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Differences in Adolescents' Smoking Behavior and Media Exposure to Smoking Advertisements in Urban and Rural Padang City

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ABSTRACT

***Background**: Smoking is a habit that cannot be eliminated and leads to a variety of illnesses and even death. Young people are particularly vulnerable to the effects of electronic and non-electronic media. **Aims**: The study was to compare cigarette advertising exposure to electronic and non-electronic media among early teenagers in urban and rural Padang. **Methods**: The research design was cross-sectional. The sample consisted of 266 junior high school students from the city of Padang. Multi-stage random sampling was used to select the sample. Data were collected between 13 March and 4 April 2024. Data were collected through questionnaires and interviews and processed using Stata software version 17. The results revealed differences in smoking behavior and exposure to tobacco advertising media among early adolescents in urban and rural areas. **Results**: Smoking rates among adolescents in urban and rural areas are 20.54% and 23.38%, respectively. It is clear that in urban areas, 41.67% of adolescents smoke electronic cigarettes, but in rural areas, 72.22% smoke non-electronic cigarettes. There is a clear correlation between smoking habits and exposure to cigarette advertising in rural shops and stalls (p=0.012). Similarly, there is a significant difference in exposure to mobile phones between urban and rural areas (p=0.001 vs. p=0.000). **Conclusions**: There was a significant association between television viewing habits of films and videos in metropolitan areas (p=0.003) and the frequency of seeing health services.*

***Keywords**: Advertising, Adolescents, Cigarette, Urban, Rural, Smoking*

INTRODUCTION

The Institute for Health Metrix and Evolution states that there are 1.14 billion people who smoke, 155 million of whom are aged 15 to 24 years and 7.69 million have died (Institute for Health Metrix and Evolution, 2021). The most common diseases contributing to smoking-related deaths include trachea, bronchus, and lung cancer at 59.6%, 59% caused by chronic obstructive pulmonary disease, 28% experiencing heart problems and 19% experiencing diabetes mellitus (Schumacher *et al.*, 2024). Based on the Tobacco Atlas data, Indonesia ranks third after China and India (WHO, 2023).

The prevalence of adolescent active smokers in Indonesia is recorded at 19.2% of students, 35.6% of boys, and 3.5% of girls currently use tobacco products. The prevalence of smoking above 15 years of age in West Sumatra Province is 30.42% (BPS, 2023). Padang City is the largest contributor to the prevalence of active smokers. Based on research conducted on SMKN students in Padang city, student smokers in SMKN Padang city were 43.10%. Most of the smokers are male. As many as 43.40% of students started smoking at the age of 14-15 years old, a small proportion of female students have tried cigarettes (Sulastri *et al.*, 2018). Cigarette smoke exposure was 57.8% of students exposed to cigarette smoke at

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home and 66.2% of students exposed to cigarette smoke in enclosed public spaces.

Media and advertising play an important role in encouraging adolescents to smoke. Based on the results of the 2019 Global Youth Tobacco Survey (GYTS) research, 78.9% of students are aware of anti-smoking messages in the media around 65.2% of students are aware of cigarette advertisements or promotions when visiting points of sale and 10.5% of students own objects that carry cigarette brand logos (WHO, 2019). The results of the study, a higher proportion of children who returned to smoking occurred in children who had smoker friends (88.4%), were exposed to cigarette advertisements from magazines (84.4%), and were exposed to cigarette advertisements on television (83.2%) and, smoking parents can also encourage children to return to smoking (Rohman, 2023).

In addition, the area of residence also affects the behavior of adolescents. Living in an urban or rural environment can affect the level of physical activity and sedentary behavior of children. Research conducted in California that the prevalence of smoking behavior is higher in rural areas than urban areas and is influenced by the tobacco control system that is different in each region. In addition, the lifestyle and behavior of rural communities are less healthy than urban communities (Katrachanca and Koleske, 2021).

The use of social media also greatly influences smoking behavior in urban and rural areas. Research conducted in China shows that smoking cessation interventions using social media in the form of We Chat are efficient in urban communities than rural communities (Luo *et al.*, 2021).

Based on the exposure above, the authors are interested in raising the theme of differences in exposure to cigarette advertising media on smoking behavior in adolescents who are in urban and rural areas. The author chose adolescents because the prevalence of smokers is most commonly found in adolescents and exposure to literacy through social media has an important role in the attitudes and behavior of teenage smoking, besides that differences in smoking behavior based on geography are quite rare.

METHODS

The research conducted was a quantitative study using a cross-sectional approach. The study was conducted during the Ramadan Islamic boarding school program for junior high school (SMP) and senior high school (SMA) students in Padang City. The research was conducted at each mosque that held the Ramadan Islamic boarding school which is a mandatory program for the city of Padang which is held once a year in accordance with the Padang Mayor's program.

The study population was all junior high school children who were attending the Ramadan Islamic boarding school, a program of the Padang city government. The research sample was mosques that were willing to accept researchers to provide counseling related to smoking and conduct research related to smoking behavior. Sampling was done by stratified random sampling with the first stage of random selection in 11 sub-districts in Padang city and six sub-districts were selected with details of 3 sub-districts located in urban areas and 3 sub-districts located in rural areas. The 3 selected sub-districts were taken 3 mosques in each sub-district so that the total number of mosques was 6 mosques in 6 sub-districts in urban and rural areas.

The sample of this study was junior high school students who underwent Ramadan boarding school at the selected mosque and were willing to receive counseling on the dangers of smoking in adolescents.

The formula for the sample size is as below:

$$n = \frac{N}{1 + Ne^2}$$

N= Research sample
n= Minimum sample
e= *percentage of tolerance limit (margin of error)*

Based on the sample calculation formula, 266 respondents were obtained. The inclusion criteria of the research sample are 1) Willing to fill out the questionnaire 2) Can read and write 3) Participating in the Ramadan pesantren program 4) Being at the junior high school level of education.

Data were collected using a questionnaire adopted from the Global Youth Tobacco Survey (GYTS)

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questionnaire using Indonesian language and distributed to respondents. Questionnaire filling lasted for 10 minutes. The researcher gave directions regarding the questionnaire instructions for respondents who did not understand, they could ask the question to the accompanying enumerator.

The questionnaire consisted of several variables, namely the characteristics of the respondents, exposure to online and offline media of cigarette advertisements to smoking behavior in adolescents based on the area where the respondents live. Researchers divided the study based on demographic residence into urban and rural. Urban is according to the Badan Pusat Statistik, an urban area, if the population density, percentage of agricultural households, and the presence/access to urban facilities owned has a total value/score of 10 (ten) or more. Rural is a rural area, if the population density, percentage of agricultural households, and presence/access to urban facilities have a total score below 10 (ten) (BPS, 2020).

Data were analyzed using STATA software version 16. Data analysis was carried out twice. First, univariate analysis describes the mean, median, mode, minimum value, maximum value. Second, bivariate analysis looks at whether there is an influence of cigarette advertising media on the smoking behavior of adolescents living in urban and rural areas.

RESULTS AND DISCUSSION

Respondent Characteristics

Respondents were mostly female (58.04%) in urban areas and (52.60%) in rural areas. Grade 7 is the most respondents found in the study (38.30%) urban areas and (39.22%) in rural areas. The average pocket money of respondents in urban areas is IDR 16,280 while rural areas are IDR 13,062. The first age of smoking in urban areas is 16 years and in rural areas is 14 years.

Table 1. Descriptive Results of Respondents' Characteristics in Urban and Rural Areas

Respondent Characteristics	Urban		Rural	
	n	%	n	%
Gender				
Female	65	58,04	81	52,60
Male	47	41,96	73	47,40
Class				
7	43	38,39	60	39,22
8	32	28,57	45	29,41
9	37	33,04	48	31,37
Average pocket money	IDR 16,280.12		IDR 13,062.64	
Average age of smokers	16 years old		14 years old	

Smoking Behavior

Based on table 2 below, the first smoking experience was found in rural areas at 23.38%. The first age range of smoking in both urban and rural areas is found in the range of 14-15 years. The type of cigarette most smoked is non-electric at 72.22% in rural areas and 41.67% of e-cigarettes in urban areas. Cigarette consumption by adolescents averaged 1-5 cigarettes. On average, adolescents in urban areas consume a lot of non-refillable e-cigarettes 84.0% and 50% in rural areas. The average cost incurred for consumption of e-cigarettes in urban and rural areas is almost the same, namely Rp 34,000. Smoking cessation efforts for junior high school adolescents in both urban and rural areas were almost the same at more than 50%. However, only a small proportion received help from others to quit smoking, around 11.43% in urban areas and 30.95% in rural areas.

Table 2. Descriptive Results of Smoking Behavior in Urban and Rural Adolescents

Smoking Behavior	Urban		Rural	
	n	%	n	%
Smoking experience				
Ever	23	20,54	36	23,38
Never	89	79,46	118	76,62
Age at first smoking				
< 7 years old	2	8,33	4	11,11
8-9 years old	3	12,50	2	5,56
10-11 years old	2	8,33	8	22,22
12-13 years old	7	29,17	8	22,22
14-15 years old	8	33,33	14	38,89

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16-17 years old	1	4,17	0	0
Types of cigarettes smoked				
Non-electric cigarettes	9	37,50	26	72,22
E-cigarette (vape)	10	41,67	2	22,22
E-cigarettes and non-electric cigarettes	5	20,83	8	5,56
Non-electric cigarette consumption per day				
1-5 bars	12	92,31	34	100
6-10 bars	1	7,69	0	0
11-15 bars	0	0	0	0
16-20 bars	0	0	0	0
>20 bars	0	0	0	0
E-cigarette consumption per month				
Refillable cigarettes	3	12,0	9	50,0
Non-refillable cigarettes	21	84,0	9	50,0
Combination of the two	1	4,0	0	0
Average cost spent per month consuming refillable e-cigarettes	IDR 33,389.44		IDR 34,764.71	
Smoking cessation efforts				
Yes	33	94,29	33	82,5
No	2	5,71	7	17,5
Experience of receiving help from others to quit smoking				
Ever	31	11,43	13	30,95
No	4	88,57	29	69,05

Relationship between Media Exposure and Smoking Behavior

Based on table 3 below, there are differences in exposure to cigarette advertising media with smoking behavior in urban and rural areas. Rural areas have a significant relationship between exposure to advertisements in stalls and shops with smoking behavior with a per-value of 0.012. In addition, exposure to short messages or cellular phone calls received to encourage visiting the company's website to sell cigarettes was strongly associated with smoking behavior in both urban and rural areas with a per-value of 0.001 vs 0.009. While the exposure factor of seeing actors using cigarettes while watching television, videos, and movies in urban areas has a significant relationship with smoking behavior with a per-value of 0.003. Pictorial warning images have a significant relationship with smoking behavior in rural areas with a pervalue of 0.000. However, in contrast to urban areas, there is a significant relationship between adolescent literacy by seeing, reading or hearing advertisements about the impact of cigarette use on health on smoking behavior with a per-value of 0.018.

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Table 3. Relationship between Media Exposure and Smoking Behavior among Adolescents in Urban and Rural Areas in Padang City

Media exposure	Smoking Behavior in Urban Areas		P-Value	Smoking Behavior in Rural Areas		P-Value
	N	%		N	%	
Frequency of seeing, reading, or hearing cigarette advertisements						
Never	5	3,31		17	11,04	
Rare	60	39,74	0.130	49	31,82	0.335
Sometimes	57	37,75		38	24,68	
Almost every day	22	14,57		34	22,08	
Every day	7	4,64		16	10,39	
Frequency of cigarette product advertisements seen on billboards						
I haven't seen any billboards for the past 30 days	24	15,89		27	17,53	
Many	27	17,88	0.314	36	23,38	0.427
Some	88	58,28		72	46,75	
None	12	7,95		19	12,34	
Frequency of cigarette product advertisements seen in magazines or newspapers						
I have not looked at magazines or newspapers in the last 30 days	73	48,34	0.092	58	37,66	0.151
Many	13	8,61		14	9,09	
Some	28	18,54		43	27,92	
None	37	24,50		39	25,32	
Frequency of seeing cigarette advertisements on internet social media						
I have not used the internet for the past 30 days	4	2,65	0.114	7	4,55	0.269
Many	23	15,23		29	18,83	
Some	82	54,30		74	48,05	
None	41	27,15		44	28,57	
Frequency of seeing cigarette advertisements in shops, stalls or kiosks			-			
I have not visited any shops, stalls or kiosks in the last 30 days	0	0		16	10,39	**0.012***
Yes	115	100		23	14,94	
No	0	0		115	74,68	

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Experience of owning t-shirts, pens, backpacks, or other items with cigarette product brand logos						
Yes	14	9,33	0.454	10	6,49	0.574
No	136	90,67		144	93,51	
Text messages or cell phone calls received to encourage visiting a company's website to sell cigarettes						
I do not receive text messages or cell phone calls	1	0,66		34	22,08	
Many	3	1,99		1	0,65	
Some	9	5,96	**0.001***	8	5,19	**0.009***
None	136	90,07		111	72,08	
Frequency of seeing actors using cigarettes while watching television, videos and movies						
I don't watch television, videos, or movies	3	1,99		10	6,49	
Never	22	14,57		39	25,32	
Rare	69	45,70		46	29,87	
Sometimes	39	25,83	**0.003***	49	31,82	**0.900**
Most of the time	5	3,31		5	3,25	
Always	5	3,31		3	1,95	
Frequency of seeing health warnings on cigarette packs						
I haven't seen a cigarette packet for the past 30 days	21	13,91		23	14,94	
Yes, I see health warnings on cigarette packs	124	82,12		14	9,09	
No, I see health warnings on cigarette packs	6	3,97	1.000	117	75,97	**0.000***
Frequency of seeing, reading or hearing advertisements about the impact of cigarette use on health						
Never	12	7,95		14	9,09	
Rare	54	35,76		50	32,47	
Sometimes	60	39,74	**0.018***	66	42,86	0.094
Almost every day	18	11,92		15	9,74	
Every day	7	4,64		9	5,84	

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Respondents in this study were in the adolescent age range of 14-15 years. Based on the 2018 Basic Health Research, the prevalence of adolescent smoking has increased from 18.3% in 2014 to 19.2% in 2019 (Ministry of Health, 2018). Smoking behavior in adolescents is influenced by exposure to advertising and seeing smokers around children, including smokers in the house and public figures who display tobacco products on TV or in outdoor media. According to the 2019 GYTS survey report, approximately 78.9% of students are aware of anti-smoking messages in the media, 65.2% of students are aware of cigarette advertisements or promotions when visiting points of sale and 10.5% of students own objects that carry cigarette brand logos (WHO, 2019).

Individuals' perceptions of their exposure to media messages can shape their peers' perceived attitudes and behaviors toward an issue. People tend to assume that the more often others are exposed to media messages, the more likely those media messages are to have an impact on others' attitudes and behaviors (Katrachanca and Koleske, 2021). The results showed that there were differences in media exposure with adolescent smoking behavior in urban and rural areas. Rural areas have a significant relationship between exposure to advertisements in stalls and shops with smoking behavior. Cigarette advertising for rural areas uses more offline media such as posters and stickers displayed in stalls or shops. This is in line with this study that youth exposure to and acceptance of tobacco advertising at the point of sale (POS) and individual sales promotions can positively influence adolescents' attitudes toward tobacco brand consumption and smoking behavior (Stubbs, 2021). An individual who has seen advertisements and promotions is 2.91 times and 2.82 times more likely to have used and currently use e-cigarettes, respectively, after controlling for socioeconomic factors, region, and smoking status (Wulan *et al.*, 2022).

Cigarette companies' efforts in obtaining prospective consumers do marketing by advertising sending short messages or cellular phones to encourage prospective consumers to visit the cigarette company's website, these advertisements affect smoking behavior in both urban and rural areas. This is by research that adolescents have the perception that *online* advertisements for tobacco products look fun or cool and encourage adolescents to buy tobacco products (Chen, Tilden, and Vernberg, 2020).

In addition, tobacco companies also use music videos as a growing promotional strategy. This study examines the impact of e-cigarette product placement and imagery in music videos on susceptibility to e-cigarette use among young adults. Exposure to actors using cigarettes while watching television, videos, and movies in urban areas has a significant relationship with smoking behavior. This is in line with research showing that exposure to e-cigarette product placement in music videos can increase young adults' intention to try e-cigarettes in the future (Donaldson *et al.*, 2022). In addition, cigarette advertisements aired on television have the highest recall for the audience (Ganz *et al.*, 2020). This is in line with research showing that exposure to cigarette advertising on television, total exposure to cigarette advertising, cigarette promotion, and gender have a significant relationship with adolescent smoking behavior during the pandemic (Laili *et al.*, 2022).

In controlling smoking behavior in adolescents, high knowledge is needed, especially the dangers of smoking. Improving health literacy in adolescents is crucial because it plays a role in facilitating the development of smokers from the stage of having no intention to quit to have the intention to quit (Sun *et al.*, 2023). Research showed that urban areas have good literacy towards health obtained by seeing, reading, or hearing advertisements about the impact of cigarette use on health on smoking behavior. Unlike the case with rural areas adolescents are influenced with *pictorial warnings* or *pictorial warnings* also increase the desire not to smoke, intention to quit smoking, negative emotional reactions, thinking about the dangers of smoking, and conversations about quitting smoking (Brodar *et al.*, 2018). This is in line with research that a person's attractiveness is reduced if they see standard packaging with pictorial warning labels compared to standard branded packaging without pictorial warning labels (Katrachanca and Koleske, 2021).

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CONCLUSION

There are differences in exposure to cigarette advertising media on smoking behavior in adolescents who are in urban and rural areas. Adolescents in urban areas tend to be exposed to attractive cigarette advertisements through social media, poster while rural areas are exposed to cigarette advertisements through print media.

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