Tackling Smoking among Children: Price and Peer Effects in Indonesia

Teguh Dartanto
Rus'an Nasrudin
Johannes Hasibuan
Dwi Atmi Rohmatilah
Department of Economics Faculty of Economics and Business, Universitas Indonesia, Depok, Indonesia
Renny Nurhasana
Center for Social Security Studies Universitas Indonesia, Jakarta, Indonesia

ABSTRACT

The policy aims to tackle smoking among children might focus on both the peer effect and opportunity cost to smoke among children and youth. There has been a limited empirical study to test both factors in a developing country, such as Indonesia. In this regard, this research aims to revisit the current empirical study of estimating the relationship between social or peer group effect and price effect on smoking prevalence among children. The empirical technique uses both conditioning strategy and instrumental variable technique as an identification strategy to limit the bias of the relationship between varying peer's smoking prevalence and varying tobacco product price level on the probability of a child to smoke. We utilize two different datasets of the Indonesian National Socio-economic Survey (Susenas) and Indonesia Family Life Survey (IFLS) for robustness purposes. The results show that the peer effect presents positively modestly in Indonesia, and the price effect also intuitively negatively affects the probability of smoking children. The two datasets consistently indicate that for every additional ten percentage points of peer smoke, a child's probability of smoking increases by 1 to 2 percentage points. With Susenas data, we find that for every additional Rp100 (about 20% of the average price), the probability of child smoking decreases at the range of 0.4 to 3 percentage points. Our study's findings imply the necessity to increase further tobacco product price and a well-designed school or residential level intervention to reduce smoking among children through inducing cognitive behavior in limiting smoking.

Keywords: Peer Effect, Price Effect, Child Smoking, Indonesia
Subject Classification Codes: I18, I38

1
INTRODUCTION

Campaign in stopping early onset to smoke remains a significant challenge in the developing nations despite the substantial potential adverse consequences on human capital development. Two of the considered effective campaign instruments are education and price. However, empirical study estimating the relationship between the prevalence of peer smoking effect and price effect on child smoking in the context of a developing country such as Indonesia is limited. The purpose of this study is to add empirical evidence of the two relationships utilizing a cross-sectional variation based on the location of peer prevalence and cigarette price on the probability of child smoking.

The rationale to focus on peer and price policy variables to tackle smoking behavior since its onset at child or adolescence period is that the significance of the policy impact as it directly impacts the future smoking prevalence among adults. Smoking in adolescents tends to be an adult smoker (Brook et al., 1997; Nugroho, 2008). Secondly, the benefit outweighs the cost associated with an effort to tackle smoking from an early period by avoiding the unnecessary loss of human capital potential due to long-standing smoking behavior in the future in the form of health disruptions and unwise intrahousehold resource allocation.

The context of developing nations such as Indonesia opens room for such innovation of policy responses concerning the issue for many reasons. Among others, few developing nations have their education system curriculum inclusive of the anti-tobacco campaign, including Indonesia. Therefore, obtaining the direct measure of peer effect empirically is one step to further gauge the snowballing policy advocacies at the type of school-based intervention to limit the potential increasing number of children smoking. Moreover, informal industries and illicit tobacco products are enormous in a country like Indonesia, making the availability and affordability of tobacco products harmful to stopping smoking prevalence among children. Thus, price control needs to be more conservative not only for adults but also to incorporate the direct consequences on children's well-being and, therefore, needs to be more forceful. Hence, this study's expected contributions are, first, to provide the direct estimate of peer effect and price effect of child smoking in Indonesia and, second, to accentuate the policy implications from the finding.

The two main research questions of the study are, therefore, does having a higher reference group's smoking prevalence increase the probability to smoke for children in Indonesia? and by how much? Moreover, does living in a pricier tobacco product lower the probability to smoke for children in Indonesia? and by how much? We set a prior hypothesis of the positive relationship of the peer effect as established in the literature due to imitating the induced cognitive behavior (Nazlican et al., 2018) and a negative relationship between the price effect on smoking among children to income and substituting effects.

Estimating the peer and price effect is empirically challenging due to endogeneity with observational data (Krauth, 2007). Therefore, the empirical method to answer these questions is an Ordinary Least Square (OLS) estimate with conditioning and an instrumental variable (IV) technique. The use of these approaches is to limit the potential bias of estimating the pure peer effect from sorting behavior and the pure price effect from a reverse causation issue.

The rest of the sections are structured as follows. Section 2 provides context and framework. Section 3 is on method and data. Section 4 presents the results and discussion. Section 5 concludes and provides an avenue for policy implication.

2
CONTEXT AND FRAMEWORK

CONTEXT

Despite the widely campaigned lousy effect of smoking, tobacco smoking's global prevalence is not showing a significant declining trend. The world's tobacco prevalence is 21.9%, with the highest average region is Europe, and Africa is the lowest. In southeast Asia, the regional average is 24.8%, and Indonesia is the second-highest smoking country with a prevalence of 39.5 % (WHO, 2018). Moreover, Indonesia is the only region in southeast Asia that has not signed the WHO Framework Convention on Tobacco Control. Consequently, the declining pattern is not significantly seen. From 2017 to 2020, the number of smoking adult men only declined by 2%, while smoking women is raising 2.7%.

As for the youth, tobacco use is believed to be declining less than 1% for both boys and girls in recent years (tobaccofreekids.org, 2020). However, the prevalence figures for child smoking are a bit spotty, and each data provides a wide range of prevalence estimates. The Global Youth Tobacco Survey (GYTS) estimates 18.8% for children aged 13–15 in 2019. This number is higher than our calculation based on a nationally representative household survey. IFLS–5 provides a 16.45% prevalence for children aged 15–18 in 2014. Our estimates with Susenas data show that the prevalence ranges from 0.1% (age 7–12) to 10.7% (age 16–18), providing the comparable figure of GYTS of only 1.6%. A number that far less and quite conservative. See Table 1 for reference.

Table 1. Child Smoking Prevalence in Indonesia, 2015

Age group	Population	Number of smokers	Prevalence
Age 7–18	55,738,226	1,529,318	2.7%
Age 7–12	29,512,711	18,355	0.1%
Age 13–15	14,226,152	230,400	1.6%
Age 16–18	11,999,363	1,280,563	10.7%

Source: Author's Calculation based on Susenas 2015.

Despite these figure differences, the informative pattern drawn from Susenas data is that the prevalence tends to be increasing for adolescents compared with the younger age groups. For illustration, the prevalence of junior high school-age children in Indonesia is sixteen times the prevalence for the primary school-age group. Furthermore, the senior high school-age group's prevalence is almost seven times the prevalence for the junior high school-age group. This pattern implies the necessity to prioritize intervention for the concentrated age group that is the oldest age group category of children smoking, as shown in Table 1.

Behind these aggregative numbers, our study focuses on seeing how regional variation tells us about the likelihood of children becomes smokers if their peer tends to smoke and in a location that is the price is higher than another. In an ideal set up, eliciting the true magnitude of peer effect needs an experimental set up in which we randomize the placement of a child in the location that the peer is smoking (the treatment group) and in the location that their peer is not smoking (the control group) and compares the overtime changes of the smoking status by the group. Such elicitation technique, despite the internal validity, is ethically unjustifiable and socially incorrect to perform. Therefore, the second-best approach is to elicit such a relationship using the observational data's existing variation.

This second-best approach, however, is likely to suffer from contamination and biases. Therefore, we propose two empirical methods in dealing with this bias applied to the relevant data. As for the IFLS dataset, we try to limit the potential bias using the conditioning strategy. In other words, we use a control variable that could limit the selectivity or sorting by location of the peer prevalence and, at the same time, individuals' probability of smoking. Secondly, as for the Susenas data, we propose to use an instrumental variable technique as the dataset allows us to use the parent's education level as the instrument. The resulting estimates converge into a similar magnitude implying that the robustness of the results holds.

The two estimation approaches utilize locational variations of both the percentage of peer smoking and cigarette products' average price. We use the PSU (primary sampling unit) or known as the sample block of Susenas, as the locational unit. This unit is lower than the subdistrict level that we use for the IFLS dataset. We define the peer's smoking prevalence of PSU with the number of children located in there as

$$Peer\ Prevalence_j = \frac{1}{n} \sum_{i=1}^{n} S_{ij} \qquad (1)$$

With S_ij is a variable indicating each child is smoking or not (S_{ij} = 1 if smoking and zero otherwise). For peer reference, we use an age group plus-minus one[1] . For example, the individual with age 13 years olds has a pool of peer children aged 12, 13, and 14 in their respective locations. As for price at the community level, we use the average price at the household level of the imputed price (total expenditure divided by quantity) across households living in their localities. Therefore, the average price level at the community *j* is calculated across household i who has imputed price of IMP_{ij} as

$$Avg\ Price_j = \frac{1}{n} \sum_{i=1}^{n} IMP_{ij} \qquad (2)$$

[1] As for IFLS data, we extend into plus-minus three to obtain an adequate number of samples.

Table 2 presents the regional variation of the peer smoking prevalence by province. Even though we expect an average of about 6% at the national level, the table shows disperse regional variations of the figure. Among 26 provinces in our sample, the three top provinces to have the highest number of peer smoking are Bengkulu (3.77%), West Nusa Tenggara (3.53%), and South Sumatera (3.34%). On the other hand, a province like Maluku, Aceh, or North Sumatera sees the lowest prevalence figures.

Table 2: Variations of % Peer Smoking at the Community Level by Province, 2015

Province	Mean	SD	Min.	Max.
Aceh	1.58	5.23	0	66
North Sumatera	1.52	4.72	0	60
West Sumatera	2.69	6.50	0	58
Riau	2.22	5.36	0	48
Jambi	2.93	7.07	0	42
South Sumatera	3.34	7.35	0	61
Bengkulu	3.77	8.47	0	100
Lampung	3.28	7.82	0	100
Jakarta	2.42	6.75	0	55
West Java	3.26	7.95	0	100
Central Java	3.23	8.29	0	100
Yogyakarta	3.24	9.13	0	100
East Java	2.91	7.82	0	100
Bali	2.00	6.19	0	49
West Nusa Tenggara	3.53	8.56	0	100
East Nusa Tenggara	1.71	4.82	0	39
West Kalimantan	2.72	6.14	0	48
Central Kalimantan	2.05	5.60	0	44
South Kalimantan	2.53	6.49	0	48
East Kalimantan	1.28	4.65	0	42
North Sulawesi	1.92	6.40	0	100
Central Sulawesi	2.89	6.25	0	46
South Sulawesi	2.75	6.48	0	72
Southeast Sulawesi	2.17	5.35	0	54
Maluku	1.06	3.76	0	33
Papua	2.40	7.11	0	100
Total	2.60	6.91	0	100

Source: Author's Calculation based on Susenas, 2015

Another significant variation is within province variations. Like Bengkulu and Lampung, some provinces in Sumatera have some PSU with 100 percent of children's peers are smoking. A similar pattern has been found in Java, such as in West Java, Central Java, Yogyakarta, and East Java, densely populated locations, raising concerns about the large size numbers or magnitude of children being smokers. Given these variations, we believe so, by come conditioning variables, we could associate partial effect of these locational variations into the probability of a child to become smoker as the measure of peer effect.

Table 3: Variations of Average Cigarette Price at the Community Level by Province, 2015

Province	Mean	SD	Min.	Max.
Aceh	826.15	97.06	514	1294
North Sumatera	783.69	94.73	500	1400
West Sumatera	827.19	72.09	542	1086
Riau	799.88	71.62	566	1099
Jambi	758.97	76.00	548	1164
South Sumatera	739.67	69.97	525	1053
Bengkulu	756.50	76.75	510	1000
Lampung	760.39	99.93	513	1095
Jakarta	912.63	64.31	754	1254
West Java	803.97	77.06	529	1235
Central Java	766.49	68.11	542	1071
Yogyakarta	755.03	74.12	581	994
East Java	733.08	88.25	501	1296
Bali	740.40	54.72	592	903
West Nusa Tenggara	845.16	65.96	634	1096
East Nusa Tenggara	883.80	123.88	500	1250
West Kalimantan	757.00	90.09	531	1204
Central Kalimantan	775.42	75.63	520	1257
South Kalimantan	748.08	71.73	520	1112
East Kalimantan	869.81	87.74	580	1092
North Sulawesi	754.89	97.66	556	1302
Central Sulawesi	687.19	74.55	506	996
South Sulawesi	713.99	78.41	512	1129
Southeast Sulawesi	701.91	75.15	519	1022
Maluku	1099.76	121.63	500	1476
Papua	955.12	178.88	556	1480
Total	788.63	113.57	500	1480

Source: Author's calculation based on Susenas, 2015

Similarly, we use a regional variation of price for the second research question. From Table 3, we see a modest regional variation of 113, with the national average, converge to Rp788 per stick of cigarette, implying coefficient variations at 14.4 percent for overall type and brand. Province level variations show that province like Maluku sees upper bound for high price level out of one standard deviation of the national average and in contrary, Central Sulawesi sees the lower bound of the number from the national average. There has been a considerable variation among PSUs or a sub-district level such that Rp500 has the lowest average price and Rp1480 as the maximum. Pricier prices tend to be found in the Eastern part of Indonesia, suggesting extra margin costs for distribution and supply-side limitation but not for provinces in Java, for example. We expect that part of these regional price variance could explain the probability of a child becomes a smoker as the measure of *price effect*.

FRAMEWORK

The above section explains how the variable of interest varies across the location in the Indonesian context. Now, we focus on how the variations across individuals' children become smokers or not reflect the variation in the dependent variables. The first query to explore was that at what age children mostly start to smoke.

According to Indonesia's GHS (General Health Survey) 2013, 1.5% of all smokers start their habit at the very young age of five to nine. This number is more significant to be about a third if we limit only for child sample (Meyersohn and Harris 2011). Moreover, still to GHS 2013, as for the general smokers' population, they smoke primarily at the age of 15-19, that is 56.9%. It also seems for Indonesia that boys started earlier than girls (Okoli et al., 2013).

Why and what factors make these children smoke? Most literature on children smoking accentuates curiosity as the main drivers for smoking (Hasanah, 2014; Leventhal & Cleary, 1980; Nazlican et al., 2018; Okoli et al., 2013; Salasa et al., 2013; Tristanti, 2016). Furthermore, knowledge to initiate smoking mainly is coming from a friend (Chotidjah, 2012). This shows how important are other individuals who smoke in friendships or the peer effect in making a child smoke. Furthermore, children who smoke are motivated 'to feel accepted by their peer (Okoli et al., 2013; Rugkåsa et al., 2001; Salasa et al., 2013) or have a status create a specific image (Salasa et al., 2013). Thus, the simple nexus from not smoking is a line-up of trying, accepting, and continuing to smoke with environmental factor plays a role, including friends/peer.

Therefore, our framework rests on environmental factors as the driver for being a smoker among children. We acknowledge that in addition to friends, the parental aspect also could play a role (Armstrong et al., 1990; Krauth, 2007; Nazlican et al., 2018; Nugroho, 2008; Tristanti, 2016), as well as a sibling (Armstrong et al., 1990; Brook et al., 1997; Krauth, 2007; Nazlican et al., 2018; Tristanti, 2016)or policy-relevant variable at locality including price (Armstrong et al., 1990; Brook et al., 1997; Krauth, 2007; Nazlican et al., 2018; Tristanti, 2016). We thus focus on two out of those determinants: friends/peer and price and leave parental and sibling aspects as the avenue for further study, yet we acknowledge the importance of these factors as part of environmental determinants for child smoking.

However, eliciting these latent mechanisms is challenging due to the nature of unobservability of the event and endogeneity at the empirical data nature. Firstly, when children smoke mostly at no knowledge of their parents and asking survey questions either to child or parents about the smoking status, they are prone to under-reporting bias. Secondly, child income or the available money to buy cigarettes comes from their parents (cite) and less likely from their social networks. Moreover, mainly of the occurrence, the spending was hidden or masked under 'good spending' at the knowledge or understanding of their parents. Thus, estimating the true impact of price effect on consumption among children is likely to be contaminated by unobserved spending. To sum up, estimating both the peer and price effect on the likelihood of a child smoking is challenging.

To what extend the estimation of peer and price effect matters for policy discussion is the connection between the potential intervention originated from these two determinants of smoking children and their cessation. Identifying the true and accurate effect and its magnitude of the cause is halfway toward solving the entire problem of child smoking. Potential policy implication related to the cessation of smoking children could be associated with taxation (Chaloupka et al., 2000; Hidayat & Thabrany, 2010; Nakajima, 2007; Powell et al., 2005) or teacher-led program (Armstrong et al., 1990; Taylor et al., 2016) or peer-led program (Armstrong et al., 1990; Powell et al., 2005; Rugkasa et al., 2001; Taylor et al., 2016) and school-based program (Putra, 2020; Taylor et al., 2016; Tobacco Control Support Center, 2007). Therefore, our study contributes to pushing the snowballing discussion and introducing any further policy relevance intervention by ensuring the direction of the causes (peer and price) and how much its effect occurs. Such hard evidence is essential to convince policy-making and stakeholders to take any appropriate responses and actions.

3
METHOD AND DATA

This study's empirical approach is standard OLS with conditioning with IFLS 5-2014 data and an instrumental variable (IV) technique with Susenas 2015 data. As for both questions, we use the following equation in the baseline or naïve OLS specification:

$$P(S_i = 1) = \alpha + \beta_1 \, Peer\ Prevalence_j + \beta_2 \, Avg\ Price_j + X_i Y + L_j Y + E_{it} \qquad (1)$$

Where P(S_i=1) is the probability of child i smoking, *Peer Prevalence*$_j$ is the measure of peer effect at location *j*, *Avg Price*$_j$ is the measure of price effect at location *j*, X_i is the covariate at individual/household level (age, gender, household income, number of household member, marriage status of household head, and household gender), L_j is control variable at location *j* (urban-rural dummy, island dummy), and E_i is the idiosyncratic error term. The main parameters of interest are the peer effect of β_1 and the price effect β_2. Each of them measures how much impact from an additional proportion of peer smoking and the additional average price at the community level on the probability of child becomes a smoker. Then, for limiting the endogeneity problem of the variable of interest, we use the instrumental variable technique in which we instrument *Peer Prevalence*$_j$ with parental average education level and *Avg Price*$_j$ with elevation level at each location *j*, specifically with Susenas dataset. These instrumental variables are expected to purge out the sorting effect, under-reporting bias of peer smoking, and the measurement error for the imputed price level. The argument is that variation in parental education level and elevation is partially random and only affects the probability of child smoking through peer and price effects.

DATA

This study's data source is Indonesia's National Socio-Economic Survey (Susenas) 2015 and Indonesia Family Life Survey (IFLS 5) 2014. Both datasets contain information on the individual status of smoking, demographics, and socioeconomic characteristics.

The IFLS–5 has more comprehensive information than the Susenas and covers approximately half of Indonesia's provinces (mainly the western part of Indonesia). We use this data to check the consistency of estimates results. Susenas, however, includes all Indonesian provinces and hence provides more representative information for the whole nation. Both datasets are used for robustness purposes and for checking the consistency of the results.

We calculate the peer's appropriate measure (equation 1) and price effect (equation 2) by applying the formula to the data. We utilize information on age and community ID to implement the formula in calculating the number of peers' designated values, the number of peer smokes, and the individual (household level) imputed price level from the dataset.

4
RESULTS AND DISCUSSION

In general, the two factors, the peer effect and the price effect, statistically affect a child's chances of smoking. The point estimate of the positive effect of peer smoking on a child's likelihood of smoking is in the range of 1 to 2 percentage points of each 10-percentage point increase in the proportion of peers smoking. This effect is slightly low compared to existing studies, such as Krauth (2007), who find the range between 4 to 24 percentage point increase in own smoking associated with a 25 percentage point increase in peer smoking with the Californian dataset (USA). The expected differences could be attributed to the different nature of grouping in which the study use school's peer group whereas ours use residential/ locational peer group.

The price effect also has a negative and statistically significant (Susenas) and negative but minimal effect on IFLS data, at the range of 0.4 to 3 percentage point reduction probability smoking from every Rp100 rupiah (20% from mean price) price increase. This translates into the elasticity of -0.74 to -5.5 of price onto own smoking probability. Compared to the existing magnitude with Indonesian data, our result is comparatively high than Hidayat and Thabrany (2010), who estimates the own-price elasticity at the range of -0.13 to -0.27 for the short run and -0.35 to 0.75 for the long run. The estimate for IFLS 5 is likely to be upward biased as well as we presume that a more significant standard error occurred due to a smaller sample in addition to the coefficient shifts. Overall (Table 4) and in particular for adolescence (Table 5-Panel B), the peer price effect (translated into elasticity) tends to be more dominant than the peer effect in affecting the own probability to become a smoker for children in Indonesia.

Table 4: Main Estimate

Dependent variable: Smoking = 1, 0 otherwise

Variables	Susenas 2015		IFLS 2014	
Peer effect	0.002	***	0.001	***
	(0.000)		(0.000)	
Price effect	-0.004	***	-0.030	
	(0.010)		(0.104)	
Individual covariates	Yes		Yes	
Household covariates	Yes		Yes	
Location covariates	Yes		Yes	
Number of observations	217,238		1,427	

Note:
Robust standard error in bracket and *, **, *** indicates statistical significance level at 10, 5 and 1%, respectively.

Besides, in terms of the heterogeneity of peer and price effect on the probability of child smoking, we find variations in the impact where there is a tendency based on age groups and location. The heterogeneity information of impact estimate helps differentiate policy based on territorial. First, in terms of geographical variations, both peer and price effects tend to be stronger in rural areas than urban areas (Table 5-Panel A). It suggests emphasizing cessation policy efforts focused in the rural area than urban. Another interpretation of this gap is also associated with the urban-rural gap in terms of health literacy issues. Second, we find that the peer and price effect tend to be more significant for adolescents than younger children. This is reasonable since friendship and knowledge from friends to smoke are more available for older age groups as we presume they are likely to engage in social ties. Therefore, any program at the school level or peer-led intervention at the residential level should target first the older children than the younger ones.

Table 5: Heterogeneous Effect by Location and Age

Panel A-By Location

Dependent variable: Smoking =1, 0 otherwise

Variables	Urban	Rural
Peer effect	0.0005***	0.001***
	(0.0000)	(0.000)
Price effect	-0.0004**	-0.001***
	(0.0001)	(0.000)
Individual covariates	Yes	Yes
Household covariates	Yes	Yes
Location covariates	Yes	Yes

Panel B-By Age

Dependent variable: Smoking =1, 0 otherwise

	Age 7–12	Age 13–15	Age 16–18
Peer effect	0.0001***	0.0003***	0.001***
	(0.0000)	(0.0000)	(0.000)
Price effect	0.0000	-0.0007***	-0.003***
	(0.0000)	(0.0002)	(0.000)
Individual covariates	Yes	Yes	Yes
Household covariates	Yes	Yes	Yes
Location covariates	Yes	Yes	Yes

Note: Estimates are using Susenas data. Robust standard error in bracket and *, **, *** indicates statistical significance level at 10, 5 and 1%, respectively.

5
CONCLUSION AND POLICY IMPLICATION

This study shows that both the peer effect positively affects and the price effect negatively affects one's probability of becoming a smoker. They have statistically and consistently significant relationships across two nationally representative household survey data in the Indonesian context. The point estimate estimates are comparable with existing studies, except that the estimate for peer effect is slightly conservative.

The price effect is more dominant than the peer effect concerning children's probability of smoking. First, it is imperative to increase cigarette prices further to limit the growing number of children smoking. The more expensive the cigarette price could significantly lower the prevalence of smoking children. Second, the peer effect was found to be additionally noteworthy as a policy instrument to limit the own probability of smoking for Indonesian children. Moreover, our study also finds territorial basis and age basis for policy design of both increasing price and peer-based intervention to identify the focus and targeted subpopulation. Lastly, integrated and comprehensive efforts are to increase cigarette price simultaneously to influence children's social cognitive behavior (for example, peer-lead anti-smoking campaign programs in schools, prohibition of cigarette advertisements around schools) are the essential way forward policymakers and stakeholders drawn from this study.

REFERENCES

Armstrong, B. K., De Klerk, N. H., Shean, R. E., Dunn, D. A., & Dolin, P. J. (1990). Influence of education and advertising on the uptake of smoking by children. *Medical Journal of Australia*, 152(3), 117–124. https://doi.org/10.5694/j.1326-5377.1990.tb125117.x

Brook, J. S., Whiteman, M., Czeisler, L. J., Shapiro, J., & Cohen, P. (1997). Cigarette Smoking in Young Adults: Childhood and Adolescent Personality, Familial, and Peer Antecedents. *Journal of Genetic Psychology, 158(2)*, 172–188. https://doi.org/10.1080/00221329709596660

Chaloupka, F. J., Hu, T.-W., Warner, K. E., Rowena, J., & Yurekli, A. (2000). The taxation of tobacco products. *In Tobacco control in developing countries* (Issue January, pp. 237–272).

Chotidjah, S. (2012). Pengetahuan tentang Rokok, Pusat Kendali Kesehatan Eksternal dan Perilaku Merokok. *Makara, Sosial Humaniora*, 16(1), 49–56.

Hasanah, H. (2014). Baby Smoker: Perilaku Konsumsi Rokok Pada Anak Dan Strategi Dakwahnya. *Sawwa: Jurnal Studi Gender*, 9(2), 253–274. https://doi.org/10.21580/sa.v9i2.635

Hidayat, B., & Thabrany, H. (2010). Cigarette smoking in Indonesia: Examination of a myopic model of addictive behaviour. *International Journal of Environmental Research and Public Health*, 7(6), 2473–2485. https://doi.org/10.3390/ijerph7062473

Krauth, B. V. (2007). Peer and selection effects on youth smoking in California. *Journal of Business and Economic Statistics*, 25(3), 288–298. https://doi.org/10.1198/073500106000000396

Leventhal, H., & Cleary, P. D. (1980). The smoking problem: A review of the research and theory in behavioural risk modification. *Psychological Bulletin*, 88(2), 370–405. https://doi.org/10.1037/0033-2909.88.2.370

Nakajima, R. (2007). Measuring peer effects on youth smoking behaviour. *Review of Economic Studies*, 74(3), 897–935. https://doi.org/10.1111/j.1467-937X.2007.00448.x

Nazlican, E., Ersoy, Ö., Akbaba, M., & Demirhindi, H. (2018). Social factors should not be underestimated in smoking behaviour among adolescents: A patriarchal experience from senior high school students in Turkey. *IPSTID 14th Annual Conference, October*.

Nugroho, M. A. B. (2008). *Beberapa Faktor yang Berhubungan dengan Perilaku Merokok pada Siswa SLTP di Kecamatan Bendosari Kabupaten Sukoharjo Tahun 2008*. Universitas Muhammadiyah Surakarta.

Okoli, C., Greaves, L., & Fagyas, V. (2013). Sex differences in smoking initiation among children and adolescents. *Public Health*, 127(1), 3–10. https://doi.org/10.1016/j.puhe.2012.09.015

Powell, L. M., Tauras, J. A., & Ross, H. (2005). The importance of peer effects, cigarette prices; and tobacco control policies for youth smoking behavior. *Journal of Health Economics*, 24(5), 950–968. https://doi.org/10.1016/j.jhealeco.2005.02.002

Putra, I. P. (2020). *Sekolah Bebas Rokok Akan Diselaraskan dengan 'Merdeka Belajar'*. Medcom.Id. https://www.medcom.id/pendidikan/news-pendidikan/0kp0eV0k-sekolah-bebas-rokok-akan-diselaraskan-dengan-merdeka-belajar FOLLOW

Rugkåsa, J., Kennedy, O., Barton, M., Abaunza, P. S., Treacy, M. P., & Knox, B. (2001). Smoking and symbolism: Children, communication and cigarettes. *Health Education Research*, 16(2), 131–142. https://doi.org/10.1093/her/16.2.131

Rugkasa, J., Knox, B., Sittlington, J., Kennedy, O., Treacy, M. P., & Abaunza, P. S. (2001). Anxious adults vs. cool children: Children's views on smoking and addiction. *Social Science and Medicine*, 53(5), 593–602. https://doi.org/10.1016/S0277-9536(00)00367-1

Salasa, M. R., Rochana, T., & Alimi, M. Y. (2013). Fenomena Siswa Perokok (Studi Kasus di SMA Negeri 3 Demak). *Solidarity: Journal of Education, Society and Culture*, 2(1), 23–35.

Taylor, J., Taylor, A., Lewis, S., McNeill, A., Britton, J., Jones, L. L., Bauld, L., Parrott, S., Wu, Q., Szatkowski, L., & Bains, M. (2016). A qualitative evaluation of a novel intervention using insight into tobacco industry tactics to prevent the uptake of smoking in school-aged children. *BMC Public Health*, 16(1), 1–8. https://doi.org/10.1186/s12889-016-3205-8

Tobacco Control Support Center. (2007). *Tembakau dan Pendidikan di Sekolah Mengenai Dampak Penggunaan Tembakau serta Produknya terhadap Kesehatan* (1, Issue 1). http://tcsc-indonesia.org/wp-content/uploads/2012/08/Tembakau-dan-Pendidikan_rev100712.pdf

Tristanti, I. (2016). Remaja dan Perilaku Merokok. *The 3rd University Research Colloquium*, 328–342.