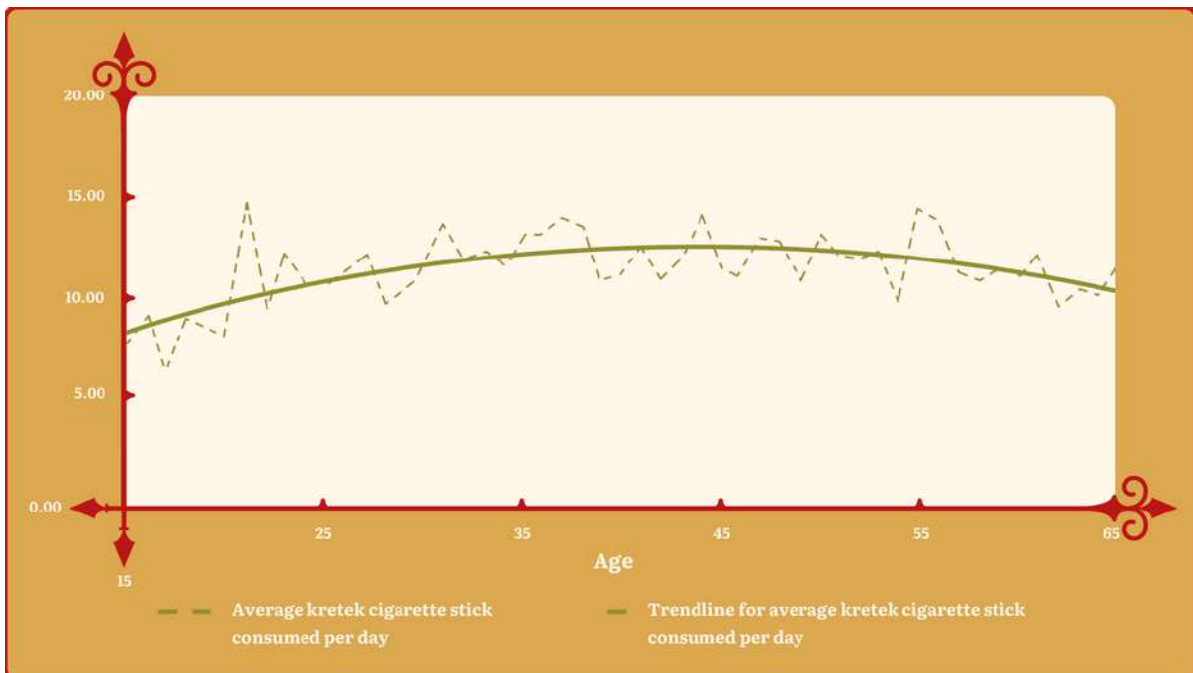


Figure A3. Trendline of daily consumption of kretek cigarettes across age (n = 1,934)