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Spatial Analysis and the Distribution Map of Cigarette Expenditures and Tuberculosis CNR in Indonesia in 2021-2022

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ABSTRACT

***Background**: Indonesia is in second place with the highest number of Tuberculosis (TB) cases in the world with a death rate reaching 144,000 cases per year. Smoking has become the second biggest risk factor for TB in Indonesia after poor environmental conditions and Indonesia ranks third with the highest number of smokers in the world. **Objective**: to analyze the relationship between cigarette expenditure and TB Case Notification Rate in 2021-2022. **Method**: The study design is an observational quantitative study using secondary data. Mapping was carried out using the QGIS application and spatial analysis was done using the GeoDa application's spatial regression. **Results**: in 2021 the majority of provinces in Indonesia is in the medium category for average per capita weekly cigarette expenditure and is in the low category for CNR TB. In 2022, most provinces in Indonesia were in the high category for average per capita per week cigarette expenditure and in the medium category for TB CNR. Papua Province needs to get more attention from the government because even though the average cigarette expenditure is low, the TB rate is high. DKI Jakarta Province needs to receive more attention because apart from its high TB rate, the average per capita cigarette expenditure is also high. There's a relationship between cigarette expenditure and TB CNR in 2021 but not in 2022. **Conclusion**: There was an increasing trend in cigarette expenditure and TB CNR in Indonesia from 2021 to 2022 and a lack of consistency in the relationship between the two variables from 2021 to 2022.*

***Keyword**: Cigarette, Cigarette Expense, Tuberculosis, SDGs.*

INTRODUCTION

Tuberculosis (TB) is a contagious infectious disease that mainly affects the lungs caused by Mycobacterium tuberculosis and is a disease with high prevalence throughout the world (Sharma et al., 2021). TB often occurs in individuals from low socioeconomic backgrounds, marginalized groups in society, or groups of people whose immune systems are weakened (Natarajan et al., 2020; Olmo-Fontánez & Turner, 2022). Risk factors for TB transmission include age, history of alcohol abuse, homeless status, and transmission through the environment such as exposure to indoor air pollution and cigarette smoking (Li & Wang, 2023; Martins-Melo et al., 2020; Obore et al., 2020; Xu et al., 2020). TB disease is a significant global health problem with an estimated number of people diagnosed with TB in 2021 reaching 10.6 million cases There was an increase of 600,000 cases from the previous year with a total death rate of 1.5 million people per year (Chiang et al., 2021). Indonesia is in second place with the highest number of TB cases in the world with a death rate reaching 144,000 cases per year, the incidence of TB cases in Indonesia reaches 354 per 100,000 population and this situation is a big obstacle to achieving TB elimination target by 2030 (Kementerian Kesehatan RI, 2022).

Smoking has become the second biggest risk factor for TB in Indonesia after poor environmental conditions (Sulistyawati & Ramadhan, 2021). Indonesia is ranked fourth among countries with the highest smoking rates and has the highest number of male smokers globally (Rachmawati et al., 2023). Most smokers in Indonesia are men

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with the highest level of education being elementary school, living in low economic categories, and living in urban areas. 46% started smoking when they were teenagers with an average cigarette expenditure of IDR 56,000.00 per week. In this case, there are comparable implications for the high number of smokers in Indonesian society with spending on purchasing cigarettes every week (Salsabila et al., 2022).

The negative impact of smoking is not only felt by active smokers but also by passive smokers (Diningrum et al., 2023; Rifqi et al., 2022). Apart from being able to cause noncommunicable diseases, second-hand smoke exposure is also associated with latent TB infection and active TB in children and may alter the immune response (Altet et al., 2022). Smoking has a significant effect on TB, increasing susceptibility to TB by increasing the growth of Mycobacterium tuberculosis more rapidly, which is a major obstacle to successful treatment. The proportion of deaths, failure to follow treatment, and discontinuation of treatment tend to be higher in the smoker group (Corleis et al., 2023).

This article aims to analyze and describe the results of mapping to analyze the relationship between cigarette expenditure and TB Case Notification Rate in 2021-2022. Knowing the picture of the distribution of TB cases and smoking habits, it is hoped that this can help the Indonesian government in making decisions about handling TB and smoking cases in Indonesia, which can then improve the quality of life of the community.

Combining these variables provides a comprehensive view of how smoking prevalence and cigarette expenditure might be correlated with TB rates. Most existing studies might focus on either smoking or TB separately, but not both in conjunction. Applying these distributions geographically can uncover regional patterns and hotspots, which is vital for targeted interventions.

The urgency of this research lies in its potential to influence current and future public health strategies significantly, especially in the context of ongoing global health challenges. Its distinctiveness stems from the integrated, geographically detailed, and timely approach to analyzing the relationship between cigarette expenditure and TB Case Notification Rate, filling a gap left by more narrowly focused studies.

METHODS

The study design is an observational quantitative study using secondary data obtained from the Indonesian health profile and the Central Bureau of Statistics publication. This study used publicly accessible secondary data that did not require ethics approval. Spatial classification analysis techniques were performed to map TB cases and cigarette expenditure across provinces in Indonesia based on the categories of low cigarette expenditure and low TB cases (LCLT), low cigarette expenditure and medium TB cases (LCMT), low cigarette expenditure and high TB cases, medium cigarette expenditure and low TB cases (MCLT), medium cigarette expenditure and medium TB cases (MCMT), medium cigarette expenditure and high TB cases, high cigarette expenditure and low TB cases (HCLT), high cigarette expenditure and medium TB cases (HCMT), and high cigarette expenditure and high TB cases (HCHT). The spatial analysis was carried out using spatial lag model regression of GeoDa application based on the average expenditure of cigarettes, smoking prevalence, and TB CNR.

The process of data analysis in map creation with QGIS encompasses several essential stages. Initially, geographical data was gathered from diverse origins and brought into the QGIS platform. Subsequently, this data undergoes adjustments and refinements, which may involve configuring projection settings or performing data cleansing tasks. Following this, spatial examination is conducted using the array of analysis tools within QGIS, such as overlay techniques, interpolation methods, or distance measurements. The outcomes of these analyses are then translated into visually informative maps, presenting patterns, trends, or spatial correlations within the geographical data in a clear and accessible manner. QGIS's user-friendly interface and adaptable functionalities enable efficient and precise analysis of geographical data.

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RESULTS AND DISCUSSION

Average Cigarette Expenditure and TB CNR in Indonesia (2021-2022)

Figure 1 shows a comparison of the average expenditure on cigarettes in each Indonesian province in 2021 and 2022. Almost all provinces show an increase in average expenditure on cigarettes from 2021 to 2022 (the average increase is Rp603,41 per capita per week), which is indicated by the height of the graph bars in 2022 compared to 2021. Provinces such as West Java (Rp21.493,35 per capita per week), Central Java (Rp21.822,55 per capita per week), and DI Yogyakarta (Rp21705,65 per capita per week) are the provinces that have the highest average cigarette expenditure in 2021. However, in 2022 there is a change in the highest ranking with West Java (Rp22.207,27 per capita per week), Aceh (Rp22.166,14 per capita per week), and North Sulawesi (Rp22.134,67 per capita per week) being the three highest, indicating cigarette consumption in the region. This increased significantly from the previous year. Meanwhile, there are provinces such as Papua, West Papua, and North Maluku with the lowest average cigarette expenditure in 2021-2022.

The province with the highest average increase in cigarette expenditure in 2021-2022 was DKI Jakarta, with an increase of 4.48%. On the other hand, the province with the lowest increase in average expenditure in both years was East Java, with an increase in expenditure of only 0.98%. Regionally, no very striking pattern differentiates between the western and eastern regions of Indonesia in terms of cigarette expenditure, with each province having a unique trend and not showing a geographically consistent pattern.

The graph in Figure 2 depicts a comparison of the Tuberculosis (TB) Case Notification Rate (CNR) in all provinces in Indonesia between 2021 and 2022. Most provincial areas show an increase in TB CNR from 2021 to 2022. Several provinces with significant increases include South Kalimantan (109%), DI Yogyakarta (103%), and West Java (100%) On the other hand, several provinces showed the lowest increase in TB CNR from 2021 to 2022, namely West Sulawesi (30%), Riau Islands (43%), Riau (47%). The provinces with the highest TB CNR in 2021 are DKI Jakarta (263) and Papua (268). In 2022, the highest position for CNR TB will also be the same in the two provinces, namely DKI Jakarta (501) and Papua (454).

The Distribution Map of Average Cigarette Expenditure and TB CNR in Indonesia (2021-2022)

In 2021, most provinces in Indonesia are colored orange, indicating that the average per capita per week of cigarette expenditure is in the medium category (Figure 3). The results of the spatial analysis of TB CNR in 2021 show that most provinces in Indonesia are in the low category (Figure 4). The analysis results showed LCLT (6%), LCMT (6%), MCLT (47%), MCMT (6%), HCLT (32%), and HCMT (3%). An interesting finding is in the provinces of Papua and West Papua where the average per capita per week of cigarette expenditure is in the low category but the CNR is in the medium category.

The low weekly per capita expenditure on cigarettes in Papua and West Papua can be caused by the economic level in these two provinces which tends to be lower compared to other provinces in Indonesia. Papua has big challenges in terms of economic and social development, even though it has abundant natural resources. Limited economic access and low-income levels make residents prioritize other basic needs over cigarettes. This is supported by (Adam & Purwana, 2022) who explained that there is the income per capita variable partially has a substantial impact on the dependent variable with a negative coefficient which means that low-income groups are more vulnerable to becoming smokers.

The TB CNR for Papua and West Papua Provinces are in the medium category (Figure 4), which can be caused by several contributing factors. One of them is limited access to health services in Papua and West Papua which is one of the main factors (Efraim Mudumi et al., 2021). The existing health infrastructure is faced with geographical challenges that make the distribution of medical personnel uneven, thus hampering the distribution of adequate health services. Low public knowledge about TB also plays a role in the spread of this disease. Limited access to information risks causing individuals not to immediately intervene for the TB symptoms they are

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suffering from (Depo & Pademme, 2022). Increasing public knowledge and behavior regarding TB leads to increased early detection and prevention behavior (Ayu Rahmadani et al., 2023).

Table 1. The symbol of every province in Indonesia is based on the number on the Indonesian map (figure 3-6)

Number/ Symbol	Province
1	Aceh
2	Bali
3	Banten
4	Bengkulu
5	DIY Yogyakarta
6	DKI Jakarta
7	Gorontalo
8	Jambi
9	West Java
10	Central Java
11	East Java
12	West Borneo
13	South Borneo
14	Central Borneo
15	East Borneo
16	North Borneo (before 2019, North Borneo is part of East Borneo)
17	Bangka Belitung Islands
18	Riau Islands
19	Lampung
20	Maluku
21	North Maluku
22	West Nusa Tenggara
23	East Nusa Tenggara
24	Papua
25	West Papua
26	Riau
27	West Sulawesi
28	South Sulawesi
29	Central Sulawesi
30	Southeast Sulawesi
31	North Sulawesi
32	West Sumatera
33	South Sumatera
34	North Sumatera

In 2022, most provinces in Indonesia is red, indicating that the average per capita per week of cigarette expenditure is in the high category (Figure 5). These results show that there is an increasing trend in cigarette expenditure in almost all provinces in Indonesia. Even West Papua, which was previously in the low category, has increased its status to medium. Only Papua province remains in the low category.

An increase in cigarette spending can occur due to several factors. Exposure to cigarette advertising and promotions is still very high in Indonesia (Septiono et al., 2022). Many adults and teenagers report frequently seeing cigarette advertisements on television, radio, and in stores. In addition, cigarette advertising in Indonesia focuses on controlling emotions, increasing masculinity, and upholding traditional values while embracing modernity and globalization (MANAN et al., 2023; Turisno et al., 2021). This encourages an increase in cigarette consumption in Indonesia. Ease of access to cigarette products, both in terms of affordable prices and availability in various places, also contributes to high cigarette expenditure.

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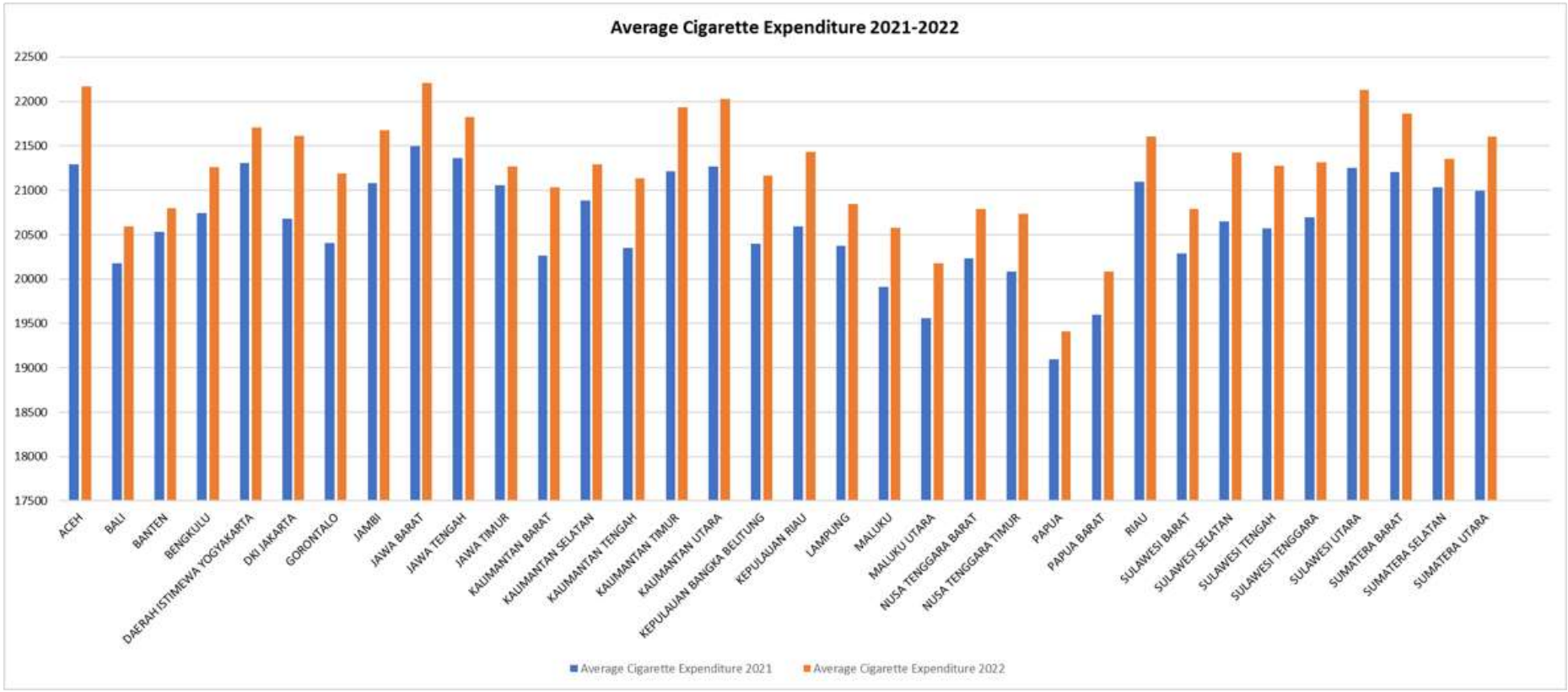

Figure 1. Average expenditure on cigarettes in 2021-2022 in Indonesia

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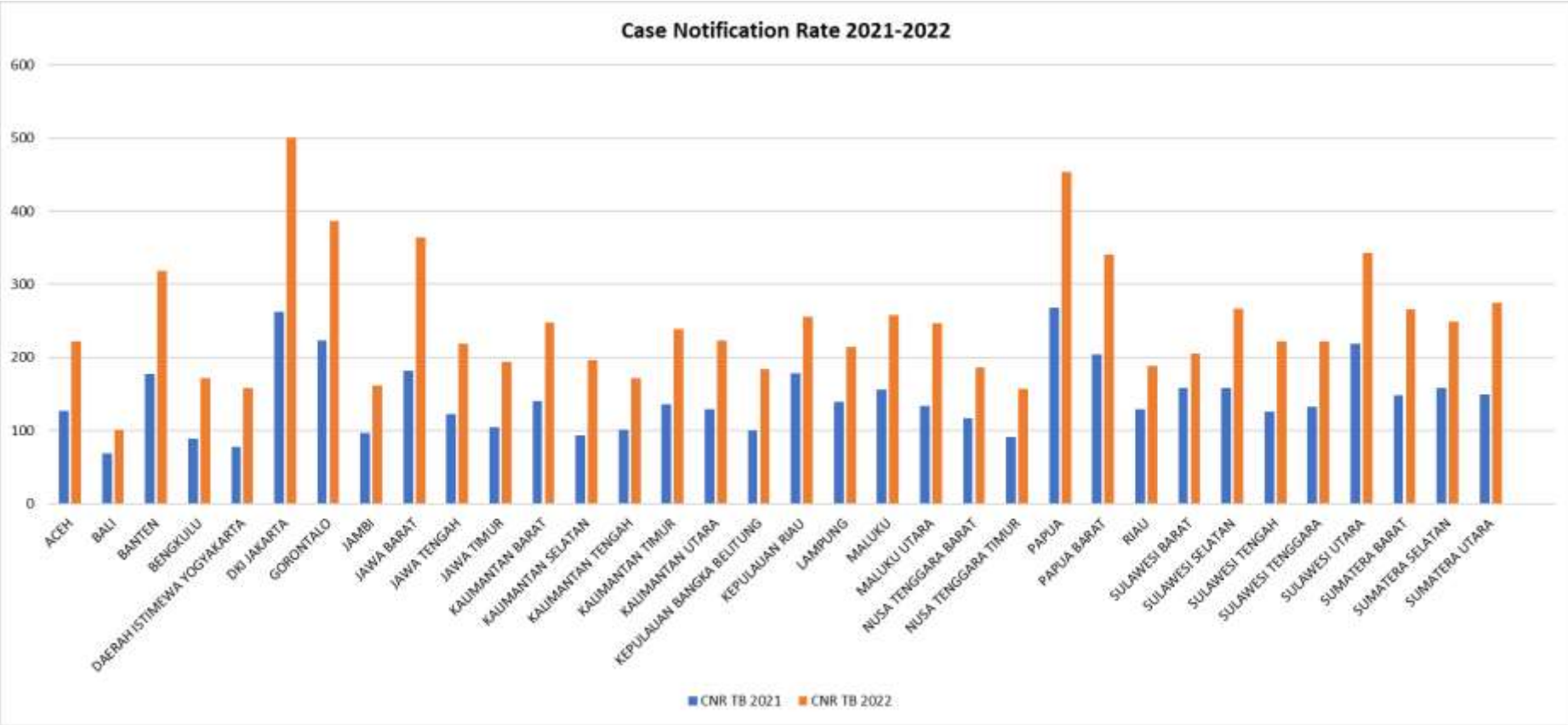

Figure 2. Tuberculosis Case Notification Rate in Indonesia in 2021-2022

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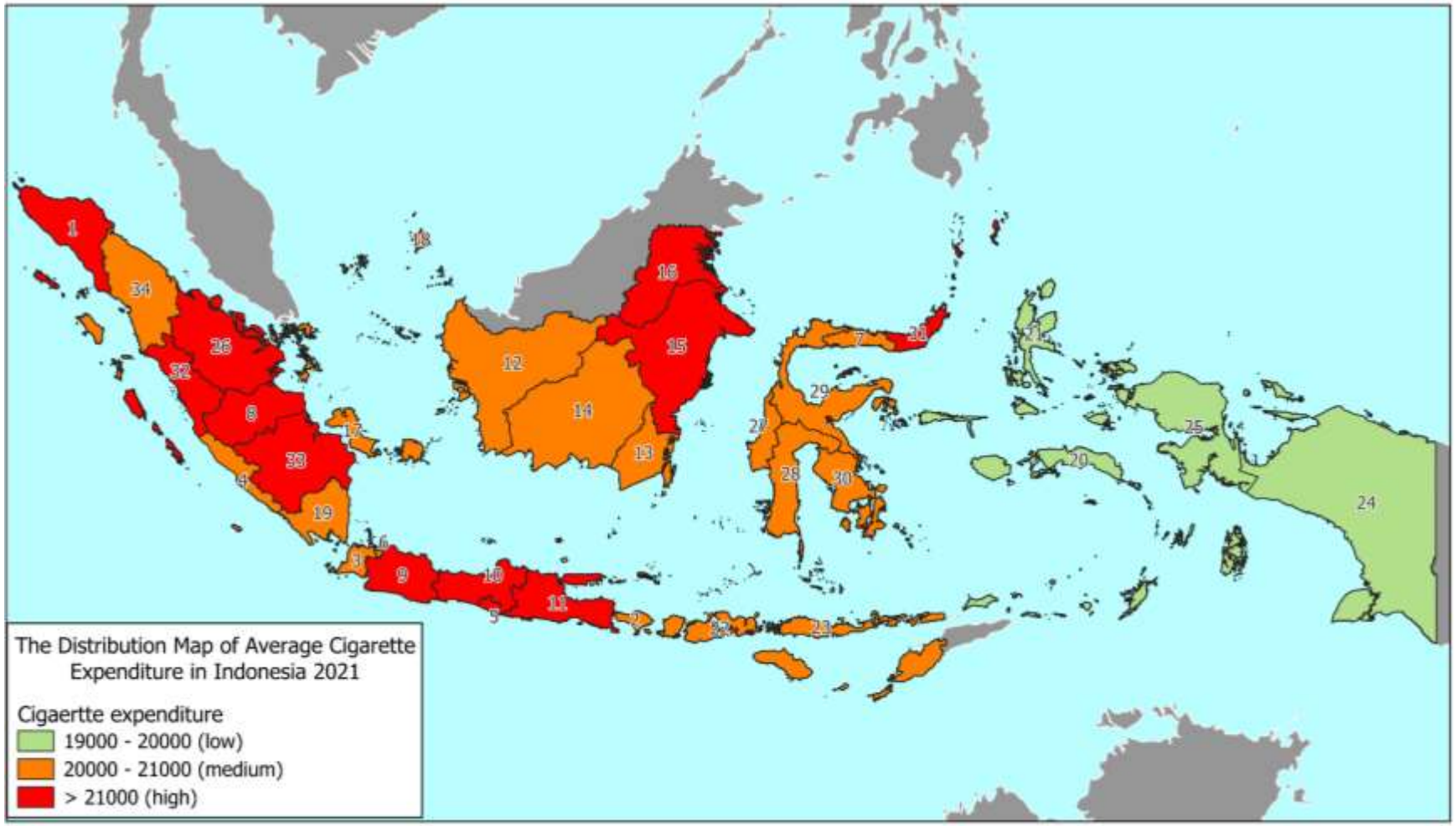

Figures 3. Distribution Map Average Cigarette Expenditure in Indonesia 2021

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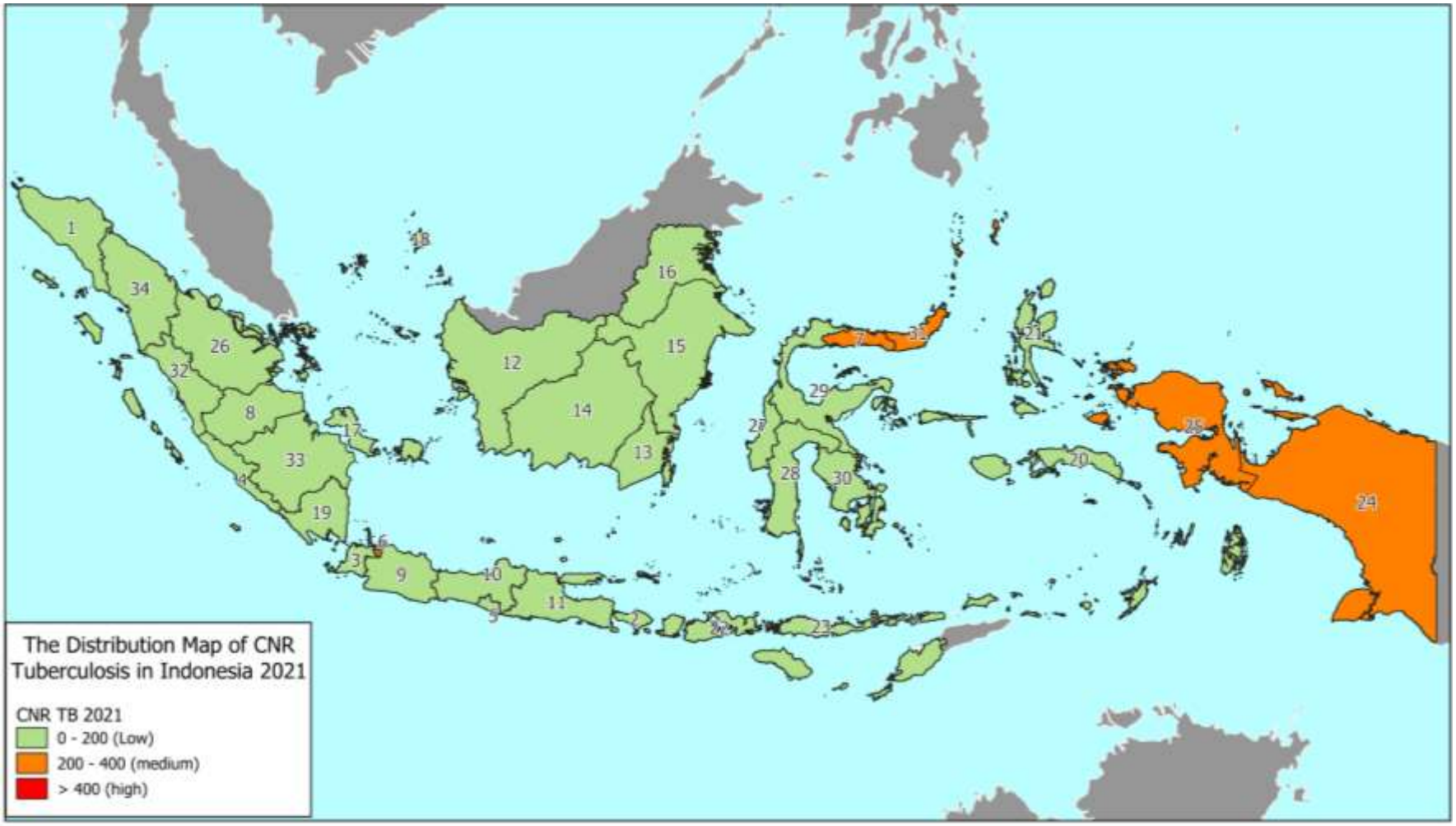

Figures 4. Distribution Map CNR TB in Indonesia 2021

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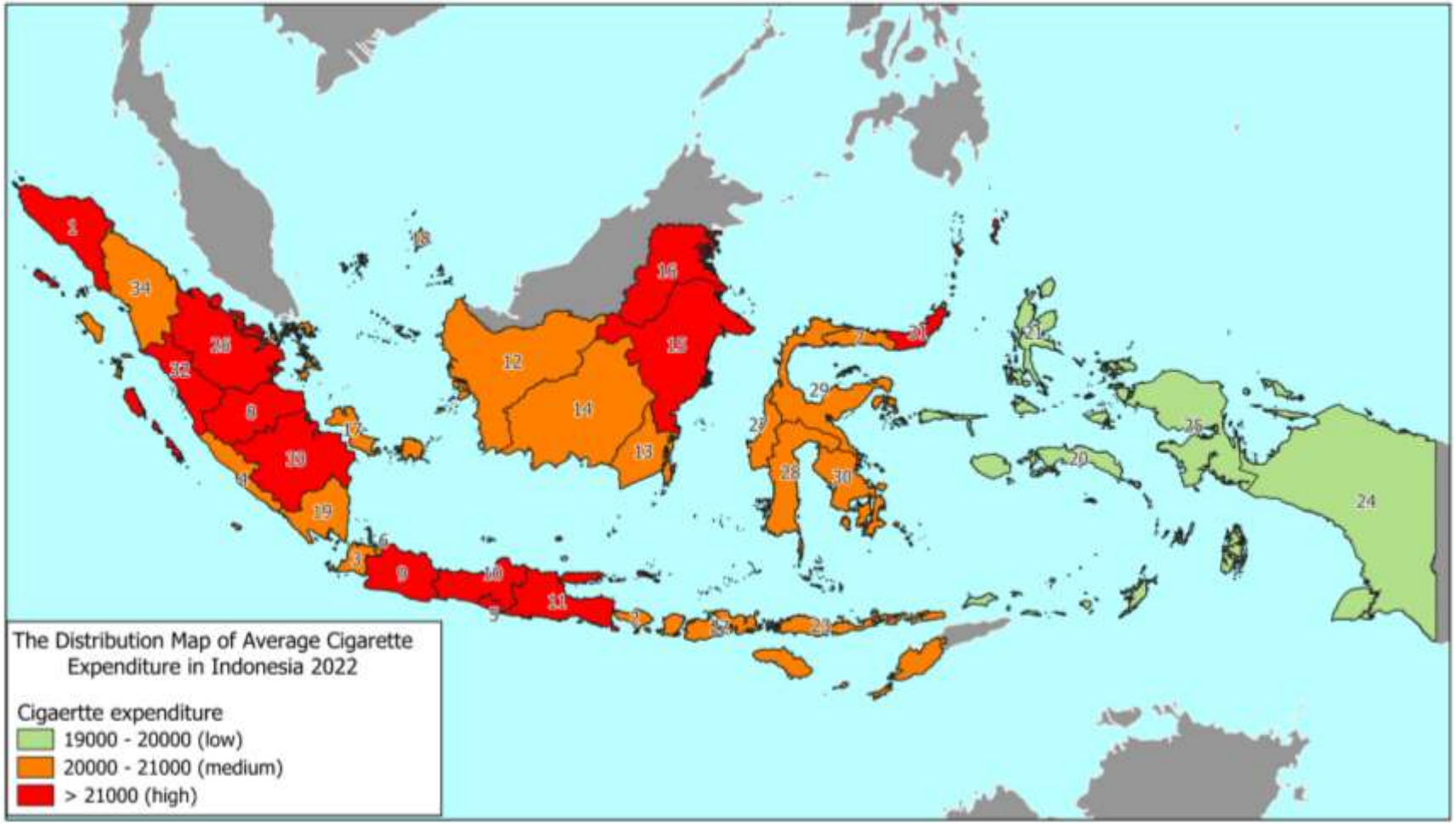

Figures 5. Distribution Map Average Cigarette Expenditure in Indonesia 2022

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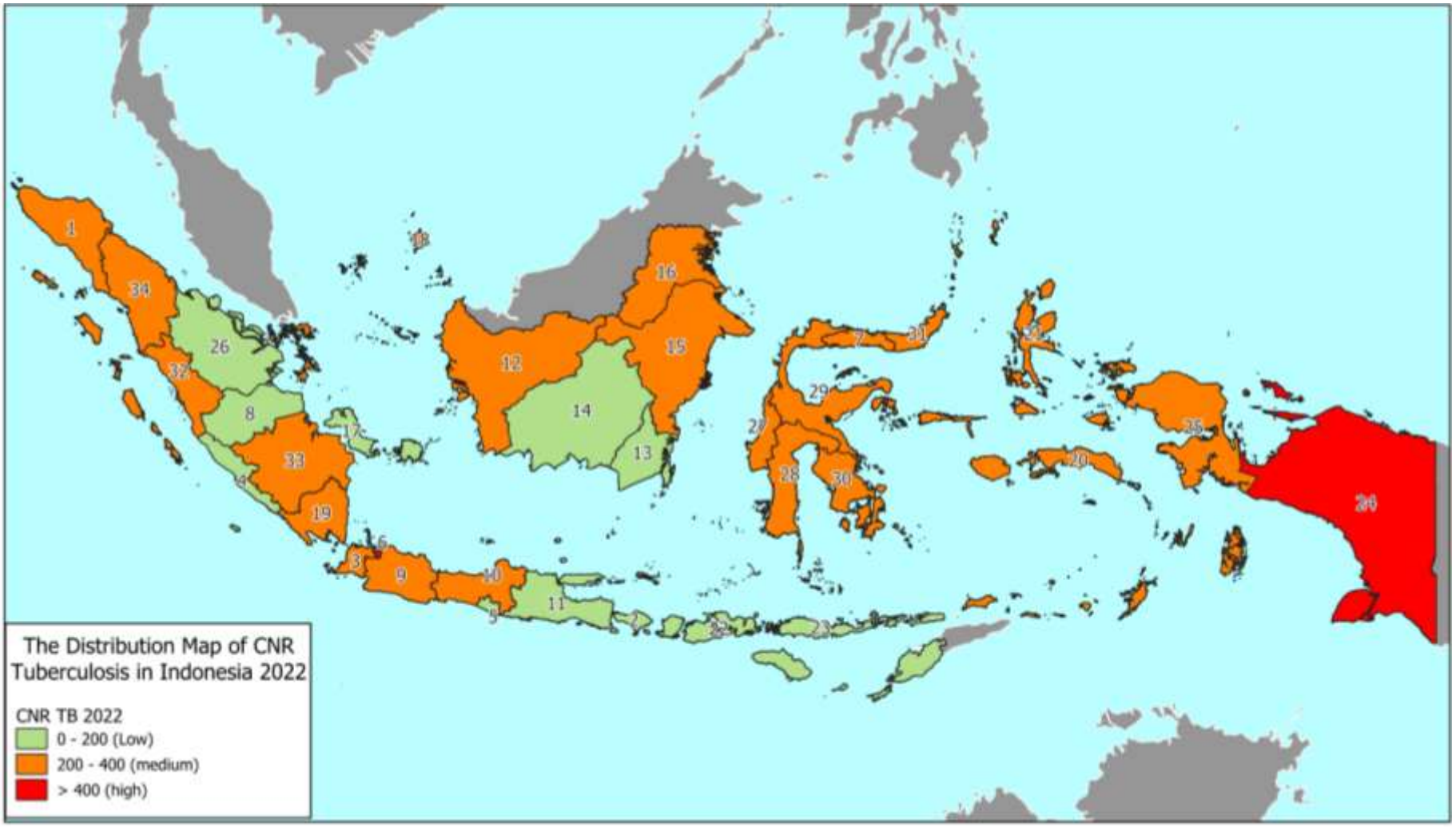

Figures 6. Distribution Map CNR TB in Indonesia 2022

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The results of the spatial analysis also show that there is an increasing trend in TB CNR in all provinces in Indonesia, where previously the majority were in the low category, and now the majority is in the medium category in 2022 (Figure 6). The provinces of DKI Jakarta and Papua are even in the high category so they need to receive more attention. The high CNR of TB in DKI Jakarta and Papua Provinces can occur due to several factors such as literacy levels, and access to better sanitation are associated with a decrease in the incidence of tuberculosis in Jakarta (Falefi et al., 2023). Papua Province has a high social vulnerability to TB, this is caused by several factors such as place of residence, exposure to cigarette smoke, economy, social demographics, and welfare (Lestari et al., 2022) The results of the spatial analysis showed that 6 provinces were classified as showing LCHT (3%), MCLT (9%), MCMT (18%), HCLC (23%), HCMT (44%), and HCHT (3%). These results were dominated by high cigarette expenditure and medium TB cases at 44%. In line with previous research which explains that smoking is associated with an increased risk of TB (Kim et al., 2022). Similar research also shows that smoking is related to pulmonary TB (Feng et al., 2023)

The Relationship of Average Cigarette Expenditure and TB CNR in Indonesia (2021-2022)

Spatial regression results using the spatial lag model show that in 2021 there is a relationship between average cigarette expenditure per capita per week in Indonesia and CNR TB (p-value 0,00306). However, in 2022, the results show that there is no relationship between average cigarette expenditure per capita per week and CNR TB (p-value 0,11928).

Table 2. The Relationship of Average Cigarette Expenditure and TB CNR in Indonesia 2021-2022

Year	Dependent Variable	Independent Variabel	P-value
2021	TB CNR	Cigarette Expenditure	0.00306
2022	TB CNR	Cigarette Expenditure	0.11928

The lack of a consistent relationship between cigarette expenditure and TB CNR from 2021 to 2022 suggests that the dynamics influencing both variables are complex and subject to various external factors. These can include changes in public health policies, economic conditions, healthcare access, data quality, and natural variability in behavior and disease patterns. Further investigation into these factors, possibly through more detailed data analysis or supplementary qualitative research, could provide deeper insights into the observed temporal changes.

CONCLUSION

Mapping results of the distribution of TB cases and cigarette expenditure in Indonesia in 2021-2022 shows an increasing trend in cases. Namely, in 2021 the majority of provinces in Indonesia is in the medium category for average per capita weekly cigarette expenditure and is in the low category for TB CNR. In 2022, the majority of provinces in Indonesia are in the high category for average per capita per week cigarette expenditure and in the medium category for CNR TB. Papua Province needs to get more attention from the government because even though the average cigarette expenditure is low, the TB rate is high. DKI Jakarta Province needs to receive more attention because apart from its high TB rate, the average per capita cigarette expenditure is also high. The analysis of the relationship between average cigarette expenditure and TB CNR shows a lack of consistency from 2021 to 2022.

The study may suffer from data quality issues, including incomplete or inaccurate data on cigarette expenditure and TB cases. There may be other confounding factors not accounted for in the study, such as environmental factors, genetic predispositions, and varying healthcare practices. A two-year study period might be insufficient to capture longer-term trends and relationships. While the study provides valuable insights into the relationship between cigarette expenditure and TB CNR, it is essential to address the identified limitations through more comprehensive data collection, extended study periods, and the inclusion of additional variables and advanced analytical methods. These steps will help in developing more effective public health

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strategies and policies to combat TB and reduce smoking rates.

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Predisposing, Enabling, and Reinforcing Factors of E-cigarette Use among Junior High School Students in Yogyakarta, Indonesia

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ABSTRACT

***Background**: The number of e-cigarette users has increased tenfold over the past ten years. The prevalence of e-cigarette use continues to increase, especially among students. **Objective**: This study aims to identify factors that encourage the use of e-cigarettes among junior high school students in Yogyakarta City. **Methods**: This study used a cross-sectional survey approach with a sample size of 582 taken using a proportional stratified random sampling technique. Data were collected through a structured questionnaire, including respondent characteristics (gender, and age) as well as predisposing, enabling, and reinforcing factors for e-cigarette use. Data were analyzed using a chi-square test for bivariate analysis and a logistic regression test for multivariate analysis. **Results**: The results showed that knowledge (RP=4.06, CI 95%=1.60-10.3, p<0.05), affordability (RP=2.46, CI 95%=1.37-4.39, p<0.05), family members smoking (RP=3.14, CI 95%=1.62-6.09, p<0.05), peers smoking (RP=8.14, CI 95%=3.92-16.9, p<0.05) were associated with the use of e-cigarettes in students. Meanwhile, the availability of cigarettes is not significant with the use of e-cigarettes in students (RP=1.98, CI 95%=0.96-4.09, p>0.05). The results of multivariate analysis showed that the most influential factor in the use of e-cigarettes was peer smoking behavior. **Conclusion**: There is a relationship between knowledge, affordability, smoking family members, and smoking peers with the use of e-cigarettes in students. Health promotion programs on the dangers of e-cigarette use and how to avoid them should be implemented, as well as restrictions on access to e-cigarettes through the implementation of smoke-free areas in schools.*

***Keywords**: E-cigarette use, Junior high school students, Predictors.*

INTRODUCTION

E-cigarettes or vapes are considered a modern alternative to traditional cigarettes, yet their use still carries significant health risks as they rely on batteries to produce vapor containing liquid nicotine and other chemicals (Hutzler et al., 2014; Daniluk et al., 2018; Visser et al., 2019). Smoking prevalence has decreased globally, from 22.7% in 2007 to 17% in 2021, yet the number of smokers remains high due to population growth (The Tobacco Atlas, 2023). In 2021, approximately 4.5% of adults in the United States used e-cigarettes, with the highest rate of use occurring in the 18-24 age group, reaching 11.0% (Centers for Disease Control and Prevention, 2023).

The latest data from the Global Youth Tobacco Survey (GYTS) in 2019 shows that 40.6% of students in Indonesia (aged 13-15 years) have used tobacco products, with the number of students who smoke currently reaching 19.2% (WHO Indonesia, 2020). In addition, the prevalence of e-cigarette use in Indonesia is also recorded to be increasing, reaching 3% in 2021. This figure has increased significantly compared to 2011 which was only 0.3% (CDC, WHO and Kemenkes RI, 2022). In terms of gender, the prevalence of e-cigarette use among men was recorded to be higher, at 5.8%, while among women it was only 0.3%. The percentage of smoking in the population aged ≥ 15 years in Yogyakarta Province shows an increasing trend from year to year. In 2022, the figure reached 23.97% and increased to 24.82% in 2023 (BPS, 2024).

E-cigarettes are believed to be an option for smoking cessation as they were considered an effective form of nicotine

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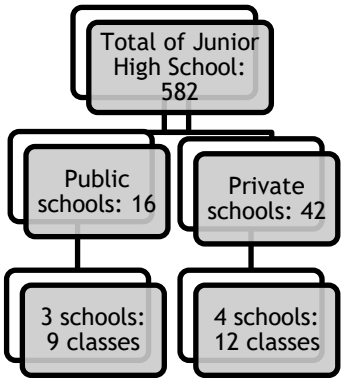
replacement when first introduced (Cobb et al., 2010). However, research results from BPOM in 2015 showed that the liquid or aerosol used in e-cigarettes contains addictive compounds, carcinogenic and cancer-causing components. Nicotine, an addictive substance, is also present in e-cigarettes (Indonesian Ministry of Health, 2020). Despite this, school students continue to use e-cigarettes despite a lack of awareness and understanding of the risks and impacts. Previous research found that the level of e-cigarette use is almost equivalent to conventional cigarette use among students. (Artanti et al., 2017; Kim and Selya, 2020). Some factors that contribute to the use of e-cigarettes and traditional cigarettes include conventional smoking habits, the belief that e-cigarettes are less addictive than conventional cigarettes, the belief that e-cigarettes do not cause cancer, parental acceptance of e-cigarettes, parental attitudes towards e-cigarettes, and the availability of funds to buy e-cigarettes (Bigwanto et al., 2022).

Adollescent-centered tobacco control efforts are relevant and important today. Health promotion for smoking prevention and cessation includes three approaches: 1) through mass public such as social marketing, mass media interventions; 2) through individuals such as motivational intervening, peer education and 3) through community approaches namely community mobilization, and environmental change through media advocacy and setting-based interventions (Golechha, 2016). Efforts to prevent and control cigarette use require an understanding of the causes of cigarette use behavior so that the purpose of this study is very relevant to support these efforts. This study aims to determine the predisposing, enabling and reinforcing factors that encourage the use of e-cigarettes in junior high school students in Yogyakarta city. This research is important as a basis for determining appropriate health promotion programs and for strengthening advocacy for e-cigarette control in Yogyakarta and in Indonesia in general.

METHODS

This type of research uses a cross-sectional survey approach (Heni, Amila and Juneris, 2021). The choice of this design was motivated by the aim of finding and analyzing determinant factors associated with e-cigarette use. In addition, the method was chosen for its ability to collect data on several variables simultaneously. This not only saves time and money in data collection, but also makes it possible to compare and contrast different types of data within the same group of respondents.The research location involved public junior high schools (SMPN) and private junior high schools in Yogyakarta City. The sampling technique used was proportional stratified random sampling (Sugiyono, 2021). The minimum sample size was determined using the hypothesis testing formula for the proportion of two populations, 5% level of significance, and 90% power level (Lemeshow et al, 1997). The determination of schools was done by lottery. There are 3 public and 4 private junior high schools with a total sample size of 582 students.

Figure 1. Research Sample Details



The grouping of schools is distinguished based on strata, namely public and private schools, using the stratified random sampling method. The stratified random sampling method is a sampling method carried out by grouping the population based on strata or levels, selecting samples randomly and simply from each stratum, and then combining them into research samples (Masturoh and Anggita, 2018). The sampling technique is proportional stratified random sampling used to obtain a representative sample by looking at the population in Yogyakarta City.

Data collection uses a structured questionnaire and respondents have been explained before filling out. The questionnaire instrument was adopted from previous research (Kurniasih, 2008;

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Trisnowati, 2012). Variables that became the focus of the study included respondent characteristics (gender, and age). In addition, the independent variables measured involved predisposing factors (level of knowledge about the health effects of smoking), supporting factors (availability and affordability of cigarettes), and reinforcing factors (smoking behavior of family members and smoking behavior of peers), which are related to the use of e-cigarettes. Data analysis was conducted using the chi-square test for bivariate analysis and the logistic regression test for multivariate analysis (Lestari and Yudhanegara, 2017). This study has obtained permission from the Research Ethics Commission of the University in Yogyakarta with number 134.3/FIKES/PL/IX/2022.

RESULTS AND DISCUSSION

Overview of Predisposing, Enabling, and Reinforcing Factors for the Use of E-cigarettes by Junior High School Students

The results showed that most of the respondents were 14 years old as many as 280 (48.1%), came from grade 8 as many as 277 (47.6%), and were mostly female as many as 323 (55.5%). In predisposing factors, most respondents had good knowledge, as many as 520 (89.3%). In addition, in supporting factors, most respondents did not encounter cigarette sellers inside the school, reaching 543 (93.3%), while around 320 (55%) respondents reported the presence of cigarette sellers around the school. Students' daily pocket money was mostly in the range of Rp11,000 - Rp15,000, as many as 230 (39.5%). Access to e-cigarettes was obtained by 43 (7.3%) respondents. Most respondents (54.1%) thought the price of e-cigarettes was expensive. Respondents were of the view that the price of cigarettes could not be bought by students if the price was greater than 80,000, reaching 270 (46.4%).

Most respondents had family members who smoked, 346 (59.5%), and the majority of them reported their father as a smoker, 244 (42%) In terms of reinforcing factors. The number of respondents who reported having no close friends or peers who smoke was 335 (57.6%). The people who most influenced students' smoking behavior were peers, 97 (16.7%). The most commonly chosen smoking location was at a friend's house, reaching 57 (9.8%). The majority of respondents (7.2%) reported that they smoked during leisure time or on a whim. Finally, 23 (4%) respondents had smoked with family.

Regarding cigarette consumption patterns, it was found that some respondents, 56 (9.6%), used e-cigarettes. Meanwhile, the majority of respondents currently use a combination of e-cigarettes and conventional cigarettes, 30 (5.2%). The majority of current e-cigarette smoking habits were reported as sometimes, reaching 48 (8.2%). The main source of information about e-cigarettes was from neighbors or peers, 38 (6.5%). The main reason respondents used e-cigarettes was out of curiosity or wanting to try, recorded as 34 (5.9%). An overview of predisposing, supporting, and reinforcing factors for the use of e-cigarettes in students is presented in table 1 below.

Table 1. Univariate Analysis (N=582)

Variable	n	%
Predisposing factor		
Knowledge		
Less	8	1.4
Simply	54	9.3
Good	520	89.3
Enabling factors		
There is a cigarette seller in the school		
Yes	39	6.7
No	543	93.3
There is a cigarette seller around the school		
Yes	320	55.0
No	262	45.0
Pocket money per day		

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Variable	n	%
Rp1.000 – Rp5.000	50	8.6
Rp6.000 – Rp10.000	176	30.2
Rp11.000 – Rp15.000	230	39.5
>Rp16.000	126	21.6
Access to E-cigarette		
From family	16	2.7
Offered by friends	23	4.0
Bought it themselves	43	7.3
Do not use E-cigarrete	526	90.4
Opinion on E-cigarrete prices		
Moderate	129	22.2
Expensive	315	54.1
Very expensive	138	23.7
Opinion to keep E-cigarette out of reach of student		
Rp20.000 – Rp30.000	94	16.2
Rp31.000 – Rp50.000	100	17.2
Rp51.000 – Rp80.000	118	20.3
>80.000	270	46.4
Reinforcing Factors		
Family members smoking		
Yes	346	59.5
No	236	40.5
Family members who smoke		
No smoking	236	40.5
Father	244	42.0
Father and older brother	11	1.9
Father and grandfather	3	0.5
Dad and uncle	3	0.5
Older brother	40	6.9
Cousin	1	0.2
Brother, father, grandfather, uncle	6	1.1
Grandfather	17	2.9
uncle	5	0.9
Brother	17	3.8
Number of peers		
None	335	57.6
One	44	7.6
Two	40	6.9
Three	38	6.5
More than four	99	17.0
People who influence smoking		
Father	13	2.2
Religious leader	1	0.2
Cigarette advertisement	12	2.0
Brother	5	0.9
Idol figure	1	0.2
Friends	97	16.7
No smoking	453	77.9
Usual smoking places		
Green bean porridge stall	6	1.0
Badminton court	1	0.2
Home	34	5.8
Desert places	12	2.1
Friend’s house	57	9.8
Anywhere	1	0.2
Cafe	1	0.2
Garden	2	0.3
Field	1	0.2
Hangout spot	2	0.3
Ronda post	1	0.2
House, shop, friend’s house	1	0.2
Stall	4	0.7
River	1	0.2
Out of the house	2	0.3

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Variable	n	%
School	1	0.2
Tidak merokok	453	77.9
Situations that lead to smoking		
Family issues	1	0.2
When I see people smoking	8	1.4
When I bored	21	3.6
When I am feeling nervous	10	1.7
When the mouth feels bad	6	1.0
When I have nothing to do	42	7.2
When stressed/upset/angry	41	7.1
No smoking	453	77.9
Ever smoked with family		
Ever	23	4.0
Never	559	96.0
The pattern of cigarette use		
Using E-cigarette		
No	526	90.4
Yes	56	9.6
Current use of E-cigarrete		
No smoking	526	90.4
Using E-cigarette only	26	4.5
Using E-cigarettes and conventional	30	5.2
How often to use an E-cigarette		
No smoking	526	90.4
sometimes	48	8.2
everyday	5	0.9
Never	3	0.5
Media information on E-cigarrete		
No smoking	526	90.4
Internet (social media)	15	2.6
Environment/peers	38	6.5
Parents	3	0.5
Reason to use E-cigarrete		
No smoking	526	90.4
Invited by friends	5	0.9
Idle	15	2.6
Addicted	2	0.3
Curious	34	5.9

Predictors of e-cigarette use among junior high school students

In the bivariate analysis test, the categories in each category were simplified into two categories to avoid empty cells and to bring up the PR and CI values.

Table 2. Bivariate Analysis (N=582)

Variables	E-cigarrete use				*p-value*	RP	CI 95%	
	Yes	%	No	%			*Lower*	*Upper*
Knowledge								
Less	3	0,5	5	0,9	**0,033**	4,06	1,60	10,3
Good	53	9,1	521	89,5				
Affordability								
Yes	42	7,2	278	47,8	**0,002**	2,46	1,37	4,39
No	14	2,4	248	42,6				
Availability								
Yes	7	1,2	32	5,5	**0,086**	1,98	0,96	4,09
No	49	8,4	494	84,9				
Family member smoking								
Yes	46	7,9	300	51,5	**0,000**	3,14	1,62	6,09
No	10	1,7	226	38,8				
Peers smoking								
Yes	48	8,2	199	34,2	**0,000**	8,14	3,92	16,9
No	8	1,4	327	56,2				

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Based on Table 2, it is known that respondents who have less knowledge and use e-cigarettes are 3 people (0.5%). The results of bivariate analysis between knowledge and use of e-cigarettes obtained a value of RP = 4.06, CI (confidence interval) 95% = 1.60-10.3, and p-value = 0.033. The results of the analysis show that people who have less knowledge have a 4.06 times greater risk of using e-cigarettes compared to people who have good knowledge. Knowledge has a significant relationship with e-cigarette use (p-value <0.05).

Respondents who had tried smoking and stated the affordability of cigarettes were 42 people (7.2%). The results of bivariate analysis between cigarette affordability and e-cigarette use obtained an RP value = 2.46, 95% CI = 1.37-4.39, and p-value = 0.002. The results of this analysis indicate that the presence of cigarette affordability has a 2.46 times greater risk of using e-cigarettes compared to the absence of cigarette affordability. Cigarette affordability had a significant relationship with e-cigarette use (p-value <0.05).

Respondents who had tried smoking and stated the availability of cigarettes were 7 people (1.2%). The results of bivariate analysis between cigarette availability and e-cigarette use obtained an RP = 1.98, 95% CI = 0.96-4.09, and p-value = 0.086. The results of this analysis can conclude that the availability of cigarettes has a 1.98 times greater risk of using e-cigarettes compared to the absence of cigarette availability. Cigarette availability had no association with e-cigarette use (p-value > 0.05).

Respondents who had tried smoking and stated that there were family members who smoked were 46 people (7.9%). The results of bivariate analysis between family members who smoke and the use of e-cigarettes obtained RP = 3.14, 95% CI = 1.62-6.09, and p-value = 0.000. The results of this analysis can conclude that the presence of family members who smoke has a 3.14 times greater risk of using e-cigarettes compared to the absence of family members who smoke. The behavior of family members who smoke has a significant relationship with the use of e-cigarettes (p-value <0.05).

Respondents who had tried smoking and stated that there were peers who smoked were 48 people (8.2%). The results of bivariate analysis between peers who smoke and use e-cigarettes obtained RP = 8.14, 95% CI = 3.92-16.9, and p-value = 0.000. The results of the analysis can be concluded that the presence of peers who smoke has a risk of 8.14 times greater to use e-cigarettes compared to the absence of peers who smoke. The behavior of peers who smoke has a significant relationship with the use of e-cigarettes (p-value <0.05).

The Most Influential Factor on the Use of E-Cigarettes among School Children

Based on table 3, it is known that there are 4 models in the multivariate analysis, namely model 1 which includes all variables, model 2 the variable of cigarette availability is omitted, model 3 the variable of cigarette affordability is omitted, model 4 the variable of knowledge is omitted. It can be concluded that the logistic regression equation model 4 is statistically robust to predict the incidence of e-cigarette use. The equation contains the variables of the smoking behavior of family members and the smoking behavior of peers. The final model, model 4, showed that people who had smoking peers had an 8.54 times greater risk of using e-cigarettes compared to people who did not have smoking peers.

Table 3. Multivariate analysis of e-cigarette use

Variable	Model 1 RP CI 95% *p-value*	Model 2 RP CI 95% *p-value*	Model 3 RP CI 95% *p-value*	Model 4 RP CI 95% *p-value*
Knowledge level				
Less	4,92 (0,92-26,32) 0,063	5,02 (0,94-26,86) 0,059	5,06 (0,97-26,45) 0,055	
Affordability of cigarette				
Yes	1,39 (0,69-2,77)	1,41 (0,72-2,78)		

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	0,353	0,318		
Availability of cigarette				
Yes	1,14 (0,45-2,93) 0,780			
Smoking behavior of family members				
Yes	2,31 (1,10-4,83) 0,026*	2,32 (1,11-4,84) 0,025*	2,41 (1,16-5,01) 0,019*	2,41 (1,16-4,99) 0,018*
Peers smoking behavior				
Yes	7,58 (3,40-16,88) 0,000*	7,59 (3,41-16,91) 0.000*	8,39 (3,85-18,27) 0,000*	8,54 (3,93-18,56) 0,000*

*= significant

The results of research by Wahidin et al. (2021), found that there was a significant relationship between knowledge and e-cigarette consumption (p=0.001). These findings indicate that individuals with less understanding are 13.5 times more likely to use electronic cigarettes compared to individuals who have very good knowledge (Wahidin, Handayani, and Ayu, 2021). In contrast, research by Palmes et al. (2021) found that there was no relationship between knowledge and attitude towards e-cigarette smoking (Palmes, Trajera, and Sajnani, 2021). Individual knowledge about e-cigarettes plays an important role in controlling health behaviors. Individuals who have a good understanding of electronic cigarettes tend to have internal control, while individuals who lack knowledge tend to rely on external control (Hasna, Cahyo and Laksmono, 2017). Environmental, family, residential, and social factors all have an impact on people's understanding of the dangers of e-cigarettes. The environment is an important non-formal source of information; a lack of information from the environment can lead to students being unaware of the dangers of smoking (Delpian, 2019).

Meanwhile, Hasna et al. (2017) found a relationship between the price of e-cigarettes and their use among novice smokers in Bekasi City (p-value=0.000). Similar findings were also obtained from research by Hamzah (2021) which revealed a correlation between the price of e-cigarettes and their use among students (Hamzah, 2021). Research by Fauzi et al. (2022) also found a relationship between the affordability of e-cigarettes and the level of use. E-cigarettes are increasingly favored by students due to various factors, including ease of access and use, and the influence of social media (Sapru et al., 2020). Sales of e-cigarettes are on the rise, especially among students. This is due to specialty stores, internet access, discounts, and community support. Lack of government oversight impacts availability and affordability. In addition, the accessibility of e-cigarette juice sharing helps students who run out of supplies to continue smoking e-cigarettes (B. Hamzah, 2021).

Bigwanto and Nurmansyah (2018) found that the availability and accessibility of e-cigarettes were strongly correlated with vaping activity among students. Students who had high availability and access to e-cigarettes were 2.26 times more likely to use them (OR, 2.26; 95% CI= 1.411-3.621) (Bigwanto and Nurmansyah, 2018). However, research conducted by Arman (2018) did not find a significant relationship (p=0.407) between the availability of electronic cigarettes and their use behavior. This is due to the limited availability of electronic cigarettes around schools, as most are available online or in locations far from the school environment (Arman, 2018).

Furthermore, Devhy & Yundari (2017), showed there was a significant influence between parental role models on e-cigarette smoking behaviour in male students at Saraswati 1 Denpasar Senior High School. Students who have smoking families are 2.5 times more likely to smoke e-cigarettes actively than those who do not have smoking families (Devhy and Yundari, 2017). The family has an important role in shaping a person's behavior patterns and attitudes. The likelihood of using electronic cigarettes is higher in families whose members use electronic cigarettes (Damayanti, 2017). Positive parent-child relationships,

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spending more time with family, and anti-smoking expectations from parents are associated with lower rates of student smoking (Weemer, Ketner and Crecelius, 2021).

Research conducted by Devhy & Yundari (2017) found that students who have smoking friends are 2.6 times more likely to smoke e-cigarettes actively than those who do not have smoking friends. The results showed that there was a significant influence between peers on smoking behavior in male students (Devhy and Yundari, 2017). In addition, another study stated a significant relationship between peer influence and smoking behavior (Aisyiah, Nurani and Husaeyni, 2022). Students reported peer influence as one of the reasons they started using e-cigarettes, in addition to low perceived harm and social acceptance (Feliu et al., 2023). Peer effects increased students' probability of smoking by 14.5%, suggesting a potential peer influence on students' smoking behavior (Hasna, Cahyo and Laksmono, 2017). Emotional changes in students, such as a sense of disobedience to parents make them prefer to be with friends outside the home. In addition, students' curiosity about new things often encourages them to try new things, including consuming electronic cigarettes (vaping) (Sitinjak and Susihar, 2020).

The best way to protect young people from the dangers of tobacco use, including e-cigarettes, is to discourage the use of these products through strong public policies that make it easy for young people to abstain from tobacco use (Hazard et al., 2022). In addition, school-based programs that teach students about the risks of e-cigarettes and address the main factors that drive students to use e-cigarettes, such as misperceptions, taste, nicotine content, addiction, and marketing, can also be effective in preventing student e-cigarette use (Liu, Gaiha and Halpern-Felsher, 2022).

Based on the results of the above research, it is recommended that schools provide health education about the dangers of e-cigarettes to students by including the material in school lessons. Schools can also collaborate with health centers for health promotion activities related to the impact of smoking on health, especially e-cigarettes. The results of the study can be used as advocacy material to include material on the impact of smoking on health and the economy in the school curriculum. The Yogyakarta City Government should be more assertive in regulating the advertisement, sale and sponsorship of e-cigarettes, especially those close to the school environment.

LIMITATIONS

This study provides an understanding of the factors associated with e-cigarette use among students in grades 1-3 at public and private schools in Yogyakarta City. However, the results may not be directly applicable to the wider population as they are limited to a specific area. The cross-sectional research method does not allow observation of changes over time, so it cannot identify developing trends or patterns. The variables studied mainly focused on respondent characteristics and factors related to e-cigarette use, thus not covering all factors that may influence the phenomenon. The analytical methods used also have limitations in illustrating the complexity of the relationships between the variables observed in this study. Therefore, the interpretation of the results should carefully consider these limitations.

CONCLUSION

Factors such as knowledge about e-cigarettes, affordability of cigarettes, smoking behavior of family members, and smoking behavior of peers have a significant association with e-cigarette use among junior high school students in grades 1-3 in Yogyakarta City. The multivariate analysis model showed that the smoking behavior of family members and peers was the strongest factor in predicting e-cigarette use. Recommendation. Health Promotion throught intensive health education about the dangers of e-cigarettes and how to avoid them is needed, as implementing restrictions on access to e-cigarettes around schools with strict regulations and policies, and involving family and peers in fostering healthy behavior and socializing the risks of e-cigarettes.

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Case-control Study: The Effect of Exposure to Cigarette Advertisements on Smoking Behavior in School-Age Children in Batu

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ABSTRACT

***Background**: Cigarette smoking is a danger that threatens the world community. Cigarette advertising content that is often aired on electronic media can provide opinions and shape the perceptions and actions of someone who sees it.* ***Objective**: This study aims to analyze the effect of exposure to cigarette advertising on smoking behavior in school-age children.* ***Methods**: This study used a case-control design. The case sample is a portion of school children aged 10-14 years who smoke in the Batu Health Office work area recorded in school-age smoking screening data as many as 81 samples. The control sample is a portion of school children aged 10-14 years who do not smoke in the Batu Health Office work area and who are schoolmates of the 81 case samples. The sampling technique was carried out by simple random sampling.* ***Results**: There is an effect of exposure to online cigarette advertisements on smoking behavior in school-age children (pvalue:0.016; OR:2.718;95%CI 1.258-5.872). Exposure to cigarette advertisements through offline media and idol figures did not show a statistically significant effect, however, based on the results of the study, showed that students who have been exposed to cigarette advertisements tend to smoke.* ***Conclusion**: Students who are exposed to cigarette advertisements through online media have a risk of becoming a smokers.*

***Keywords**: Cigarette ads, Children, Smoking.*

INTRODUCTION

Cigarettes are a danger that threatens the world community. Data from The Global Tobacco Epidemic states that the prevalence of the world's smoking population is 17% (WHO, 2023). *World Health Organization* (WHO) states that around 8 million people die each year from smoking or other tobacco-related diseases. Cigarettes are also deadly to non-smokers, exposure to secondhand smoke causes 1.2 million deaths each year, 65,000 of which are children who are passive smokers. (WHO, 2023). Cigarette consumption is one of the main risk factors for non-communicable diseases such as coronary heart disease, stroke, cancer, chronic lung disease, and diabetes mellitus, which are the leading causes of death in the world, including Indonesia. (WHO, 2020). Data presented by The Global Youth Tobacco Survey (GYTS) shows that 19.2% of students in Indonesia are smokers. 35.6% are male students and 3.5% are female students.

The proportion of the age of first smoking in Indonesia is highest when it is in the age group 15 - 19 years at 48.2%, while when it is in the age group 10 - 14 years at 10.6%. This means that the average smoker in Indonesia has started smoking while still in elementary school to high school, even as much as 10.6% have started smoking while still in elementary school and junior high school. (Kemenkes RI, 2019a).

The proportion of adolescent smokers aged 10 - 18 years in East Java based on Riskesdas data in 2018 was 9.84%. This is in line with the data on the proportion of the highest age of first smoking in East Java when it was in the age group of 15-19 years, which amounted to 47.33%, while when it was in the age group of 10-14 years it was 11.03%. This means that the average smoker in East Java has started smoking while still in junior high school and even elementary school. (Kemenkes RI, 2019b).

Batu City has a proportion of adolescent smokers in 2022 of 6.60% (Dinas Kesehatan Kota Batu, 2023). This is reinforced by Riskesdas data in 2018

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which shows that the proportion of the age of first smoking in Batu City is highest when in the age group 15-19 years, which is 56.29%, while when in the age group 10-14 years it is 11.43%. (Kemenkes RI, 2019b). *Global Youth Tobacco Survey* 2019 stated that 76.6% of students bought cigarettes from grocery stores, street vendors, or kiosks, and among students who were smoking who tried to buy cigarettes, 60% were not prevented from buying cigarettes even though their age was still not enough. This makes it easier for adolescents to gain access to cigarettes so it provides a great opportunity for adolescents to smoke freely. (WHO, 2020).

The content of substances in cigarettes can harm school-age children. Smoking behavior in school-age children can reduce learning focus, learning disorders, impaired attention, decreased energy, anxiety disorders, and mild depression. When someone is addicted to cigarettes, the nicotine contained in cigarettes stimulates the brain to release substances that provide a sense of comfort. Nicotine addiction can result in discomfort, irritability, and difficulty concentrating.

The nicotine contained in cigarettes can cause addiction and disrupt brain development in adolescence. This can cause damage to almost all organs such as breathing, and heart, and even cause stroke and lung cancer (Kusumawardani et al., 2018). In addition, smoking at a young age has the potential to increase the risk of becoming a smoker for life. The age of first smoking affects a person's sustainability in smoking in adulthood. The younger the first age of smoking, the more likely a person is to become a heavy smoker in adulthood.

People who smoke for> 10 years have a significant relationship to the occurrence of various diseases. Based on data from the Indonesian Ministry of Health in 2023, 59.6% of trachea, bronchus and lung cancer, 59.3% of Chronic Obstructive Pulmonary Disease (COPD), then 28.6% of heart disease, 20.6% of diabetes mellitus (DM), and 19.7% of stoke were caused by cigarettes or tobacco products. (Kemenkes RI, 2023).

Based on research conducted by Martini et al (2020) smoking duration > 20 years has the potential to suffer from lung cancer disease (Martini et al., 2020). There is a much higher risk of developing COPD when starting smoking at the age of <15 years. Smoking habits that start at age < 15 years have a 12 times greater risk of developing COPD compared to age ≥15 years because smoking in childhood and adolescence can slow lung growth and development, thus increasing the risk of COPD in adulthood. (Safitri et al., 2021). The burden of smoking-related diseases in East Java in 2018, stroke and lung cancer patients occurred mostly in productive age, namely between 17-55 years. This means that the patient has started smoking under the age of 17 so by the time he is 17 years old he has suffered from diseases caused by smoking. (Martini et al., 2018).

Exposure to cigarette smoke at an early age can also contribute to growth inhibition (WHO, 2020). Increased Body Mass Index (BMI) and weight deficit are also associated with cigarette smoke exposure (Nadhiroh et al., 2020).

Research conducted by the *Tobacco Control Support Center-* Ikatan Ahli Kesehatan Masyarakat (TCSC-IAKMI) in 2018 stated that children and adolescents under 18 years of age are more exposed to cigarette advertisements through TV. (TCSC-IAKMI Tobacco Control Support Center- Ikatan Ahli Kesehatan Masyarakat Indonesia & The Union International Union Against Tuberculosis and Lung Disease, 2018).

Cigarette promotions carried out in the media are used by cigarette manufacturers to attract consumers. Various kinds of cigarette advertisements are usually presented in the form of billboards, posters, and advertisements in electronic media. Cigarette advertising content that is often aired on electronic media can provide opinions and shape the perceptions and actions of someone who sees it. Opinions that are made as if by smoking a person looks mature and confidence increases (Istifaizah, 2018).

Cigarette advertisements are made as attractive as possible by raising the theme of friendship, friendship, and togetherness. Cigarette advertisements made with creativity will touch the psychological side of adolescents who show an image of brave, maco, trendy, cool, togetherness, optimistic, unyielding, manly, adventurous, creative, critical, and various other things that are proud

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and represent the inner voice of young people and adolescents. This is shown to effectively influence teenagers to smoke. Cigarette advertisements are found on television, and the highway in the form of banners, and posters using youth idols (Fransiska & Firdaus, 2019).

Adolescence is the most impressionable target for tobacco product manufacturers. As many as 75% of school students have seen advertisements for tobacco products. With this exposure, school students have a high potential to become active tobacco users into adulthood. (Islami et al., 2019). The importance of conducting promotions to the public regarding the impact of exposure to cigarette advertisements that are deliberately targeted at teenagers.

Based on the above problems, it is important to research the effect of exposure to cigarette advertising on smoking behavior in school-age children. The importance of researching children aged 10-14 years who are elementary and junior high school level children in Batu City is because the prevalence of the age of first smoking at the age of 10-14 years continues to increase so there needs to be an early prevention effort to reduce the number of novice smokers by increasing health promotion efforts to the community regarding the impact that will result from exposure to cigarette advertisements to school-age children.

METHODS

This study used a case-control design. This research design is an epidemiological study that begins by identifying case groups and control groups, then examined retrospectively for influencing factors. This study was used to analyze the factors influencing exposure to cigarette advertising on smoking behavior in school-age children in Batu City. The location in this study is the work area of the Batu City Health Office, East Java. The case population in this study were all school children aged 10-14 years who smoked in the Batu City Health Office work area recorded in the school-age smoking screening data at the Batu City Health Office in 2023. The control population in this study were all school children aged 10-14 years who did not smoke in the Batu City Health Office work area and were schoolmates of the case population. The case sample is a portion of school children aged 10-14 years who smoke in the Batu City Health Office work area recorded in the school-age smoking screening data at the Batu City Health Office in 2023 while the control sample is a portion of school children aged 10-14 years who do not smoke in the Batu City Health Office work area who are schoolmates of the case sample.

The sample calculation in this study is to use the odds ratio (OR) of previous studies on variables that influence smoking behavior in school-age children. Thus, in this study, the largest minimum sample size calculation was taken, namely the variable of the effect of ease of access to cigarettes. The sample size calculation uses the StatCalc feature contained in Epi info 7.2.5.0. The variable obtained a minimum sample size of 72 samples.

The sampling technique in this study was to use probability sampling techniques with a simple random sampling approach. Simple random sampling was conducted from a population list of cases based on school-age smoking screening data available at the Batu City Health Office. To avoid samples that drop out because at the time of data collection, the sample does not attend school, the number of case samples taken in this study is 81 samples and 81 control samples, so the total sample in this study is 162 samples. Sampling in this study was carried out proportionally from the population of adolescent smokers who were in elementary and junior high schools recorded in school-age smoking screening data at the Batu City Health Office. selection of case groups and control groups based on school-age smoking screening data.

RESULTS AND DISCUSSION

Respondent Characteristics

Table 1. Characteristics Distribution of Respondents by Case Group and Control Group

Characteristic	Smoking		No Smoking	
	n	%	n	%
Gender				
Men	75	92,6	65	80,2
Women	6	7,4	16	19,8
Total	81	100,0	81	100,0
Age				
13–14 y.o	64	79,0	48	59,3

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10-12 y.o	17	21,0	33	40,7
Total	81	100,0	81	100,0

Based on Table 1 in this study, the majority of school-age smokers were male, namely 75 children (92.6%). Whereas in the control group or the non-smoking group, the majority of respondents were male, namely 65 children (80.2%). Table 1 shows that the majority of respondents who smoke are in the age group 13-14 years as many as 64 people (79.0%).

The Effect of Cigarette Advertising Exposure on Smoking Behavior in School-Age Children in Batu City

The factor of exposure to cigarette advertisements will measure the influence of exposure to cigarette advertisements on smoking behavior in school-age children in Batu City both from exposure to offline cigarette advertisements (cigarette advertising banners, cigarette advertising billboards, cigarette promotions in sports activities (sponsorship), and television advertisements), online such as cigarette promotional advertisements on social media (youtube, TikTok, and Instagram) and from the presence of idolized figures.

Table 2. Analysis of the Effect of Cigarette Advertising Exposure on Smoking Behavior in School-Age Children in Batu City

Cigarette Advertising Exposure Variable	Smoking		No Smoking		OR (CI 95%)
	n	%	n	%	
Offline					
High exposure	22	27,2	21	25,9	1,065 (0,530 - 2,140)
Medium exposure	59	72,8	60	74,1	
Total	81	100,0	81	100,0	
Online					
High exposure	26	32,1	12	14,8	2,718 (1,258 - 5,872)
Medium exposure	55	67,9	69	85,2	
Total	81	100,0	81	100,0	
Idol Figures					
High exposure	18	22,2	11	13,6	1,818 (0,798 - 4,144)
Medium exposure	63	77,8	70	86,4	
Total	81	100,0	81	100,0	

Table 2 shows that in the case group or smoking group who had high exposure to cigarette promotional advertisements on offline media were 22 people (27.7%), while in the control group or non-smoking were 21 people (25.9%). Of students who had moderate exposure to offline media 59 people (72.8%), while in the control group, there were 60 people (74.1%). The variable exposure to cigarette advertisements offline has a p-value of 1.000, which means that the variable exposure to offline media does not have a significant influence on smoking behavior in school-age children in Batu City.

Students who had high exposure to cigarette promotion from online media in the case group or smoking group amounted to 26 people (32.1%), while in the control group, it was 12 people (14.8%). Students who had moderate exposure to cigarette promotion in the case group amounted to 55 people (67.9%), while in the control group, it amounted to 69 people (85.2%). The p-value on the online media exposure variable is 0.016 and the odds ratio value is 2.718 with a 95% confidence interval of 1.258 - 5.872. So that online media exposure has a significant influence on smoking behavior in school-age children in Batu City. Table 2 shows that exposure with high intensity through idol figures in the case group amounted to 18 people (22.2%), while in the control group, it was 11 people (13.6%). Exposure with moderate intensity through idol figures in the case group amounted to 63 people (77.8%), while in the control group, it amounted to 70 people (86.4%). The variable exposure through idol figures has a p value> 0.05, which is 0.219 so exposure through idol figures does not have a significant influence on smoking behavior in school-age children in Batu City.

Advertising is a medium for conveying information to the public about a product and advertising has a function to convey information, persuade, or remind the public of the product. Cigarette advertisements are increasingly intensively carried out by the cigarette industry. Cigarette promotions carried out in the media are used by cigarette manufacturers to attract consumer interest. Various kinds of cigarette advertisements are usually presented in

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the form of billboards, posters, and advertisements in electronic media. Cigarette advertising content that is often aired on electronic media can provide opinions and shape the perceptions and actions of someone who sees it. Opinions that are made as if by smoking a person looks mature and confidence increases (Istifaizah, 2018).

In this study, it is known that media exposure influences smoking behavior in school-age children in Batu City, especially on media exposure through online media or online with the p-value of online media exposure being 0.016. The OR result in this study is 2.718 so students who are exposed to cigarette promotions through online media with high intensity have a 2.718 times greater risk of smoking behavior compared to those exposed to cigarette promotions through online media with moderate intensity.

The results of this study are in line with research conducted by Puspitawati & Widyanthini, (2021) in Denpasar City in 2020 revealed that adolescents use social media more to find information. This is evidenced by the percentage of adolescents who use electronic cigarettes and have seen advertisements amounting to 35.6% and 39.0% of these advertisements were found on social media.

In previous research conducted by Batubara, (2018) A study conducted on students in Pematang Siantar City in 2017 found that there was a relationship between exposure to cigarette advertisements and smoking behavior among students in Pematang Siantar City. In general, cigarette advertisements are made as attractive as possible by raising the theme of friendship, friendship, and togetherness. Cigarette advertisements are made very creatively to touch the psychological side of adolescents who show an image of brave, dashing, trendy, cool, togetherness, optimistic, unyielding, manly, adventurous, creative, critical, and various other things that are proud and represent the inner voice of young people and adolescents. (Fransiska & Firdaus, 2019).

To attract more consumption, cigarette manufacturers have a reliable way. Various advertisements in the form of billboards, posters and advertisements in the electronic media are displayed to stimulate consumers to try the products they advertise. Various terms such as *low, light, mild* are used by manufacturers to make it seem as if cigarettes are safe and the amount of substance content is lower. As a result, smokers feel that they can smoke and even consume more because they think that the cigarettes they consume only contain a small amount of substances (Manafe et al., 2019).

Cigarette advertisements have a role in the desire and behavior of smoking. Cigarette advertisements have a significant influence on adolescent smoking behavior. Adolescents feel that cigarette advertisements are true and can influence their point of view in making decisions about smoking behavior. (Fadhila et al., 2021).

Whereas in offline exposure to cigarette advertisements and exposure through idol figures, this study revealed that there was no significant influence on smoking behavior in school-age children in Batu City. This is in line with the results found in the study by Solihin et al., (2023) This is in line with previous research which revealed that not all adolescents pay attention to and capture the message of cigarette advertisements even though they have seen them repeatedly. This is in line with previous research which revealed that not all adolescents pay attention and capture the message of cigarette advertisements even though they have seen them repeatedly (Fadhila et al., 2021).

CONCLUSION

Exposure to cigarette advertisements affects smoking behavior in school-age children in Batu City, especially exposure to cigarette advertisements through online media. Although statistically exposure to cigarette advertisements through offline media and idol figures does not show a significant effect, children who have high-intensity exposure tend to have smoking behavior.

This study is inseparable from various limitations. This study used a case-control research design that allows for recall bias due to the limited memory of respondents. Designing clear and specific research objectives is a step taken to minimize the bias that occurs.

It is suggested that concerned institutions and local governments

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eliminate cigarette advertisements both in conventional media and internet-based media. The elimination of cigarette advertising starts from the promotion of cigarette products, showing people smoking, showing cigarettes or e-cigarettes, cigarette smoke, cigarette packs or e-cigarette liquid bottles or those related to other tobacco products.

Every person is prohibited from broadcasting and describing in the form of pictures or photographs, broadcasting, displaying or showing people smoking, showing cigarettes, cigarette smoke, cigarette packs or related tobacco products, and all forms of tobacco product information in print media, broadcasting media, and information technology media related to commercial/advertising activities or making people want to smoke. Implementation has been ongoing for outdoor advertising and commercial media but has never been implemented for advertising and content that is broadcast or displays the form and activity of smoking in internet-based media.

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Intention to Quit Smoking in Active Smoking Health Students: What is the Role of Self-Efficacy?

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ABSTRACT

***Background**: Students were agents of change, meaning they were movers, pioneers, and initiators in driving positive change. Specifically, health students were considered to have high abilities, skills, and knowledge regarding health issues and the dangers of smoking. Each student had different levels of self-efficacy. **Objective**: This study aimed to analyze the relationship between self-efficacy and the intention to quit smoking among active smoker health students by involving the dimensions of self-efficacy. Additionally, the researcher described the aspects of self-efficacy dimensions possessed by active smoker health students. **Methods**: This research was a type of analytical survey research using a quantitative method approach. The population of this study consisted of 60 active smoker health students with the criteria of active S1 health students from the 2016-2018 cohorts. The independent variable in this study was the dimension of self-efficacy, which consisted of the level, strength, and generality dimensions. Meanwhile, the dependent variable was the intention to quit smoking. The research data were collected through interviews and data acquisition tools using questionnaires. Data analysis used univariate and bivariate analysis with the Spearman test. **Results**: The analysis results of the relationship between respondent characteristics and the intention to quit smoking showed no relationship between respondent characteristics (faculty p=0.609, cohort p=0.928, gender p= -0.925, and age p= -0.673) and the intention to quit smoking. Additionally, the analysis results of the relationship between self-efficacy dimensions (level dimension p=0.000, strength p=0.000, and generality p=0.009) and the intention to quit smoking showed that there was an interrelated relationship affecting the intention to quit smoking. **Conclusion**: From this research, it can be concluded that there was a relationship between self-efficacy and the intention to quit smoking among health students who are active smokers at the University of Jember.*

***Keywords**: Quit, Students, Intention, Self-efficacy, Smokers.*

INTRODUCTION

The WHO (World Health Organization) stated that 10 types of diseases were the leading causes of death worldwide (WHO, 2018:42). Five of these 10 types of diseases were primarily caused by smoking. The 2016 Global Health Report recorded that 21.6 million people worldwide died due to smoking (WHO, 2018:42). According to the WHO (in Putri, 2017:206), it was estimated that by 2030, deaths due to smoking would increase, with 8 million people expected to die from smoking habits. This increase in death rates was considered dangerous for global conditions, as 80% of these deaths were projected to occur in developing countries. Indonesia was one of the developing countries ranked third as the largest cigarette consumer after China and India (Munir, 2019:113).

According to BPPK (2018:327), the prevalence of smoking habits in the 15-19 age group in Indonesia was 12.7%, and in the 20-24 age group, it was 27.3%. A study by the School of Strategic and Global Studies of the National Security Study Center of the University of Indonesia mentioned that 33.03% of individuals aged 18-24 were active smokers (Ayuwuragil, 2018). The average number of smokers among the population aged ≥10 years in Indonesia was 24.3% (BPPK, 2018:326). According to the definition of adolescence by the Population and Family Planning Board (BKKBN), adolescents are those aged 10-24 years and not married. Thus,

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the above age category could be concluded as the adolescent age group. The BPPK (2018:327) results showed that the 15-19 and 20-24 age groups were daily active smokers, so students could be considered an at-risk group for smoking.

Adolescents in Indonesia were among the highest users of cigarettes and experienced a continuous increase. Adolescence is a transition period from childhood to adulthood. During this period, adolescents experienced both physiological and psychological growth. The psychological changes experienced by adolescents confused, resulting in emotional turmoil and psychological pressure, making them prone to deviating from social norms and rules (Nopianto et al., 2017:26). The phenomenon often associated with adolescents, particularly male adolescents, was smoking. Smoking during early adolescence had dangerous risks because this period was crucial for growth. The risks of smoking in early adolescence were far worse compared to adults who started smoking later (Nugraha, 2015:4).

Early smoking posed negative health impacts on individuals. Smoking behavior in adolescence could result in earlier disease onset. Smoking has high health risks and could lead to various disease complications. While smoking was not a direct cause of diseases, it triggered and exacerbated conditions that could lead to death (Nasution, 2007:17). Some diseases triggered by smoking included cancer, heart attacks, impotence, pregnancy and fetal complications, stroke, cataracts, dental damage, osteoporosis, and sperm abnormalities (Aula, 2010:30).

Students were agents of change, driving better societal shifts. Their health status influenced the quality of human resources. Optimal student health led to healthy adolescents, whereas poor health status had the opposite effect. The smoking trend among students became a symbol of socialization in their environment. Students smoked to appear free and mature among their peers. Reasons for smoking included relaxation, peer pressure, self-presentation, curiosity, stress, anxiety, and a desire for challenges (Rahayu, 2017:2).

The University of Jember, a public university in Jember Regency, had 15 faculties with 31,545 active students from the 2011-2018 cohorts as of October 18, 2018. Research by Abdul Latif (2015:72) on University of Jember students found that they had moderate knowledge (73.40%) about health promotion media on cigarette packaging, moderate attention (55.32%) to health promotion media on cigarette packaging, and a negative attitude towards smoking and its dangers.

The University of Jember has 5 health faculties and 1 health study program: the Faculty of Medicine, Faculty of Dentistry, Faculty of Nursing, Faculty of Pharmacy, Faculty of Public Health, and the Nutrition Science Study Program. Health students were considered to have high abilities, skills, and knowledge about health issues and the dangers of smoking. As future health professionals, they should participate in smoking prevention actions (Meilani, 2017:3). Research by Trisnowati on the smoking behavior model of adolescents aimed at health students found that 9 out of 34 health students admitted to smoking. Although health students were expected to set a good example, this was not always the case (Trisnowati et al., 2017:114). Based on this information, health students at the University of Jember were also at risk of smoking. This explanation justified the choice of health students at the University of Jember as the subject of this study.

The preliminary study was conducted by the researcher at the University of Jember, particularly among students pursuing education in the Faculty of Health Sciences. The researcher identified smoking health students by utilizing social networks. The researcher contacted several friends studying in each health faculty at the University of Jember to gather information about smoking health students. The researcher collected data on the number of active smokers among health students three times: on July 1, 2019, August 29, 2019, and December 17, 2019. The data collection method used by the researcher involved distributing questionnaires via Google Forms, which were disseminated through social media (WhatsApp). The questionnaire consisted of five questions. The reason for using Google Forms was to facilitate reaching health students and to shorten the data collection time. The questionnaire was distributed to 234

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health students from the 2016-2018 cohorts, including 105 male and 129 female students. Based on the data collection results, it was found that 35 health students were active smokers, representing 15%, while 199 health students did not smoke, representing 85%.

In addition to distributing questionnaires, the researcher also conducted unstructured interviews with active smoker health students. These interviews were conducted over five days, from June 27 to July 1, 2019. The interviews involved five respondents from each health faculty at the University of Jember. The purpose of these unstructured interviews was to gather information on the reasons behind why health students continued to smoke despite their background as future health professionals. The interview results revealed that health students smoked for reasons such as stress relief, easing unpleasant feelings or thoughts, and experiencing pleasure when smoking. The effects of smoking were the main reasons for health students to continue smoking. Additionally, the students smoked an average of 1-4 cigarettes per day. They were aware that as health students, they were expected to be dedicated to health, but this awareness did not influence their smoking behavior.

Individual behavior varies significantly due to various influencing factors. According to Skinner (in Mahyarni, 2013:13), behavior is an individual's response or reaction to external stimuli. However, the received stimuli do not always result in behavior. Several other factors can trigger behavior, one of which is intention. Intention will not form if there are no influencing factors (Mahyarni, 2013:13). The development of individual behavior has led to theories used to measure how behavior emerges. One such theory is the Theory of Planned Behavior (TPB), which predicts individual behavior when they do not have full self-control. According to this theory, the variable perceived behavioral control is added, which is similar to self-efficacy, as an individual's control perception is determined by their belief in achieving a particular behavior (Ramdhani, 2011:59). This describes the confidence individuals have in deciding to smoke or not.

The decision to smoke or not may be stimulated by the development of self-efficacy (self-belief). According to Haryati et al. (2015:104), adolescent smoking behavior is believed to be influenced by self-efficacy. Self-efficacy is an individual's belief in their ability to achieve specific goals. It means believing in one's capability to face problems or tasks. Haryati et al. (2015:104) found a significant relationship between self-efficacy and adolescent smoking behavior. High self-efficacy in adolescents leads to not smoking, while low self-efficacy leads to smoking. Another study by Shuck, Otten, Kleinjan, Bricker & Engels (2014) (in Haryanti et al., 2015:101) on 2,888 respondents in a High School in Eastern Texas found that self-efficacy is related to the intention and belief in smoking behavior, based on an individual's belief in smoking.

According to Bandura (in Ghufron, 2017:80), self-efficacy varies among individuals based on its dimensions. Self-efficacy has three dimensions: level, generality, and strength. Bandura (in Simanjuntak, 2019:3) stated that measuring an individual's self-efficacy refers to these dimensions. The aspects of self-efficacy dimensions are interrelated and influence an individual's confidence in determining behavior (Antasari, 2016:5). Antasari et al. (2016:6) found that most guidance and counseling teachers had low self-efficacy, illustrated by the dimensions of level, strength, and generality.

Etter et al. (in Nurjanah et al., 2018:119) revealed that self-efficacy could predict the success of smoking cessation programs. It also plays a role in building an individual's confidence in their ability to quit smoking (Rokhmah, Rahman, and Rif'ah 2023). Besides self-efficacy, the success of an individual in their effort to quit smoking is determined by their intention. A strong intention to quit smoking strengthens the smoker's control over their behavior in any condition while smoking (Rosita et al., 2012:7).

Based on the above explanation, the dimensions of self-efficacy are part of the elements used to describe the self-efficacy of active smoker health students and their intention to quit smoking. Self-efficacy and intention can predict the success of smoking cessation programs.

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Therefore, the researcher aimed to analyze the relationship between self-efficacy and the intention to quit smoking among active smoker health students, involving the aspects of self-efficacy dimensions. The theory used in this research is the Theory of Planned Behavior (TPB) by Icek Ajzen.

METHODS

This study employed an analytic survey research design using a quantitative method approach. It was also a cross-sectional study aimed at analyzing the relationship between the self-efficacy of active smoker health students and their intention to quit smoking, involving the dimensions of self-efficacy. The research was conducted within the University of Jember, specifically at the respondents' respective faculties and the CDAST (Center for Development of Advanced Science and Technology) building from February 24, 2020, to March 1, 2020. The population of this study consisted of active smoker health students registered at the University of Jember. The sample size was 60 active smoker health students, selected using the Accidental Sampling method.

The independent variable in this study was the dimensions of self-efficacy, which include the level, generality, and strength dimensions. The dependent variable was the intention to quit smoking among active smoker health students at the University of Jember. Primary data were obtained through interviews using questionnaires, and secondary data were sourced from BAAK University of Jember, Riskesdas data, and BPS data. Data analysis was conducted univariately and bivariately using the Spearman Test.

RESULTS AND DISCUSSION

Data collection for this study was carried out from February 24, 2020, to March 1, 2020. The respondents were 60 active smoker health students at the University of Jember. The number of respondents per faculty was determined according to a proportional allocation formula. The researcher selected three cohorts (2016-2018) that met the inclusion criteria for the study sample.

Relationship Between Respondent Characteristics (Faculty, Cohort, Gender, and Age) and Intention to Quit Smoking Among Active Smoker Health Students

a. The relationship between faculty and intention to quit smoking among active smoker health students

The faculty represents the respondents' chosen field of study pursued during their academic tenure. The characteristics of respondents based on faculty are presented in the following table:

Table 1. Distribution of Respondents Based on Faculty

Faculty	Frequency	Percentage (%)
Faculty of Pharmacy	12	20
Public Health Faculty	15	25
Nursing Faculty	18	30
Faculty of Medicine	7	11
Faculty of Dentistry	8	13
Total	**60**	**100**

Based on Table 1, it was found that the Faculty of Nursing had the highest number of smoking students, accounting for 30% or 18 respondents. Meanwhile, the Nutrition Science Program was the health faculty with no smoking students, accounting for 0% or 0 respondents. The distribution of the relationship between faculties and the intention to quit smoking is presented in the following table:

Table 2. Frequency Distribution of the Relationship Between Faculties and the Intention to Quit Smoking Among Active Smoking Health Students

No.	Faculty	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	Faculty of Pharmacy	8	13.3	4	6.7	12	20	0.609
2.	Public Health Faculty	6	10	12	19.9	18	29.9	
3.	Nursing Faculty	7	11.7	8	13.3	15	25	
4.	Faculty of Medicine	3	5	4	6.7	7	11.7	
5.	Faculty of Dentistry	4	6.7	4	6.7	8	13.4	
6.	Nutritional Science Study Program	0	0	0	0	0	0	

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Total	**28**	**46.7**	**32**	**53.3**	**60**	**100**

The results in Table 2 provide information about the relationship between respondents' characteristics based on their faculties and their intention to quit smoking among health students who smoke. It was found that the Faculty of Nursing had the highest percentage of students with a low intention to quit smoking, at 19.9% or 12 respondents. The analysis of the relationship using Spearman's rho test showed that the relationship between faculties and the intention to quit smoking among health students who smoke had a p-value of 0.609 (p>α). This indicates that there is no significant relationship between the faculty and the intention to quit smoking among health students who smoke (Rokhmah, Ode, and Savitri, 2020).

The analysis of the relationship between respondents' faculties and their intention to quit smoking yielded a p-value of 0.609 (p>α), indicating no significant relationship between the faculty of the respondents and their intention to quit smoking. A study by Salawati (2010:179) that explored smoking behavior among students from health and non-health faculties at Universitas Muhammadiyah Semarang revealed that most informants from both health and non-health faculties were aware of the general dangers of smoking, the chemicals contained in cigarettes, and the health impacts of smoking on themselves and others. These informants believed that smoking was enjoyable and beneficial, particularly in relieving stress or pressure. All informants in the study had the intention to quit smoking, but most found it challenging to do so.

The results of the above study did not differentiate between health and non-health faculties in terms of smoking behavior. Therefore, the faculty did not instill confidence in individuals to develop an intention to quit smoking. Health students, who are expected to possess higher abilities, skills, and knowledge about health issues and the dangers of smoking, should serve as examples and inspirations for non-health faculties. However, this expectation contradicts the existing facts. There is no significant difference in smoking behavior between health and non-health students.

b. The Relationship Between Year of Enrollment and the Intention to Quit Smoking Among Active Smoking Health Students

Year of enrollment refers to the academic year in which the respondents began their studies and were registered as active students. The characteristics of respondents based on their year of enrollment are presented in the following table:

Table 3. Distribution of Respondents Based on Year of Enrollment

Year of Enrollment	Frequency	Percentage (%)
2016	35	58.3
2017	14	23.3
2018	11	18.3
Total	**60**	**100**

Based on Table 3, it was found that the majority of respondents were from the 2016 cohort, accounting for 58.3% or 35 respondents. The cohort refers to the academic year during which the respondents began their studies and were registered as active students. The majority of smoking respondents in this study were from the 2016 cohort, while the fewest respondents were from the 2018 cohort. Therefore, it can be concluded that the higher the cohort, the greater the number of smoking students.

The distribution of the frequency regarding the relationship between cohort and the intention to quit smoking is presented in the following table:

Table 4. Frequency Distribution of the Relationship Between Year of Enrollment and the Intention to Quit Smoking Among Active Smoking Health Students

No.	Year of Enrollment	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	2016	17	28.35	18	29.98	35	58.33	0.928
2.	2017	5	8.35	9	15	14	23.35	

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3.	2018	6	10	5	8.32	11	18.32
Total		**28**	**46.7**	**32**	**53.3**	**60**	**100**

The results in Table 4 provide information related to the relationship between the characteristics of respondents based on the year of enrollment and the intention to quit smoking among health students who smoke. It was found that most of the respondents in this study were from the 2016 enrollment year. Table 4 shows that 29.98% or 18 respondents from the 2016 enrollment year had a poor intention to quit smoking. The analysis of the relationship showed that the relationship between the year of enrollment and the intention to quit smoking among smoking health students had a p-value of 0.928 (p>α), indicating that there was no relationship between the year of enrollment and the intention to quit smoking among smoking health students.

The year of enrollment refers to the academic year that respondents started their studies until they were declared active students. Based on the research results, most smoking respondents were from the 2016 enrollment year and had a poor intention to quit smoking. A study conducted by Wahyudi (2019:15) found that most students from the Civil Engineering Department at Muhammadiyah University of Makassar, enrolled in 2016, fell into the heavy smoker category, amounting to 59.3% or 35 respondents. Spearman's rho analysis showed that there was no relationship between the year of enrollment and the intention to quit smoking.

The higher the enrollment year, the greater the use of cigarettes. This is due to the increasing workload or pressure faced by respondents, leading them to seek solutions to relax or relieve stress through smoking. The more cigarettes consumed, the smaller the intention to quit smoking. However, smoking was also found among lower enrollment years, even though the number of respondents was not as many as in the 2016 enrollment year. Therefore, higher or lower enrollment years do not provide confidence in building the intention to quit smoking. Thus, there is no relationship between the year of enrollment and the intention to quit smoking.

c. The Relationship Between Gender and the Intention to Quit Smoking Among Active Smoking Health Students

Gender refers to the biological physical characteristics of respondents as stated on valid identification cards. The characteristics of respondents based on gender are presented in the following table:

Table 5. Distribution of Respondents Based on Gender

Gender	Frequency	Percentage (%)
Man	60	100
Total	**60**	**100**

The results in Table 5 indicated that the majority of smoking respondents in this study were male, accounting for 100% or 60 respondents, with no female respondents. This condition occurs because female students in the health faculty were some of them who were smokers but were not in the active smoker category. Apart from that, in the health faculty environment, female smokers were still rare compared to male smokers.

The distribution of the relationship between class and intention to quit smoking is presented in the table below:

Table 6. Distribution of Frequency of the Relationship Between Gender and Intention to Quit Smoking in Active Smoking Health Students

No.	Gender	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	Man	28	46.7	32	53.3	60	100	0.925
2.	Woman	0	0	0	0	0	0	
Total		**28**	**46.7**	**32**	**53.3**	**60**	**100**	

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The results in Table 6 provide information regarding the relationship between respondents' characteristics based on gender and their intention to quit smoking among active smoking health students. It was found that the majority of smoking respondents in this study were male. Table 6 provides information that 53.3% or 32 male respondents had a poor intention to quit smoking. The analysis of the relationship indicated that the p-value for the relationship between gender and intention to quit smoking among smoking health students was 0.925 (p>α), meaning that the null hypothesis was rejected, indicating no relationship between gender and intention to quit smoking among smoking health students.

Based on the research findings, it was found that all respondents in this study were males. This aligns with the study by Andika (2018:47) on active smoking students at the University of Jember, where all respondents were males. The analysis of the relationship using Spearman's rho test indicated that the relationship between gender and intention to quit smoking among active smoking health students obtained a value of 0.925 (p>α). This implies that there is no relationship between gender and intention to quit smoking among active smoking health students.

The analysis results are consistent with the study conducted by Akmal et al. (2017:86), which showed that the majority of respondents were males, totaling 306 respondents or 93.9%, while females accounted for 20 respondents or 6.1%, with less intention to quit smoking. The statistical test result for the relationship between gender and intention to quit smoking was 0.453 (p>α), indicating no relationship between gender and intention to quit smoking.

d. Relationship between age and intention to quit smoking in active smoking health students

Age represents the lifespan of respondents from birth to the time of the study. Characteristics of respondents based on age are presented in the table below:

Table 7. Distribution of Respondents Based on Age

Age	Frequency	Percentage (%)
19 years old	5	8.3
20 years old	17	28.3
21 years old	22	36.7
22 years old	16	26.7
Total	**60**	**100**

Based on Table 7, it is known that the majority of smoking respondents were 21 years old, accounting for 36.7% or 22 respondents. Smoking respondents in this study fall into the late adolescence category especially, 19-24 years old.

The distribution of the relationship between class and intention to quit smoking is presented in the table below:

Table 8. Distribution of Frequency of the Relationship Between Age and Intention to Quit Smoking in Active Smoking Health Students

No.	Age	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	19 years old	3	5	2	3.31	5	8.31	0.673
2.	20 years old	6	10	11	18.32	17	28.32	
3.	21 years old	11	18.34	11	18.32	22	36.66	
4.	22 years old	8	13.35	8	13.35	16	26.7	
Total		**28**	**46.7**	**32**	**53.3**	**60**	**100**	

The results in Table 8 presented information regarding the relationship between respondents' characteristics based on age and their intention to quit smoking among active smoking health students. It was found that 18.32% or 11 respondents aged 20 and 21 had a poor intention to quit smoking among smoking health students. The analysis of the relationship indicated that the p-value for the relationship between respondents' age and intention to quit smoking among smoking health students was 0.673 (p>α), meaning that the null hypothesis was rejected, indicating no relationship between respondents' age and intention to quit smoking among smoking health students.

In this study, the age category revealed that the majority of respondents

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fell into the late adolescence category, which is 19-22 years old. Based on the research data obtained, it was found that most smoking respondents had a poor intention to quit smoking, especially among those aged 21. The analysis result of the relationship between age and intention to quit smoking showed a value of 0.673 (p>α). This implies that there is no relationship between age and intention to quit smoking among active smoking health students. The analysis results align with the findings of Akmal et al. (2017:1069), which showed an analysis value of 0.686 (p>α), indicating no relationship between respondents' age and intention to quit smoking.

While older age usually strengthens the intention to quit smoking, not everyone follows this pattern due to various factors influencing individuals' intention to quit smoking (Akmal et al. 2017:87). This statement contradicts the research findings, as even though older age does not necessarily indicate a stronger intention to quit smoking. This difficulty arises because respondents find it challenging to quit smoking due to addiction and the pleasure derived from smoking in relieving stress or pressure experienced by the respondents.

The Relationship between Self-Efficacy, which Includes Level, Strength, and Generality Dimensions, and Intention to Quit Smoking among Active Smoking Health Students

a. Relationship between level dimension and intention to quit smoking among active smoking health students

The Level Dimension refers to the degree of difficulty of tasks, work, and problems faced by respondents. This dimension describes the level of difficulty, tasks, and problems faced by respondents in their intention to quit smoking. Categories in the level dimension are divided into three categories: low, moderate, and high. The level dimension is considered low if it scores 4-8, moderate if it scores 9-13, and high if it scores 14-16. The distribution of frequency in the level dimension is presented in tabular form as follows:

Table 9. Distribution of Frequency Based on Level Dimension

Level Dimension	Frequency	Percentage (%)
Low	7	11.7
Currently	47	78.3
High	6	10
Total	60	100

The results in Table 9 provide information regarding the distribution of the level dimension among smoking respondents. It was found that 78.3% or 47 respondents had a moderate level dimension. Meanwhile, 11.7% or 7 respondents had a low level dimension, and 10% or 6 respondents had a high level dimension. Most respondents still doubted their ability to quit smoking.

Table 10. Distribution of Frequency of the Relationship Between Level Dimension and Intention to Quit Smoking among Active Smoking Health Students

No.	Level Dimension	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	Low	1	1.67	6	10	7	11.67	
2.	Currently	22	36.7	25	41.6	47	78.3	0.000
3.	High	5	8.33	1	1.7	6	10.03	
Total		**28**	**46.7**	**32**	**53.3**	**60**	**100**	

The results in Table 10 present information regarding the distribution of the relationship between the level dimension and the intention to quit smoking among active smoking health students. It was found that 41.6% or 25 smoking respondents with a moderate level dimension had a poor intention to quit smoking. The analysis of the relationship indicated that the p-value for the relationship between the level dimension and the intention to quit smoking among active smoking health students was 0.000 (p<α), meaning that the null hypothesis was accepted, indicating a relationship between the level dimension and the intention to quit smoking among active smoking health students.

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The relationship between the level dimension and the intention to quit smoking showed that most respondents with a moderate level dimension had a negative relationship with the intention to quit smoking. The analysis using Spearman's rho test showed a relationship between the level dimension and the intention to quit smoking with a value of p=0.000. This is because respondents' abilities can determine a behavior to build confidence in their intention to quit smoking.

According to Gwaltney et al. (cited in Shadel et al. 2017:01), self-efficacy can be used as smokers' belief in abstaining from smoking, belief in quitting smoking, and maintaining individual beliefs to quit smoking. The results of an experimental study conducted by Shadel et al. (2017:05) on the influence of self-efficacy on smoking cessation with 103 samples of adult smokers aged 18-63 years showed that 57 respondents had high self-efficacy, indicating a greater chance of quitting smoking compared to 46 respondents who still had a low chance of quitting smoking. A study conducted by Istifaizah (2017:87) showed a relationship between self-efficacy and intention to quit smoking in adolescent boys at SMK PGRI Sukodadi with a value of p=0.000.

The research results illustrate that adolescent boys with good self-efficacy tend to have a good intention to quit smoking, those with sufficient self-efficacy have an intention to quit smoking in the moderate category, while adolescents with low self-efficacy have an intention to quit smoking in the low category. According to Bandura (cited in Istifaizah, 2017:88), self-efficacy refers to an individual's belief in their ability to perform and organize a series of tasks in their life. Individuals need self-efficacy to remain competent and effective in facing various situations or events full of pressure.

b. Relationship between strength dimension and intention to quit smoking among active smoking health students

The Strength Dimension refers to the level of strength of individuals' beliefs or expectations about their ability (Ghufron, 2017:80). This dimension in the study describes the level of strength of respondents' beliefs in their intention to quit smoking. The strength dimension has three categories: low, moderate, and high. The strength dimension is considered low if it scores 4-8, moderate if it scores 9-13, and high if it scores 14-16. The distribution of frequency in the strength dimension is presented in tabular form as follows:

Table 11. Distribution of Frequency Based on Strength Dimension

Strength Dimension	Frequency	Percentage (%)
Low	3	5
Currently	48	80
High	9	15
Total	**60**	**100**

The results in Table 11 presented information regarding the distribution frequency of the strength dimension among smoking respondents. It showed that 80% or 48 respondents had a moderate strength dimension. Meanwhile, 5% or 3 respondents had a low strength dimension, and 15%, or 9 respondents had a high strength dimension. The determination of respondents regarding their belief to quit smoking mostly fell into the moderate category or were indecisive.

Table 12. Distribution of Frequency of the Relationship Between Strength Dimension and Intention to Quit Smoking among Active Smoking Health Students

No.	Strength Dimension	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	Low	0	0	3	5	3	5	
2.	Currently	20	33.35	28	46.63	48	79.98	0.000
3.	High	8	13.35	1	1.67	9	15.02	
Total		**28**	**46.7**	**32**	**53.3**	**60**	**100**	

The results in Table 12 presented information regarding the distribution frequency of the relationship between the strength dimension and the intention to quit smoking among active smoking health students. It was found that 46.63% or 28

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smoking respondents with a moderate strength dimension had a poor intention to quit smoking. The analysis of the relationship indicated that the p-value for the relationship between the strength dimension and the intention to quit smoking among active smoking health students was 0.000 (p<α), meaning that the null hypothesis was accepted, indicating a relationship between the strength dimension and the intention to quit smoking among active smoking health students.

This study indicated that most respondents with a moderate strength dimension had a negative relationship with the intention to quit smoking. The analysis using Spearman's rho test showed a relationship between the strength dimension and the intention to quit smoking with a value of p=0.000. According to Bandura, the strength dimension is related to the degree of individual ability to their belief (Jumari et al. 2013:4).

Borreli & Mermelstein (cited in Ham et al. 2009:16) stated that self-efficacy was one of the predictors to explore in smoking cessation behavior. The research results of Ham et al (2009:21) showed that self-efficacy played a role in smoking cessation programs. According to Amaliah et al. (2018:140), there was a strong positive correlation between the willingness to quit smoking in terms of self-efficacy and smoking cessation efforts. The higher the self-efficacy of individuals to quit smoking, the greater the likelihood of someone successfully quitting smoking. Meanwhile, individuals with low self-efficacy would return to smoking or become addicted again. The study conducted by Amalia et al. (2018:146) discussed the analysis of the self-efficacy formation stage in smoking cessation efforts among smoking cessation clinic clients, providing information that informants still found it difficult to quit smoking because it required a long process. The informants already felt addicted, making it difficult to change their behavior.

c. Relationship between generality dimension and intention to quit smoking among active smoking health students

The Generality Dimension refers to the breadth of behavioral domains in which individuals felt confident about their abilities. Simply put, this dimension described individuals' confidence in their ability to face various situations and events they encountered. This dimension in this study described smoking respondents' confidence in facing the intention to quit smoking. The generality dimension had three categories: low, moderate, and high. The generality dimension was considered low if it scored 3-6, moderate if it scored 7-10, and high if it scored 11-12. The distribution of frequency in the generality dimension was presented in tabular form as follows:

Table 13. Distribution of Frequency Based on Generality Dimension

Generality Dimension	Frequency	Percentage (%)
Low	3	5
Currently	36	60
High	21	35
Total	**60**	**100**

The results in Table 13 presented information regarding the distribution frequency of the generality dimension among smoking respondents. It showed that 36% or 60 respondents had a moderate generality dimension. Meanwhile, 5% or 3 respondents had a low generality dimension, and 35% or 21 respondents had a high generality dimension. Most respondents' confidence levels were still indecisive in their efforts to quit smoking.

Table 14. Distribution of Frequency of the Relationship Between Generality Dimension and Intention to Quit Smoking among Active Smoking Health Students

No.	Generality Dimension	Intention to Quit Smoking						*p-value*
		Positive		Negative		Total		
		N	%	N	%	N	%	
1.	Low	1	1.67	2	3.8	3	5.47	
2.	Currently	14	23.35	22	36.6	36	59.95	0.009
3.	High	13	21.68	8	13.3	21	34.98	
Total		**28**	**46.7**	**32**	**53.3**	**60**	**100**	

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The results in Table 14 presented information regarding the distribution frequency of the relationship between the generality dimension and the intention to quit smoking among active smoking health students. It was found that 36.6% or 22 smoking respondents with a moderate generality dimension had a poor intention to quit smoking. The analysis of the relationship indicated that the p-value for the relationship between the generality dimension and the intention to quit smoking among active smoking health students was 0.009 ($p<\alpha$), meaning that the null hypothesis was accepted, indicating a relationship between the generality dimension and the intention to quit smoking among active smoking health students.

There were three (3) aspects of the self-efficacy dimension, one of which was the generality dimension. The research results of the relationship between the generality dimension and the intention to quit smoking indicated that the moderate generality dimension was negatively related to the intention to quit smoking. The analysis using Spearman's rho test showed a relationship between the generality dimension and the intention to quit smoking with a value of p=0.009.

Bandura (cited in Shadel et al. 2017:02) stated that self-efficacy played a central role in human behavior. The analysis conducted by Ham et al (2009:18) on the process of behavior change had a significant relationship with self-efficacy. The process of individual behavior change would affect individuals in making decisions. King et al. (cited in Ham et al. 2009:21) stated that the impact of decision-making balance in the stage of the behavior change process could be mediated through self-efficacy.

Self-efficacy could affect an individual's success in controlling their health (Nurjanah et al. 2017:119). Individuals with high self-efficacy would be more capable of controlling their health. They would be more able to control their health and trust more in their ability to maintain control of their behavior. According to Etter et al. (cited in Nurjanah et al. 2017:119), self-efficacy could be used as a predictor of success in smoking cessation programs. The higher the self-efficacy of individuals to quit smoking, the greater the likelihood of individuals successfully quitting smoking. Additionally, self-efficacy could play a role in building individuals' beliefs in their ability to quit smoking, manifested through a series of behaviors through several sources of self-efficacy formation (Nurjanah et al. 2017:120).

Intention to Quit Smoking

Intention is an indication of an individual's readiness to engage in a particular behavior. In this study, intention describes the indication that arises within smoking respondents to make efforts to quit smoking. Intention has two categories: good and bad. Intention is considered positive if it scores > 3 and negative if it scores ≤ 3. The distribution frequency results of intentions are presented in tabular form as follows:

Table 15. Distribution of Frequency of Intention to Quit Smoking

Intention	Frequency	Percentage (%)
Positive	28	46.7
Negative	32	53.3
Total	**60**	**100**

The results of Table 15 presented information regarding the distribution frequency of intentions to quit smoking among smoking respondents. There were 53.3% or 32 respondents who had a negative intention to quit smoking, while 46.7% or 28 respondents had a positive intention to quit smoking.

The intention was an indication of an individual's readiness to engage in a particular behavior, based on attitudes toward the behavior, subjective norms, and perceived behavioral control (Kholid, 2014:42). Quitting smoking intention was interpreted as a strong individual desire to stop smoking habit consciously (Akmal et al. 2017:81). The research results found that 32 respondents (53.3%) had a negative intention. This result was not far from the previous study by Andika (2018:50) on active smoking university students at Jember University, where 64.1% or 41 respondents had a bad intention to quit smoking.

An individual's success in their efforts to not smoke was determined by the extent of their intention to quit smoking. A firm intention to quit smoking entirely strengthened smokers to control

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their behavior in any situation while engaging in smoking activities (Rosita, 2012:8). Several components of the Theory of Planned Behavior (TPB) had a significant relationship with the intention to quit smoking, namely attitudes and subjective norms (Droomers et al. 2004:197). Generally, more favorable attitudes toward smoking cessation were associated with quitting smoking. This statement contradicted the existing facts; most respondents still found it difficult to control their behavior in any condition or situation while engaging in smoking activities.

CONCLUSION

Most of the smoking health students at Jember University originated from the Faculty of Nursing at 30%, the majority of smoking student cohorts came from the 2016 cohort at 58.3%, all smoking students were male at 100%, and the age of smoking students was mostly found at the age of 21 at 36.7%. The frequency distribution results of the level dimension found that most smoking health students had a moderate level dimension at 78.3%. The frequency distribution results of the strength dimension found that most smoking students had a moderate strength dimension at 80%. The frequency distribution results of the generality dimension found that most respondents had a moderate generality dimension at 60%. The frequency distribution results of the intention to quit smoking found that most smoking students had a negative intention to quit smoking at 53.3%.

The characteristic variables of smoking health students based on faculty, cohort, gender, and age had no significant relationship with the intention to quit smoking among smoking health students. The level dimension variable had a significant relationship with the intention to quit smoking among smoking health students. The strength dimension variable had a significant relationship with the intention to quit smoking among smoking health students. The generality dimension variable had a significant relationship with the intention to quit smoking among smoking health students.

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Cross-Sectional Study: Can Cigarette Advertising Influence Health Faculty Students?

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ABSTRACT

***Background**: Smoking behavior among faculty students still in a high prevalence. One of the causes of this behavior is the existence of smoking advertisements on various media, including social media. **Objective**: This research aims to determine smoking behavior among students and their responses to cigarette advertising. **Method**: This is survey research using a cross-sectional approach. Samples were taken from 69 students who had filled out a questionnaire distributed via Google Forms. **Results**: The research showed that the average age of respondents was 24 years from 19-44 years. As many as 68.1% were female, and unmarried (63.8%). As many as 26.1% of respondents smoked and the age at which they started smoking was approximately 17 years from the range of 14-19 years with an average of 1-12 cigarettes per day from their pocket money (68%). As many as 29% of respondents were influenced by cigarette advertising, with medium and large levels of influence each at 1.4%. As many as 62.3% of their family members smoke; the majority are fathers (46.4%) and older brothers (8.7%). The results of the research show that smoking behavior is still widely practiced by students at health faculties. **Conclusion**: Gender and the influence of cigarette advertising related to students' smoking behavior. It's necessary to invigilate and stop cigarette advertisements in various accessible media. Education for students is needed, and can be included in learning courses, as well as a policy not to smoke in all academic activities, both on and off campus.*

***Keywords**: Cigarette advertising, Health faculty students, Smoking behavior.*

INTRODUCTION

Smoking behavior among school children and students still has a high prevalence. One of the causes of this behavior is the existence of smoking advertisements on various media, including social media and electronic media. Smoking behavior is one of the main health problems in Indonesia and other developing countries. Smoking behavior in the world is 1.3 billion, of which 942 million are male smokers and 175 million are female smokers who are over 15 years old (Drope & Schluger, 2018).

Basic Health Research Data in 2018, the highest prevalence of residents aged ≥10 years who smoke every day and occasionally is in West Java province (32.0%), the lowest is in Bali province (23.5%)(Badan Penelitian dan Pengembangan Kesehatan, 2018). The 2023 Indonesian Health Survey found results regarding conditions related to smoking behavior. Prevalence of Smoking in Population Aged 10-18 years in the last 1month, West Java Province is the highest province with the number of daily smokers (7.3%), occasional smokers 3.8% and former smokers 1.4%. Men who smoke every day are higher (8.9%) than women (0.1%). The education level of most smokers is high school (12.9%), with the occupations of farmers/farm laborers and fishermen, each accounting for more than 40%. There are more smokers living in rural areas than in urban areas and those with high incomes smoke, less than those with lower incomes (Badan Kebijakan Pembangunan Kesehatan, 2023). As many as 7 million deaths in developing countries are caused by exposure to cigarette smoke from other people,

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including in Indonesia. If not prevented, it's estimated that by 2020 there will be an increase of 8 million deaths (World Health Organization, 2018)

The results of previous research conducted at high schools in Pekanbaru concluded that the reason why someone smokes is because of their peers. Students smoke because they are influenced by their school friends. The more school friends who smoke, the more likely a student is to become a smoker because they want to join in and be friends with these friends. Apart from that, giving unreasonable pocket money also causes students to become smokers (Yulviana, 2015). (Yulviana, 2015). Research conducted on students from health faculties and non-health faculties at the Muhammadiyah University of Surakarta shows that the number of health faculty students who smoke is still quite high. Smoking-free areas have been implemented on the campus, but there are obstacles to implementing them (Nugroho, Kusumawati, & Wijayanti, 2019).

The price of cigarettes is not expensive and it is permissible to buy one cigarette at a time, causing someone to be tempted to buy, and can cause addiction. The ease of getting cigarettes and the fact that there is no prohibition on being a smoker has been the reason why people smoke (Fransiska & Firdaus, 2019). Research conducted in 2021 on teenagers shows that smoking behavior mostly starts at the age of 15 years. The biggest source of influence comes from peers, and the reason for smoking is because they want to try it and just want to taste cigarettes. Most people know the dangers of smoking because of the advertisements on cigarette packs. Even though they know the dangers of smoking, they still smoke for the reason of reducing the stress they feel and feeling calmer by smoking (Almaidah et al., 2020).

Research conducted on health faculty and non-health faculty students at Muhammadiyah University Surakarta showed that the number of health faculty students who smoke was still quite high. In health faculties, it was 55.6%, while in non-health faculties it was higher, namely 83.7%. Differences in characteristics and lecture activities are one of the causes of this difference in prevalence. Health faculty students have better knowledge about the dangers of smoking than non-health faculty students, so there are fewer cases of smoking (Rahayu, 2017). Another research on students was carried out in Papua, namely by comparing the smoking habits of students at the Papua Mining Engineering Faculty and the Medical Faculty. The research results show that students at medical faculties have a lower prevalence compared to engineering faculties. Habits that can affect health include consuming alcohol and smoking which can cause health problems in the future if not treated immediately (Rase, Zaini, Kamalle, & Ain, 2021).

The existence of different regulations in various places is also the cause of the high smoking habit among students. Faculties that do not have a no-smoking rule are one of the factors causing students to smoke. Likewise, the rise of cigarette advertising on every public street in the form of banners or posters which can be seen by all ages, as well as advertisements on television and social media, which are now very easily accessible to all people, can be the cause of someone becomes a smoker. The absence of a ban on cigarette advertising in various media has made the public's perception of cigarettes normal and not considered something dangerous, considering that the state has not banned the distribution of cigarettes along with advertisements and places where cigarettes are easily available.

This research has differences with previous research conducted by Rase, Zaini, Kamalle, & Ain, (2021) who researched the smoking behavior of students at the Faculty of Medicine and the Faculty of Mining, University of Papua. Previous research mostly discussed factors related to smoking behavior, while this research also discusses the responses of students from health faculties to cigarette advertisements and their smoking behavior.

Based on this background, the researcher intends to research smoking behavior among health faculty students and their responses to cigarette advertisements in various media. The difference between this research and previous research is this study aims to analyze the factors that influence smoking behavior among health faculty students, which consists of several

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variables, such as age, gender, marital status, family who smoke, age at which they started smoking, costs incurred to buy cigarettes and number of cigarettes per person, age starting smoking, and the influence of advertising in various media on smoking behavior.

METHODS

This research is an analytical survey research with a cross-sectional approach. Data was collected using a questionnaire given to respondents using a Google, form which contained a questionnaire that explored the variables studied. Independent variables of this research are age, gender, marital status, family member smoking behavior, age started smoking, number of cigarettes, cost of cigarettes, and the influence of smoking advertisements. The dependent variable was smoking behavior among health faculty students.

The research population was all health students at the Health Institute in Bandung City, and samples were taken from health faculty students who were willing to take part in the research by filling in informed consent on the form that was distributed. Students at the health faculty consist of regular students and transfer students who come from employees who are already working. The total number of samples who filled out the questionnaire containing 10 questions about respondent characteristics, smoking habits, and responses to cigarette advertising in full was 69 people. The sample was taken by purposive sampling, namely respondents who were willing to fill out the questionnaire, which was circulated using Google Forms via the WhatsApp group for a week. The collected data was analyzed using a tabular form with descriptive explanations. To determine the relationship between cigarette advertising and smoking behavior, it was tested using the Chi-Square statistical test at alpha 5%. This research has received an ethical certificate from the Health Research Committee from Immanuel Health Institute Number 32/KEPK/IKI/IV/2024.

RESULTS AND DISCUSSION

The research was conducted on 69 health faculty students at one of the health colleges in Bandung, consisting of transfer students and regular students. Data was collected within 1 week, and the following results were obtained:

Table 1. Research variables and respondent characteristics

Variable	n = 69	%
Age (years)		
15-19	9	13.0
20-24	40	58.0
25-29	5	7.2
30-34	8	11.6
35-39	2	2.9
40-44	5	7.2
Gender		
Male	22	31.9
Female	47	68.1
Marital status		
Married	25	36.2
Unmarried	44	63.8
Smoking behavior		
Yes	18	34.1
No	44	65.9
Ever	7	10.1
Family members smoking		
Yes	43	62.3
No	26	37.7
Family members who smoke		
Father	32	46.4
Brother	7	10.1
Inlaw	1	1.4
Husband	1	1.4
Father and brother	1	1.4
Mother and uncle	1	1.4
Little brother	1	1.4
Age started smoking (year) (n=25)		
10-14	1	4.0
15-19	24	96.0
Number of cigarettes/day (stick)		
1-6	19	76.0
7-12	6	24.0
Cost of buying cigarettes (n=25)		
Pocket money	17	68.0
From work	6	24.0
From others	2	8.0
Total Cost of buying cigarettes (n=25)		
>= Rp 25.000,-	20	80.0
>Rp 25.000,-	5	20.0
Family responses		
Forbid	9	13.0
Let	60	87.0
The influence of		

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advertising on smoking behavior		
Yes	20	29.0
No	49	71.0
The big influences of advertisements on smoking behavior		
Nothing	49	71.0
Normal	18	26.1
Currently	1	1.4
Big	1	1.4

Table 1 shows that most of the respondents' ages ranged from 20-24 years (58.0%). This is because this age is the end of regular students who are currently studying. The research respondents consisted of regular students and students from transfer levels or employees who were continuing their studies with basic education from Diploma III, so the age range ranged from 19 to 44 years, with a mean of 24.7 years and a standard deviation of 6.9 years. Based on SKI data for 2023, the proportion of people aged 20-24 years who smoke is 24.5% (23.8-25.2%) (Badan Kebijakan Pembangunan Kesehatan, 2023). When compared with the 2023 Indonesian Health Survey results, the percentage is higher, considering that the target of this research is students with ages ranging from 20-25 years.

The male gender of the respondents was 31.9% male and 68.1% female. There are more women in health faculties, compared to non-health faculties, for example, engineering faculties. As many as 25 people (36.2%) of respondents were married, especially students with transfer status, while there were more unmarried students, namely 44 people (65.9%). The 2023 Indonesian Health Survey results show that men have a greater proportion of smoking (Health Development Policy Agency, 2023). The results of the logit analysis of the 2018 Riskesdas found that gender was positively related to smoking behavior in male adolescents, and they had a higher probability of daily smoking than females (Direja & Febrimuliani, 2021).

There were 34.1% of respondents who had a smoking habit, 65.9% who did not, and 7 people who had smoked (10.1%). The reasons for smoking among students are that at first, they try it, feel calmer when smoking, some are addicted to cigarettes, are curious about the taste of cigarettes, close friends have a smoking habit and feel stressed so they need to calm their minds, and some smoking for no particular reason.

Respondents who had family members who smoked were 62.3%, and most of the family members who smoked were fathers (46.4%). Of the 25 people who smoked, the age at the start of smoking was between 15-19 years (96.0%). The number of cigarettes spent per day is between 1-6 cigarettes (76.0%), and the money used to buy them is mostly pocket money (96.0%) and the amount of money spent on cigarettes is mostly less than IDR 25,000. ,- (80.0%). The smoking location for most students is not on campus, because there is a prohibition on smoking in campus areas. Places, where students smoke, include on the balcony of the house, anywhere other than on campus, at a friend's house or boarding house, and also in places to hang out, such as in cafes with other friends.

The presence of family members who smoke can be the cause of a child becoming a smoker because they feel there is support from parents or other family members. Apart from that, family members who smoke at home cause disease for other family members, because the others become passive smokers. The results of research on family members who smoke, it turn out to be the cause of bronchopneumonia (Sustrami, 2020). Apart from that, many diseases can be caused by smoking behavior, such as hypertension, various types of cancer, stomach problems, and also reproductive health problems. The majority of respondents' families responded to the smoking habit (87.0%) and only 13.0% gave warnings. The results of research on adolescents in Banda Aceh show that the family has an important role in adolescent smoking behavior. One of the functions of the family is to prevent bad behavior, namely the smoking behavior of family members. There is a need to divide roles and control functions between families, so that they can prevent behavior that endangers the health of individual family members and their families, such as active and passive smoking at home (Raihana Irma ; Suryane Sulistiana Susanti, 2019).

The existence of cigarette advertisements in various media can influence someone to become a smoker.

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The research results showed that the majority of respondents were not influenced by cigarette advertisements (71.0%), however, there were still 29.0% who were influenced by these advertisements, so they need to be wary of advertisements in various media. The magnitude of the influence of these advertisements varies, as many as 1.4% still feel that cigarette advertisements have a big influence on their smoking behavior.

Table 2. Cross Tabulation Analysis of Factors Associated with Smoking Habits

Independent Variables	Smoking Habits				p-value OR (CI 95%)
	Yes		No		
	f	%	f	%	
Age (years)					0.101 4.36 (0.90-21.14)
< 25	16	32.7	33	67.3	
>= 25	2	10.0	18	90.0	
Gender					0.005** 5.71 (1.79-18.21)
Male	11	50.0	11	50.0	
Female	7	14.9	40	85.1	
Marital status					0.560 0.596 (0.184-1.93)
Married	5	20.0	20	80.0	
Unmarried	13	29.5	31	70.5	
Family member smoking					0.468 1.82 (0.56-5.88)
Yes	13	30.2	30	69.8	
No	5	19.2	21	80.8	
The family member who smoking					0.756 0.53 (0.10-2.82)
Parents	10	28.6	25	71.4	
Relatives	3	42.9	4	57.1	
Age started smoking					1.00 1.41 (1.09-1.83)
10-14 years	1	100.0	0	0.0	
15-19 years	17	70.8	7	29.2	
Number of cigarettes/ day (stick)					0.218 0.63 (0.45-0.89)
1-6	12	63.2	7	36.8	
7-12	6	100.0	0	0.0	
Total cost of buying cigarettes					0.36 0.86 (0.47-0.89)
<=Rp 25.000,-	13	65.0	7	35.0	
>Rp 25.000,-	5	100.0	0	0.0	
The influences of cigarette smoking					0.0001** 26.26 (8.47-106.46)
Yes	14	70.0	6	30.0	
No	4	8.2	45	91.8	

Adv: Chi-Square Test at level 5%*, 1%**

Based on Table 2, the results of the cross-tabulation between several factors related to smoking habits, data shows that there is a relationship between gender and the influence of advertising and the ability to smoke, with a p-value of less than 5%. The research results show that the higher the advertising, the more

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it will influence students in deciding to smoke. If we look at the OR value, it can be said that students who are influenced by smoking advertisements will have a 26 times higher chance of smoking compared to those who are not influenced by cigarette advertisements. Likewise, with the gender variable, the majority of students who smoke are male. Men have a 6 times higher chance of smoking than women. This is per the results of previous research and the results of the 2023 Indonesian health survey.

Other variables studied, such as age, marital status, age at which one started smoking, as well as the cost of buying cigarettes and others, did not have a significant relationship with smoking behavior in students. The presence of parents or family members who smoke does not influence smoking behavior, this is because students have a circle of friends outside the home who spend more time away from home. Peer influence can be an opportunity for someone to smoke. Research conducted on teenagers in the Parongpong area stated that peers have a positive influence on someone's smoking behavior (92.0%) (Kristiani & Ricky, 2023). Likewise, research conducted on students in Wonokromo Surabaya, proved that peer support is one of the causes of someone smoking, especially for teenage boys (Amalizar, Afridah, & Setiano, 2023).

Of the 20 respondents who felt that cigarette advertising influenced their behavior, it turned out that the majority, namely 70.0%, had the habit of smoking. Of the 49 respondents who felt that the cigarette advertisements they accessed did not influence their smoking behavior, it turned out that the majority (81.6%) did not have a smoking habit. Advertisements of various cigarette brands can influence smoking behavior. Someone who is exposed to cigarette advertising through various mass media has a more or less greater chance than those who are not exposed to cigarette advertising to become a smoker (TCSC-IAKMI, 2018). Another study of 533 respondents from various districts and cities in Indonesia, found that cigarette advertising had a statistically significant effect on smoking behavior (Putro et al., 2022). Students who are exposed to cigarette advertisements have a permissive tendency towards smoking behavior.

Other research conducted in Pamekasan Regency, East Java, shows that there is a significant influence between smoking behavior and cigarette advertising. When compared between urban and rural areas, the influence of cigarette advertising affects urban communities compared to rural areas (Fadhila, Widati, & Fatah, 2022). Research conducted at the Islamic Boarding School stated that knowledge was not related to smoking behavior in students (Rokhmah, 2023). Based on this, it can be interpreted that even though students are students from health faculties, it turns out there are still those who have the habit of smoking.

In urban areas, cigarette advertising is more massive, because it can be carried out along the roads, as well as in strategic places visited by many people, especially teenagers, students, and college students. In the City of Bandung, there is a Bandung City Regional Regulation Number 4 of 2021 concerning No-Smoking Areas. The onslaught of advertising is of course more in urban areas than rural areas, so health workers should be more alert in areas with people who are more susceptible to the influence of cigarette advertising. Education must be carried out starting from elementary school because at these ages, advertising has a big influence on a person's life. If no education balances the information obtained, it will give an incorrect perception of smoking behavior.

CONCLUSION

Smoking behavior still exists among students in health faculties, especially male students. There is a relationship between gender and smoking behavior, with the trend being that more men smoke than women. Even though they know a lot about the dangers of smoking, because they have been exposed to a lot of information about the dangers of smoking, they still smoke for various reasons. Cigarette advertisements in various mass media are related to students' smoking behavior. There are still those who are influenced by the cigarette advertisements. Based on this study, it is necessary to follow up with education and regional regulations regarding smoking-free areas which can prevent and reduce smoking habits. A ban on cigarette

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advertising in various media would be an alternative solution to reduce or eliminate the influence of advertising on smoking habits, especially for pupils and students. Despite the prevalence of healthy students who are influenced by cigarette advertising on their smoking behavior, it is also necessary to pay attention to the importance of discussing the dangers of smoking during college and limiting cigarette advertising in the campus environment.

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Feasibility Test of Picture Book Recognizing the Dangers of Smoking as a Media for Educating Children about The Dangers of Smoking

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ABSTRACT

Background: *The picture book media 'Recognizing the Threat of Smoking' as education about the dangers of smoking for children. The theme used in the picture book media is the danger of smoking, which was appropriately given to children, especially those in grades 4-6 of elementary school, with an age range of 10-12 years old.* ***Objective:*** *The general aim of this research was to test the feasibility of the picture book as a media for educating children about the dangers of smoking.* ***Methods:*** *This research was a research and development study with a qualitative approach conducted in January 2021 in Jember Regency. Data collection was done through interviews, observations, and documentation. Data analysis used Thematic Content Analysis.* ***Results:*** *This picture book consists of 18 pages, created through four stages: starting from the synopsis made directly by the researcher, creating a storyline also done directly by the researcher. Followed by a colleague as an illustrator for creating digital images, and a digital book is also done by the illustrator, then the final stage is printing done by the researcher.* ***Conclusion:*** The material presented in the picture storybook about the dangers of smoking to children was suitable for children to read, but there were suggestions regarding the exposure of information on the health effects of smoking, which was considered insufficient. It was feared that if the health effects of smoking were only limited to a few diseases, the educational message would be less effective for children, who might think that smoking only causes minor health issues.

Keywords: *Cigarettes, Media, Pictures, Storybooks, Threats.*

INTRODUCTION

There are 25 types of diseases caused by smoking habits such as emphysema, lung cancer, chronic bronchitis, and other lung diseases. Other impacts include coronary heart disease, increased blood cholesterol, low birth weight (LBW) in babies of smoking mothers, miscarriage, and stillbirths. Active smokers inhaled cigarette smoke through the mainstream smoke channels containing filters The cigarette filter was able to reduce up to 70% of harmful substances, so only about 30% of the harmful substances were absorbed by the body of the active smoker (Fitriyano, *et al*. 2016:56).

Indonesia is the third largest country in the world for cigarette consumption, after China and India. Tobacco consumption in Indonesia has increased significantly, due to the increase in household income, population growth, low cigarette prices, and mechanization of the clove cigarette industry (Tobacco Control Support Centre-IAKMI, 2015). The number of smokers in Indonesia has shown a progressive increase from 2007 to 2018, including among the population aged 10-18 years. According to Basic Health Research in 2018, smokers in East Java amounted to 23.91% of 39,292,972 people, which is about 11,752,527 people in East Java are smokers. On this provincial scale, the Jember Regency contributed the largest percentage of smokers by 35% (Riskesdas, 2018:55).

Based on the records of the Indonesian Child Protection Commission (KPAI), throughout 2019 out of 70 million children in Indonesia, 37% or 25.9 million of them smoked. Then, as many as 43 million children aged up to 18 years are at risk of deadly diseases. 74.2% of children smoking is due to the presence of signs or cigarette advertisements in stores selling

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cigarettes. The government, together with the Minister of Health and the Minister of Home Affairs No. 7/2011 Article 3, has clearly stated that the family environment is a playground for children and is categorized as a Smoke-Free Area (KTR).

Children as secondary or tertiary smokers are at greater risk than primary smokers because there is a mechanism of sidestream smoke, namely when harmful substances enter the child's body without filtration (Kusumawardani et al., 2015:2). Harmful substances enter the body of passive smokers without filtration. If harmful substances enter and accumulate in the lungs, they will cause respiratory system disorders. The small size of particles can also allow entry of these harmful substances directly into the bloodstream, which can then disrupt the body's health, if accumulated over a long period, it can even cause other chronic diseases (Gema & Syamsudin, 2016).

The effort of conveying information on media selection is very important and needs to be considered because correct selection and delivery will provide maximum results in information dissemination (Rokmah, et al., 2012). Various communities and campaigns from society have tried to provide education about the dangers of smoking to smokers and parents. Previously, the media used to suppress cigarette cases in children was the S.A.D.A.R campaign which aims to make smokers, especially those who already have children, not smoke near children and know the ethics of smoking when dealing with children in various places, both in public places and private places. However, this campaign is still not effective in suppressing cigarette cases in children (Perdana & Waspada, 2016:7).

Based on these problems, researchers took the initiative to develop a picture storybook media "Know the Threat of Cigarettes" as education about the dangers of smoking for children. Picture stories are imaginary stories, fictional stories, or fictions that do not happen (Hana, 2011:14). Storybooks are things that are usually liked by children. Children tend to like children's books and magazines that emphasize adventure stories (Hurlock, 1992:162). The age of children is the age of learning through what they see and hear, therefore one effective medium in moral education for children is through picture stories. At the age of 10-12 years, children enter pre-adolescent development, both physically and psychologically at this time they are looking forward to puberty.

Seeing the facts of the threat of cigarettes to children in the family environment, it is very important to provide appropriate media to maximize the cohesion between the material of cigarette danger education and children as the main target (Depkes RI, 2012; Rokhmah et al., 2012). Children aged 9-10 years or equivalent to grade 4 of elementary school generally can analyze a text and the ability to make conclusions. Entering the age of 11-12 and above or grade 6 of elementary school, children's thinking patterns are more critical and able to understand the concept of cause and effect even synthesizing their knowledge through the environment and objects studied (Bujuri, 2018:46-47). This means that picture stories become relevant media to explain the dangers of cigarettes to children because they can maximize the literacy skills as well as fantasies of children in grades 4-6 of elementary school.

Through picture storybooks, moral values that can be emulated by children in everyday life are embedded. In addition, the method of picture storytelling has advantages compared to other media, namely, it can sharpen children's imagination and memory, attract children's attention to listen to what is conveyed, and picture stories are media that can help convey messages easily (Musfiqon, 2016:11-12). In the long run, it is hoped that this picture storybook can become one of the media used by child health promoters to convey the dangers of smoking. In line with the results of that research, Farenda (2018:15-20) found that picture stories can support science learning in fourth-grade students of SDN 46/V Rantau Jaya in terms of material relevance, language, and practicality. Meanwhile, picture stories with regional nuances have a positive impact on character formation in sixth-grade students of SDN Pengangsalan because learning becomes effective and students' competencies are further explored (Sriati, 2015:180).

The picture storybook media "Know the Threat of Cigarettes" themed on the dangers of smoking in children needs

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media suitability assessment. Researchers used media experts, child psychologists, and public health experts as media assessors because they understand the creation of good and appropriate media, both in terms of the content of picture stories, the composition of picture storybooks, and the influence of media on the knowledge and attitudes of the target audience. Suggestions from experts are aimed at developing the content of picture stories, the composition of picture storybooks, and the influence of media on the knowledge and attitudes of the target audience. The overall assessment is based on the ABC Behavior Change Theory, which explains that consequences have more influence on the continuity of behavior implementation than the influence given by an environmental event. This theory is useful for designing interventions that can improve the behavior of individuals, groups, and organizations (Kholid, 2014:65).

METHODS

The type of research conducted is research and development with a qualitative approach that will result in descriptive data in the form of words. According to Borg and Gall (Sugiyono, 2015:4), research and development (R&D) is a research method used to develop and validate products used in education and learning. This research tests a product and assesses its effectiveness in society.

The research was conducted in the Jember Regency. The research sites are scattered throughout Jember Regency, but one of the research sites used Zoom meetings due to the distance amid this pandemic. The researchers began the research by interviewing primary informants and additional informants, which was conducted from January 2021 to February 2021.

The targets of this research are media experts, child psychologists, and public health experts, with a total of 3 primary informants, supplemented by additional informants, namely elementary school students in grades 4-6 and elementary school teachers, totaling 4 additional informants. The primary informants in this research are media experts, one of whom is a lecturer at a state university in Jember Regency; child psychologists, a lecturer and practicing psychologist currently pursuing a Ph.D. at one of the leading universities in East Java; and public health experts, an activist working in an NGO focused on child preventive measures. The additional informants in this research are children who receive education through picture storybooks and class teachers as mediators of information delivery. Additional informants will be interviewed about their opinions regarding the suitability of the media created by the researcher.

The illustrated storybook that had been tested for feasibility would be tested on students to see whether they understood the dangers of smoking based on the content of the illustrated stories. Then, the students' understanding was checked with their homeroom teachers at their school. As a result, the data analyzed by the researchers led to a conclusion.

RESULTS AND DISCUSSION

Based on the criteria formulated by the researcher, the primary informants consisted of three individuals: IU1, IU2, and IU3. The researcher conducted a credibility test aimed at testing the accuracy of the data in qualitative research. The credibility test was conducted using source triangulation, where the researcher interviewed the additional informants (primary school students) and technique triangulation with the homeroom teacher in providing education to the students. The research was conducted with in-depth interviews with primary and additional informants starting on January 14, 2021. The final interview was conducted on January 20, 2021.

Characteristics of Informants

a. **Primary Informants (PI)**

The primary informants in this study were media experts, public health experts, and psychology experts. There were three primary informants in this study with characteristics including age, gender, education level, place of residence, and expertise in their respective fields as specified (2022).

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Table 1. Characteristics of Key Informants

Primary Informants	Age (Year)	Gender	Education Level	Residence	Position
1.	39	Man	Master's Degree at the Indonesian Art Institute Yogyakarta	Wirolegi, Jember Regency	Lecturer
2.	26	Man	Bachelor's Degree Tompotika Luwuk Banggai University	Jatinegara, East Jakarta	Member of the Children's Lantern
3.	44	Man	Master's Degree from Airlangga University	Jl. Semeru, Jember Regency	ecturer and psychologist

1. Primary Informant 1 (PI1)
   PI1 was a 39-year-old male born in Yogyakarta. He has been working as a lecturer at the Faculty of Cultural Sciences, specifically in the Television and Film Study Program, for eleven years, from 2010 to the present.
2. Primary Informant 2 (PI2)
   PI2 was a 26-year-old male. He was a graduate of the FKM University of Tompotika Luwuk Banggai and was actively involved in anti-smoking activities with the Laskar Anak Community.
3. Primary Informant 3 (PI3)
   PI3 was a 44-year-old male. He was a psychologist, evidenced by his Professional Certification Letter (SPP) from the Indonesian Psychological Association. He has been working as a child psychologist for approximately 17 years, from 2004 to the present.

b. **Additional Informants (AI)**

The additional informants in this study consisted of a homeroom teacher and students from grades 4-6 of an elementary school. The information provided by the additional informants was used by the researcher as a consideration for information.

Table 2. Characteristics of Additional Informants

Additional Informants	Gender	Age (Year)	Position
1.	Woman	54	Teacher
2.	Man	10	4th grade student
3.	Man	11	5th grade student
4.	Man	12	6th grade student

1. Additional Informant 1 (AI1)
   AI1 was a 54-year-old female. She lived in Wirolgi and worked as a homeroom teacher for grade 4 at an elementary school.
2. Additional Informant 2 (AI2)
   AI2 was a 10-year-old boy. He was currently in grade 4 of elementary school. AI2's family environment included a smoker, and AI2 aspired to become a smoker when he grew up.
3. Additional Informant 3 (AI3)
   AI3 was an 11-year-old boy. He was currently in grade 5 of elementary school. AI3's family environment included a smoker, and AI3 had even tried smoking.
4. Additional Informant 4 (AI4)
   AI4 was a 12-year-old boy. He was currently in grade 6 of elementary school. AI4's family environment included a smoker, and AI4 had also tried smoking together with AI3.

Description of the Process of Creating the Picture Book Recognize the Threat of Cigarettes

a. The Process of Writing the Story Synopsis

The researcher began the picture book creation process by writing the story synopsis for the picture book "Recognize the Threat of Cigarettes." The story synopsis was the initial stage in the creation process. The theme was the foundational basis for determining the content of the picture book. The theme of the picture book created by the researcher was "The Importance of Knowledge About the Dangers of Smoking." The time setting in the picture book created by the researcher was the present, and the places used as settings included the family room, the yard, the street, and the classroom.

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b. Process of Creating the Storyline

The storyline helps in identifying the story on each page by specifying the desired angles and image sizes and facilitating the sketching process (Yudistira, 2014:4). The storyline created by the researcher consisted of two columns: narrative and desired illustrations.

The completed storyline was then communicated with the illustrator to be translated into the desired cartoon visuals. The storyline was made in a general form, with the illustrator heavily involved in imagining the visual representation for each page of the book. However, the overall concept and color schemes were based on the researcher's ideas.

c. Process of Creating Verbal and Visual Character Descriptions

The initial step was to create verbal character descriptions, followed by visual character designs made by the illustrator, Muhammad Wahyu Ansori, from the Visual Communication Design department. The verbal character descriptions detailed the characters textually, including their names, genders, ages, physical features, and traits shown in the story. Below is the depiction of verbal and visual character descriptions in the picture book "Recognize the Threat of Cigarettes":

Table 3. Verbal and Visual Character Descriptions

No.	Name	Character	Characteristics	Attributes
1	Keni		a. Boy b. Black hair c. Bangs in the middle d. Olive skin	Keni was a cheerful, friendly, brave, and polite boy. Besides being handsome, he was one of the smartest students in his class.
2	Mother		a. Wore a hijab b. Wore an inner hijab c. Olive skin	Her mother was Keni's biological mother. She was loving, gentle, and patient.
3	Father		a. Black hair b. Neatly trimmed hair c. Had a mustache d. Wore a wristwatch e. Dressed neatly	Father was Keni's biological father. He was loving, hardworking, and wise.
4	Homeroom teacher		a. Curly hair b. Homeroom teacher c. Male	The teacher in this story was the homeroom teacher. He was young, and able to explain the material well, making it easy for the students to understand. He was a creative teacher.

d. Process of Creating the Digital Picture Book

After character depiction, the next step was creating the picture book. The software used for creating the picture book was graphic software on a computer/laptop. The first step involved sketching based on the previously created storyline. The verbal descriptions on each page were visualized with illustrations and accompanied by the narrative text (Yudistira, 2014:5).

The completed illustration sketches were inked using drawing pens, brushes, or other tools. After inking, the remaining pencil sketches were erased, and the sketches were digitized. The next step involved coloring the characters and settings on each page, followed by adding the narrative text to each illustrated page. The fonts used in the picture book

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included Chalk Marks® and Times New Roman®. This entire process was assisted by the illustrator, following the author's previously developed concepts.

After creating the book's content, the next step was creating the cover. The cover needs to be attractive to represent and support the book's competitiveness (Yudistira, 2018:5). The picture book's size was A5 (14.8 x 21.0 cm), using 150 gr Art Paper for the cover and 100 gr Art Paper for the pages.

Assessment of the Elements of the Picture Book KEN AROK

a. Theme

The theme is the meaning contained in a picture book about the dangers of smoking. The media expert informant (PI1) stated that the theme of the dangers of smoking used in the picture book medium was appropriate for children, especially those in grades 4-6, as indicated by the following quote:

> "...for a theme targeting elementary school children, I think it is appropriate, especially for those in grade 4, maybe, grade 4 or grade 5... perhaps from an early age." (PI1)

The chosen theme in the picture book KEN AROK was about the dangers of smoking. According to Aditama in Ambarwati et al. (2014: 2), even though some people know the dangers of smoking through cigarette ads, the habit of smoking is still widespread. This aligns with the public health expert (PI2) who stated:

> "I agree, smoking is a significant issue. Making smoking the theme of a storybook like this is very beneficial." (PI2)

The research results showed that all primary and additional informants agreed that the theme used in the picture book was appropriate for children. Additionally, education about the dangers of smoking is seldom provided to children. It is hoped that the appropriateness of this picture book's theme will be well-received, especially among children in grades 4-6 of elementary school.

b. Characters

The media expert informant stated that the depiction of characters in the picture book was quite good, considering the expressions adjusted to each condition in the story. This aligns with Sugiarti (2013: 10), who stated that characters in a story have traits that match the roles they play. This is reflected in the quotes from the primary media expert informant (PI1) and the psychologist expert (PI3):

> "...the father's character, the mother's character, is adequate..." (PI1)

> "Complete characters include the roles of parents and teachers, which is good. It makes the story more alive and realistic." (PI3)

Based on the quotes from the primary informants, characters play an essential role in the flow of the story. Children tend to idolize characters in a story. This is explained in the research by Salawati, T., and Nuke, I. (2016: 98) titled "Analysis of Needs to Design Children's Comics 'ASETAR' (I Will Stay Healthy Without Cigarette Smoke)," which states that children prefer characters in stories that are of their age group, as they can relate to the experiences of the characters.

c. Plot

The plot used in this picture book is progressive, making it easy for children to understand. The media expert informant (PI1) stated that the plot used in the picture book was appropriate, as indicated by the following quote:

> "...the storyline itself is acceptable." (PI1)

Roysa et al. (2017: 2) mentioned that readers can create or interpret the story's plot through its sequence. This was also conveyed by the primary informants, a public health expert (PI2) and a psychologist (PI3):

> "The plot starts when the child first sees his father smoking, sees a smoking-related disease on TV, and realizes his father is a smoker. Then he

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gets education at school about the dangers of smoking." (PI2)

"The plot is clear, starting with the advertisement, leading to the idea of how to get his father to quit smoking, and eventually succeeding." (PI3)

Roysa et al. (2017: 5) stated that problems and conflicts in a story must be within the children's intellectual and emotional reasoning. This consideration ensures that children with simple reasoning abilities can follow the story, ending with a family hero who successfully educates his father about the dangers of smoking.

d. Background

The background serves as a reinforcement of the content of a story. This is in line with the opinion of Muhardi and Hasanudin in Puspitasari (2017: 4), stating that the background aims to clarify the atmosphere of the place and time of the events in the story. The main informant, a media expert, and a psychologist stated that the background used in the illustrated storybook media is appropriate, and the accuracy in using the background, both in terms of place and time, is following the following quotes:

"The background here is clear, at home, at school, on the street, the timing is already appropriate" (IU1)

"The depiction of the background is good, it matches the story being built" (IU2)

Based on the above quotes, the background in the illustrated storybook appears realistic, resembling real life. According to Jubaedi (2016: 87), the appropriate story background for children is the environment around them, such as home and school. In contrast to the opinions of the media expert and public health expert, the psychologist stated that there is a depiction of the background that is not quite right. Here is a quote from the interview with the psychologist:

"Right now, there's something wrong with the background, in the TV show there should be some writing like the effects or impacts of smoking or something like that" (IU3)

Based on the quote above, the psychologist stated that the lack of additional text on television as a background presents the dangers of smoking. This is in line with Puspitasari's research (2017: 4), stating that the success of a background in a story is determined by the suitability and clear depiction of a place, time, and atmosphere in building a story so that the impression of where, when, and how the situation occurred can be depicted well to children.

e. Point of View

Storybooks are generally narrated directly by their authors, but authors can also use characters in the story to narrate the stories they write. The illustrated storybook "Know the Dangers of Smoking" uses a third-person point of view; it is from this perspective that readers follow the course of the story. According to the primary informant, a public health expert, and a psychologist, the point of view used in the illustrated storybook is appropriate. Here are excerpts from their interviews:

"It's third-person, this perspective from the story. It's good, clear." (IU2)

"The point of view isn't an issue, it's pretty much third-person." (IU3)

Choosing the right point of view will influence readers' ability to understand the content of the story. This is in line with Koasih's opinion in Puspitasari (2017: 5) that a writer's position in presenting a story consists of two kinds: direct involvement as a first-person narrator or as a character, either the main character or supporting characters visible in the story, usually, authors use "I" or "me"; while some play the role of a third person or observer, here the author only narrates between characters, typically using names.

f. Style

The primary media informant, public health expert, and psychologist stated that the style used in the illustrated storybook is appropriate for children to read, using a cartoon block

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style can captivate children's interest in reading, as per the following quotes:

> "The right style will also increase children's enthusiasm for reading because it's quite interesting... in many aspects, style selection is indeed a characteristic of a product." (IU1)

> "In many aspects, style selection is indeed a characteristic of a product." (IU1)

> "This cartoon style, yes, means... very child-friendly, yes, they'll surely be very happy to see it made like this, very attractive." (IU2)

> "... the cartoon style is nice, suitable for the target audience of 4th-6th-grade students." (IU3)

The above quotes confirm that children and cartoons are inseparable. Almost all children like cartoons. According to Jubaedi (2016:87), the cartoon block style can captivate children for reading because it presents cartoon forms with bright and attractive colors.

g. Moral

Morals and illustrated storybooks are inseparable. A storybook is inherently filled with the meaning or moral messages it intends to convey to its readers. The primary media informant (IU1) and public health expert (IU2) stated that the moral used in the illustrated storybook is appropriate. A storybook always contains a message to be conveyed. This is in line with Oentardjo et al.'s research (2013: 10) that books are one of the right moral improvements, this is also supported by stories with good morals. Here are excerpts from interviews with the primary media informant (IU1) and public health expert (IU2).

> "... all stories must have moral messages conveyed and it has been successfully included in this book." (IU1)

> "If related to morals, this illustrated storybook is good." (IU2)

Writers are free to express how they want to convey the moral of the story they write. Chaeruddin (2016: 254) writes that storytelling methods are very effective in instilling moral values in elementary school-aged children. Therefore, the author of the illustrated storybook "Know the Dangers of Smoking" also writes the ending story with a reward, in this case, to be memorable by the readers, especially children. Children will be more interested in the rewards they will receive after doing something.

h. Overall Appearance

The illustrated storybook "Know the Dangers of Smoking" was printed in A5 size, namely 14.8cm x 21.0cm, using 210 GSM Art Paper for the cover and 150 GSM Art Paper. Primary media experts, public health experts, as well as psychologists, have stated that the overall appearance of the illustrated storybook is suitable for children to read. Because overall, it has made children interested in reading it. The cartoon animation appearance is in line with children's characters as stated in the following quotes:

> "It's good overall, it's quite good, bringing a child who becomes a hero in his family." (IU1)

> "... cool, it's really good, turns out I just knew KEN-AROK is, know the dangers of smoking, hehe, it's good, really good." (IU2)

> "Overall, it's very child-friendly, especially from the aspect of images and colors." (IU3)

Additional informants, students from grades 4-6 in elementary school, stated that the overall illustrated storybook is attractive, as per their quotes:

> "Good, bright, colorful, so enjoyable to look at..." (T2) "... exciting to read because the drawings are all good, interesting..." (T3)

> "Not easily bored because it's funny, the cartoons are cute." (T4)

According to Nendya (2015:68), the appearance of a storybook is better at depicting the condition of children and also reflects children's daily activities. Storybooks can use cartoon appearances, which are attractive for children's

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education. Then, the appearance of facial expressions in animations makes characters more interesting and lively.

i. Suggestions

The illustrated storybook "Know the Dangers of Smoking" is not without errors; therefore, the author asked for suggestions from all primary media experts, public health experts, and psychologists. The primary media expert gave some suggestions overall in the preparation of the book "Know the Dangers of Smoking," including the following quotes:

> "Yesterday I also read and found some typos." (IU1)

> "Maybe there's information here about the age limit segment for this book for what, for educational book support." (IU1)

Based on the quote from the primary media expert, there are some errors in writing. Additionally, the media expert suggests adding an age limit segment to support children's educational books in elementary schools, which can be included in the cover. Of course, the suggestions from the primary media expert will enhance the illustrated storybook "Know the Dangers of Smoking."

In contrast, the primary public health experts and media experts suggest increasing the chat box or conversation balloons; this is because children might get bored reading paragraph texts. Here are the quotes:

> "Just increase the chat box because the A5 size is already big enough, and it's a shame if the content is just pictures." (IU2)

> "So, children at that age are more interested in comics than novels." (IU3)

> "... increase conversation balloons, don't increase paragraphs at the beginning, or if you have many paragraphs with many conversations at the beginning, it's better not to." (IU3)

Based on the above quotes, public health experts and media experts suggest that children are more interested in speech balloons in the form of comics to prevent boredom while reading. Because if there is too much text and children get bored reading it, they won't easily accept the message conveyed. Therefore, there needs to be adjustments to the paragraphs to avoid appearing boring.

CONCLUSION

Of the three main informants, most are men dominated by lecturers, one of whom also holds a position as a psychologist with an average of postgraduate qualifications in their field, while another informant is an activist in the field of anti-smoking in children with a bachelor's degree from one university in Sulawesi.

The illustrated storybook "Know the Threat of Smoking to Children" consists of 18 pages through 4 stages, namely synopsis making, storyline making, digital image making, and digital bookmaking, which were assisted by colleagues from the visual communication design department.

The theme used in the illustrated storybook media, the danger of smoking, is already appropriate for children, especially grades 4-6 in elementary school. The characters in the illustrated storybook are already quite good by paying attention to expressions that are adjusted to each condition in the story. The plot has adhered to the rules by using a progressive plot, making it quite easily accepted by children. Accuracy in the use of backgrounds, both in place and time. The perspective is eye level using a cartoon block style that can capture children's interest in reading. Thus, the overall appearance of the illustrated storybook is already suitable for children to read. The use of color on the cover of the illustrated storybook is already appropriate, using the basic color blue to symbolize intelligence, combined with highlighting the main character icon that represents the content of the illustrated storybook created.

The material presented in the illustrated storybook about the dangers of smoking to children was already suitable for children to read, but there was some advice, especially regarding the presentation of information about the health effects of smoking that was considered lacking. It was feared that if only a few diseases caused by smoking

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were highlighted, the educational message might not be effectively conveyed to children because they might perceive that smoking only poses minimal health disturbances to the body.

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Strategies of Young Fathers to Quit Smoking in the Context of Indonesian Men

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ABSTRACT

***Background**: Smoking cessation is a critical step towards improving overall health and well-being, not only for individuals but also for their families. Although young fathers who smoke may have particular difficulties while trying to stop, they can conquer their addiction with the correct techniques and assistance. **Objective**: This study aims to investigate the strategies used by young Indonesian fathers to give up smoking after the birth of their children. **Method**: We gathered thirty young fathers who were smokers at the time for semi-structured, in-depth interviews. The process of coding data from grounded theory was utilized to interpret the acquired data, even though grounded theory was not the theoretical framework used in this investigation. **Results**: Some informants described their efforts to change their smoking behavior, including both external and internal efforts, for both individuals who intend to quit and those who continue to smoke. Numerous additional informants mentioned external efforts. The informants have different motivations for wanting to quit smoking. According to an analysis of the interviews, there are two main sources of motivation and/or intents for quitting: internal and external cues. **Conclusion**: The complex experiences that young fathers have when attempting to quit smoking are influenced by some factors, including the transition to parenting, specialized support programs, and the significance of family encouragement.*

***Keywords**: quit smoking, strategies, young fathers*

INTRODUCTION

Smoking cessation is a critical step towards improving overall health and well-being, not only for individuals but also for their families. Because smoking poses a severe threat to public health, it is imperative that young fathers are encouraged to give up the habit (Guri-Scherman,2024). The well-being of young fathers' families as well as their own health can be greatly enhanced by health promotion initiatives that assist them in quitting smoking. Helping young fathers quit smoking requires a multifaceted approach that considers their unique circumstances and challenges (Bottorff, 2019). Tailored smoking cessation programs, cultural adaptations, brief advice, supportive family environments, role modeling, peer support, and the use of technology can all contribute to successful smoking cessation among young fathers (Bottorff, 2019).

Young fathers who smoke may face unique challenges when trying to quit, but with the right strategies and support, they can successfully overcome their addiction (Martinez, et al, 2021) (Poole, et.al, 2022). This is challenging to stop smoking, but for young fathers, it's even more important to make the right choice. As fathers, they have a fresh obligation to preserve and prioritize the health of their families (Demontigny et.al, 2018; Nomaguchi, K., & Milkie, M. A.,2020). Recognizing the influence that smoking can have on their personal well-being and the well-being of their children, young fathers are increasingly finding techniques to quit smoking and create a smoke-free atmosphere (O'Donnell, et al,2019).

Paternity participation in smoking cessation is linked to the tasks that future fathers must play as a father: protector,

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provider, and role model for their child's health, according to various academics (Bottorff et al., 2019). The following efforts are being taken: learning about the SHS effect, creating smoking regulations at home, committing to quit smoking, ensuring that cigarettes are not kept within reach of children, and offering continuous reminders (Bottorff et al., 2010). Modern fatherly norms and aspirations demand that men retain partner relationships, insulate children from passive smokers, and take on the role of more committed and active fathers than previous generations. Men who continue to smoke maintain their masculinity in the face of these demands (Kwon, J. L. Oliffe, J. L. Bottorff, & M. T. Kelly, 2014). As a result, a method for studying smokers' health and economic benefits and drawbacks that incorporates health beliefs, health behavior, and motivation is necessary.

Due to the father's duty to ensure the good health of his family, the birth of a child and being a new father are frequently linked to a desire to quit smoking before birth (Bottorff et al., 2017; Bottorff et al., 2019) and after the birth of a child (Pollak et al., 2015). This will to stop smoking is generally related to an attempt to prevent SHS exposure at home (Saito et al., 2018). However, only a small percentage of expectant fathers quit smoking during or after their wives' pregnancies, and even fewer definitively quit.

One of the advantages of fathers' changing roles today is that they are closer to their children. Despite the pregnancy of their partners, males could be unable to quit smoking because of the deeply established part that smoking tobacco have on their lives, as a source of happiness, and a means of being responsible fathers (Bottorff, Radsma, Kelly, & Oliffe, 2009). Men's continued smoking is supported by a more complex dynamic, according to Bottorff (2017), which includes reliance on smoking to express specific masculinity patterns (e.g., risk-taking, independence, and self-reliance), traditional gendered divisions in parenting responsibilities, and the stress associated with fatherhood responsibilities.

A father is a man who holds a specific place in the family. Not only does the father give financially to the family, but he also plays a vital role in a variety of areas. A father's responsibility comprises ensuring the well-being and health of each family member via a variety of approaches (Crone, et. al, 2021). One of them entails refraining from harmful health behaviors such as smoking, drinking, or drug use.

In the context of Indonesian men, encouraging young fathers to cessation smoking is crucial because smoking is a serious public health issue (Ayuningtyas, et al, 2021; Kodriati, N., Pursell, L., & Hayati, E. N., 2018). By implementing these strategies, we can support young fathers in improving their health and creating a smoke-free environment for their families. This study aims to investigate the strategies used by young Indonesian fathers to give up smoking after the birth of their children.

METHODS

This study uses a qualitative design. Descriptive data from study procedures including people's written or spoken words and observed behaviors are produced by qualitative technique approaches (Yin, 2009). The qualitative paradigm in this study offers a means of investigating phenomena using several techniques that characterize one-on-one interactions with research participants (Creswell, 2007; Creswell et al., 2003).

Process of Recruitment

Purposive sampling is biased, but it is appropriate for this study because the targeted young parent is an ardent tobacco smoker. Furthermore, snowballing is appropriate for our study because using tobacco necessitates multiple social encounters with other smokers (Kumboyono, K. et al, 2020; Pourtau, L.et al, 2019). To participate in this study, the researcher will contact acquaintances, colleagues, and personal contacts who work in the child development and postpartum midwifery units at the Public Health Center (PUSKESMAS) in Samarinda City to introduce possible interviewees meet the inclusion criteria.

Process of Data Collection

The in-depth interview is a face-to-face interaction between the researcher and the informant to understand their perspective on their own life, experience, or situation (Taylor et al., 2015). Because

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of the subjective nature of this method, researchers will need to use interpersonal skills to conduct the research, beginning with gaining access to possible participants. Once the researchers have gained access to the first responders, they must continue to use these talents to keep in touch with them. As a result, qualitative researchers must pay special attention to establishing and maintaining research connections (Taylor & Bogdan, 1984; Taylor, Bogdan, & deVault, 2015). The researcher will visit gatekeepers such as health cadres who live in the study field after receiving information from the Public Health Center/PUSKESMAS. The researcher scheduled three sessions to collect data. The first was to build trust by providing explicit information about the research and making an appointment between the researcher and the informant, then the researcher conducted the main interview with the informant in the second meeting, followed by a final meeting for clarification and termination.

The focus of the in-depth interview questions will be on the smoking experience as it relates to parenting. The researcher will perform a semi-structured face-to-face one-on-one in-depth interview after a brief presentation of the informed consent and the participant's signing. Each interview is expected to run between 30 and 60 minutes. Interviews will be digitally recorded, verbatim transcribed, notes taken, and accuracy checked. To participate in the interviews and for transportation, fathers will get US$10 (Rp. 140.000,00) in cash.

Data analysis

Grounded theory systematically develops a theory based on information gathered through social research (Glaser, Strauss, & Strutzel, 1968). The data analysis method based on grounded theory coding was employed for this study since it is more robust and traceable. Encoding is a critical process in grounded theory. The researcher's "basic analytic method" is coding (Corbin & Strauss, 1990). Making pre-code, code, axial code, and core category are the four steps of processing research data in this study. The researcher systematically pre-coded the data for each informant transcript and then sorted and selected potential and relevant data for the research issue. The scientists began coding. A code was created by combining pre-codes that were similar and related. The purpose of coding is to help the analyst acquire new insights into the data by dismantling standard thinking methods (interpreting) data events (Charmaz, 2006; Corbin & Strauss, 1990). The researcher created axial codes to enhance the argument by creating a core category to identify codes. The link between events, time, reasons, and actions from the informants' data creates axial coding. In axial coding, the relationships between categories and subcategories are validated against data. There is also further category development, and one continues to look for indicators of it (Charmaz, 2006; Corbin & Strauss, 1990). The researcher examined each prior phase after creating axial coding. To reanalyze, generalize, and map the acquired data, start with pre-code and axial codes. The axial codes were classified into key categories after they were rechecked. The core category represents the investigation's central phenomenon (Corbin & Strauss, 1990).

The Mahidol University Social Sciences Institutional Review Board (MUSSIRB) has authorized this study with Certificate of Approval No. 2019/252.0612.

RESULTS AND DISCUSSION

The age range of the informants in this study was 22 to 39 years old, with an average age of 32. The bulk of the informants have completed high school, with the remaining individuals having completed elementary, junior high, and college schooling. The average number of informants is two; the highest number of informants is five. Dayaks and Kutai make up the minority in this study, with Javanese, Buginese, and Banjarnese making up the majority. The majority of informants said they were the only ones who smoked in their homes, although a few said that other individuals, including their brother, father-in-law, and friends, also smoked there. Regarding their employment position, the majority of the informants are workers in the informal sector, such as laborers, motorcycle/taxi drivers, and traders, while the majority of interviewees are employed in the formal sector, such as security guards, employees, and teachers. Table 1 displays the sociodemographic details of the informants.

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Table 1. Socio-demographic characteristics of study informants

Characteristics	Total *N*=30 (%)
Age	
22-29	7 (23.3)
30-39	23 (76.6)
Ethnicity	
Javanese	10 (33.3)
Buginese	8 (26.7)
Banjarnese	6 (20.0)
Kutai	3 (10.0)
Dayaknese	3 (10.0)
Education	
Elementary school	3 (10.0)
Junior High School	3 (10.0)
Senior high School	16 (53.3)
College or higher	8 (26.7)
Marital Status	
Married	30 (100)
Number of people smoking at home	
Only informant	24 (80.0)
others	6 (20.0)
Number of children in the home	
1-2	26 (86.7)
3-5	4 (13.3)
Age of children's (N=56)	
0-12 months	5 (8.9)
1-5 years	34 (60.7)
6-10 years	9 (16.1)
11-15 years	8 (14.3)
Employment	
Formal (*teacher, security, finance, civil servant, temporary employees in government and private offices*)	10 (33.3)
Informal (*traders, motorcycle/taxi drivers, laborers, farmer, handyman craft, keeper shop*)	18 (60.0)
Odd jobs	2 (6.7)

The strategies for quitting smoking

To change smoking behavior, both for those who have the intention to stop smoking and those who keep smoking, some informants stated their efforts if they want to stop smoking with internal efforts and external efforts. Several other informants stated efforts related from outside themselves. The informants have various reasons to stop smoking or the desire to stop smoking. Analysis of the interviews suggests that the reasons and/or intentions for quitting originate from both internal and external cues.

Prepare to quit smoking internal

Internal preparation for quitting smoking is 1) having a smoking cessation strategy, 2) smoking cessation methods, and 3) Perceived benefit for the intention to quit smoking from inside.

Having a smoking cessation strategy

When asked about participants' strategies for stopping smoking, participants described seven main strategies: delaying buying cigarettes, stopping smoking immediately, not thinking about smoking, reducing smoking, exercising, asking friends who had successfully quit smoking, and consulting health workers:

> "*... Delay the time of buying cigarettes...I did not finish one of the sticks directly, but left half of the stems, then continued smoking again*" (P2, age 26)

Smoking cessation methods /Tool-assisted methods for quitting smoking

Based on the data analysis, four methods can be identified concerning participants' intention to quit smoking: using medicine, using e-cigarettes, chewing candy, and using salt. As illustrated by the interview P19, age 32.

> *"I will provide candy in the car or in a place that is easy to reach, yes slowly I will try that"*

The method for quitting smoking that was chosen by most participants was chewing candy. Chewing candy is an easy and cheap method for participants. The use of e-cigarettes and medical treatment requires sufficient funds and information about both methods. Only one informant chose the use of salt stuck to the tongue, which according to him would reduce the desire to smoke.

Perceived benefit for the intention to quit smoking from inside

When asked about the reasons for having the intention to stop smoking, participants described two main factors, namely because of the increasing age and health state, P9, age 27 states "*...I have a desire to stop. Yeah… if I can stop, I want to stop because I'm getting older, my body is weak. If I smoke all the time, My body will be damaged right*"

Prepare to quit smoking through social support

There are several strategies to quit smoking from outside participants that can be identified in this study, such as external influences and using appropriate methods. External factors in cues to action, such as interactions with other people, in this case friends, discussions with health care providers, or even religious messaging such as fasting, are all related to the Health Belief Model (HBM). In Malaysia, for example, where Muslim smokers can refrain from smoking while fasting during Ramadan (Ahmad et al., 2012).

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Strategies for quitting smoking from external influences

Based on data analysis, participants tend to adopt several strategies if they had the intention to quit smoking, such as limiting smoking friends, announcing that they wanted to quit smoking, and fasting Ramadhan.

> *"… I don't meet smoker friends, limit meeting with them. If possible limit the time with them."* (P7, age 35)

> *"I believe that I can quit smoking during the Ramadan Fast. And I can stop during the fast because if I smoke it will break my fast. Because there is a prohibition on eating or drinking if I am fasting. Smoking is one of the prohibitions."* (P22, age 39)

Participants with high severity perceptions were more motivated to take action to prevent smoking-related diseases by designing a smoking-cessation strategy. Not only from inside himself but even from outside.

Table 2. Summary of the strategies for quitting smoking

Strategy(s)	Frequency of informants
Strategies for quitting smoking from internal efforts	
Delay buying cigarettes	4
Stop smoking immediately	4
Don't think about cigarettes	3
Reduce to 1 cigarette/day	6
Exercise	2
Consultation with health workers	1
Asking friends	1
Strategies for quitting smoking from external influences	
Limiting meetings with smokers	8
Declare if want to stop smoking	1
Fasting and quitting smoking	6
Few smoker friends	6
Tool-assisted methods for quitting smoking	
Use medicine	3
Using E-cigarette	3
Chewy candy	6
Using salt	1

The main symptom of several body intended to consult a health worker. Almost all informants intend to quit without help from health workers. According to Morphett's (2015)'s study, deep desire is the foundation of quitting smoking performance (Morphett, Partridge, Gartner, Carter, & Hall, 2015). Efforts that will be made by the informants are strategies from within themselves such as chewing candy and from outside themselves such as hanging out with friends. However, a strong intention alone does not guarantee that someone will stop smoking if it is not accompanied by a comprehensive understanding of the dangers of smoking behavior. Those who had failed to quit smoking tended to be more motivated to quit and more aware of the difficulty of changing their habits (Grogan, et al, 2022). The majority of the participants wanted to stop smoking. They are prepared to quit smoking if the time comes, and they have strategies to quit smoking from inside and outside themselves.

The relationship between strong self-effort and various methods will make it easier to realize the desire to quit smoking accompanied by having a strong intention to act. To successfully stop smoking, one needs a strong inner resolve. Not thinking about cigarettes, delaying buying cigarettes, and asking friends who managed to quit smoking are internal factors. Apart from such efforts, there is also a need for strong reasons why to quit smoking, such as because of health and aging.

Regarding methods for quitting smoking, participants conveyed four methods, such as chewing candy, using e-cigarettes, medical treatment, and using salt. In the cigarette industry, ammonium salt is added as a taste correction so that the nicotine intensity is well distributed (VI, H. J. C., 2023). The distraction of placing salt on the tongue can convey a taste like smoking even though you are not smoking. The physiological basis of the approach is that sulfide salts are produced when silver acetate contacts the sulfides in tobacco smoke (Cuello-Nuñez, et al, 2018). In an unlit cigarette, the nicotine is dissolved in the moisture of tobacco leaf as water-soluble salt, but in a burning cigarette, nicotine volatilizes and is present in the smoke as free

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nicotine suspended on minute droplets of tar, nicotine exists as dissociated salts (ions) (Althakfi, S. H., & Hameed, A. M, 2024). Chewing candy is widely chosen by them as a ways to quit smoking. (Lee, C. Y.,et.al, 2018; Lee, C. Y., & Chang, Y. Y, 2021).

There are six participants chose to reduce smoking every day. A strategy of limiting the number of cigarettes smoked would increase the number of addicted smokers who quit smoking and reduce the number of relapses (WHO, 2015). The rest had other strategies such as quitting completely, delaying buying cigarettes, or asking friends who had successfully quit smoking. Only one person has a strategy to ask health workers.

The reason participants have the desire to smoke is because of their health, which is in line with the existing literature (Romijnders, K. A., Van Osch, L., De Vries, H., & Talhout, R., 2018). *Perceived health risks* experienced by informants due to tobacco use, such as increasing age resulting in decreased body function, and negative health impacts, will make informants consider quitting smoking (Leppänen, A., Ekblad, S., & Tomson, 2020).

The relationship between the strategies and methods used to quit smoking is a preparation that is made to have the intention to implement smoking cessation in social support. One of the factors of preparation to quit smoking is social preparation such as limiting hanging out with smoker friends or needing a friend to hear that he wants to quit smoking. A strategy from external factors to quit smoking is needed as social support. Apart from social support, tools are also needed to stop smoking, such as chewing candy, drugs, salt, and even e-cigarettes. The relationship between strong self-effort and various methods will make it easier to quit smoking accompanied by having a self-effort to act. Not thinking about cigarettes, delaying buying cigarettes, and asking friends who managed to quit smoking are internal factors. Apart from such efforts, there is also a need for strong reasons to quit smoking, such as because of health and aging. Below is a summary table of the Intention effort to quit smoking. The efforts are as follows: seeking information about the passive smoker effect, making rules about cigarettes at home, making a commitment to stop smoking, do not leave cigarettes within reach of children, and provide continuous reminders (Nurhasana, et al., 2020) The strategy that many participants chose was to limit smoking friends or to have a few smoking friends, and the rest of them chose fasting as an attempt to try to quit smoking. Even though they are still smokers now, they are already thinking about what plans they will make if they are ready to quit smoking in the future, because individual perceptions can predict their actions, according to the Health Belief Model (HBM) (Pribadi, E. T., & Devy, 2020). The need for the role of health workers and facilities provided to help them in their efforts to stop smoking, because in this study only one informant asked for help to quit smoking (Rice, et al., 2017; Lindson, et al., 2021)

Quitting smoking is a significant decision, and for young fathers, this choice often becomes intertwined with their roles as parents and their desire to prioritize their family's well-being. The decision to quit smoking is deeply personal, but life changes, such as starting a family, can significantly influence this choice (Bridges, W., & Bridges, S. .,2019). However, the experiences of young fathers in modifying their smoking habits are equally important and warrant attention.

One of the most effective ways to encourage young men to stop smoking is the shift to parenting. Dad's stories about their successful quitting generally focus on the reasons they were motivated to quit, with many mentioning their fatherhood and wanting to put their family's health first as the main reasons. It is clear from this that parenting has a significant influence on young dads' intentions to give up cigarettes.

It's critical to acknowledge the special requirements that young fathers have when trying to give up smoking (Thirlway, F,2020). Programs for quitting smoking that are specifically tailored to this group of people can offer the support and direction they need (Rigotti, et al, 2022). Tailored treatment approaches that take into account the unique situations and obstacles encountered by young fathers have demonstrated the potential to enhance the efficacy of smoking cessation programs (Washington (DC): US Department of Health and

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Human Services; 2020). Additionally, offering young dads accessible avenues to seek support in their quest to quit smoking can be achieved through the use of digital technologies like SMS text message interventions and support in primary care settings (Zhou, et al, 2023).

Young fathers who want to quit smoking can find great help and encouragement from their family, especially from their kids (Allport, et al., 2018). Youngsters can provide useful support by taking on tasks that would cause their parents to worry when they retire, like meal preparation, errand running, or housework assistance (Townsend, P., 2023). Furthermore, creating an environment that is encouraging and helpful for young fathers who are trying to give up smoking can be achieved by acknowledging their accomplishments and providing positive reinforcement.

Tailored smoking cessation strategies for young fathers, such as culturally adapted programs, personalized treatment approaches, digital interventions, and targeted support in primary care settings, play a crucial role in effectively supporting young dads in quitting smoking. These strategies acknowledge the unique needs and challenges faced by young fathers, ultimately increasing the likelihood of successful smoking cessation. By understanding and using these strategies, young fathers can set a positive example for their children and begin the journey toward a smoke-free future. It is crucial to remember that these tactics must be customized for the Indonesian environment and attentive to cultural differences. Health promotion initiatives can effectively support Indonesian men in quitting smoking by addressing the particular obstacles faced by young fathers and utilizing their roles as fathers and providers.

CONCLUSION

A variety of factors, including social support and self-preparation, affect young fathers' experiences with stopping. By recognizing and addressing these influences, tailored solutions can be developed to effectively support young fathers in their quit journey. We can create health-promoting programs to help young fathers stop smoking if several sectors work together. Health promotion initiatives and social support for fathers who smoke to assist them in quitting can be implemented as recommendations and follow-up to this study. Health education initiatives and awareness campaigns that use a variety of platforms, such as social media, community events, and health facilities, can raise public awareness of the risks associated with smoking and the advantages of quitting.

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Smoking Behavior in Health Students in Jayapura City

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ABSTRACT

***Background**: The 2021 Global Adult Tobacco Survey (GATS) showed an increase in the number of adult smokers by 8.8 million, namely from 60.3 million in 2011 to 69.1 million in 2021. Although the prevalence of smoking in Indonesia has decreased from 1 8% to 1.6, Papua Province's percentage of smoking among the population aged ≥ 15 years from 2021-2023 is 24.91%, decreasing to 22.22% in 2023 to 22.3%. **Aims**: This research is to determine the perception of smoking among health students in Jayapura City. **Method**: The research used a descriptive survey with samples from 100 health students from various universities in Jayapura City, the research location, from June to September 2023. Data were collected using a questionnaire consisting of several questions. The data were analyzed univariately, displayed in table form, and narrated. **Results**: There were 34 respondents (34%) smoking activities and 66 respondents (66%) who did not. This type of cigarette is smoked 100% cigarettes. The number of cigarettes smoked was 4-6 cigarettes; there were 25 respondents (73.5%) and nine respondents (26.5%) 7-10 cigarettes. Twenty-nine respondents (85.3%) smoked outdoors, and five respondents (14.7%) were indoors. Length of smoking ≥ three years, there were 30 respondents (88.2%), and for less <than one year, there were four respondents (11.8%). The reason for smoking was to relieve stress for 25 respondents (73.5%) and for hanging out with friends for nine respondents (26.5%). Plans to stop smoking: 27 respondents (79.5%) and 7 respondents (20.5%) did not stop smoking. **Conclusion**: It can be concluded, that the reason for smoking is because of stress and having many problems, but more respondents want to stop smoking. Efforts and good intentions can stop smoking among health students as agents of societal change.*

***Keywords**: Behavior, Jayapura, Smoking, Student Health.*

INTRODUCTION

Non-communicable diseases (NCDs) have been part of the double burden of epidemiology for the last few decades and tend to increase. The high rate of morbidity with the burden of medical costs, which are not cheap, as well as the high rate of death or disability that it causes, makes this disease a priority disease that must be addressed. One of the main risk factors for NCDs that can be changed and greatly contribute to the incidence of several non-communicable diseases is tobacco use and smoking habits (Ministry of Health of the Republic of Indonesia, 2022).

The smoking habit is a form of smoking tobacco, which is a major risk factor for cardiovascular disease and respiratory tract disease and the cause of more than 20 types of cancer and other health problems (Handayani, 2023). Based on the 2020 World Health Organization (WHO) report, 22.3% of the world's total population uses tobacco, including 36.7% men and 7.8% women. Of the total 1.3 million tobacco users worldwide, more than 80% live in countries with low and middle economic levels. Tobacco use has an impact on the economic condition of the family because smokers prioritize spending on buying cigarettes over fulfilling food and adequate shelter as basic human needs. If this condition is left for a long time, it will result in poverty (WHO, 2022).

Smoking habits in Indonesia are alarming. The prevalence of smoking among adult men is 62.9%. This puts Indonesia third in the world, after India and China, as the largest cigarette users. Likewise, the prevalence of smoking among adolescents aged 10-18 years has increased. In 2013, the prevalence of smoking in adolescents (10-18 years) was

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7.2%, and in 2018 it was 9.1% (Fauzi, 2017).

The percentage of smoking in the age group > 15 years in Papua Province since 2020-2022 has decreased, namely from 24.91 to 22.22, but in the adult age group, it has increased (BPS, 2022). The Jayapura Indonesian Abdi Sehat Foundation (YASIN) survey in 2020 showed that 34.9 percent of students in Jayapura City smoked. Around 50 to 70 percent of this figure is high school students. (Yasin, 2020). In 2020, the smoking situation among students showed data of 34.9; this smoking activity continues with students moving from high school to university in Jayapura City. The total population in Papua province is 1,774,690 men and 1,604,612 women spread across all districts and cities in Papua. The number of students in the city of Jayapura who are in tertiary institutions at the Bachelor level is 127,808 people, and those at the Diploma III level are 17,647 people (Papua Health Profile, 2019). PTM needs serious treatment to protect the public from the dangers of PTM; Jayapura city has PTM data for Asthma at 3.51%, Diabetes Mellitus at 1.80%, Heart at 0.59%, Hypertension 7.77%, Stroke 0.70% for 4.24% of patients with student status, 0.11% with kidney failure, 0.03% with student status and 14.19% with joint disease and 2.89% of patients with student status. (Riskesdas Papua, 2018).

Based on preliminary observations carried out by researchers in January-March 2023 at several universities in Jayapura City, smoking is one of the habits carried out by students on campus and outside campus. The smoking habit occurs among students when sitting together with friends while doing work.

On assignments or when relaxing in cafes or campus canteens. Smoking activity also occurs among health students, even though, as health students, they should be more careful about their behavior by not smoking, in reality, there are still healthy students who smoke. Research by Jarelnape in 2022 on medical students in Sudan showed that the prevalence of smoking was 48.8% (41.1% in men and 7.7% in women). In total, 76.8% reported daily smoking of 5–10 cigarettes per day. In terms of students' beliefs about smoking, 86.8% disapproved of selling cigarettes at universities. Of these respondents, 68.4% did not approve of smoking on campus. This research proves that there are still healthy students who smoke. As an agent of change, smoking activity must be stopped so that it does not have an impact on society. With the description of the problem that has been presented, further research is needed on the perception of smoking among health students in the city of Jayapura. This research aims to determine the perception of smoking among health students.

METHODS

Descriptive survey research is research conducted to determine the value of independent variables, either one or more variables (independent), without making comparisons or connecting one variable with another variable. According to (Adiputra, 2021). The data source for this research uses primary data sources, data directly obtained from respondents, while secondary data comes from journals and the results of the same research. The research was conducted from April to July 2023. The research was conducted at 15 state and private universities Jayapura. The sample in this study consisted of 100 students using the Slovin formula. The sample was taken using a random sampling technique.

The research used seven closed questions, which respondents answered. The data is processed using univariate analysis to provide information on the questions asked in the questionnaire. Data is presented in table form and narrated according to the research objectives. This research maintains the confidentiality of the information provided by respondents; the information provided is only used for research purposes with research ethics issued by FKM with no. 044/KEPK-FKM UC/2023

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Smoking Perceptions among health students in Jayapura City

Smoking	N	%
Yes	34	34
No	66	66
Total	**100**	**100**

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Table 1 shows that there are 34 respondents (34%) of health students who smoke, while there are 66 respondents (66%) of health students who do not smoke.

Table 2. Frequency Distribution of Smoking Perceptions among health students in Jayapura City

Variable	N	%
Type of cigarette		
Cigarettes	100	100
Many Cigarettes smoked one day		
4-6 stems	25	73,5
7-9 stems	9	26,5
Smoking Place		
Indoor	29	85,3
Outdoor	5	14,7
Long time smoking		
≥ 3 years	30	88,2
< 1 years	4	11,8
Reasons for smoking		
Overcoming stress	25	73,5
Get together with friends	9	26,5
Plan to quit smoking.		
Yes	27	79,5
No	7	20,5
Total	**34**	**100**

Success for a country can be seen from the quality of the nation's youth; young people have a big role in any changes that occur in the social environment, especially "students" who are called "agents of change." As the name suggests, as agents of change, students must play an active role in helping build this nation. Many positive things can be done, such as producing scientific works that can be useful for society, playing an active role in society, being a good role model for society, and other productive things (Andika, 2021)

Smoking is a form of smoking tobacco, which is a major risk factor for cardiovascular disease, respiratory tract disease, and the cause of more than 20 types of cancer and other health problems (Handayani, 2023). 34 respondents smoked among health students in the city of Jayapura, which means that smoking also occurred among health students. Health students should be a generation of quality in all aspects of their lives because health students can become health leaders in society, become role models for society, and develop the concept of empowerment in the health sector; with active smoking activities it will certainly influence them in implementing a healthy living paradigm.

Smoking not only has an impact on active smokers but also on the environment (Seroyadji, 2024). Research conducted by Granados PS and friends states that an estimated 766,571 tons of cigarette butts pollute the environment every year. Likewise, data released by the World Health Organization WHO (World Health Organization) in 2022 states that every year the tobacco industry has resulted in losses of 8 million human lives, 600 million trees, 200,000 hectares of land, 22 billion tons of air, and produce 84 million tons of carbon dioxide (CO2). The environmental impact due to cigarettes smoked by health students is 100% the type of cigarette, where cigarette butts are thrown away in any place and pollute the environment. The type of cigarette smoked is by the type of cigarette produced in Indonesia and distributed throughout Indonesia namely Cigarette production consists of 3 types: Hand-rolled Clove Cigarettes (SKT), Machine-Made Clove Cigarettes (SKM), and Machine-made White Cigarettes (SPM). The most widely produced cigarettes are machine-made kretek cigarettes (SKM). Machine-rolled Kretek Cigarettes (SKM) increased from 2011-2018 by 26.3% (TCSC, 2022).

The maximum number of cigarettes smoked by respondents was 4-6 cigarettes per day; in 1 cigarette, there are 400 types of chemical compounds, 400 dangerous substances, and 43 substances that cause cancer (carcinogenic). Carbon monoxide (CO), a poisonous gas, reduces oxygen levels in the blood, thereby reducing concentration and the emergence of dangerous diseases. Tar is a dangerous substance that causes cancer (carcinogenic) and various other diseases (P2PTM, 2022). The results of this study show that the respondents' bodies contain dangerous substances that are at risk. One of the biggest risk factors that cause lung cancer is smoking (Prasetio et al, 2019). Apart from that, other research conducted by Lipfert (2019) proves that smoking is the biggest trigger for lung cancer, where there is a tendency for people who actively smoke to be at higher risk of developing lung cancer. Around 85% - 90% of lung cancer sufferers are caused by active smoking habits. Smoking is a habit that can damage health and can

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cause various diseases, which can result in morbidity and mortality, where the Crude Death Rate (CDR) can be used as a mortality parameter (Dodi, 2021).

The number of cigarettes smoked in 1 day and the length of time the respondent smoked shows that the respondent had consumed 5475 cigarettes in 3 years; the longer the respondent smoked, the more cigarettes the respondent had smoked. A greater perception that smoking is dangerous is associated with a greater likelihood of being a non-daily smoker (Anas SR, 2022) where non-daily smokers generally perceive their smoking habit to pose less of a health hazard compared to a daily smoking habit. The logic of minimizing or quitting smoking as a strategy to minimize or reduce harm is supported by a large body of research showing that the association between smoking and many diseases becomes stronger the more cigarettes are smoked each day (i.e., a dose-response relationship) (Schane RE, 2009).

Smoking activities are carried out outside, but there are still people who smoke inside the house. The danger of smoking inside the house is that cigarette smoke does not disappear for up to 3 hours, and the residue can stick to various equipment in the house, such as carpets, walls, clothes, etc. Smaller smoke particles make it very easy to move from one room to another, even if the door is closed. The smoke that comes from the smoker's breath will stick to clothes, hair, skin, and other things on the bodies of other family members, so it will be carried wherever they go (Ministry of Health of the Republic of Indonesia, 2023).

Experiencing stress and the problems they face, smoking becomes one of the activities to eliminate these feelings. The nicotine in cigarettes makes it feel delicious and addictive to keep smoking and gives momentary pleasure when smoking. Nicotine has the effect of causing addiction because it can bind to nicotic acetylcholine receptors found in nerves in the brain. Activation of this nerve will result in the release of dopamine. Dopamine in the brain increases, thereby strengthening brain stimulation and activating the reward pathway, namely the regulation of feelings and behavior caused by certain mechanisms in the brain. This is what creates the desire to use nicotine again and triggers physical nicotine dependence to occur quickly and violently. Apart from that, dopamine is a chemical compound produced by the body that balances feelings of pleasure, joy, motivation, and self-confidence in humans. This effect is desired by smokers, which causes addiction. So, if someone consumes cigarettes continuously, it will increase dopamine levels in the body, which results in a feeling of addiction (Prasetyo, 2019).

Planning to stop smoking was the most frequent choice of respondents in this study. According to WHO in the Health Promotion Book, behavior change carried out through planning is one of the behavior change strategies. To design effective smoking cessation interventions, the effectiveness of delivering smoking cessation recommendations is of concern. According to the transtheoretical model. (Emadzadeh M, 2020 and Owusu, 2020) Individuals begin the change process during the "pre-contemplation" stage. Next, the individual enters and moves through the "contemplation," "preparation," and "action" stages before reaching the "maintenance" stage. This model reveals how interventions influence the behavior change process. The unique cyclical characteristic of the transtheoretical model focuses not only on reflection in taking action but also on change moving in the opposite direction. Also, it describes the hesitations and actions associated with quitting smoking well. According to this model, each stage can be differentiated, and the timing of certain changes in attitudes, intentions, and behavior can be explained (Emadzadeh M, 2020 and Owusu, 2020). However, its applicability to specific populations must be further verified.

CONCLUSION

The behavior of smoking among health students is that the activity of smoking tobacco rolled in paper or cigarettes is 100%, the number of cigarettes smoked is 4-6 in 1 day, respondents have been smoking for more than three years, while most smoking activities are done outdoors. The reason for smoking is because of stress and having many problems, but more

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respondents want to stop smoking. Efforts and good intentions can stop smoking among health students as agents of societal change.

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Strengthening Tobacco Consumption Control Policies: Program Integration for Social Assistance Recipients in Indonesia

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ABSTRACT

***Background**: The prohibition on using social assistance funds for purchasing cigarettes has been stipulated in the Minister of Social Affairs Decree Number 175 of 2022. However, the primary goal of this program to improve community welfare is threatened as this misuse persists. **Aims**: This study aims to analyze the challenges and obstacles in implementing the policy to control cigarette consumption among social assistance recipients and to identify integrated priority programs across sectors. **Methods**: This qualitative study employs a case study approach. Data were collected through in-depth interviews and focus group discussions with informants representing central governments, regional governments, and social assistance officers. The interviews were then analyzed using SWOT analysis to formulate strategies and identify the priority program. **Results**: The analysis reveals that cross-sector collaboration is a key strength for reinforcing cigarette consumption control among the recipients. This is implemented through the Family Capability Improvement Meeting (P2K2), involving healthcare workers who educate the dangers of smoking and establish Smoking Cessation Service Clinics (UBM). The proposed priority program integrates the social assistance program with UBM clinics to help recipients quit smoking. **Conclusion**: The study concludes that strengthening this policy requires comprehensive program integration with multi-sector involvement. This enhancement also necessitates stronger central regulatory support through the Government Regulations as derived from Health Law Number 17 of 2023. Strengthening this policy is expected to contribute to achieving the SDGs by improving community health and quality of life,* and alleviating poverty through improved effectiveness of the social assistance program.

***Keywords**: Poverty alleviation effort, Smoking cessation program, Social assistance, Social welfare improvement, Tobacco consumption control.*

INTRODUCTION

Social assistance programs are a crucial strategy implemented by the government to address poverty and enhance community welfare in Indonesia. The Indonesian government has carried out several social protection programs through social assistance, such as the Family Hope Program (PKH), Non-Cash Food Assistance (BPNT), Indonesia Smart Program (PIP), and recipients of the National Health Insurance (JKN) (The World Bank, 2020). According to the mandates of Law Number 11 of 2009 on Social Welfare and Law Number 13 of 2011 on the Handling of the Poor, the state is obligated to provide social protection for citizens in economically weak and vulnerable conditions to meet their basic needs (Republic of Indonesia, 2009; Republic of Indonesia, 2011).

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However, despite the implementation of various social assistance programs, there are still significant challenges in their execution. Several studies indicate that there is an increase in cigarette consumption among social assistance recipients, which can threaten the effectiveness of these programs (Dartanto et al., 2021; Milcarz et al., 2017; Simanjuntak & Jinnai, 2021; White & Basu, 2016).

To address this issue, President Joko Widodo and the Ministry of Social Affairs, through the regulation of the Minister of Social Affairs Decree Number 175 of 2022 on Tobacco Consumption Control within the Ministry of Social Affairs, have emphasized the importance of prohibiting the use of social assistance funds for purchasing cigarettes (Firmansyah, 2017; Putri, 2021). However, this policy still faces various challenges. The relatively low cost of cigarettes, averaging Rp30,000 per pack, and the availability of single cigarettes for as low as Rp2,000 per stick, pose significant issues (Nurhasana, Hartono, et al., 2022). Additionally, the high density of cigarette kiosks around residential areas increases accessibility for the public (Hartono, Meirawan, et al., 2021). Another challenge arises from the exposure to cigarette advertising, promotion, and sponsorship (TAPS), which significantly influences smoking behavior in the community (GATS, 2021). Furthermore, there are still instances of social assistance officers smoking, even in the presence of social assistance recipients (Nurhasana et al., 2023).

The National Socioeconomic Survey (Susenas) indicates that tobacco consumption predominantly stems from impoverished communities (Susenas, 2019). The repercussions of income expenditure on cigarette purchases include impoverished families, wherein household members who smoke tend to diminish family nutritional consumption, as income intended for household necessities, child nutrition, healthcare, and education is redirected to prioritize cigarette purchases (Dartanto et al., 2021). Parents exhibiting smoking behaviors result in a heightened risk of stunting in children due to insufficient nutritional fulfillment during gestation (Dartanto et al., 2019). Women within impoverished families are vulnerable to being victims of cigarette smoke exposure, leading to various illnesses (Reitsma et al., 2021). Further studies also indicate that a 1% increase in cigarette expenditure elevates the likelihood of poverty by 6% in households (Dartanto et al., 2018). Conversely, the state bears the burden of greater healthcare costs due to smoking-related illnesses (CISDI, 2021).

The negative impact of tobacco consumption on social assistance recipients creates an urgency to integrate tobacco control measures across various levels, ranging from households to the broader community environment. The phenomenon of allocating social assistance funds to prioritize cigarette purchases over more pressing basic family needs indicates the need for a reassessment of supervision mechanisms and education regarding the use of social assistance in Indonesia.

To ensure the optimal implementation of Ministry Social Affairs Decree Number 175 of 2022 at the regional level, the reinforcement of this policy requires stronger central regulatory support. The implementation of Government Regulations (PP) as derivatives of Health Law No. 17 of 2023 could be a crucial step in providing a solid legal foundation for tobacco consumption control among social assistance recipients. This step aligns with Sustainable Development Goals (SDGs) targets 1 and 3, aiming at poverty alleviation by maximizing the use of social assistance funds for their intended purpose, as well as enhancing the welfare and health of the population. By reducing tobacco consumption among social assistance recipients, the government can help improve their well-being and mitigate the risks of smoking-related diseases. Therefore, this research aims to analyze the policy challenges in tobacco consumption control among social assistance recipients and formulate strategies to identify priority programs that can be integrated with multi-sector involvement as a policy-strengthening measure.

METHODS

This qualitative study employs a case study approach, conducted in two stages of data collection. The first stage

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involved in-depth interviews with selected informants, while the second stage employed Focus Group Discussions (FGD) with government representatives. Informants were purposively selected based on adequacy and relevance, comprising representatives from the Commission VIII of the Indonesian House of Representatives (DPR RI), the Directorate of Poverty Reduction and Community Empowerment of the Ministry of National Development Planning (Bappenas), the Directorate of Social Security Protection of the Ministry of Social Affairs, as well as the Social Services Departments of Depok City and Bogor District, and social assistance officers. The analysis results were formulated into strategies adoptable by the government, which were then subjected to feedback through FGDs with government informants. All data collection processes, including in-depth interviews and FGDs, were audio-recorded upon obtaining consent from the informants.

The conceptual framework of this study applies a systemic approach comprising input, process, and output factors. Input variables encompass factors such as infrastructure, funding, personnel, relevant institutions, socialization, and policy/regulatory oversight related to tobacco consumption control among social assistance recipients. Process variables include external barriers (cheap cigarettes, loose cigarettes, and cigarette advertising) and internal variables (reward systems for non-smoking recipients and sanctions for smoking recipients). Output variables comprise priority strategies and proposed priority programs for tobacco consumption control in the future.

The data analysis commenced with the transcription of audio interviews followed by inter-informant source triangulation. Data were presented by showcasing interview excerpts. This study employed SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) utilizing the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) approaches. Before the Focus Group Discussion (FGD), Indonesian government informants were administered a questionnaire to prioritize strengths and weaknesses as internal factors, as well as opportunities and threats as external factors. Feedback from the SWOT analysis to stakeholders through the FGD yielded SWOT priorities, strategies, and programs.

To establish the ranking order, responses were quantified using the PCI formula (Perceived Consensus Index) to measure the level of agreement or consensus among informants regarding a piece of information within the formula (Jahan et al, 2022):

PCI = (Pvh x 4) + (Ph x 3) + (Pm x 2) + (Pl x 1) + (Pn x 0)

Pvh: Number of informants strongly agreeing with the information; Multiplied by 4: This gives the highest weight, indicating that "strongly agree" responses have the greatest impact on increasing the PCI value.

Ph: Number of informants agreeing with the information; Multiplied by 3: This gives a high weight, but not as high as "strongly agree". This weight indicates that "agree" responses are also important, but less so than "strongly agree".

Pm: Number of informants expressing neutrality towards the information; Multiplied by 2: This gives a moderate weight, reflecting that neutral responses have a moderate impact on the PCI value.

Pl: Number of informants disagreeing with the information; Multiplied by 1: This gives a low weight, indicating that "disagree" responses have a small impact on the PCI value.

Pn: Number of informants strongly disagreeing with the information; Multiplied by 0: This gives zero weight, meaning that "strongly disagree" responses do not contribute to the PCI value.

Each category of response has a different weight, reflecting the level of agreement among informants regarding the given information. These weights are then multiplied by the number of informants providing each response. The results of these multiplications are then summed to obtain the PCI value.

In addition, before we conducted the fieldwork, we requested permission for surveys in three cities (Jakarta, Depok, and Bogor) from the Ministry of Home Affairs. The permit number is 045/UN2.F13.D2.UKK4.1/PPM.01/2022.

RESULTS AND DISCUSSION

The findings of this research analyze the challenges and obstacles of

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tobacco consumption control policies among recipients of social assistance in Indonesia. These challenges and obstacles are categorized into internal and external aspects.

A. Input of tobacco consumption control plans for social assistance recipients

Resources

Controlling tobacco consumption among social assistance recipients involves the central government, local governments, and social assistance program facilitators. Despite the deployment of volunteers from the central government, the number of volunteers remains significantly lower compared to the number of individuals requiring assistance.

> *"We need resources to come down/set from the Center. Social assistance officers should be under the scope of the Central Government. In the regions, there aren't enough resources to monitor tobacco control." (Social Service of Depok City, November 2022)*

> *"In Pancoran Mas Subdistrict, there are 3 people to assist 1,100 social assistance recipients." (Social Assistance Officer, Depok City, November 2022)*

> *"...maybe we still need a lot more human resources..." (Social Assistance Officers, Bogor District, December 2022)*

Monitoring and Evaluation

The limitation in the quantity of these resources creates constraints in monitoring the utilization of social assistance funds and hinders the evaluation process.

> *"...we could do it, but then we'd have to put in extra effort for monitoring." (Ministry of Social Affairs, December 2022)*

> *"(regarding the use of social assistance funds to buy cigarettes). We can't confirm the actual conditions. It's beyond our reach. We also don't know and haven't received any reports that when the household receives money, the husband (head of the family) asks to buy cigarettes." (Social Service of Bogor District, December 2022)*

Reward and Punishment System

This study also explores the potential implementation of a reward and punishment system in enforcing the prohibition of cigarette product purchases from the perspective of stakeholders. Several informants expressed that the implementation of this system could be conducted under certain conditions or stipulations, such as clarity in supervision, as conveyed in the following quotation:

> *"Incentive systems can be implemented if there's clear oversight; without it, enforcing sanctions becomes challenging. The current sanctions primarily involve withholding assistance if the funding is from the local area." (Social Service of Depok City, November 2022)*

> *"The budget for social assistance spending, especially for PKH, is indeed substantial. The last figure I knew was around 28 trillion... considering future needs, it still seems insufficient. Adding rewards would mean additional funds; we believe there are still a few other priority areas currently untouched." (Social Service of Bogor District, December 2022)*

B. Process in controlling cigarette consumption among social assistance recipients

Cigarette Price Aspect

The majority of stakeholders, both at the central and regional levels, acknowledge that cigarette prices are still relatively low.

> *"...the price of cigarettes in Indonesia should be high so that small communities can't afford to buy them. We hope that cigarette taxes will increase by 40-60 to 20% each year, but 10% is given by the state, so if the cigarette price is 100,000 or 60,000, people will stop. The Ministry of Health supports this." (Ministry of Health, January 2023)*

Another issue to be noted in cigarette sales is the problem of loose cigarette sales. When the price per pack of cigarettes increases but can still be

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purchased per stick, it still opens the possibility for cigarettes to be bought by lower to middle-income groups.

> *"The price of cigarettes is quite cheap and can be bought individually, making it very affordable. Some of those we interviewed during the PKH beneficiary household survey work as motorcycle taxi drivers, and they can easily buy at least 4-5 sticks a day at individual prices." (Ministry of National Development Planning, December 2022)*

The variation in cigarette prices contributes to hindering the control of smoking behavior, particularly among lower to middle-income populations, as indicated by the following excerpt:

> *"...in the village areas, until today, yesterday the price of cigarettes went up again, those familiar brands are now in the 30s (thousands of Rupiah) and even nearly reaching 50 (thousands of Rupiah), but those cheap cigarettes suddenly emerged, I don't know what brand they are, so now people who couldn't afford them before have the opportunity to buy." (Indonesian House of Representatives, January 2023)*

Non-Price Aspect

In addition to the price and bulk sales of cigarettes, cigarette advertisements in nearby stalls become a factor that enables lower-middle-class citizens to buy cigarettes. The presence of advertising media in community stalls, according to informants, is installed without obtaining permission from local authorities.

> *"There's a possibility that cigarette advertisements displayed in neighborhood shops influence smoking behavior, including among social assistance recipients." (Social Assistance Officer, Depok City, November 2022)*

The limited dissemination of information about the prohibition of using social assistance funds to purchase cigarettes in local areas hinders the optimal implementation of the policy. It requires dissemination reaching various parties, both internal and external to the government/the Ministry of Social Affairs so that the policy can be implemented more effectively.

> *"The bureaucracy process is quite long, including the delivery of information about this new Minister of Social Affairs decree. The letter/regulation can take days in the province or region, so it can't be immediately executed at the regional level." (Social Assistance Officer, Depok City, November 2022)*

The Importance of Involvement from Various Cross-Sector Collaborations

This study also examines the involvement of existing cross-sector collaborations and the potential for future collaborations to better disseminate tobacco control policies among social assistance recipients. Social assistance officers have collaborated with community groups such as the Family Welfare Empowerment (PKK). Future collaborations needed include cooperation between the Ministry of Health and the Ministry of Social Affairs in establishing Standard Operating Procedures (SOP) stipulating that social assistance recipients must participate in the Smoking Cessation Service Program (*Upaya Berhenti Merokok*/UBM) to continue receiving social assistance.

> *"Well, there's a presidential instruction about the healthy living campaign, you can check it in Presidential Instruction Number 1, which it outlines the tasks of the Ministry of Social Affairs, all these tasks fall under one umbrella, meaning that the movement (can be utilized to) mobilize the community for healthy living... it's just not happening." (Ministry of Social Affairs, December 2022)*

C. Output of Tobacco Consumption Control among Social Assistance Recipients

SWOT Prioritization

Based on interviews conducted with the informants, assessments of strengths, weaknesses, opportunities, and threats were obtained and ranked as presented in Table 1.

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Table 1. SWOT Prioritization Lists

Strengths Priority	*Opportunities Priority*
1. There exists a health material on tobacco consumption control within the framework of Family Capacity Building Meetings (*Pertemuan Peningkatan Kemampuan Keluarga*/P2K2) 2. There is a requirement that cash assistance is distributed non-cash. 3. Non-cash Food Assistance (*Bantuan Pangan Non-Tunai*/BPNT) is provided in the form of vouchers that can only be redeemed at designated agents. 4. Regulations stipulate that e-wrongs or social assistance agents are prohibited from selling tobacco products. 5. The Department of Social Affairs mandates that social assistance officers must sign a declaration stating their non-smoking status while on duty.	1. The opportunities for cross-sector collaboration within the Ministries/Agencies. 2. The presence of clear directives prohibiting smoking among participants of the Regional Health Insurance Beneficiaries (PBI) program. 3. Coordination between schools and social assistance officers to monitor smoking behavior among recipients of the Family Hope Program (PKH). 4. The National Medium-Term Development Plan (RPJMN) mandates that social assistance funds are not utilized for purchasing cigarettes. 5. Collaboration with the Family Welfare Development (PKK) in overseeing the utilization of social assistance funds.
Weaknesses Priority	***Threats Priority***
1. The difficulty in obtaining evidence of cigarette purchases from social assistance funds. 2. The absence of technical guidelines under Minister of Social Affairs Decree Number 175 of 2022. 3. The lack of prohibition on smoking for social assistance officers in their assignment letters. 4. Lack of social assistance officers to monitor smoking behavior in beneficiary families 5. Budgetary constraints in implementing direct monitoring systems. 6. Smoking behavior, considered private within households, has not yet been recognized as abnormal behavior among social assistance recipients.	1. The price of cigarettes remains low. 2. Cigarettes are still available in loose or unpackaged form, sold at very low prices. 3. The affordability of cigarettes persists among economically disadvantaged communities. 4. There are many cigarette advertisement posters in local shops.

Strategy Prioritization

The results of the prioritization analysis of the SWOT Table 4 yielded SO strategies, ST strategies, WO strategies, and WT strategies. These prioritized strategies are proposed to be utilized in strengthening the policy on tobacco consumption control among recipients of social assistance, which can subsequently be integrated into a prioritized program.

Table 2. Strategy Prioritization

Strategy Prioritization (n= 8 informants)	Score	Priorities
SO Strategy: Enhancing tobacco consumption control among social assistance recipients through collaboration with cross-sectoral healthcare services.	32	1
ST Strategy: Advocating for price increase policies and minimizing cigarette price variations.	31	2
WO Strategy: Implementing a ban on single cigarette sales and tightening regulations on cigarette pack sales.	30	3
WT Strategy: Enhancing surveillance of cigarette spending among beneficiary families through more technical regulations.	29	4

The SO strategy in Table 5 indicates that cross-sectoral collaboration is a priority strength in achieving tobacco consumption control among social assistance recipients in Indonesia. This collaboration entails cooperation between healthcare workers in providing education regarding the dangers of smoking during Family Capacity Building Meetings (P2K2). Healthcare workers can also conduct outreach to Beneficiary Families to encourage them to visit Smoking

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Cessation Service Clinics (UBM) where they can receive consultations on quitting smoking.

Integrating the Social Assistance Program and Smoking Cessation Service Program

One of the programs of the Ministry of Health is the Smoking Cessation Service Clinic (UBM), which can be one of the methods for controlling tobacco consumption among social assistance recipients. The government can add a requirement to the eligibility for social assistance, namely evidence of visits by smoking social assistance recipients to UBM clinics. Certificates from visits to UBM clinics by smoking social assistance recipients can serve as proof for the disbursement of social assistance funds.

The proposal for integrating social assistance with UBM is also supported by the presence of UBM clinic facilities and supporting equipment in most primary healthcare centers. Additionally, the O_2 capacity tests at UBM clinics do not require significant costs.

Respondent's Feedback on Priority Programs

The Ministry of Social Affairs and the Ministry of Health strongly support the implementation of integrating UBM programs for social assistance recipients. However, restrictions on advertising and the sale of single cigarettes, as well as increasing cigarette prices to reduce affordability for the public, still need to be pursued by the government.

"For UBM clinics, integration with the local Health Office is possible, for example, it could be piloted in Bogor Regency. This is applicable and how the collaboration between the Social Affairs Office and the Health Office can be realized, as it is the role of the local government that understand the characteristics of the region." (Ministry of Social Affairs, February 2023)

> *"If they smoke, it is proposed that they participate in smoking cessation programs." (Ministry of Health, February 2023)*

The phenomenon of cigarette consumption among social assistance recipients in Indonesia necessitates comprehensive efforts to mitigate recurring occurrences in the future. However, the implementation of these efforts still encounters various barriers and challenges. First, there is a constraint in the limited Human Resources (HR) capacity that has not been equipped with effective coaching and mentoring efforts related to tobacco consumption control among social assistance recipients, making it difficult to change their smoking behavior (Taher & Syakurah, 2023). Consequently, social assistance recipients lack an effective understanding of the dangers of smoking and the importance of utilizing social assistance for basic needs (Dartanto et al., 2021). To address this issue, one solution that needs to be implemented is increasing the number of trained HR in tobacco control programs. By enhancing the capacity and quantity of HR involved, it is hoped that coaching and mentoring for social assistance recipients can be carried out more effectively.

Second, the significantly higher number of social assistance recipients compared to the number of officers also poses a challenge in regularly monitoring and evaluating the progress of smoking behavior among social assistance recipients (Kock et al., 2019). Inadequate monitoring leads to a lack of accurate and comprehensive data on the pattern of assistance fund utilization. Without this data, it is difficult for the government and other stakeholders to obtain a clear picture and evaluate the effectiveness of implemented social assistance programs (Helms et al., 2017). Suboptimal evaluation also means that issues such as the use of assistance funds for purchasing cigarettes may continue without appropriate intervention.

Third, the development of incentive and sanction mechanisms for social assistance recipients should be carried out to address this issue. Social assistance recipients who use the funds for essential needs should be rewarded. On the other hand, recipients who are found to misuse the assistance funds for non-essential purchases, such as cigarettes, should face strict sanctions. However, the implementation of this system certainly requires careful planning and consistent execution to encourage positive behavior from the assistance recipients and serve as a strong motivation for them to maintain compliance. This system can

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also improve household consumption in a better direction (Septiandika & Septiana, 2021).

Furthermore, concerning the aspect of pricing, one strategy to reduce cigarette consumption is through increasing cigarette prices. Cigarette prices in Indonesia are relatively low compared to middle-income countries such as Bangladesh, Brazil, India, Malaysia, the Philippines, Thailand, and Vietnam (PEBS UI, 2018). The average price of cigarettes in Indonesia still ranges around Rp30,000 per pack, and cigarettes can still be purchased individually at a very cheap price of Rp2,000 per stick (Nurhasana, 2022). This factor facilitates access to cigarettes, particularly encouraging increased cigarette consumption among social assistance recipients.

Studies indicate that increased cigarette consumption among social assistance recipients results in reduced allocation of funds for other basic family needs, such as nutritious food, education, and healthcare, and may lead to increased economic burden on families (Dartanto et al., 2021). Price hikes have a significant effect on smoking behavior, particularly among young men (Robertson, 2017). A price increase of Rp70,000 per pack leads to a 74% increase in smokers' interest in quitting (Nurhasana, Ratih, et al., 2022).

One of the strategies to increase prices is through tobacco tax hikes. Price increases would have a greater impact on smokers with lower socioeconomic status (Brown et al., 2014), and raising tobacco taxes can suppress the purchasing power of the population for cigarettes (Goodchild et al., 2016). Additionally, the government should also consider banning the sale of single cigarettes to deter easy access to tobacco products, including among children and adolescents. Without the option of purchasing single cigarettes, individuals would be forced to buy cigarettes per pack or at a higher price. This is expected to reduce cigarette consumption rates, particularly among the impoverished (Guindon & Chaloupka, 2016).

In terms of non-price factors, the prevalence of tobacco advertising, promotion, and sponsorship (TAPS) also significantly contributes to increased cigarette consumption among social assistance recipients. Exposure to advertising increases the likelihood of someone starting smoking and reduces the chances for smokers who want to quit (Hartono et al., 2023). Aggressive and persuasive TAPS strategies by the industry often use glamorous images to attract public attention, particularly adolescents (Dewhirst, 2019). TAPS for tobacco products should be banned to protect children and adolescents (Alasqah et al., 2019; Hartono, 2023). Prohibition of TAPS is essential to reduce the appeal of cigarettes to children and adolescents, inhibit marketing efforts targeting these age groups, and minimize exposure to messages that glorify tobacco use (Satpathy et al., 2021; Shang et al., 2016).

The strategy of integrating cross-sectoral programs, specifically social assistance programs and UBM clinics, represents an effective and innovative endeavor to optimize the objectives of both initiatives. Priority programs involving multiple sectors will necessitate robust coordination and synergy among the Ministries/Agencies involved to ensure successful and sustained implementation across all regions of Indonesia consistently. This is inspired by Poland's achievement in motivating over half of social assistance recipients to cease smoking through a smoking cessation program (Milcarz et al., 2017).

Therefore, programs aimed at preventing the misuse of social assistance funds for the purchase of cigarettes, as stipulated in Minister of Social Affairs Decree number 175 of 2022, need to be continually promoted and enforced at the regional level. The integration of programs supported by policy reinforcement can ultimately align with the SDGs' objectives to support poverty alleviation and ensure healthy lives and social well-being for all. To address these barriers and challenges, the government needs to issue comprehensive regulations regarding tobacco consumption control, through the Government Regulation as a derivative regulation of Health Law No. 17 of 2023, as a means of strengthening policies for controlling tobacco consumption among social assistance recipients in Indonesia.

CONCLUSION

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Social assistance recipients or beneficiary families still have easy access to cigarettes because they are available in loose form, there are cheaper cigarette options, and tobacco advertising, promotions, and sponsorships (TAPS) displayed in shops attract attention to purchase cigarettes. The implementation of Minister of Social Affairs Decree Number 175 of 2022 faces significant challenges due to limited resources for monitoring at the local level and various external constraints. Priority strategies to control cigarette consumption among the recipients include cross-sectoral collaboration optimized during Family Capacity Building Meetings (P2K2), increasing visits to UBM Clinics by social assistance recipients, simultaneously advocating for price increases, prohibiting the sale of loose cigarettes, minimizing cigarette price variations to make them less affordable, and banning cigarette advertising, promotions, and sponsorships across various media.

Furthermore, comprehensive educational efforts are needed to raise awareness about the negative impacts of cigarette consumption, from household settings to the broader community environment, to foster mutual awareness and concern in reminding each other of the primary needs for using social assistance funds.

The government needs to ensure that tobacco consumption control policies not only focus on regulatory aspects but also integrate effective educational and awareness programs. Law enforcement should be regulated through Government Regulations as derivatives of Health Law Number 17 of 2023, especially strengthening control over addictive substances, to ensure that the regulations implemented have reliable enforcement. This implementation is also key to supporting the achievement of Sustainable Development Goals (SDGs) in Indonesia, particularly in achieving good health and enhancing the well-being of all age groups, as well as poverty alleviation efforts. Additionally, it can make a significant contribution to global tobacco control efforts.

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Statistics of Perception Role Ulama on Smoke-Free Policy: Can Implementation of Banda Aceh City?

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ABSTRACT

***Background**: Smoking control policies' effectiveness requires all parties' active role. In Aceh, as a region that implements Islamic law, religious leaders and ulama are an important part of the success of a policy, including the smoke-free area (SFA) policy. There is no research yet related to the ulama's involvement and role in Banda Aceh's SFA policy. **Objective**: Therefore, this research aims to examine the citizen's perception of the roles of religious leaders and ulama in supporting SFA policy in Banda Aceh City. A total of 202 respondents were randomly selected to provide their perceptions. **Methods**: This study utilizes a mixed-methods approach, comprising a survey of perceptions followed by an in-depth literature review. **Results**: The research findings indicate that out of 202 respondents, 88.00 percent are aware of the Smoke-Free Areas (SFA) policy, with 85.64 percent strongly supporting its implementation. However, concerning the religious leaders' fatwas, only 34.65 percent are well-informed and understand about it. The involvement of religious leaders in policy formulation, dissemination, and monitoring exceeds 50.00 percent, although around 15 percent of respondents perceive a lack of involvement. **Conclusion**: Regarding the presence of smoke-free mosques and Islamic schools, the majority of the participants perceive it as still limited. 16.34 percent believe there are no smoke-free Islamic boarding schools, and 19.31 percent perceive that mosques in Banda Aceh are not yet smoke-free. The community also hopes that religious scholars will show a direct model by refraining from consuming cigarettes themselves.*

***Keywords**: perception, religious leaders, smoke free*

INTRODUCTION

Banda Aceh, the capital of Aceh province in Indonesia, is a city with strong culture and religious values, especially in the context of Islamic laws. Religious orders and religious leaders or ulama colours citizen's daily activities, whether related to economics, culture or health. However, development and health issues still occur in Banda Aceh, such as the high number of smokers, especially youth smokers.

The high number of smokers in the city of Banda Aceh raises the question of where the ulama stand on this issue. Ulama are expected to pay special attention, either by issuing a fatwa or other recommendation or by setting a direct example by not smoking. However, understanding the extent to which ulama can influence policy and behavior regarding cigarette consumption remains an important research focus.

The link between religion and health issues has been widely studied (Nonnemaker et al., 2006; Pabbajah et al., 2020; Rosemary, 2009). The role of religious leaders or ulama in the social life of urban communities has also been studied and shown have a strategic role (Abidin, 2017). Research related to the role of religious figures in smoking control policies has become the focus of social and health research (Irshad & Jampes, 2015). Practicing worship has been proven to reduce cigarette consumption or plans

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to quit smoking (Alzyoud et al., 2015; Rios & Matias, 2021).

Previous studies show that the success of anti-smoking campaigns is often closely linked to support from local religious and community leaders. Therefore, understanding the public's perceptions and expectations regarding the role of ulama in controlling cigarette consumption can be an important first step in efforts to promote a healthier and more sustainable environment in the City of Banda Aceh.

Examining public perceptions of ulama's role in curbing cigarette consumption in Banda Aceh offers a unique lens into the region's social and cultural dynamics. This analysis not only enriches our understanding but also provides valuable insights for crafting more effective public health policies. By recognizing how the community views ulama as agents of change in reducing smoking, policymakers can design strategies that resonate with local values and norms. However, it's crucial to acknowledge the potential for diverse opinions among ulama themselves, which could pose challenges for a unified approach.

METHODS

This research is quantitative with descriptive statistical data to see the public's perception of the role of the ulama in the smoke-free policy in Banda Aceh City. Data collection was carried out using a survey through the Google Form survey tool and processed using STATA and Excel applications. When the instrument is distributed, a research code of ethics is also attached, emphasizing that it will maintain the confidentiality of the personal identity of the sample respondents. The survey targeted several community groups, namely students, government employees, journalists, academics, activists/CSO members, ulama/religious leaders/students, and the citizens. The research sample was chosen randomly by distributing questionnaires via Google Forms, namely people who live in Banda Aceh City and are over 17 years old.

To get a deeper and broader response, the participants were also divided into three categories:

1. Citizen of Banda Aceh City and activities in Banda Aceh
2. Citizen Aceh Besar Regency but activities in Banda Aceh City
3. Not a citizen of Banda Aceh or Aceh Besar, but activities in Banda Aceh City

Table 1. Survey Questions

Participation Levels	Questions
Issuance of Fatwa or Religious Statements	1. There is a fatwa regarding smoking activities 2. Fatwa is in line/per smoke free policy 3. Fatwa prohibits smoking 4. Fatwa suggests creating a place for smokers 5. MPU issues other documents related to KTR policy
Preparation and monitoring of policies	1. Ulama are involved in policy formulation 2. Ulama are involved in policy dissemination 3. Ulama are involved in monitoring policies 4. Ulama are involved in policy evaluation
Education and counseling	1. Ulama plays an active role in educating the public regarding KTR policies 2. Ulama plays an active role in educating people about the dangers of smoking 3. Ulama plays an active role in encouraging people to live healthily without smoking
Community Engagement	1. Ulama build a community that cares about smoking policies or the dangers of smoking 2. Appeal from scholars regarding the dangers of smoking or other smoking issues 3. There are smoke-free Islamic boarding schools/religious places 4. There is a smoke-free mosque

Source: survey 2024

RESULTS AND DISCUSSION

Respondent Characteristics

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This study has the responses of 202 respondents consisting of various groups of people in Banda Aceh City or another city. The largest number of respondents were students at 28.71 percent and the fewest were ulama/religious figures/students at 1.98 percent. Respondents are dominated by the 1981-1996 birth group at 37.62 percent and at least the alpha generation (born 2013 and above) at 0.99 percent. The distribution of male and female respondents is relatively balanced.

Table 2. The Respondent

Respondent	Freq.	Percent
You are...		
Activist of CSO	7	3.47
Academics	39	19.31
Citizen	43	21.29
Government employee	42	20.79
Student	58	28.71
Religious Leaders	4	1.98
Journalist	9	4.46
Total	**202**	**100.00**
Born at…		
1946 - 1964	3	1.49
1965 - 1980	51	25.25
1981 - 1996	76	37.62
1997 - 2012	70	34.65
2013 and above	2	0.99
Total	**202**	**100.00**
Gender…		
Male	99	49.01
Female	103	50.99
Total	**202**	**100.00**
Citizens of…		
Citizens of Banda Aceh City and activities in Banda Aceh	74	36.63
Citizen Aceh Besar Regency but activities in Banda Aceh City	67	33.17
Not citizen of Banda Aceh or Aceh Besar, but activities in Banda Aceh City	61	30.20
Total	**202**	**100.00**

Source: survey 2024

Citizen Perception of Smoke-Free Policy

The survey results show that the residents of Banda Aceh City fully support the implementation of the KTR policy even though they have different levels of understanding. As many as 43.56 percent of respondents knew well and 45.05 just knew. There were 9.41 not aware of the KTR policy in Banda Aceh City.

Table 3. The Understanding of Smoke-Free Policy and Fatwa of Band Aceh City

Response	About the Policy		About the Fatwa	
	Freq.	Percent	Freq.	Percent
Understand well	88	43.56	70	34.65
Just understand	91	45.05	111	54.95
Hesitate	4	1.98	3	1.49
Do not understand	19	9.41	18	8.91
Total	**202**	**100.00**	**202**	**100.00**

Source: survey 2024

Table 4. The Support of Smoke-Free Policy in Banda Aceh City

Response	Support for Policy		Support for Fatwa	
	Freq.	Percent	Freq.	Percent
Fully support	173	85.64	132	65.35
Support	25	12.38	64	31.68
Hesitate	2	0.99	2	0.99
Do not support	2	0.99	4	1.98
Total	**202**	**100.00**	**202**	**100.00**

Source: survey 2024

The result also shows the strategic issues related to smoking control in the city of Banda Aceh. The most common issue is youth smokers and 66.50 percent of respondents choose it. Furthermore, respondents also consider the ease with which young children can buy cigarettes and the difficulty of finding smoke-free public spaces as the main issues.

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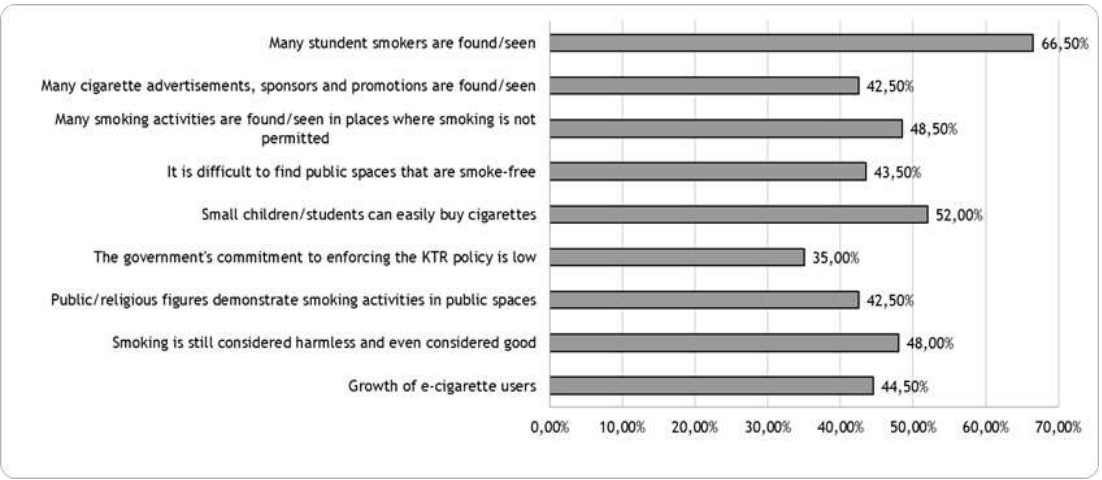

Source: survey 2024

Graph 1. Perception on Issues of Cigarette Controlling in Banda Aceh City

Involvement of Ulama in the KTR Policy Process

The involvement of ulama in a policy is believed to be able to increase the effectiveness of the policy, specifically regarding public acceptance of the policy. More than 47.03 percent of respondents agree that ulama or religious leaders are considered to have been involved in the policy process at the preparation stage. A similar response also shows for the engagement at, socialization/promotion (47.03 percent) and monitoring/evaluation (19.80). However, there are still people who believe that the ulama is not involved in any policy stages, with an average of response about 10 percent.

Table 5. Perception of Ulama Engagement on Smoke-Free Policy

Response	Policy Formulation		Socialisation and Promotion		Monitoring and Evaluation	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Engage fully	45	22.28	40	19.80	35	17.33
Engage	95	47.03	95	47.03	95	47.03
Hesitate	40	19.80	36	17.82	40	19.80
Don't engage	22	10.89	31	15.35	32	15.84
Total	**202**	**100.00**	**202**	**100.00**	**202**	**100.00**

Source: survey 2024

The Role of Ulama in Education and Counseling on KTR Policy

Ulama or religious leaders have become references in the development of social issues in Aceh. In Table 6, the response indicates that the role of the ulama in educating SF policy, providing counseling, and making invitations or appeals is in the range of 40 percent. However, there was a group of respondents who considered that ulama had not/did not play a role in their capacity. This response was in the range of 23 to 25 percent.

Table 6. The Role of Ulama on Educating and Counselling SF Policy

Response	On Education		On Counselling		Appealing/Invitation	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Having strategic Role	33	16.34	29	14.36	35	17.33
Having role	84	41.58	82	40.59	82	40.59
Do not have role	48	23.76	50	24.75	51	25.25
Do not know/hesitate	37	18.32	41	20.30	34	16.83
Total	**202**	**100.00**	**202**	**100.00**	**202**	**100.00**

Source: survey 2024

The Role of Ulama in the Tobacco Control Community

Ulama can also get involved in the anti-smoking community. The survey results showed that around 50 percent of

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participants thought that the ulama was involved in the community. Not only involved but also giving advice and lectures regarding the dangers of smoking. However, there are still many people who see that ulama are not involved in the community. There are more than 25 percent of respondents who think that way. It is believed that ulama have a role in influencing society in the city of Banda Aceh, so they must set an example of behavior in complying with and participating in socializing smoke-free areas wherever they are.

Table 7. Engagement of Ulama in SF Community/Organization

Response	Community Engagement		Appealing about The Danger of Smoke		Sermon about The Danger of Smoke	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Many	13	6.44	17	8.42	20	9.90
Few	108	53.47	121	59.90	103	50.99
None	29	14.36	28	13.86	44	21.78
Do not know	52	25.74	36	17.82	35	17.33
Total	**202**	**100.00**	**202**	**100.00**	**202**	**100.00**

Source: survey 2024

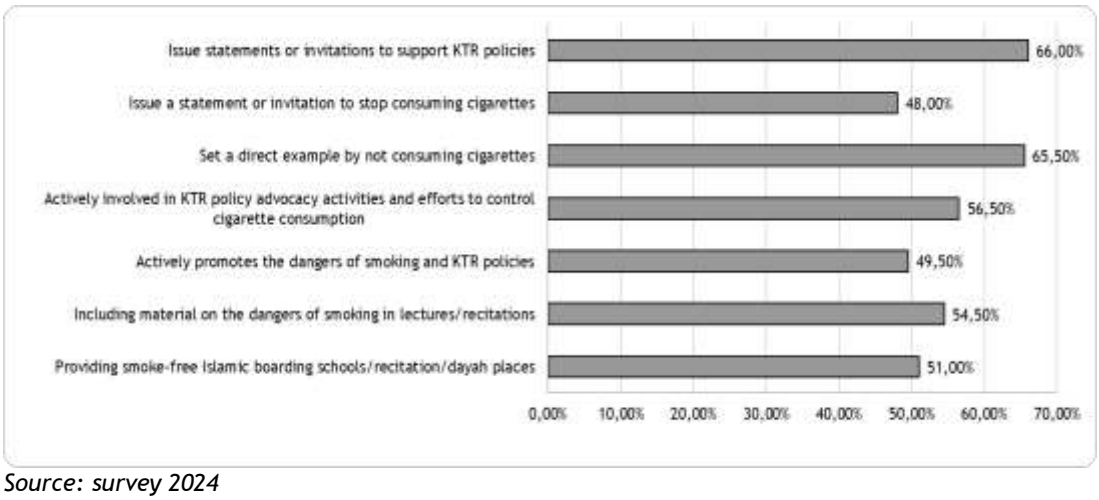
Table 8. The Perception on Mosques and Islamic Schools that Smoke-Free

Response	Smoke-Free Islamic School/Quran Center		Smoke-Free Mosque/Praying Place	
	Freq.	Percent	Freq.	Percent
Many	38	18.81	45	22.28
Few	75	37.13	86	42.57
None	33	16.34	39	19.31
Do not know	56	27.72	32	15.84
Total	**202**	**100.00**	**202**	**100.00**

Source: survey 2024

This study also perception mapping regarding the existence of smoke-free mosques and Islamic boarding schools in Banda Aceh City. The survey results showed that as many as 18.81 percent of respondents thought that there were many Islamic boarding schools/recitation places that were smoke free. However, around 27 percent of respondents did not know that there were Islamic boarding schools/recitation places that were smoke-free. In fact, 16.34 percent thought that there were no smoke-free Islamic boarding schools.

An assessment is also given regarding whether there are already smoke-free mosques. Even though there were responses that thought it existed or was available, there were still 19.31 percent who thought it did not exist, and 15.84 percent did not know.



Source: survey 2024

Graph 2. The Expectation for Strengthening the Role of Ulama in SF Policy

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Citizen Expectations on Ulama regarding Smoke-Free Policy

At the end of the survey, this study asked respondents to express their expectations for strengthening the role of the ulama in supporting the smoke-free policy in Banda Aceh. The highest expectation is for the ulama to issue more statements and appeal to the public to comply with Banda Aceh's SF Policy (66.00 percent). Further, the citizens also expect the ulama can be an example by not consuming cigarettes (65.50 percent). The third most important expectation is ulama will be more engaged in KTR advocacy activities and encourage the community not to consume cigarettes (56.50 percent).

Policy awareness is one of the foundations for the success of an SF policy. If the public already knows the existence and points of SF policy, it will be easier to implement it. In this study, we figured out that only 43.56 percent of respondents understand the policy. Likewise, with ulama fatwas, only 34.65 percent of respondents knew them well. This finding is supported by the Aceh Institute's FGD notes with ulama 2023-24 that many Acehnese people do not know and are aware of a fatwa from Acehnese ulama regarding smoking.

This study finds that the involvement of ulama must be carried out not only at the policy implementation stage but also starting from policy formulation. Research conducted by WHO shows that Religious leaders are key social players. That, without the involvement of ulama, several health policies may not be successful. FGD's notes from the Aceh Institute also state that the involvement of ulama in the smoke-free policy in Banda Aceh has only been intensified in the recent two years since the TC program was conducted by Aceh Institute.

This study finds that the role of the ulama in socializing SF policy and the dangers of smoking has occurred. However, previous research concluded that the role of ulama has not been seen as effective in socializing the dangers of smoking for health and supporting efforts to stop smoking in Banda Aceh City (Rosemary, 2009). There are still differences in views between ulama regarding smoking, causing dualism in society. In another study, a fatwa regarding smoking had limited impact in Bogor. However, the normative influence of religion is still clearly visible, namely expecting their religious leaders to talk more about smoke-free policies (Byron et al., 2015).

Apart from involvement in policy, ulama is also involved in education and counseling about the dangers of smoking. Education has proven effective in increasing students' interest in quitting smoking (Ismail et al., 2021). Ulama are also involved in the tobacco/cigarette control community so they can contribute directly to the movement. The FGD's notes conducted by Aceh Institute show that ulama is willing to be invited to participate in many activities regarding cigarette controls in Banda Aceh City. Several religious leaders are willing to provide video statements or appeals to people to stay away from cigarettes.

The existence of a smoking fatwa will only be effective if the public has a high awareness (Chabiba, 2021). Fatwas are not necessarily capable of changing people's behavior or attitudes regarding health issues, for example in the case of Covid 19 (Pabbajah et al., 2020). For example, The Indonesian Ulama Council's statement regarding restrictions on worship gatherings was not fully followed by people who continued to worship in mosques and other places.

The role of ulama or religious figures is also seen in the increasing number of Islamic boarding schools/religious places that are already smoke-free. Even though the number is not large, there are already several mosques that are smoke-free because the management enforces KTR in the mosque area. FGD's notes from the Aceh Institute also show that the cleric or mosque administrator will ensure that the mosque follows these rules. Moreover, if there are SF stickers, they will completely prohibit worshipers from smoking in the mosque.

CONCLUSION

Through the research results, it can be concluded that the existence of smoke-free mosques and Islamic boarding schools in Banda Aceh is still limited. It is known that as many as 16.34 percent think that there are no smoke-free Islamic boarding schools, while 19.31 percent think that mosques in Banda Aceh are not smoke-free. The public also hopes that the ulama can set a direct example by

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refraining from consuming cigarettes so that it is easier for many people to adapt.

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Innovation to Control Cigarette Consumption and Stunting Through the Kabar Besti Program (Smoke and Stunting Free Families)

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ABSTRACT

***Background**: Cigarette consumption causes economic and health losses to smokers and their families. The main determinant of stunting in toddlers in Sleman Regency is cigarette consumption by family members. **Aims**: The research aims to develop innovations to control cigarette consumption and toddler stunting through the Kabar Besti (Keluarga Bebas Asap Rokok dan Bebas Stunting) or the Smoke and Stunting Free Families Program. **Method**: This research uses an action research approach which includes: 1) innovation development, 2) innovation dissemination, 3) program adoption, and 4) program evaluation. The research was conducted in Sumberan Hamlet, Candibinangun Village, Pakem District, Yogyakarta for 6 months, from August 2023 to January 2024. **Result**: The development of the Kabar Besti program was successfully initiated with the following phases: 1) needs assessment, namely gathering support, exposing the program, and looking for opportunities and challenges in implementing the program; 2) dissemination of innovation in the community, namely socialization of the program to hamlet heads, toddler Posyandu, youth groups, and youth and youth communities; measuring lung capacity and collecting data on cigarette consumption patterns in the community of fathers and teenagers; 3) program adoption is proven by a declaration of joint commitment to implementing the Kabar Besti program; 4) program evaluation: there was a decrease in the number of fathers who smoked from 70.1% before the intervention to 68.6% after the intervention. **Conclusion**: The Kabar Besti program has been successfully developed and proven to increase community and stakeholder commitment to controlling cigarette consumption and stunting.*

***Keywords**: Cigarette consumption, Kabar Besti program, Smoking behavior, Stunting*

INTRODUCTION

The impact of cigarette consumption is multidimensional, starting from the family economy to the health of smokers and their families, including the incidence of stunting of children under five in smoking parents (Simanjuntak, 2022). Cigarette consumption in poor families causes low access to nutritious food, low intake of vitamins and minerals, and poor food diversity and sources of animal protein. Mothers whose teenage years lack nutrition, even during pregnancy and lactation, will greatly affect the growth of the child's body and brain (Agustina, 2022). Children living in households with chronic smoking parents as well as those with transient smokers tend to have slower growth in weight and height than those living in households without smoking parents. Children whose parents are chronic smokers have a 5.5% higher probability of experiencing stunting compared to children of non-smoking parents.

Stunting is a condition where a child has a height below the age standard. Stunting is an indicator of failure to thrive in toddlers due to a chronic lack of nutritional intake in the first 1,000 days of life. Stunting is one of the health problems in Indonesia which is a priority for the Indonesian government to reduce

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its prevalence (Bayu, 2022). The prevalence of stunting in Indonesia fell from 24.4% in 2021 to 21.6% in 2022 (Indonesian Ministry of Health, n.d.). Thus, almost a quarter of toddlers in the country experience stunting. The government targets the prevalence of stunting in Indonesia to fall below 14% by 2024 (Bayu, 2022).

This stunting condition will cause a decrease in children's intelligence/cognition (Sari & Ni Komang Ayu Resiyanthi, 2020). The father's smoking behavior at home is significantly related to the incidence of stunting ($p<0.05$) (Muchlis et al., 2023; Zubaidi, 2021). The new findings of this research are support for the implementation of Smoke-Free Zones by implementing tobacco-free living behavior. Early childhood children who live in this environment have better growth (Hasyim et al., 2022; Muchlis et al., 2023).

A preliminary study in March 2023 reported that the main determinant of stunting among under-fives in Sleman Regency was the smoking behavior of family members (64%). Stunting prevention is a strategic issue for the Sleman District Health Service and Candi Binangun Village, Pakem District is one of the stunting locus areas. Previous research explains that programs to reduce exposure to passive smoke at home start with policies at the population level to reduce mortality, and morbidity and widen health disparities (Alwan et al., 2011). Children's health is a major theme in families that implement a smoke-free home policy (Bleakley et al., 2013).

The results of discussions with the promotion sector of the Sleman Regency Health Service (Dinkes) agreed that the Pakem Community Health Center was the technical implementation unit of the Sleman Regency Health Office for the stunting prevention program through the smoke-free family program. This location was chosen as a pilot project for the implementation of the KaBar Besti program, not only because it is a stunting locus but also because it has support from the Community Health Center, community leaders, and local health cadres.

The smoke and stunting-free family innovation (KaBar BesTi) is a follow-up program carried out by researchers, namely the smoke-free home program in several areas in Yogyakarta which has succeeded in changing people's smoking patterns. (H Trisnowati et al., 2020; Heni Trisnowati, 2017). As a further innovation, the KaBar BestTi program emphasizes the importance of not smoking in families with stunted children under five years old (toddlers) and diverting cigarette shopping with side dishes or other nutritional needs for toddlers. The innovation in this study is in the form of a community-based model of controlling cigarette consumption and stunting of toddlers with the agreement of the besti news movement from the community as one of the program outputs. The Kabar besti movement is a family or household-level movement with several commitments namely: Furthermore, the existence of health promotion media in the form of besti news piggy banks, besti news posters, and besti news leaflets is a tool in educational interventions. This research aims to develop the Kabar Besti program as an innovation to control cigarette consumption and stunting in the Sleman-Yogyakarta Regency.

METHODS

This research uses an action research (AR) approach, namely a type of research that uses a participatory approach to targets (Smith et al., 2010), and carries out interventions for improvement, some activities are educational, focus on the problem, the context is specific, and there is collaboration between researchers and those studied (Montgomery et al., 2015; Morton & Montgomery, 2013), (Coghlan & Brannick, 2014), (Green & Thorogood, 2009). The applied research stage of the Besti News program includes 1) innovation development, 2) innovation dissemination, 3) program adoption, and 4) evaluation of the structured interview program in the community of fathers, mothers of toddlers, and health cadres regarding the implementation of Besti News. The research was conducted in Sumberan Hamlet, Candibinangun Village, Pakem District, Yogyakarta for 6 months, from August 2023 to January 2024. The program targets were mothers of toddlers, the fathers' community, and the youth community. The research team consisted of lecturers, health workers, health cadres, and students. The role of

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lecturers is as program initiators, educational resources, and assisting in research implementation. Research data collection through structured interviews was carried out by lecturers and public health students carried out by a team of students. Health promotion staff at the community health center guided before the research took place and opened communication with the hamlet. Health cadres act as field coordinators for the implementation of the Kabar Besti program whose duties include determining the implementation day, inviting targets who will attend, and coordinating with each RT head in their area to prepare the place and prepare for activities. This research protocol has received an ethical certificate from Ahmad Dahlan University with the number 012308180.

RESULTS AND DISCUSSION

Steps for Innovating the Kabar Besti Program

The Kabar Besti Program has effectively implemented many stages to control cigarette smoking and address stunting, including innovation development, innovation dissemination, program adoption, and program assessment. Table 1 displays the comprehensive study stages, while Figure 1 presents the outcomes of the agreement to execute The Kabar Besti Program in the form of a proclamation.

Table 1. Outlines the Various Stages of the Kabar Besti Innovation Research Conducted In Dusun Sumberan, Desa Candi Binangun, Pakem Sleman In 2023.

No	Stages	Date of Implementation	Results
1	**Innovation Development**		
	a. Need Assessment: Securing endorsement from relevant parties and delivering a program presentation to the team of Pakem Primary Health Care and stakeholders at Candi Binangun, Pakem.	August 26, 2023	The program received a positive response from PHC and stakeholders at Desa Candibinangun. This presents a favorable occasion for the program to persist.
	b. Need Assessment: secondary data collection from Pakem PHC	August 27-28, 2023	We collected data on clean and healthy living behavior, home smoking behavior, toddler stunting, and water quality at Desa Candibinangun.
	c. Examining program potential and challenges: the enforcement of smoking-free area legislation, the implementation of GERMAS (Healthy Living Movement), and the enhancement of community social capital	August 29-30, 2023	Sleman is currently engaged in the expansion and enhancement of the implementation of GERMAS, with a specific focus on rural populations. One of the methods used is the establishment of No-Smoking Areas at the local level. The community's social capital, including values such as mutual collaboration, openness, regular meetings, and toddler Posyandu, is utilized to implement the program.
	d. A focus group discussion was held with the PHC staff to present secondary data and develop a plan of action for The Kabar Besti program.	2 September 2023	The study site was selected as Dusun Sumberan due to its representation of 25% of the overall population of stunted toddlers, as indicated by the data from The Pakem PHC in 2022.
2.	**Dissemination of Innovation**		
	a. The Kabar Besti Program in Dusun Sumberan Hamlet is being socialized among the	September 4-9, 2023	Data was acquired regarding the timetable for toddler Posyandu activities, youth

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	health cadres through advocacy and cooperation.		(karang taruna) activities, and community activities. Analyzing potential avenues and obstacles to the execution of a program: Most males are smokers. Health cadres are responsible for coordinating operations with the community, including implementing and locating initiatives.
	b. Integration of The Kabar Besti dissemination and educational initiatives with Posyandu gatherings: Investigating the Impact of Cigarette Smoke on Growth Retardation in Young Children; Assessing Maternal Lung Function with a Spirometer	October 14, 2023	**Health education topic:** Promoting the integration of the Kabar Besti Program: Substituting cigarette purchases with eggs for toddlers: Empowering moms to become leaders of healthy households **Agreement:** Prioritise purchasing cigarettes for the dietary requirements of toddlers, refrain from smoking within the house, avoid smoking close to infants and young children, and dispose of cigarette butts responsibly. **Health promotion media:** Leaflets and Posters (represented by Figure 1 and Figure 2)
	c. The socialisation of The Kabar Besti and health education programs at youth Posyandu meetings: The significance of healthy teenagers in reducing stunting	October 14, 2023	"Promoting adolescent engagement as proactive youth volunteers; disrupting the cycle of tobacco dependency and educating families on healthy lifestyles." **Health promotion media**: Leaflets and Posters
	d. socialization of The Kabar Besti program and providing health education in the father's forum e. Assessment of pulmonary capacity and gathering of data on cigarette usage f. The dissemination of health promotion media through the distribution of leaflets, posters, and Kabar Besti money boxes.	October 13 -15, 2023 Locations: Third, fourth, and fifth neighborhoods (toddlers' addresses are spread across these three neighborhoods)	The Kabar Besti program highlighted the significance of fathers' involvement in addressing toddler stunting during socialization. "Promoting Fathers as Kabar Besti Heroes": fostering a robust family unit by cultivating physically and mentally fit family members, devoid of any exposure to tobacco smoke and devoid of any impediments to growth and development." Encouraging fathers to allocate income previously used for purchasing cigarettes towards providing their children with essential nourishment, such as eggs, meat, fish, tofu, tempeh, vegetables, and fruit.
3	**Program Adoption**		
	a. Organising the Kabar Besti declaration in collaboration with the community and	November 2-3, 2023	The outcome of the agreement between the leader of the dusun and health cadres is to

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	stakeholders			pledge a collective dedication to The Kabar besti movement. The Kabar besti movement was endorsed by community representatives and stakeholders.
	b. Agreement on The Kabar Besti Movement in Dusun Sumberan	November 2023	14-16,	The Kabar Besti program was well received by the community and stakeholders. All participants have unanimously agreed to execute The Kabar Besti movement. The proclamation event coincided with a social gathering for fathers in each respective neighbourhood, specifically in the third, fourth, and fifth neighbourhoods. The initiative commenced with a presentation of the study's findings, reinforcing the dedication of the community and disseminating health promotion materials in the shape of the "Kabar Besti Money Box" (Figure 3). Fathers should promptly transition to purchasing cigarettes in order to allocate funds towards meeting the nutritional requirements of toddlers. Simultaneously, declarations were made to groups of mothers of toddlers during posyandu exercises for toddlers. The document contains the details of the Kabar Besti movement agreement. 1. Instead of purchasing cigarettes to meet the dietary requirements of young children 2. Allocate the funds previously spent on cigarettes towards fulfilling the dietary requirements of toddlers. 3. Refrain from smoking within your residence. 4. Avoid smoking in close proximity to infants and young children. Refrain from carelessly discarding cigarette butts (Figure 4)
4	**Program evaluation**			
	a. Evaluation of The Kabar Besti movement program and lung capacity measurements in the fathers community	December 9-16, 2023 Locations: Third, fourth, and fifth neighbourhoods		An assessment of The Kabar Besti movement was conducted by conducting brief interviews with each father simultaneously during the dads' meeting/social gathering.

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	b. Signing of Implementing Agreement with Pakem PHC	December 14, 2023 Locations: Third, fourth, and fifth neighborhoods	An Implementing Agreement was made between the Faculty of Public Health and the Pakem PHC to ensure the continuation of The Kabar Besti program.
	c. Evaluation of The Kabar Besti movement at toddler posyandu	December 15-16, 2023	A concurrent focus group discussion will be held for mothers of toddlers and health cadres during the Posyandu event. The purpose of the discussion is to address the implementation of The Kabar Besti

The Kabar Besti program utilizes health promotion media, such as leaflets (figure 1) and posters (figure 2), to facilitate the socialization process and enhance the comprehension of the presented material among the target audience. All attendees at the socialisation event received leaflets, while the leaders of their particular neighbourhoods were handed posters. Subsequently, it should be positioned in a conspicuous area, preferably a patrol post, to provide maximum visibility for the general public.

Figure 1. Leaflet of Stunting dan The Kabar Besti

Figure 2. Poster of The Kabar Besti

The Kabar Besti money box (figure 3) has been delivered to all the fathers in attendance at the socialization event, as well as to mothers of toddlers whose husbands have yet to receive the money box. The provision of health promotion media in the form of a money box is intended to incentivize and facilitate fathers in initiating a shift in their cigarette consumption habits by transitioning to purchasing cigarettes. Instead of purchasing smokes, consider using those funds towards saving or investing in a toddler's nutritional requirements. Figure 4 displays the outcomes of the implementation of The Kabar Besti program, which was agreed upon and documented in the form of a statement.

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Figure 3. The Kabar Besti Money Box

Figure 4. Declaration of The Kabar Besti

This declaration serves the purpose of guaranteeing the long-term viability of the program and bolstering the dedication of community leaders to maintain oversight of The Kabar Besti program. Moreover, the announcement of The Kabar Besti program holds significance as it provides a chance to elucidate to all inhabitants that refraining from smoking in the presence of infants and young children, rather than purchasing cigarettes, is a novel societal standard and a constituent of a communal initiative. It demonstrates that the execution of The Kabar Besti movement is a collaborative strategy that commences at the domestic level.

The declaration is an integral component of the development process for a community-based health program that incorporates an empowerment method, whereby the community is directly engaged in all stages of the program, from planning to evaluation (Heni Trisnowati, 2021). Prior researchers have made declarations about the implementation of a smoke-free household program in the city of Yogyakarta (Padmawati et al., 2018) and the objective is to establish and implement a smoke-free household initiative in rural regions within Bantul Regency, Yogyakarta (H Trisnowati et al., 2019). The smoke-free home declaration encompasses guidelines such as refraining from smoking near pregnant women and children, as well as affixing a smoke-free home sticker on the exterior of the residence (H Trisnowati et al., 2019).

Socio-economic Factors, Cigarette Consumption Patterns, and Acceptance of the Kabar Besti Program

The Kabar Besti Program was introduced and data was collected through social gatherings in the father's community. The study findings indicated that a significant proportion of the participants were smokers, specifically 70.7%. Among these smokers, the majority (32.8%) reported smoking between 11 and 20 cigarettes per day. The respondents unanimously agreed to the implementation of The Kabar Besti program, with a 100% acceptance rate. Additionally, a significant majority of respondents, amounting to 60.3%, expressed their desire to quit smoking. However, a small percentage of respondents, namely 7.0%, still showed reluctance about quitting smoking. For a more comprehensive explanation, please refer to Table 2 below.

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Table 2. The Frequency Distribution of Variables Among The Group of Fathers in Dusun Sumberan, Desa Candibinangun Hamlet, Pakem, Sleman (n=58)

Variables	Frequency & Percent.			Total
	3 Neighborhoods (n=24)	4 Neighborhoods (n=12)	5 neighborhoods (n=22)	
Age of fathers (years)				
<50	13(54.1)	8(66.6)	10(45.5)	31(53.4)
=50	1(4.2)	2(16.7)	12(54.5)	15(25.9)
>50	10(41.7)	2(16.7)	0(0)	12(20.7)
Total	**24 (100.0)**	**12 (100.0)**	**22(100.0)**	**58(100.0)**
Type of occupation				
No/Not yet working	0(0)	1(8.3)	0(0)	1(1.7)
Educational staff	0(0)	1(8.3)	0(0)	1(1.7_)
Self-employed	3(12.5)	0	7(31.8)	10(17.2)
Laborer	4(16.7)	3(25.0)	4(18.2)	11(19.0)
Farmers	17(70.8)	7(58.4)	11(50.0)	**35(60.4)**
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Smoker status				
Yes	16(66.6)	10(83.3)	15(68.2)	**41(70.7)**
No	7(29.2)	2(16.7)	7(31.8)	16(27.6)
Never tried	1(4.2)	0(0)	0(0)	1(1.7)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Smoking location				
No smoking	7(29.2)	2(16.7)	7(31.8)	16(27.6)
Outdoor	14(58.3)	1(8.3)	8(36.4)	23(39.6)
Indoor	0(0.0)	1(8.3)	0(0)	1(1.7)
Outdoor & indoor	3(12.5)	8(66.7)	0(0)	11(19.0)
Others	0(0.0)	0(0)	7(0)	7(12.1)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Total of cigarette consumption				
No smoker	7(29.2)	2(16.7)	7(31.8)	16(27.6)
1-10 stick	9(37.5)	1(8.3)	7(31.6)	17(29.3)
11-20 stick	5(20.8)	6(50.0)	8(36.4)	19(32.8)
21-30 stick	2(8.3)	3(25.0)	0(0)	5(8.6)
>30 stick	1(4.2)	0(0)	0(0)	1(1.7)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Expenditures for buying cigarettes per day				
No smoker	8(33.3)	2(16.7)	7(31.8)	17(29.3)
<20.000	8(33.3)	4(33.3)	12(54.5)	24(41.4)
20.000-35.000	6(25.0)	5(41.7)	3(13.6)	14((24.1)
>35.000	2(8.3)	1(8.3)	0(0)	3(5.2)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Toddler ownership				
Yes	10(41.7)	5(41.7)	6(27.3)	21(36.2)
No	14(58.7)	7(58.3)	16(72.7)	37(63.8)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Acceptance of The Kabar Besti Program				
Agree	24(100.0)	12(100.0)	22(100)	58(100.0)
Disagree	0(0.0)	0(0)	0(0)	0(0.0)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**
Intention to stop smoking				
No smoker	8(33.3)	2(16.7)	7(31.8)	17(29.3)
Yes	15(62.5)	9(75.0)	11(50.0)	35(60.3)
No intention	1(4.2)	1(8.3)	0(0)	2(3.4)
doubtful	0(0.0)	0(0)	4(18.2)	4(7.0)
Total	**24(100.0)**	**12(100.0)**	**22(100.0)**	**58(100.0)**

According to the data in Table 2, the percentage of male smokers at the study location is 70.7%. This prevalence is higher than The National data, which shows that 62.9% of men in 2018 consumed tobacco (via smoking and

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chewing) (*ATLAS TEMBAKAU INDONESIA 2020*, n.d.). Moreover, Indonesian men have the greatest smoking rate among ASEAN countries, namely at 66%, while Singapore has the lowest incidence at 21.1%. The prevalence of smoking among women in Indonesia, Laos, Myanmar, and the Philippines is notably high, ranging from 5.8% to 8.4% (Tan & Dorotheo, 2021). The elevated proportion of male smokers in the study area can be attributed to the prevailing perception among men that smoking is a socially acceptable behavior and a perceived necessity.

Smoking exerts a substantial influence on health due to its correlation with illness, reduced lifespan, and diminished quality of life. Furthermore, smokers incur greater healthcare costs compared to individuals who do not smoke. Smoking not only detrimentally affects personal health, but also harms the household finances (Ginting & Maulana, 2020). Tobacco consumption in low- and middle-income nations is inversely linked to household spending on education and healthcare, underscoring the potential adverse effects of tobacco use on investment in the development of human capital (Chowdhury & Chakraborty, 2019).

In addition, when examining expenditure on cigarettes, it is shown that 41.4% of fathers allocated less than IDR 20,000 for this purpose. This demonstrates that obtaining cigarettes remains very uncomplicated, except for their availability in retail stores. The accessibility of purchasing cigarettes has a significant impact on individuals' smoking habits (Muliyana & Thaha, 2013; Muslim et al., 2023). According to Lawrence Green's concept, the availability of cigarettes is considered one of the elements that can impact smoking behavior (Glanz et al., 2008; H Trisnowati, 2018). The accessibility of cigarettes in society is directly correlated with the price of cigarettes in Indonesia. Unlike Malaysia, Myanmar, Singapore, and Brunei Darussalam, the cost of cigarettes in Indonesia is about 1.6-1.9 USD, making it comparatively inexpensive and within reach for most people (Alliance Southeast Asia Tobacco Control, 2021) As cigarette prices climb, the occurrence of smoking declines (Dartanto et al., 2018). An additional study conducted in Indonesia indicates that up to 74% of those who smoke would cease purchasing cigarettes if the cost of cigarettes were set at IDR 70,000 or 5 USD (Nurhasana et al., 2022).

The results reveal a noteworthy fact: there is a significant level of public knowledge on the importance of safeguarding infants and young children from the harmful effects of cigarette smoke. This is evidenced by the complete approval of The Kabar Besti program by the public. They exhibit strong support and enthusiasm in actively engaging in all aspects of The Kabar Besti program activities. Aside from the significant contributions of health cadres and community leaders, particularly the leader of Dusun, this is an influential aspect in the success of The Kabar Besti program. In addition, your strong determination to quit smoking presents a favorable occasion to implement diverse interventions aimed at assisting you in quitting or decreasing your cigarette intake.

Evaluation of The Kabar Besti Program

The evaluation of the Kabar Besti program is to assess the program's influence on alterations in the cigarette consumption patterns of parents, with a particular focus on fathers. The evaluation was conducted utilizing quantitative methodologies, specifically through organized interviews with participants, where questionnaires were administered directly. The evaluation was conducted one month following the announcement of the Kabar Besti program. The focus of the assessment is the cohort of dads. A total of 51 father participants took part in the evaluation from all neighborhoods.

The evaluation results indicated that a significant proportion of respondents (82.4%) had undergone socialization regarding the Kabar Besti program. One month after the implementation of the Kabar Besti program, the majority of men, precisely 35 individuals, continued to smoke, accounting for 68.6% of the total. However, among these smokers, 23 people (45.1%) had redirected their cigarette expenses towards meeting their nutritional needs, while 21 people (41.2%) had saved money by refraining from purchasing cigarettes. Additionally, 86.3% of respondents reported not smoking at

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home or in the presence of infants or young children. During the implementation of the program evaluation, it was discovered that 19 individuals, accounting for 37.3% of the participants, expressed a wish to quit smoking. The prevalence of paternal smoking fell from 70.1% before the intervention (August 2023) to 68.1% following the intervention (December 2023). Thus, it can be inferred that the Kabar Besti Program has effectively influenced the smoking habits of dads, particularly those who had infants and/or young children (Table 3).

Table 3. The Evaluation Result of The Kabar Besti Program among fathers (n=51)

Variables	Freq. & Percent.			Total (%)
	3 Neighborhoods (n=24)	4 neighborhoods (n=12)	5 neighborhoods (n=22)	
Age of fathers (years)				
<50	5 (27.8)	4(44.4)	9(37.5)	18(35.3)
=50	2 (11.1)	2(22.2)	15(62.5)	19(37.3)
>50	11 (61.1)	3(33.3)	0(0.0)	14(27.4)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Toddlers ownership				
Yes	5 (27.8)	4(44.4)	7(29.2)	16(31.4)
No	13 (72.2)	5(55.6)	17(70.8)	35(68.6)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Experience in getting socialization of The Kabar Besti program				
Yes	15 (83.3)	7(77.8)	20(83.3)	42(82.4)
No	3 (16.7)	2(22.2)	4(16.7)	9(17.6)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Smoking status after The Kabar Besti program				
Yes	10 (55.6)	8(88.9)	17(70.8)	35(68.6)
No	8 (44.4)	1(11.1)	7(29.2)	16(31.4)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Redirect income allocated for purchasing cigarettes				
Yes	7 (38.9)	3(33.3)	13(54.2)	23(45.1)
No	11 (61.1)	6(66.7)	11(45.8)	28(54.9)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Refrain from purchasing cigarettes to save money				
Yes	7 (38.9)	3(33.3)	11(45.8)	21(41.2)
No	11 (61.1)	6(66.7)	13(54.8)	30(58.8)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
No smoking within indoor area				
Yes	15 (83.3)	8(88.8)	21(87.5)	44(86.3)
No	3 (16.7)	1(11.2)	3(12.5)	7(13.7)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Avoid smoking close to infants or young children				
Yes	15 (83.3)	8(88.8)	21(87.5)	44(86.3)
No	3 (16.7)	1(11.2)	3(12.5)	7(13.7)
Total	**18 (100.0)**	**9(100.0)**	**24(100.0)**	**51(100.0)**
Intention to stop smoking				
No skomer	8 (44.4)	1(11.1)	7(29.2)	14(27.4)
Yes	7 (38.9)	7(77.8)	5(20.8)	19(37.3)
No	1 (5.6)	1(11.1)	5(20.8)	7(13.7)
Doubtful	2 (11.1)	0(0.0)	7(29.2)	9(17.6)
Total	18 (100.0)	9(100.0)	24(100.0)	51(100.0)

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The KaBar BesTi program is an innovative initiative promoting smoke-free and stuting-free environments within families. It is a continuation of the smoke-free home program implemented by researchers in various parts of Yogyakarta. The program has effectively transformed people's smoking habits. The Kabar Besti program introduces a new approach by highlighting the significance of abstaining from smoking within families that have children under the age of five who are experiencing stunted growth. In the Kabar Besti program, each family is encouraged to establish a commitment to refrain from smoking inside the household. In addition, to mitigate stunting, it is recommended that each household prioritize purchasing nutritious side dishes or other essential nutritional items for young children instead of spending money on cigarettes. The relationship between cigarette usage and stunting is inseparable, as stunting typically affects young children who are exposed to cigarette smoke within their own families. The primary objective of the KaBar Besti program is to diminish the prevalence of those who engage in smoking, deter the initiation of new smokers, minimize exposure to cigarette smoke, and regulate the occurrence of growth impairment in young children. The Kabar Besti program is a grassroots initiative that promotes specific commitments and agreements at the family or household level. These include 1) Redirecting funds that would have been spent on cigarettes towards meeting the nutritional needs of toddlers; 2) Saving money that would have been spent on cigarettes to meet the nutritional needs of toddlers; 3) Prohibiting smoking within the home; 4) Avoiding smoking close to babies and toddlers; 5) Ensuring responsible disposal of cigarette butts.

In December 2023, the monitoring data indicated seven male toddlers, accounting for 36.8% of the total, and 12 female toddlers, accounting for 63.2%. In November 2023, the data from monitoring the nutritional status of toddlers showed that the percentage of toddlers experiencing stunting reduced to 11.11%, which means that 2 out of 18 toddlers were affected. In addition, in the stunting data for 2022 and 2023, there has been a significant decline in the percentage of stunted toddlers, from 25% to 11.11%. The decline is substantial, amounting to 13.89% over one year. The incidence of stunting in Desa Candibinangun, Pakem, Sleman by the end of 2023 is highly promising as it has successfully reached the national goal of less than 14%. This data aligns with the Indonesian government's objective of decreasing the prevalence of stunting in Indonesia to less than 14% by 2024 (Bayu, 2022; Peraturan Presiden Republik Indonesia & Kementerian PPN/Bappenas, 2019).

The decrease in the prevalence of stunting among toddlers can be attributed to various factors, such as the diligent participation of mothers in toddler posyandu, where the health of toddlers is monitored every month. Additionally, fathers who smoke refrain from doing so at home, thereby minimizing direct exposure of toddlers to cigarette smoke. The Kabar Besti program serves as a means of support and reinforcement for families with toddlers, encouraging them to adopt healthy lifestyles. This includes refraining from smoking in the house and near babies and toddlers, as well as making a shift in cigarette shopping habits. These changes have a positive impact on smoking patterns in society as a whole, particularly among parents of toddlers. The rate of change in cigarette consumption patterns is gradually aligning with the growing consciousness among parents of young children to prioritize the dietary requirements of their sons and daughters who are under the age of five.

CONCLUSION

The Kabar Besti program has been established and demonstrated to enhance community and stakeholder dedication to regulating cigarette consumption and stunting. The Kabar Besti program should be disseminated as a strategic measure to regulate cigarette use habits and address stunting in toddlers. The program's success relies heavily on the collective dedication of the health service, PHC, and stakeholders at the Dusun and Desa.

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A Comparative Analysis of Smoke-Free Compliance in Aceh

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ABSTRACT

***Background**: Aceh Province has a smoke-free area policy. At the district level, 22 of 23 have implemented the policy. However, the effectiveness has varied significantly. One aspect of concern is compliance with establishing indoor smoke-free environments. **Aims**: This study conducts a comparative analysis of the success of implementing smoke-free policies in Aceh. **Methods**: The effectiveness is calculated based on seven indoor compliances: signage, cigarette butt, smoking, ashtray, the smell of smoke, selling, as well as cigarette advertising/promotion/ sponsorship. The data utilized are from compliance surveys conducted by the Aceh Institute in 2022 and 2023. **Results**: The average signage compliance is 28.45 percent with Banda Aceh City having the highest compliance at 50,8 percent. Regarding compliance with no smoking activities, the average is 88.48 percent. However, the existence of cigarette butt is relatively high, with an average of 17,69 percent with Nagan Raya having the lowest rate. This study finds three main conditions related to the effectiveness of a smoke-free policy. First, the commitment of the government to disseminate, implement, and monitor the policy. More activities conducted by the government seem to increase compliance. Second, the collaboration between government and stakeholders. Collaboration is encouraged in the policy for more effective implementation. Third, resources to implement the policy. Adequate resources improve the implementation such as the signage coverage and policy enforcement. **Conclusion**: The compliance level of the smoke-free policy varies in each district in Aceh. Factors that influence it are commitment, collaboration, and availability of resources.*

***Keywords**: compliance, policy, smoke-free areas.*

INTRODUCTION

The smoke-free area (SFA) policy is crucial in protecting public health from the dangers of cigarette smoke, both for active and passive smokers. By implementing SFA in public places such as offices, schools, hospitals, and public transportation, the risk of chronic diseases such as heart disease, lung cancer, and respiratory problems can be reduced significantly. Apart from that, this policy also encourages smokers to reduce or stop smoking, as well as increasing public awareness about the dangers of smoking. In Indonesia, the obligation to establish SF Policy in the regions is ordered in on Government Regulation Number 109/2012.

Aceh Province, with its strong cultural and religious background, is committed to implementing the SFA policy in its territory. At the district level, 22 out of 23 have SFA policies, both regulated by regional law and the mayor/regent decree. However, the level of compliance with SFA policy varies. Some districts/cities may demonstrate high levels of compliance, while others still face various challenges in implementation. This difference in compliance means that the SFA has not been able to provide conditions under the expectations of these regulations. This condition has also become a public question as to why this difference occurs.

The compliance rate and its effectiveness as well as the barriers have been academic concern (Septiono et al., 2020). Studies of compliance are conducted in several regions in Indonesia. Di Bengkulu, low compliance is caused by low awareness, budget limitations and weak regional government coordination (Yunarman et al., 2020). In Jayapura, the low compliance of SF policy caused by

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limited budget, lack of support from local non-government organizations and universities, lack of public awareness, and lack of leadership on SF policy (Wahyuti et al., 2019). Further political will is crucial to policy effectiveness (Kramer et al., 2023).

Although there have been several studies on SFA compliance in Indonesia, none have discussed it in the context of Aceh. Therefore, this research discusses the level of SFA compliance in Aceh by comparing several districts/cities.

METHODS

This study is exploratory research. The data utilized are from compliance surveys conducted by the Aceh Institute in 2022 and 2023. The policy review is conducted by analyzing the policy and the advocacy notes of Aceh Institute during its smoke-free advocacy 2019-2024 in Aceh Province. However, we only focus on three districts, namely Banda Aceh City, East Aceh Regency, and Nagan Raya Regency. The effectiveness is calculated based on seven indoor compliances: signage, cigarette butt, smoking, ashtray, the smell of smoke, selling, as well as cigarette advertising/promotion/ sponsorship. The number of observations is different. In Banda Aceh is 250 venues, Nagan Raya 204 venues, and East Aceh Regency is 200 venues.

Graphic 1. The Surveyed Venues in Nagan Raya Regency

Graphic 2. The Surveyed Venues in East Aceh

Graphic 3. The Surveyed Venues in Banda Aceh City

Table 1. Information of Policy in Selected City/Regency

No	City/District	Regulation No. & Year	Type of policy	Year Adopted	Population	Level of SF Policy
1	Aceh Timur Regency	Regulation 33/2019	Regulation	2019	432.849	100% SF
2	Nagan Raya Regency	Law/Qanun 3/2015	Law	2015	173.393	100% SF
3	Banda Aceh City	Law 5/2016 and Regulation 46/2017	Law	2017	257.635	100% SF

Source: The UNION and Statistical Bureau of Indonesia, 2024

RESULTS AND DISCUSSION

The survey data of the Aceh Institute survey show that the average level of compliance with the presence of SF stickers or smoking prohibition stickers in the three districts is 28.45 percent. This rate is different from the average of impressions related to indoor smoking which is at the level of 11.52 percent and the smell of cigarettes which is at the level of 14.75.

Regarding the SFA Policy sticker and smoking ban, Banda Aceh City is ahead with a compliance rate of 50.80 percent. This achievement is very far compared to Nagan Raya which is only 22.06 percent and East Aceh 12.5 percent. The results of the Aceh Institute's (AI) advocacy report show that the success of Banda Aceh City in placing SF stickers is due to the assistance of stickers from the tobacco control advocacy program conducted by AI.

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Furthermore, the stickers in Banda Aceh City is more well managed where each sticker has a record position, thereby increasing the effectiveness of the stickers and there is no repetition in sticking the stickers in the same places.

This study also found significant differences regarding indoor smoking activities. Most violations occurred in East Aceh regency with 18.00 percent, relatively high compared to Nagan Raya which is only 7.35 percent. Based on policy advocacy notes from the Aceh Institute, the high level of indoor smoking occurs because the SFA policy has not been well socialized in East Aceh Regency. Apart from that, the absence of stickers means that people and even government officials still smoke indoors. This is different from Banda Aceh City, the existence of sanctions and SFA stickers makes people reluctant or do not dare to smoke indoors, especially in government office buildings.

Table 2. Smoke-Free Compliance Regarding the Sign, Smoking, and The Smell

Response	Nagan Raya		Aceh Timur		Banda Aceh	
	Number	%	Number	%	Number	%
A smoking sign on the main door						
Yes	45	22,06	25	12,5	127	50,80
No	159	77,94	175	87,5	123	49,20
Total	**204**	**100,00**	**200**	**100,00**	**250**	**100,00**
People smoking in the building						
Yes	15	7,35	36	18,00	23	9,20
No	189	92,65	164	82,00	227	90,80
Total	**204**	**100,00**	**200**	**100,00**	**250**	**100,00**
Smell cigarettes in the building						
Yes	2	0,98	2	1,00	5	2,00
No	202	99,02	198	99,00	245	98,00
Total	**204**	**100,00**	**200**	**100,00**	**250**	**100,00**

Source: Surveys of Aceh Institute, 2022-2023

Table 3. Smoke-Free Compliance Regarding the Sign, Smoking, and The Smell

Response	Nagan Raya		Aceh Timur		Banda Aceh	
	Number	%	Number	%	Number	%
Cigarette butts in the building						
Yes	14	6,86	46	23,00	58	23,2
No	190	93,14	154	77,00	192	76,8
Total	**204**	**100,00**	**200**	**100,00**	**250**	**100,00**
Ashtrays or something similar in the building						
Yes	14	6,86	31	15,50	18	7,20
No	190	93,14	169	84,50	232	92,80
Total	**204**	**100,00**	**200**	**100,00**	**250**	**100,00**
Any items or goods with promotions/advertising/sponsorship from cigarette brands/companies in the building						
Yes	2	0,98	9	4,50	5	2.00
No	202	99,02	191	95,50	245	98.00
Total	**204**	**100,00**	**200**	**100,00**	**250**	**100,00**
Any activity selling cigarettes in the building						
Yes	2	0,98	90	32,14	8	3,20
No	202	99,02	190	67,86	242	96,80
Total	**204**	**100,00**	**280**	**100,00**	**250**	**100,00**

Source: Surveys of Aceh Institute, 2022-2023

Even though the city of Banda Aceh is leading in stickers, but not regarding the presence of cigarette butts. Banda Aceh City only got a score of 76.80, still inferior to Nagan Raya which was 93.14. For indoor advertising/sponsorship compliance, the three regions have the same level, namely above 95 percent. Based on the Aceh Institute's records, this happened because there were not many objects or posters promoting smoking indoors in these three areas. For indoors, most promotions come from the beverage and food industry, not from the cigarette industry.

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Regarding indoor sales, the lowest level of compliance occurred in East Aceh, namely only 67.86 percent. This happens because many cafes or restaurants sell cigarettes indoors as a complement to their business. In contrast to the city of Banda Aceh, indoor cigarette sales are very low with a compliance level that has reached 96.80 percent.

The differences in the effectiveness of smoke-free policies in regencies/cities are due to differences in commitment to policy implementation. Commitment to government is crucial to SF policy (Kramer et al., 2023; Sufri et al., 2023).The Banda Aceh City has a higher commitment than the other two regencies. The Aceh Institute's policy advocacy records show higher commitment in Banda Aceh City, compared to other regions. One indicator is the presence of the mayor and high-level officials in activities related to SF policy.

The commitment is also proved by forming a smoke-free task force yearly to implement the policy. The existence of task force influences the effectiveness of SF policy (Trisnowati & Marlinawati, 2020). In the Banda Aceh City, every year an SF team is formed and provided with training regarding the policy. The team is also equipped with working documents and protocols for SF policy enforcement. This has not been found in East Aceh Regency.

The commitment to policy monitoring also looks better in Banda Aceh City. They have a monitoring system, either manual through direct visits or based on reporting using applications. Even though Nagan Raya also has the same instrument, its implementation is still not as good as Banda Aceh City.

The effectiveness of the SF policy also requires strong and broad collaboration with stakeholders, including the community (Suteerangkul et al., 2021). In a previous study, it was stated that the environment or group support greatly influences a person's level of compliance with the smoke-free policy (Wati, 2020).Community participation, both individually and in groups, is even encouraged in policy. In Banda Aceh City, a cigarette control alliance has been formed, consisting of organizations that are concerned about the issue. The importance of community engagement is also emphasized by a previous study that states community participation programs for smoke-free may be effective in raising awareness (Suteerangkul et al., 2021)

Smoke-free stickers or no-smoking stickers are crucial in realizing smoke-free policies in local governments (Noviafni & Khaidir, 2019; Rokhmah, 2023). The number of stickers equally distributed will be directly correlated to the achievement of compliance. However, not all regions have adequate distribution of SF stickers. One factor is budget. In the city of Banda Aceh, with a larger budget compared to Nagan Raya and East Aceh, it is very possible to print stickers. However, fulfilling stickers is not always due to budget. Awareness of the importance of stickers also varies between governments, in some cases, SF sticker is considered unimportant.

Compliance with indoor smoking bans is also related to the sanctions imposed (Wahyuti et al., 2020). For example, in the city of Banda Aceh, sanctions against government employees who are caught smoking indoors include cutting performance allowances, and this has been implemented. Apart from that, there must be no exceptions to SF policy enforcement, it must be comprehensive. Strict enforcement will also have a significant impact on compliance.

Public awareness of SF policy greatly influences compliance (Bafunno et al., 2020; Fajrin, 2019; Primasari & Listina, 2022). If the socialization of the policy is deemed insufficient, it will be difficult to achieve a level of compliance with the policy. This can be seen in East Aceh and Nagan Raya regency where socialization and educational activities related to SF policy are still very few compared to Banda Aceh City. Moreover, if the public already has high knowledge and awareness, they will support the policy of banning smoking, not only indoors but also outdoors to ensure public health (Hock et al., 2019).

To ensure the implementation of the SF policy, budget availability is very crucial. Without a budget, local governments cannot supervise and enforce SF policy. Based on Aceh Institute records, the Banda Aceh city government has a better budget pattern than East Aceh and Nagan Raya in terms of smoke-free activities. Apart from that, the

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assistance from the Aceh Institute allows regions to carry out more implementation activities.

CONCLUSION

The average compliance with the presence of SF stickers in the three districts is 28.45 percent. This rate is different from the average of impressions related to indoor smoking which is at the level of 11.52 percent and the smell of cigarettes which is at the level of 14.75.

The average signage compliance is 28.45 percent with Banda Aceh City having the highest compliance at 50,8 percent. Regarding compliance with no smoking activities, the average is 88.48 percent. However, the existence of cigarette butt is relatively high, with average 17,69 percent with Nagan Raya has the lowest rate.

Three main conditions related to the effectiveness of smoke-free policy. First, the commitment of the government to disseminate, implement, and monitor the policy. More activities conducted by the government seem to increase compliance. Second, the collaboration between government and stakeholders. Collaboration is encouraged in the policy for more effective implementation. Third, resources to implement the policy. Adequate resources improve the implementation such as the signage coverage and policy enforcement.

Even though this study only analyses three regencies/cities, at least it was able to identify three main factors that the government should pay attention to to increase indoor compliance with SFA policy, namely strong commitment, broad collaboration, and sufficient resources. For further studies, we recommend more regencies/cities included to have more robust conclusions.

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A Descriptive Content Analysis of Anti-Smoking Messages among Indonesians on Instagram

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ABSTRACT

Background: *Many people turn to social media platforms to obtain information including information related to health. Understanding how the anti-smoking messages have been done is important to develop more structured and efficient Anti-smoking campaigns.* ***Objective:*** *This study aims to characterize current anti-smoking messages on Instagram in 2023 among Indonesians by employing descriptive content analysis.* ***Methods:*** *In March 2024, anti-smoking messages were searched on Instagram using several anti-smoking relevant hashtags such as #bahayamerokok #berhentimerokok and selected top posts for each hashtag. After eliminating duplicates, 210 Instagram posts were coded for the type of creator (individuals, company, education institution, community), message appeal (threat/fear, humor, social), and message form (picture, videos).* ***Results:*** *The main creator and message appeal were organizations/companies (48.1%), and threat/fear (60%) respectively. The main months of the posts being uploaded were during May or June, especially to celebrate World No Tobacco Day. The main form of the postings was in pictures (92.4%) compared to videos (7.6%). The number of likes was positively associated with the number of followers on the accounts (r=0.452, P<0.05) and the number of hashtags being used (r=0.256, P<0.05).* ***Conclusion:*** *Indonesian anti-smoking campaigns on social media should involve an Instagram account that has large followers to receive higher audience engagement. Routine anti-smoking messages throughout the year will ensure that the audience receives continuous education and information about the dangers of cigarette use.*

Keywords: *campaign, Instagram, smoking, social media*

INTRODUCTION

Smoking is one of the biggest health issues worldwide. Cigarette consumption is the primary cause of fatal health problems, resulting in about 8.7 million tobacco-related deaths each year (WHO, 2023). While smoking prevalence has declined in many countries (Dai *et al.*, 2022; WHO, 2023), Indonesia stands out with the highest adult smoker prevalence in Southeast Asia. Additionally, it ranks third globally, after India and Egypt, in terms of the largest absolute increase in the number of male smokers aged 15-24 years old (Reitsma *et al.*, 2021). Moreover, smoking prevalence among teenagers was about 38.3% (WHO, 2020) with an average age of smoking, initiation around teenage age (Reitsma *et al.*, 2021; TCSC-IAKMI, 2020)

Although exposure to advertisements and promotions on social media is positively associated with both ever using and current use of e-cigarettes (Wulan *et al.*, 2022) and cigarettes (Leung *et al.*, 2023), it is essential to have effective anti-tobacco campaigns on social media that inform about the risks of smoking to mitigate the impact of online tobacco promotions. One unique characteristic of social media is its ability to allow users to create and own their messages, as well as to share opinions through online comments. This creates a conducive audience engagement where users can actively participate in the information-sharing process and communicate with each other. Thus, popular social media platforms can be effective in spreading health information and encouraging positive behavioral changes (Lee & Chen, 2016).

In January 2023, Indonesia ranked fourth globally in internet users, following China, India, and the United States, with

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over 200 million internet users (Petrosyan, 2024). Social media usage reached 191.4 million users (68.9% of the Indonesian population), and Instagram was the third-largest social media platform (Kemp, 2022). Instagram lets individuals upload images and videos using hashtags as search keys. With keyword searches, people can explore images connected with those hashtags, thus allowing interaction with content created by users (Gao *et al*., 2020).

Instagram has become a powerful tool for public health campaigns. The large number of Instagram users has encouraged activists to use it as a medium for spreading social issues to attract public attention and shape public discourse. In Indonesia, these platforms are being leveraged to combat the tobacco epidemic. Recent studies, such as the Indonesian 2019 Global Youth Tobacco Survey, have shed light on the complex relationship between anti-smoking campaigns and youth smoking behavior (Megatsari *et al*., 2023). Despite the challenges, young Indonesians are increasingly vocal on Instagram, advocating for a tobacco-free future. They call for smoke-free areas and a ban on tobacco advertising, promotion, and sponsorship (Syakriah, 2022). With a significant presence on Instagram (Nurhayati-Wolff, 2023), anti-smoking messages can effectively reach millions, especially youth at risk of smoking. This research aims to characterize the anti-smoking messages on Instagram in 2023 among the Indonesian community using descriptive content analysis to understand what kind of posts gain significant attention from public awareness.

METHODS

Hashtags on Instagram

This study began exploration using several relevant anti-smoking hashtags. After reviewing hundreds of anti-smoking-related posts and their hashtags, the list of root smoking-related keywords such as cigarette, smoking, and tobacco. The negative-root keywords included quit, stop, anti, and danger. The combination of negative-root keywords and root of smoking-related keywords created a new group of smoking-warning keywords such as the danger of smoking or stop smoking.

Data collection

The posts were collected through Instagram's application using 16 hashtags such as #bahayamerokok, #berhentimerokok, #rokok, #suaratanparokok, #haritanparokoksedunia, #berani berhenti merokok, #htts, HariTanpa TembakauSedunia, #beraniberhenti, #hentibukanganti, #wntd, #sehattanparokok, #mahalkanrokok, #upayaberhentimerokok, #janganmerokok. The top posts were selected for each hashtag. The posts were collected in March 2024. Most posts use multiple hashtags, resulting in duplicated posts. Duplicated posts were excluded using the Instagram user ID and posting date.

Data coding and analysis

After removing duplicates, 210 Instagram posts were selected. The codebook contained both metadata and other features created. To increase the accuracy, the codebook was further revised during hand coding. All hand coding was performed independently by two authors and the principal author checked 10% of the total posts randomly.

This study uses descriptive content analysis. The posts are coded based on several categories. The type of creator (individual, company, educational institution, community), message appeal (threat/fear, humor, social), and message form (image and video). This study compares the type of content creator and message appeal based on the number of followers of the Instagram user accounts and the number of "likes" on the posts.

RESULTS AND DISCUSSION

In 2023, anti-smoking campaign posts peaked in May and June, coinciding with the World Health Organization's (WHO) World No Tobacco Day (WNTD) on May 31st. WHO annually selects a theme for WNTD to guide member countries in their anti-smoking efforts. Indonesia also hosted various events in May, such as conferences, competitions, and campaigns. Figure 1 shows the highest number of anti-smoking messages posted during the month of WNTD.

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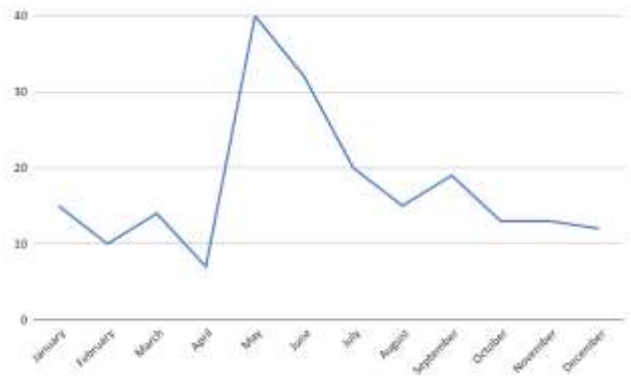

Figure 1. Number of Instagram posts per month of anti-smoking messages during 2023

This study could not provide evidence of the effect of inconsistent anti-smoking Instagram posts on the increased tendency of smoking among Indonesians. However, given the expansive online cigarette marketing, the Tobacco Enforcement and Reporting Movement (TERM), initiated by Vital Strategies, was established. It is an ongoing real-time digital monitoring system that detects online tobacco marketing as it occurs, which provides critical data to inform tobacco control policies and combat tobacco advertising on social media platforms and news sites (WHO, 2023). Furthermore, it is important to make sure that Indonesian social media users read anti-smoking messages consistently.

Evidence-based tobacco prevention campaigns play a strategic role in combating the impact of large-scale pro-tobacco messages. Continuous exposure to health messages on social media can better stimulate community engagement, especially in refraining from smoking. The ability of social media to reach a wider target audience opens up significant opportunities for health promotion efforts (Majmundar *et al.*, 2020).

Nowadays, people use multiple sources of social media. Therefore, the selection of social media channels needs to be considered to target the audience in the prevention and cessation of cigarettes. A 2021 study in the United States on 1,275 anti-tobacco health messages across three social media platforms—Twitter, Facebook, and Instagram—found that the same health message, when posted on different platforms, would elicit different audience responses. Instagram became one of the platforms focused on distributing photo and video content with the highest overall average engagement rate (AER), statistically significant compared to Facebook and Twitter (Reuter *et al.*, 2021).

Table 1. Descriptive statistics of the Instagram posts

No	Sample Characteristics	
1	Type of Creator, n (%)	
	Individuals	38 (18.1)
	Education institutions	14 (6.7)
	Government	40 (19.0)
	Community	17 (8.1)
	Private company/organizations	101 (48.1)
2	Message appeal, n (%)	
	Threat	126 (60)
	Social	53 (25.2)
	Humor	3 (1.4)
	Others	28 (13.3)
3	Forms, n (%)	
	Pictures	194 (92.4)
	Video	16 (7.6)
4	No of likes, mean ± SD	623 ± 4,125
5	No of followers, mean ± SD	26,041.3 ± 89,961.1
6	No of hashtags, mean ± SD	8.8 ± 6.0

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Smoking-related content on Instagram is diverse and abundant. It covers various aspects, including content creators, post formats, message appeal, and the timing of anti-smoking campaigns. Organizations, companies, and private entities play a significant role in creating this content, indirectly impacting public health. Image-based posts are prevalent on Instagram, often accompanied by threatening messages. Health warnings have influenced the anti-smoking campaign trend throughout 2023. Table 1 shows the descriptive statistics of the Instagram posts. Based on the content creators, the largest and the least number of posts were made by organizations/private companies' entities (48.1%) and education institutions (6.7%), respectively. The main message appeal and forms were threat/fear (60%) and pictures (92.4%). The average likes for anti-smoking posts were 623±4,125 and the account creator had an average number of followers of 26,041±89,961.

While the Indonesian internet users spent, on average, 8 hours and 36 minutes online (Kemp, 2022), it is important to note their engagement with the anti-smoking messages. Audience engagement could be measured in several ways: "comment on", "reshare", "DM/Send this to a friend", and/ or "like". In this study, "likes" was the only audience engagement indicator that could be analyzed since the other indicators were either difficult to trace or had too much zero data.

A study conducted over 18-30 years found that the more social media sites are used, the more likely individuals will "like" the posts and the daily internet users tend to "comment" and "like" more (Liu *et al.*, 2023). Given the high percentage of internet users in Indonesia, the audience engagement in anti-tobacco smoking was quite low in several posts, for example, 80 posts received less than 10 likes. The highest proportions (40-45% of posts) of receiving <10 likes came from individuals or government institutions. However, a few posts had a high number of likes, 11 posts with more than 1000 likes. The majority of those posts (45%) came from private companies/organizations and none of them from educational institutions. It showed that engagement from educational institutions was low and therefore required to improve the way messages developed.

Table 2. Spearman correlation analysis between no of likes, no of followers, and no of hashtag

Variables	No of likes	No of followers	No of Hashtag
No of likes	1.000		
No of followers	0.452*	1.000	
No of hashtag	0.256*	0.246*	1.000

*P<0.05 analyses were conducted in STATA 18.0

Table 2 indicated a positive correlation between the total likes and both the follower count of the account posting anti-smoking content and the usage of hashtags. Nonetheless, when hashtags were categorized into four groups, it was observed that utilizing over eight hashtags did not correlate with an increase in likes for the pertinent post. It is readily apparent that an anti-smoking message shared by an account with a substantial follower base, coupled with the use of multiple pertinent hashtags, is more likely to gain visibility among Instagram users. Consequently, this enhances the chances of audience interaction with the post.

One reason that explains how audiences not only want to engage with the posts but also effectively motivate smokers to stop smoking was to choose the right content. Figure 2 showed that in all types of messages, the number had a positive association of likes and total number of followers. However, given the very low number of messages using humor, the results of this type of message were not significant statistically. At the same time, several studies concluded that messages using humor were not recommended (Huang *et al.*, 2018; Reis, 2019) since it lacked emotional content related to smoking consequences.

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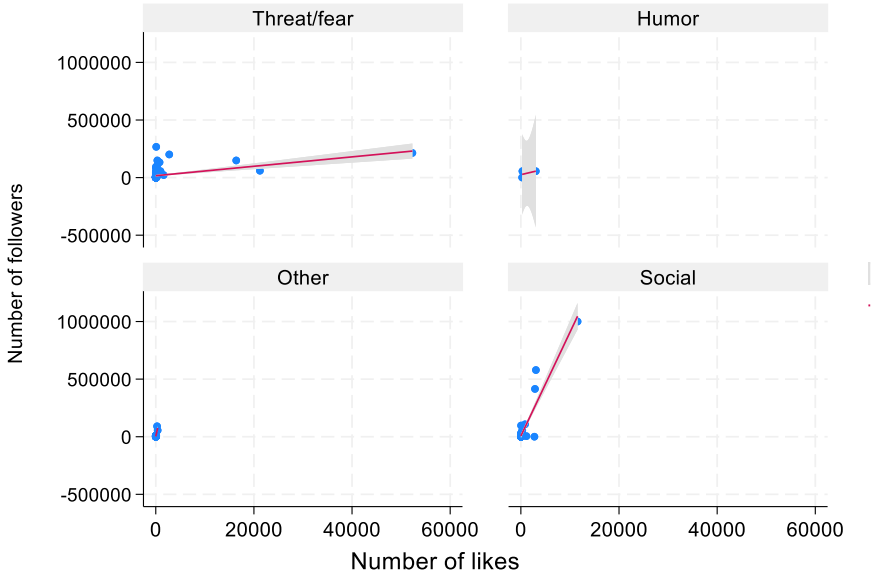

Figure 2. Spearman correlation analysis for the number of followers and likes by message appeals

On the other hand, fear/threat appeal seemed more promising to act as effective message (Huang *et al.*, 2018; Reis, 2019). To effectively engage with a fear appeal, individuals need to possess a strong sense of self-efficacy to manage both minor and major perceptions of threat (Reis, 2019). However, if the perceived threat is significant and the individual's self-efficacy is weak—particularly if they lack knowledge of effective actions to mitigate their perceived risk—they may either shun the fear-inducing stimulus or resort to alternative defensive strategies to interpret the message. Posts that communicated perceived risk and self-efficacy had a positive effect on engaging the online audience, while posts related to social expectations did not significantly predict audience engagement (Jiang & Beaudoin). Other research also found that the content of campaigns on the dangers of electronic cigarettes served as an effective way to engage the younger generation (Liu *et al.*, 2023).

Successful anti-smoking campaigns on Instagram often utilize compelling visuals and narratives to reach and engage their audience. Few approaches that have been noted for their effectiveness such as real stories (campaigns use personal stories to highlight the consequences of smoking) (Huang *et al.*, 2018; Truth Initiative, 2017), creative visuals (creative imagery using a variety of approaches from graphic images of smoking damage to emotional appeals) (Huang *et al.*, 2018), educational content (providing factual information about the dangers of smoking), and youth engagement (engaging the youth through messages that resonate with their values and experiences) (Hair *et al.*, 2017).

Messages with strong emotional content and personal relevance were considered effective in motivating smokers to quit smoking (Huang *et al.*, 2018). Messages focusing on the individual are better for those who see themselves as independent, while messages that consider the group are better for those with a more collective view. Additionally, understanding smokers' habits and the symbolic importance they place on smoking can help create more meaningful public service announcements (PSAs) to encourage quitting (Önen & Watson, 2021).

CONCLUSION

This study finds that social media, Instagram in particular, has the potential to increase audience engagement related to anti-smoking campaigns. Regular anti-smoking messages throughout the year can facilitate public acceptance of education and information regarding the dangers of smoking. Future anti-smoking campaigns on Instagram in Indonesia should use a threat/fear appeal and focus

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on personal and emotional content or images.

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The Effect of Implementing Smoke-Free Areas on Indoor Air Quality in Kulon Progo

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ABSTRACT

***Background**: The development of a city affects air pollution. Indonesia is the third country in the world with the highest number of smokers in the world. Smoking behavior produces smoke that comes from chemicals and dust or particulate matter. Pollution in closed places also has a risk that is 2 – 5 times higher than in open places. In monitoring and evaluating compliance with smoke-free areas (KTR) in Kulon Progo in 2023, from 7 areas, it was found that there were 3 areas with low compliance, namely teaching and learning facilities, workplaces & public places. **Aims**: This research reveals the differences between places that comply and do not comply with the KTR Regional Regulation and their relationship with indoor air quality to prove whether the implementation of No-Smoking Areas influences indoor air quality. **Method**: Descriptive research method with quantitative analysis using SPSS. Primary data collection by observation refers to the KTR implementation monitoring checklist and air quality measurements using particulate dust meters and anemometers. **Results**: The results of the KTR sample data collection illustrate that KTR compliance has a positive effect on air quality with a significance value of 0.48. The dominant violations are the provision of ashtrays, the discovery of cigarette butts, and people smoking outside designated places, both indoors and outdoors. Findings of indoor violations greatly affect the levels of PM 2.5 and PM 10 in the air. **Conclusion**: Exposure to air pollution such as PM that exceeds the threshold can cause health problems and reduce productivity. So implementing optimal KTR regulations can improve indoor air quality. Consistency is needed from the person in charge of the area in supervision to increase compliance. Improving air quality is also expected to improve the health and productivity of students, employees, and the community.*

***Keywords**: KTR, Air Quality, Compliance, PM*

INTRODUCTION

The development of a city is something that cannot be avoided. This also affects air pollution because it is mixed with various components. Air pollution is a situation where physical, biological, or chemical substances in the air layer on Earth in sufficient quantities can cause danger to the health of humans and other living creatures (Siburian, 2020). This also affects air quality in spaces where the air conditions in the building or structure, especially those related to the health and comfort of building occupants, will also be affected (Minister of Health Regulation No. 2 of 2023). Air quality is influenced by primary pollutants, which are released directly from certain sources and can be gasses or particles. Pollutants included in gas form are carbon (C), sulfur (S), nitrogen (N), and halogen compounds, while pollutants in particle form are in the form of solid substances or liquid aerosol suspensions including Particulate Matter (Mukono, 2003).

One of the air components that can harm health is Particulate Matter (PM). PM2.5 (particulates) are air particles smaller than 2.5 microns (micrometers). The threshold value (NAB) for PM2.5 is 65 µg/m3 (Meteorology, Climatology and Geophysics Agency, 2019). Particles contained in ambient air generally measure 0.1 – 50 µm or more. The main parameter for air pollution particles is a diameter of 2.5 µm or less. Air particles

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measuring less than 2.5 µm (PM2.5) are called fine particles, and PM10 are air particles measuring less than 10 µm. Fine air particles are very dangerous because they can penetrate the deepest parts of the lungs and heart system, causing health problems, such as acute respiratory infections, lung cancer, cardiovascular disease, and even death. Fine air particles generally come from anthropogenic sources such as motorized vehicles, biomass burning, and fuel burning (Mukhtar *et al*., 2013).

Based on the results of a field survey conducted by the Global Adults Tobacco Survey (GATS), the number of adult smokers in Indonesia is 70.2 million. This places Indonesia as the third country in the world with the highest burden of smokers. According to the Global Youth Tobacco Survey (GYTS), 3 out of 4 people start smoking at the age of less than 20 years (World Health Organization, 2014). Even though an active smoker affects overall organ health. Smoking behavior can also cause death in passive smokers. Approximately 41,000 deaths in adults and 400 deaths in infants each year are caused by exposure to cigarette smoke. Adult passive smoking causes many health problems such as stroke, lung cancer and coronary heart disease (CDC, 2020b). The risk of exposure to passive smoke does not end when the smoker stops smoking. Pollutants from smoking behavior, especially in the form of gas, can be expelled through ventilation, but can also remain on surfaces for a certain time and can cause third hand *smoke*. A person can be exposed to *third-hand smoke* through inhalation, ingestion or skin contact on any surface in the house or other closed room. The impact of *thirdhand smoke* on health is the risk of cancer, damage to internal organs such as the cardiovascular system and liver, triggering lung inflammation which can result in Chronic Obstructive Pulmonary Disease (COPD), asthma, and the risk of type 2 diabetes (P2PTM Ministry of Health of the Republic of Indonesia, 2018).

Based on data from the Global Burden Diseases 2019 Diseases and Injuries Collaborators, 5 respiratory diseases cause the highest number of deaths in the world, namely chronic obstructive pulmonary disease (COPD), pneumonia, lung cancer, tuberculosis, and asthma (GBD 2019 Diseases and Injuries Collaborators, 2020). Apart from that, smoking produces smoke which has the potential to cause air pollution originating from chemicals, dust, or particulate matter. Pollution in closed places has a risk of 2-5 times more pollution than in open places (10 EPA “Indoor Air Plus”, 2012)

The high health impacts resulting from smoking behavior require efforts to control cigarette consumption. The government has made various efforts to control the impact of smoking on health, such as requiring the implementation of the smoke-free zone (KTR) policy as outlined in Law No. 17 of 2023 concerning Health Article 151 paragraph 2 and PP Number 109 of 2012 concerning Safeguarding of Materials Containing Addictive Substances in the Form of Tobacco Products for Health article 52. The form of implementation of this policy is outlined in the No Smoking Zone (KTR) policy in various regions in Indonesia in the form of Regional regulations and regional head regulations.

Kulon Progo Regency in the Special Region of Yogyakarta has ratified it Regional Regulation (Perda) of Kulon Progo Regency no. 5 of 2014 concerning non-smoking areas which was revealed in Kulon Progo Regent's Regulation no. 3 of 2015 concerning implementation guidelines for the KTR regional regulation which has been revised with regent's regulation no. 15 of 2020. The main objective of the No-Smoking Area (KTR) is to protect and guarantee the community's right to clean and healthy air without cigarette smoke. There are 7 non-smoking areas regulated in the Kulon Progo Regional Regulation no. 5 of 2014 concerning KTR article 4 paragraph 1, namely Teaching and Learning Facilities, Health Service Facilities, Children's Playgrounds, Places of Worship, Public Transport, and other designated Public Places. In its implementation, the regional government of Kulon Progo Regency carries out evaluation and monitoring using a compliance checklist for implementing smoke-free areas which has 10 indicators, namely: Has socialization of the KTR Regional Regulation been carried out, There is a KTR Supervision Task Force, There are KTR Signs and Warnings Prohibiting Smoking, There are appropriate designated Smoking Places. with the

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provisions, no people are smoking, no cigarette butts, no ashtrays, no Cigarette Promotion media, No Cigarette Sales and no cigarette smell.

In the Monitoring and Evaluation carried out by SemarKu together with the health service in 2023, smoking-free areas were still found where KTR was not implemented optimally. It is known that of the 7 areas without smoking, there are 3 areas where people are still found smoking outside the designated places, there are still designated smoking rooms that do not comply with the provisions and cigarette butts are found which indicates that there is still smoking activity in the KTR. These areas are teaching and learning facilities, workplaces & public places.

So in this research, we want to know the differences between places that comply and do not comply with the KTR Regional Regulation and their relationship with indoor air quality to prove whether the implementation of No-Smoking Areas influences indoor air quality.

METHODS

The method in this research uses qualitative analysis with descriptive methods. Presenting primary data using observations using monitoring checklists for implementing KTR and measuring air quality using measuring instruments. Observations were carried out using a monitoring checklist for compliance with regional regulations number 5 of 2014 concerning smoking-free areas which has 10 indicators. A non-smoking area that is observed by looking at these indicators is said to be compliant if it meets all the indicators, but if one does not fulfill it then the area is declared non-compliant. Observations were carried out with the naked eye at the KTR and interviews by paying attention to the following indicators:

1. There was a socialization of Regional Regulation No. 5 of 2014 concerning Smoking-Free Areas to Staff/Pupils/Students/Other Management
2. There is a KTR Implementation Task Force
3. An announcement or sign is attached stating that the place is a KTR
4. There is a warning about no smoking
5. people are smoking outside the designated areas
6. There are ashtrays outside the designated areas
7. Cigarette butts were found outside the designated area
8. Found a cigarette advertisement
9. Cigarette sales were found in the KTR area
10. Smells of cigarettes

Measurements use measuring instruments in the form of the Anmo-300 Anemometer which is an airspeed meter and low volume measurement with a quality standard of 0.15-0.25 m/s and the DAZ-400 Particulate Dust Meter which has the function of measuring PM2.5 dust particle counts with a standard quality 25 $\mu g/m^3$, PM10 with a quality standard of 70 $\mu g/m^3$, temperature with a quality standard of 40-60% Rh and humidity with a quality standard of 18-30°C. The quality standards used are per Minister of Health Regulation Number 2 of 2023 concerning Implementing Regulations of Government Regulation Number 66 of 2014 concerning Environmental Health. Measurements are carried out by trained personnel. Measurements were carried out in 2-3 rooms at KTR for 5-15 minutes. An area is declared as meeting air quality requirements when all indicators do not exceed quality standards, but if one indicator exceeds quality standards then the area is declared not to meet air quality requirements.

The population in this study is the monitoring point for the evaluation of the implementation of smoking-free areas in 2023, Kulon Progo district in 7 smoking-free areas. The sample in this study was selected using simplified random sampling in non-smoking areas with low compliance achieved at 50 points in 3 areas, namely Teaching and Learning Facilities, Workplaces, and Public Places.

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RESULTS AND DISCUSSION

Table 1. KTR Compliance Results & Air Quality Measurements for Teaching and Learning Facilities

Teaching and Learning Facilities	Meets Air Quality Requirements	%	Does not meet air quality requirements	%
Comply with KTR	9	81.82%	0	0.00%
Not Complying with KTR	1	9.09%	1	9.09%
N	**11**			

Learning Facilities

In teaching and learning facilities, 9 points (81.82%) were found that complied with the 10 indicators of non-smoking areas and met air quality requirements. There was a finding of 1 school that met air quality but did not comply with KTR. At this school, cigarette butts were still found in the yard, indicating that there was still smoking activity in the non-smoking area but the quality of air was still in the standard. There is 1 school that does not meet air quality requirements and does not comply with KTR. At the school, ashtrays, lit cigarette butts, and a room that smelled of cigarettes were still found. It was found that in the room measured using a particulate meter, PM 2.5 measurements reached 203 µg/m^3, and PM 10 reached 429 µg/m^3 but the airflow was found to be good.

According to the Regulation of the Minister of Education and Culture (Permendikbud) of the Republic of Indonesia Number 64 of 2015 concerning KTR in the School Environment, the definition of a Non-Smoking Area is a room or area that is declared prohibited for smoking activities or activities for producing, selling and/or promoting cigarettes. The implementation of Minister of Education and Culture Regulation No. 64 of 2015 in Kulon Progo Regency was also strengthened by the ratification of Perbup No. 3 of 2015 concerning Guidelines for the Implementation of Kulon Progo Regency Regional Regulation No. 5 of 2014 concerning Non-Smoking Areas Article 7 which states that Teaching and Learning Facilities from Early Childhood Education (PAUD) to Universities and other places of study are KTR. However, from the results of observations, 2 schools did not comply with KTR because cigarette butts were still found which indicated that there was still smoking activity in non-smoking areas. Apart from that, there are still ashtrays provided in the school environment.

The high levels of PM 2.5 and PM10 found in schools due to exposure to cigarette smoke indoors hurt children's health. In research conducted on elementary school students in the Bogor district in 2018, it was proven that there was a significant relationship between the concentration of PM10 in classroom air and the incidence of ISPA in students (JNKLG. 2020). According to Grineski, Clark-Reyna, and Collins in their research in Mexico, the United States showed a significant relationship between PM 2.5 and students' average grades, indicated by a decrease in scores of around 0.11 to 0.25 as PM 2.5 exposure was received (Gilliland *et al.*, 2001). Another study in Chile stated that there was a decrease in mathematics scores of 0.4 and a decrease in language test scores of around 0.23 for every increase in exposure to PM 2.5 concentrations of 1 µg/m3 per year (Jimenez and Jordan, 2019). Apart from affecting the quality of student learning, air quality also affects the health of teachers. This was proven by Tuula Putus in her research which stated that air quality had a significant effect on the hoarseness experienced by teachers in Finland (Putus, Vilén, and Atusuo, 2024).

Table 2. KTR Compliance Results & Air Quality Measurements in the Workplace

Workplace	Meets Air Quality Requirements	%	Does not meet air quality requirements	%
Comply with KTR	6	54.55%	0	0.00%
Not Complying with KTR	6	54.55%	3	27.27%
N	**15**			

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Measurements in the Workplace

In the workplace, it was found that 6 out of a total of 15 workplaces were KTR compliant and met air quality requirements. 6 workplaces do not comply with KTR but meet air quality requirements. In workplaces that do not comply with KTR but meet air quality requirements, violations are found in the form of smokers smoking outside designated smoking areas (violators smoke in the yard or parking lot). The provision of ashtrays outside designated smoking areas and the discovery of scattered cigarette butts also indicate that visitors and employees still do not comply with the KTR by not smoking in designated areas. 3 workplaces do not comply with KTR and do not meet air quality requirements. In these 3 workplaces, violations were still found in the form of smokers smoking outside designated smoking areas. However, violations were found both outdoors and indoors. Apart from that, ashtrays were still found outside designated smoking areas and the discovery of scattered cigarette butts also indicated that visitors and employees were still not complying with the KTR by not smoking in designated areas. Even though the workplace already has a special smoking area that complies with the regulations. It was found that in the room measured using a particulate meter the highest PM 2.5 measurement reached 1449 µg/m^3, the highest PM 10 reached 277 µg/m^3 but the air flow was found to be good.

In the KTR Regional Regulation no. 5 of 2014 article 4 paragraph 3 states that the person responsible for the workplace provides a special smoking area as stipulated in article 5. However, in the 9 places that do not comply with the KTR, neither visitors nor employees still use the special smoking areas provided. This is proven by the fact that ashtrays, butts, and people smoking outside the designated areas were still found. Not to mention that the PM 2.5 and PM10 levels in 3 places that do not meet indoor air quality standards have very high values. In research conducted by Wu J et al, an increase in PM 2.5 exposure levels of 10 µg/m^3 for 25 days caused a decrease in productivity of 1%. Apart from affecting work productivity, PM10 particles can be inhaled and deposited throughout the airways in the upper part of the lungs (Wu *et al.*, 2021). Particles that stick to the surface of the lungs can cause tissue damage and lung inflammation, thereby impacting respiratory and cardiovascular health. Apart from affecting employee stress levels. Research conducted by Huichu et al in 2017 showed that higher PM can cause metabolic changes consistent with activation of the hypothalamic-pituitary-adrenal and sympathetic-adrenal-medullary axes, thereby adding potential mechanistic insight into the adverse health impacts associated with PM. Additionally, our research showed a short-term decrease in stress hormones after indoor air purification (Hiuchu Li. 2017). Which means that there is a link between increased stress hormones when a person is consistently exposed to Particulate Matter.

Table 3. KTR Compliance Results & Air Quality Measurements in Public Places

Public places	Meets Air Quality Requirements	%	Does not meet air quality requirements	%
Comply with KTR	11	45.83%	4	16.67%
Not Complying with KTR	5	20.83%	4	16.67%
N	**24**			

Of the 50 public places, 24 of them are public places consisting of star hotels, budget hotels, food processing places (Restaurants & Cafes), and airports. From the results of observations and air quality inspections, it was found that 11 public places met air quality requirements and complied with the KTR, including 2 star hotels, 5 budget hotels and 4 food processing places. It was found that 5 public places met air quality requirements and did not comply with KTR, including 1 star hotel, 1 budget hotel and 3 food processing places. Of the 5 places where KTR is violated, the ones that are most often violated are the provision of smoking places that do not comply with the provisions, the provision of ashtrays outside the designated places and the sale of cigarettes in eating places. It was

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found that 4 places did not meet air quality but complied with KTR, including 2-star hotels and 2 food processing places. In star hotels, rooms were found where PM 2.5 exceeded the quality standard and 2 food processing places where PM 2.5 and PM10 exceeded the threshold because there were cooking areas in the same room. Four public places were found that did not meet air quality requirements and did not comply with KTR, including 1 budget hotel where PM 2.5 and PM 10 exceeded quality standards, cigarette butts were found, and people were found smoking outside the designated places. It was also found that 3 food management places with PM 2.5 and PM 10 exceeded quality standards and violations in the form of smoking places that did not comply with regulations.

In hotels and food management places, air quality can determine a person's intention to visit again through perceived value, perceived quality, and affective image (Park, 2021). So air quality needs to be a serious concern, especially in hotel rooms and the provision of special smoking areas in closed areas. Much research evidence shows that pollutants, especially fine particulate matter (PM2.5), associated with smoking, are harmful to the human body. Considering that hotel rooms and indoor smoking areas are almost airtight and not too spacious. Investigations conducted in China found that cigarette combustion and smoking-induced PM2.5 concentrations can reach an average of 586 µg/m3 and 1368 µg/m3, respectively, when indoor ventilation is turned off. Ventilation operation can reduce concentrations to about 100 µg/m3. The effectiveness of opening windows as a mitigating measure is highly dependent on outdoor PM2.5 concentrations; The observed reference threshold was 100 µg/m3. The air purifier tested worked well for smoking, but not for burning cigarettes (Wilco Chan.2017). Regarding the discovery of smoking places that do not comply with the provisions, according to Kulon Progo Regional Regulation No. 5 of 2014 concerning KTR article 4 paragraph 4. Special smoking places as intended in paragraph (3) must meet the requirements: they are open places that are in direct contact with outside air; physically separated and located outside the main building; closest to 5 (five) meters from the entrance and exit; and the closest 5 (five) meters from the passing area. However, in the findings of this study, smoking areas were found to be closed and not in direct contact with outside air. In indoor smoking areas, especially in airport areas where open space is very limited, *exhausts are provided,* but *the exhaust* provided cannot suck up the smoke in the smoking room. This causes cigarette smoke to gather in the room and when the smokingroom door is opened a leak occurs which causes an increase in the PM meter around the room.

CONCLUSION

The results of the KTR sample data collection illustrate that KTR compliance has a positive effect on air quality with a significance value of 0.48. The dominant violations found in the sample area were the provision of ashtrays, the discovery of cigarette butts, people smoking outside designated areas, and there were still designated smoking areas that did not comply with regional regulations. The findings of violations regarding the provision of smoking places in the room greatly affect the levels of PM 2.5 and PM 10 in the smoking room and the rooms around the smoking room. Exposure to air pollution such as PM that exceeds the threshold can cause health problems and reduce productivity and health, both physical and mental. So implementing optimal KTR regulations can improve indoor air quality. Consistency is needed from the person in charge of the area in monitoring the implementation of KTR through the activation of the KTR task force to increase compliance along with monitoring environmental health. This needs to be done to improve air quality so that it can improve the health and productivity levels of students, employees, and the community. In future research, attention needs to be paid to repeating indoor PM measurements over time and increasing the number of samples studied to improve data quality.

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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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The Relationship Between Smoking Habits and CO Levels of Adolescents in Middle Schools in Cinere District, Depok City, West Java, 2023

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ABSTRACT

***Background**: Smoking is one of the highest risk factors for non-communicable diseases. Cigarettes Contain various dangerous substances, one of which is Carbon Monoxide (CO) which can cause multiple diseases of the lungs, heart, and other organs. The number of adolescent smokers has increased from 2014 to 2019. Riskesdas data in 2018 also shows that smokers start smoking at the age of 15-19 years. **Aims**: This study examines the relationship between smoking habits in adolescents aged 12-19 years in 16 secondary schools in the Cinere District, Depok City, West Java. **Method**: This is a cross-sectional study of 486 samples using a random sampling method. Data on smoking habits were analyzed descriptively and its relationship with CO levels was analyzed using the Kruskal-Wall Test. **Result**: Studies show that 51.9% of teenagers have never smoked, 18.6% of teenagers have tried smoking, 14.9% of teenagers smoke occasionally and 14.7% of teenagers smoke every day. 69.81% of teenage smokers smoke using conventional cigarettes, 14.1% use electronic cigarettes, and 16.1% use both. The average number of cigarettes smoked was 19 cigarettes per week. The average teenage smoker starts smoking at the age of 13 years and has been smoking for 31 months. The reason teenagers smoke is because of curiosity at 50.8% and being invited by friends at 46.6%. The presence of family members at home who smoke reaches 71.9% and there is a significant relationship between the presence of family members at home smoking and smoking habits among students. The Kruskal-Wall Test between smoking habits and CO levels produces a P-value of 0.001. **Conclusion**: It can be concluded that there is a significant relationship between smoking habits and CO levels in teenagers in secondary schools in the Cinere District area in 2023.*

***Keywords**: Smoking habits, CO Levels, adolescent, student, electronic cigarette.*

INTRODUCTION

Smoking can cause diseases and disabilities and harm almost every organ in the human body. According to the 2018 Riskesdas data, smoking is the second highest contributing factor to non-communicable diseases. Smoking can lead to various diseases such as heart disease, chronic obstructive pulmonary disease, and even cancer (CDC, 2023).

WHO data from 2023 indicates that at least 38 million adolescents aged 13-15 are tobacco users, with the Southeast Asia region having the highest number of adolescent smokers, accounting for 48% of the total adolescent smokers. The 2023 Indonesian Health Survey reported that the percentage of smokers aged 10-18 in Indonesia reached 27.02% of the population. Meanwhile, the number of adolescent smokers in West Java increased from 10.62% in 2018 (Riskesdas, 2018) to 11.1% in 2023 (Indonesian Health Survey, 2023). The 2019 Global Youth Tobacco Survey stated that 19.2% of students in Indonesia used tobacco products. Additionally, the 2023 Riskesdas data indicated that 74.9% of smokers in Indonesia started smoking between the ages of 10-19.

Adolescence is a transitional phase from childhood to adulthood. During this period, adolescents undergo mental and social growth and development, from thinking patterns to decision-making. In the middle adolescence stage, individuals reach the peak of puberty, where they

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begin to distance themselves from their parents and strive for independence to achieve autonomy. Peers play a central role in the developmental process toward adulthood (Park, 2011). Peer influence is related to smoking behavior among adolescents; those influenced by their peers are 88.17% more likely to smoke compared to those not influenced by their peers' smoking behavior (Azzahra, 2022). Therefore, smoking prevention efforts for adolescents need to be initiated early.

Cigarettes contain many harmful substances, one of which is Carbon Monoxide (CO). When someone inhales cigarette smoke, the body absorbs carbon monoxide through the lungs. The level of CO present during exhalation can be measured to determine a person's smoking status. Many researchers use CO measurements to assess tobacco exposure among smokers because it is a simple method to perform. The exhaled air CO levels in smokers are higher compared to non-smokers (Inayatillah, 2014). By measuring CO levels, an adolescent smoker can become aware of the CO exposure in their body, which may influence their future smoking behavior decisions.

The aim of this study is to describe smoking habits, including frequency of smoking, reasons for smoking, the number of cigarettes smoked, the types of cigarettes used, family members who smoke, and the age at which smoking began. Additionally, the study seeks to examine the relationship between smoking habits and CO levels in adolescents at 16 secondary schools in the Cinere District in 2023. The benefits of this research are expected to provide a data foundation for the Smoking Cessation Program in the Cinere District.

METHODS

This research is a cross-sectional study conducted from July to September 2023 on 486 students from 16 secondary schools, consisting of 8 high schools and 8 junior high schools. The sampling technique used was simple random sampling, targeting students from grades 7 to 12 who were in good health. Primary data collection was carried out through interviews about students' smoking habits and by measuring CO levels using a CO Analyzer device, specifically the Micro Smokerlyzer from Bedfont. Students measured for CO levels were instructed to inhale for 10 seconds and then exhale into the device, which then displayed their CO levels.

The questionnaire used in the study is the School-Aged Children's Smoking Behavior Screening Questionnaire, sourced from the Ministry of Health of the Republic of Indonesia in 2023. The questionnaire consists of six sections: screening location information, respondent identity, knowledge about smoking, sources of exposure to smoking behavior, CO level measurement, and a description of smoking habits. The smoking habits section includes questions on how often they smoke, the number of cigarettes smoked, types of cigarettes used, age of smoking initiation, reasons for smoking, duration of smoking, and whether there is a desire to quit smoking.

Analysis was conducted using IBM SPSS Statistics 27 software to examine the description of smoking habits and their relationship with CO levels in students' bodies. The relationship between smoking habits and CO levels was analyzed using the Kruskal-Wallis test. This non-parametric test is suitable for analyzing relationships between categorical variables (such as smoking habits) and continuous variables (such as CO levels) when the assumptions of parametric tests are not met. The Kruskal-Wallis test assesses whether there are statistically significant differences in CO levels across different categories of smoking habits.

RESULTS AND DISCUSSION

Table 1. Characteristic Sample

Characteristic	N	%
Sex		
Man	446	90.3 %
Woman	38	7.7 %
Educational Level		
Senior High School	253	51.2 %
Junior High School	231	46.8 %
Family Member smoke		
Yes	348	71.9 %
No	136	28.1 %
Knowledge about the dangers of smoking		
Yes	482	99.6 %
No	4	0.4%
Smoking Habit		
Never	251	51.9 %
Have tried	90	18.6 %
Occasionally	72	14.9 %
Everyday	71	14.7 %

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Type of Cigarette		
Conventional	91	63.6 %
Electric	21	14.7 %
Both of them	31	21.7 %
Reason of Smoking		
Curious	76	53.1 %
Peef influence	63	44.1 %
Family influence	4	2.8 %
Plan to Quit Smoking		
Yes	128	89.5 %
No	15	10.5 %

Table 1 shows that the respondents were predominantly male, accounting for 90.3%. In terms of educational levels, there is a balance between students from junior high school and senior high school, with 51.2% and 46.8%, respectively.

The family members of the respondents who smoke reached 71.9%, and there is a significant relationship between having family members who smoke and smoking habits among students (P-value <0.001). This aligns with research conducted by Vrinten in 2022, which stated that adolescents whose caregivers smoked when they were 14 years old were more than twice as likely to smoke compared to those whose caregivers did not smoke.

Out of 486 respondents, the smoking habits are as follows: 251 respondents (51.9%) have never tried smoking, 90 respondents (18.6%) have tried smoking before, 72 respondents (14.9%) smoke occasionally, and 71 respondents (14.7%) smoke every day.

Out of 143 respondents who smoke, 63.6% of them smoke conventional cigarettes, 14.7% smoke electronic cigarettes, and 21.7% use both. The National Youth Tobacco Survey in 2018 depicted an increase in the use of electronic cigarettes among adolescents in the United States. The prevalence of electronic cigarette use in Indonesia has also significantly increased from 0.2% in 2011 to 3% in 2021 (Global Adult Tobacco Survey, 2011 and 2021). A study by the Indonesian Youth Council for Tobacco Control in 2022 stated that most young people use electronic cigarettes to follow trends and appear cool in social circles.

The reason respondents start smoking is predominantly due to curiosity and peer influence, which aligns with a study by Anjum in 2016 stating that 75-94% of adolescents agree that smoking habits are caused by curiosity, and 84% of adolescents agree that smoking habits start due to peer influence. Another study by Almaidah in 2021 in Surabaya also stated that the highest reason adolescents smoke is curiosity. Adolescents have a high level of curiosity, so they want to try new things even though they are aware that smoking has dangerous health consequences.

89.5% of smoker respondents express a desire to quit smoking. In previous research, Sulastri in 2018 also stated that most smokers want to quit smoking but face difficulties due to addiction to cigarettes. The majority (99.6%) of respondents are aware of the negative health impacts of smoking, yet they still struggle to quit. Therefore, it is necessary to provide professional assistance to smokers, especially adolescent smokers, to access smoking cessation counseling at the nearest healthcare facilities.

Table 2. Overview of Smoking Habits

No	Variable	Mean	Min	Max	Sd
1	Age	15.11	12	19	1.362
2	Age of Starting Smoking	12.85	7	16	1.989
3	Number of cigarette (Per Week)	19.13	1	252	29.096
4	During smoking (in Month)	31.56	1	108	22.546
5	Co Level (ppm)	0.8	0	17	2.078

Table 2 presents an overview of smoking habits among respondent students, with a mean age of respondents being 15.11 years old. The average age of smoking initiation among smoker respondents is 12.85 years or 13 years old, with the youngest age of smoking initiation being 7 years old and the oldest being 16 years old.

The CO level test was conducted on 383 respondents who were willing to undergo the CO test, both smokers and non-smokers, with an average result of 0.8 ppm, a minimum value of 0 ppm, and a maximum value of 17 ppm. Respondents who obtained a value of 17 ppm admitted to having smoked in the morning just before the CO level test was conducted. This finding is consistent with research by Zhang in 2013, where the average CO levels substantially increased with the

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number of cigarettes smoked in the previous hour or day. The closer the time of measurement to the time of smoking, the higher the CO levels in an individual.

The study conducted by Sitorus in 2018 also found that the longer the CO levels are measured in the lungs of smokers, the lower their CO levels. Therefore, even if someone smokes, if the CO check is performed after a long period without smoking, the CO levels will be lower. Another study by Hilyah in 2021 states that the longer someone smokes, the longer they are exposed to CO from cigarette smoke, and the amount of cigarette smoke inhaled increases, leading to higher CO levels.

Table 3. Relationship Between Habitual Smoking with Co Level

	CO Analyzer
Kruskal-Wallis H	18.059
Df	3
Aaymp.Sig	0.001

Table 3 depicts the results of the Kruskal-Wallis Test between Smoking Habits and CO Level test, resulting in a P-value of 0.001. Thus, it can be concluded that there is a significant relationship between Smoking Habits and CO Levels among adolescents in Secondary Schools in the Cinere District in 2023. Research by Julie Amaliah in 2023 also shows the same, indicating a relationship between smoking, CO levels, and PEFR Value. High CO levels are influenced by the duration of smoking. Environmental factors also affect an individual's CO levels, as they may be exposed to CO gas from smoking parents or family members.

Furthermore, research by Putri in 2018 provides similar results, indicating a correlation between the amount of cigarette consumption and CO levels among adolescent smokers in Vocational High Schools in Jambi City. This finding could serve as a recommendation to strengthen the implementation of smoking cessation efforts targeting adolescent students, especially at the senior high school level. By actively reaching out to them, it is hoped that the implementation of smoking cessation efforts will increase.

This study has several limitations. Firstly, it is a cross-sectional study, where CO levels were observed and measured only at one point in time, thus not capturing changes in CO levels before and after smoking. Additionally, environmental factors such as living conditions or exposure to vehicle exhaust were not considered, which could contribute to high CO levels.

CONCLUSION

Based on research, it was found that 29.6% of high school respondents in Cinere are smokers, either occasionally or daily. The average CO level among respondents is 0.8 ppm, and according to the Kruskal-Wallis analysis, there is a relationship between smoking habits and CO levels among adolescents in the Cinere District with a p-value < 0.001. This research result is also consistent with previous studies that state CO levels in smokers are higher compared to non-smokers, indicating that CO levels are related to an individual's smoking habits.

The results of this study can be part of advocacy efforts at the cross-sectoral level to enhance the monitoring of smoke-free areas in educational settings. Additionally, efforts to encourage smoking cessation can be carried out by partnering with high schools in the Cinere area to conduct regular CO-level checks on high school students to identify those who wish to quit smoking.

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Carbon Monoxide Levels in The Lungs of Workers in City of Makassari in 2023

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ABSTRACT

***Background**: Smoking is an unhealthy behavior that can cause health problems that affect the damage to the body's organs, namely the lungs. Measurement of carbon monoxide levels using a smoke analyzer is an alternative for early detection of health problems in the lungs due to smoking. **Aims**: This study aims to determine smoking behavior and the amount of cigarette consumption with carbon monoxide levels in the lungs of workers in Makassar City. Research **Methods**: This study design is a quantitative analysis, with a cross-sectional study method, using secondary data from the smoking cessation program, Makassar City Health Office, with random sampling techniques obtained 157 men aged 40-60 years. Secondary data obtained are the results of carbon monoxide (CO) measurements using a smoke analyzer by blowing on the device. Processing of data using SPSS 25 with the chi square test. **Results**: The results showed that there were people who had a habit of smoking very high levels of carbon monoxide in the lungs (61.9%) with a p value = 0.000 and the number of cigarettes consumed during one year very high levels of carbon monoxide in the lungs (72.0%) with a p value = 0.000. **Conclusion**: there is a relationship between smoking habits and the number of cigarettes consumed by workers who smoke. Preventive interventions such as lung CO examination is an assessment of risk factors for health problems.*

***Keywords**: Impact of Smoking, Smoke Analyzer, Smoking Behavior.*

INTRODUCTION

The harmful effects of smoking can be seen from the many compounds present in a single cigarette. The problem of lung disease is one of the risk factors of smoking behavior that triggers health problems such as cough symptoms, shortness of breath and other symptoms such as chest pain and coughing up blood. The fatal impact of smoking behavior is that deaths caused by non-communicable diseases increase and will continue along with changes in unhealthy behavior. (Holt *et al.*, 2013).

The disease caused by smoking behavior that is often found with persistent signs of airflow limitation in the airway that is persistent and progressive, which is associated with an increased chronic inflammatory response in the airway, lung parenchyma due to exposure to harmful particles or gases caused by smoking (KLHK, 2020) .

Smoking is one of the bad habits that we often encounter in various places, until now people still smoke in any place. The impact that is immediately seen is that there are cigarette butts, the smell of cigarettes and the availability of ashtrays. This illustrates that existing regulations have not been able to overcome the problem of smoking behavior in the community. This smoking habit is caused by the chemicals contained in cigarettes, namely nicotine. Nicotine is a psychoactive substance that is easily available throughout the world. Nicotine as a whole-serves as the main ingredient in the form of tobacco, cigarettes, and others in humans. This shows a complex mechanism involving the

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nervous system in the brain that gives opiate and dependence effects so that smokers find it difficult to stop smoking (Tiwari *et al.*, 2020). One of the other dangerous contents is carbon monoxide, a toxic gas that has no taste and smell. If you inhale too much carbon monoxide gas, red blood cells will have more to do with carbon monoxide than oxygen. As a result, muscle and heart function will decrease.

Makassar is one of city in South Sulawesi with high prevalence of smokers. In 2018, the prevalence of smokers aged >10 years in Makassar city was 24.51% (Ministry of Health, 2018), indicating that smoking behavior starts at an early age due to the lack of optimal promotive and preventive efforts among the community. In addition, smoking in childhood is a predictive factor for smoking in adulthood.

Makassar City Health Office through the smoking cessation program in primary health care by providing services, which are screening adult men to check carbon monoxide levels in the lungs. This study aims to determine smoking behavior and the number of cigarettes consumed daily on carbon monoxide levels in the lungs. This is in line with the goal of a smoke-free area, which is to create a clean and healthy area without cigarette smoke in a specified place.

METHODS

This study design is a quantitative analysis, with a cross-sectional study method, using secondary data from the smoking cessation program, Makassar City Health Office. The data used were data on individuals who had participated in the smoking cessation program in March-October 2023. Data collection involved local health centers, samples were taken that were included in the inclusion criteria, among others, men aged 40-60 years, had smoked, currently still smoking, and willing to participate in early detection of carbon monoxide in the lungs. The sampling technique was carried out by simple random sampling. 157 samples were obtained that met the criteria. Secondary data obtained are the results of carbon monoxide measurements using a smoke analyzer by blowing on the device. This statistical analysis is to see the relationship between smoking habits and the number of cigarettes consumed with CO levels in the lungs.

Data processing is checking the completeness and clarity of data, assigning codes to each variable, entering data into a computer program and checking that the data is free from errors. This data was analyzed using SPSS 25 with the analysis technique used was the chi square test to determine the relationship between two variables.

RESULTS AND DISCUSSION

Uses a smoke analyzer detector that helps measure CO in the breath and also the bloodstream by conducting a non-invasive breath test (Ramani *et al.*, 2023). The goal is to determine a person's level of cigarette use, whether the person is a smoker or not. This smoke analyzer is easy to use, by blowing or exhaling on the device and the results will be seen on the detection device layer.

The number of respondents in this study was 157 people consisting of 63 smokers and 94 non-smokers with an age group ≥40 years-60 years who were still actively working.

Table 1. Identity of respondent

	n (157)	%
Age		
>60	45	28,7
40-49	52	33,1
50-59	60	38,2
Education		
Academy/Higher Education	32	20,4
Junior High School	104	66,2
Senior High School	21	13,3
Job Type		
Civil Servant	27	17,2
Contract Worker	74	47,1
Private Sector Employees	26	16,6
Labor	30	19,1
Smoking Habbit		
Yes	63	40,1
No	94	59,9

Secondary data source Makassar Health Office 2023

Table 1. The largest age category is at the age of 50-59 years 38.2%, age 40-49 years 33.1% and age> 60 years 28.7%. Then the highest educational status at the junior high school level was 69.4%, Academy / College 20.4% and high school level 10.2%. The distribution of types of work in this study included civil servants 17.2%, contract employees 47.1%, private

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employees 16.6% and laborers 19.1%. From the results of this study found people who have a habit of smoking as much as 40.1% and who do not smoke 59.9%.

Smoking behavior that starts from adolescence to productive age is one measure of the length of smoking in respondents. Furthermore, the longer the duration of smoking, the greater the risk of the impact of smoking behavior on lung health. People aged ≥40 years are at high risk of diseases caused by cigarette smoke that can affect lung health. This is due to the length of smoking time with age.

The level of education affects smoking behavior, the lack of knowledge of a person with low education about health and the difficulty of receiving healthy messages will have an impact on healthy living behavior. Smoking habits such as heavy smokers are longer than light and moderate smokers, the longer people with smoking habits, the more cigarettes consumed every day.

Table 2. Total Cigarette Consumption

Cigarette consumption per/day	n (63)	%
<10 cigarettes	37	58,7
>21 cigarettes	5	7,9
11-20 cigarettes	21	33,3
Total	**63**	**100,0**

Secondary data source Makassar Health Office 2023

Based on table 2, the total number of respondents who have smoking behavior is 63 people. Smoking behavior is less than 10 cigarettes per day as much as 58.7%, 11-20 cigarettes 7.9% and more than 21 cigarettes per day as much as 33.3%. The large number of cigarettes smoked every day is due to the effect of addiction so that smokers increase the number of cigarettes every day.

Table 3. Correlations between Smoking Behavior and Lung CO Levels

Smoking Behavior	CO levels in the lung		Total	P
	Low	High		
Smoker	24 (38,1%)	39 (61,9%)	63 (100%)	0,000
Non-Smoker	89 (97,4)	5 (5,3%)	94 (100%)	0,000

Table 3. The statistical test found a significant relationship between smoking behavior and lung CO levels. Smoking behavior had high lung levels of 61.9% and those who did not smoke had low lung CO levels of 97.4%. After doing the chi-square test, the p value is 0.000 so that the p value is <0.05.

Smoking habits that are too frequent can affect lung function. Based on the Indonesian pulmonary physician association for smoker criteria, CO levels are ≥10 ppm. The increase in CO levels in smokers is due to CO gas from inhaled cigarettes (Hilyah *et al*., 2021). so that daily smoking behavior has a higher risk of CO exposure in the lungs than those who do not smoke frequently.

Table 4. Correlation between the number of cigarettes consumed and lung co levels

Number of cigarettes consumed	CO levels in the lung		Total	P
	Low	High		
High Risk	7 (28,0%)	18 (72,0%)	25 (100%)	**0**
At risk	106 (80,3)	26 (19,7%)	132 (100%)	**0**

Table 4, based on the statistical test of the number of cigarettes consumed with CO levels in the lungs, the number of cigarettes consumed by the at-risk group who had high-risk levels of CO in the lungs was 72.8% and people who did not have low levels of CO in the lungs were 80.3%. After the chi square test, it was found that there was a relationship between the consumption of cigarettes at risk with Co levels in the lungs with a value of 0.000 so that the p value <0.005.

Smoking behavior using conventional cigarettes is as risky as people who use e-cigarettes. Based on the Indonesian pulmonary physician association for smoker criteria, CO levels are ≥10 ppm. The increase in CO levels in smokers is due to CO gas from inhaled cigarettes (Hilyah *et al*., 2021)

These detection tools produce different combinations of sensitivity and specificity but are still quite high. However, it is often reported that CO analyzers have a low ability to detect light smokers or regular smokers.

A lung carbon monoxide (CO) test called a smoke analyzer CO detector can help measure CO levels in a person's breath and bloodstream by conducting a non-invasive breath test. This test is conducted to determine the level of CO

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levels in a person's lungs, both active smokers and passive smokers. also has the potential to have an influence in increasing smoking cessation efforts. With at-risk individuals aged ≥40 years, having a history of cigarette smoke exposure both active and passive smokers.

Smoking is the single most preventable cause of death and disease worldwide and is the leading cause of chronic obstructive pulmonary disease (Lugg *et al.*, 2022). Carbon monoxide is one of the harmful substances contained in cigarettes, a substance that is toxic to the body. Its affinity for hemoglobin is 300 times stronger than oxygen. If we are exposed to this gas too much and too often it will reduce or eliminate the ability of hemoglobin to circulate oxygen throughout the body. If the concentration of CO is very high, it can cause death because CO can affect the body's nervous system, cardiovascular system, fertility and all organs of the body.

The measurements of the results of the CO examination in the lungs are if the results are found to be 1-6 ppm in the normal category, 7-10 ppm in the light/passive smoker category, 11-20 ppm in the smoker category, and ≥20 ppm in the heavy category. The results of this study were 157 respondents aged ≥40 years who were smokers or not who had an active smoking habit of 63 people and 94 people who were not smokers. In the age range above 40 years is very at risk of exposure to lung disease because the range of smoking time has been long with the number of cigarettes above 10 cigarettes. In heavy smokers, the largest group was at the age of 50-59 years, namely 60 people (38.2%). The risk of acute and chronic CO exposure and toxicity associated with heavy smoking, cigar, pipe, or water pipe smoking, Further research is needed to better understand the relative risks of smoke vapor products and CO. Chronic exposure to high CO levels may lead to polycythemia secondary to CO-mediated chronic functional anemia and cellular hypoxia resulting in high circulating erythropoietin levels (Dorey *et al.*, 2020).

The number of cigarettes consumed is a factor of the nicotine content in cigarettes. Neuronal nicotinic acetylcholine receptors (nAChRs) play an important role in mediating the effects of nicotine in the brain. These receptors are pentameric ligand-gated ion channels consisting of various subunits. The main subunits involved in nicotine addiction include α4, α6, ß2, and ß4 sub-units. Activation of nAChRs by nicotine leads to the release of neurotransmitters such as dopamine, which contributes to the reinforcing effects of nicotine and the development of addiction (Son *et al.*, 2020).

A dose-response relationship was observed between smoking duration and eCO levels, which showed a moderate positive correlation (Spearman rank correlation coefficient = 0.463, P < 0.001).This study provides valuable insight into the relationship between exhaled CO levels and smoking status, which emphasizes the importance of such assessments in addiction cessation services and respiratory health *(Ramani et al.*, 2023).

In another study, very frequent smoking behavior prior to the device examination, CO levels were obtained at baseline, followed by 5, 10, 15, 30 and 45 minutes after cigarette use. There was a significant increase in CO levels for conventional cigarettes compared to other modes (Vasthare *et al.*, 2018).

The level of education is dependent on a person's ability to adapt, which is measured normatively based on the level of formal education. Education is one of the intellectual abilities of human resources. Based on the results of this study, the junior high school education level was 69.4%, the Academy/ College was 20.4% and the lowest was the high school level of 10.2. According to research, low education has a chance of smoking 3 times compared to higher education.

The results of this study (table 3) suggest that there is a relationship between smoking behavior and the content of CO levels in the lungs. People who have a habit of smoking there are high levels of CO in the lungs. Variables that affect the blood COHb levels of passive smokers are how long exposure to cigarette smoke to passive smokers is in the smoking location, the presence or absence of an air ventilation system, the distance between smokers and non-smokers and how many smokers are in that location. The use of electronic cigarettes and clove cigarettes both have nicotine, in research (Jankowski *et al.*,

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2019) smoking behavior that uses e-cigarettes is more than twice the dependency p<0.001 than clove smokers. Similarly, double user dependence on nicotine is higher when using e-cigarettes. This shows that nicotine in e-cigarettes is much more addictive.

The respiration of smokers to carbon monoxide levels is 72.5% influenced by duration, frequency, the last period of smoking, and the distance of residence to the source of exposure. Reducing smoking frequency and quitting smoking can prevent and control carbon monoxide respiration. (Apoorva *et al.*, 2023). CO levels in the smoker group were significantly different from non-smoker levels, namely 22 ppm / red zone in smokers higher than non-smokers by 1-5 ppm/green zone.

There were 97.4% who did not have smoking behavior and 5.3% who had high levels of CO in their lungs. In another study, one of the impacts of frequent exposure to CO resulted in one of the lung diseases. A total of 26.7% of the study subjects were exposed to CO substances (n = 172). We found significant differences (P < 0.001) among study subjects who were in the yellow/red zone of the Smokerlyzer device or with a history of bronchial asthma. Our results revealed that among the subjects with a history of bronchial asthma and/or CO who were in the yellow/red zone of the Smokerlyzer (Ramani *et al.*, 2023). Potential molecular mechanisms for non-smokers include inflammation, oxidative stress, airway remodeling, and lung aging (Pega *et al.*, 2021)

Table 4, the relation between the number of cigarettes consumed with CO levels in the lungs shows that the number of cigarettes consumed is very risky, namely, cigarette consumption of more than 11-21 cigarettes per day is a smoker at risk of experiencing CO levels in the lungs by 72.0% and low levels of CO in the lungs by 28.0%. The number of cigarettes consumed at risk is the number of cigarette consumption of less than 10 cigarettes per day experiencing low levels of CO in the lungs by 80.3% and high levels of CO in the lungs by 19.7%. Low CO levels did not differ significantly between those who had tried cigarettes, only once, sometimes or once per week CO levels were significantly higher p<0.05 among those who reported that they smoked 1-6 or 6 cigarettes per week. There is a significant correlation between consumption of the number of daily cigarettes with expiratory air CO levels in smokers with a value of p=0.009, found in smokers with estimated CO levels of 15-34 ppm when smoking 20 cigarettes / day. Increased CO levels when increasing cigarette consumption to 20-60 ppm when 40 cigarettes per day. A heavy cigarette smoker presented twice with symptoms of CO toxicity and was found to have levels 21.8 to 24.2%. A heavy smoker presented twice with symptoms of CO toxicity and was found to have levels of 21.8 to 24.2%. symptoms of toxicity in the working lung after smoking (Dorey *et al.*, 2020).

The level of CO exposure determines the resulting health effects. The key to reduce the CO-related burden of disease is education. By knowing the levels of CO in the lung the importance of CO detectors, smokers can be more educated and more concern to prevention the impact of smoking. The government can further improve stop smoking services for active smokers and increasingly expand the application of smoke -free areas to protect passive smokers from exposure to cigarette smoke or carbon monoxide.

Smoking cessation efforts are the most effective intervention to reduce exposure to cigarette smoke that risks the development of obstructive pulmonary disease, so prevention and control efforts must be actively carried out at the basic health service level, namely Health Center. By increasing promotive services through the dissemination of information about prevention, increasing knowledge about the harmful effects of smoking and helping to change clean living behavior.

Through efforts to prevent smoking-related diseases, the Makassar City Health Office conducts preventive efforts, namely examining CO levels in the lungs for men aged ≥40-60 years. This is done to activate smoking cessation programs in basic health facilities and to integrate government programs in implementing smoke-free areas. Through the examination of CO in the lungs, it can be known the exposure to the dangers of cigarette smoke in the workplace to lung health, both active and passive smokers.

Preventive interventions such as lung co examination is an assessment of risk factors for health problems in the

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community, involving cross-sectors in an integrated manner including the implementation of a smoke-free zone policy which can be the most leverage for behavior change.

CONCLUSION

Smoking is an unhealthy behavior that affects health. Exposure to cigarette smoke actively or passively affects CO levels in the lungs. In this study, there is a relationship between smoking behavior and carbon monoxide levels in the lungs and there is a relationship between the number of cigarettes consumed per day and carbon monoxide levels in the lungs.

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Effect of Pictorial Health Warnings on Fear and Intensity Smoking Cessation

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ABSTRACT

***Background**: World Health Organization (2020) states that the number of smokers aged 15 years and over in the world is 991 million people. The highest number of smokers in ASEAN is in Indonesia (46.16%). Riskesdas South Kalimantan (2018) states that the prevalence of smokers in South Kalimantan is 24.42%. The highest prevalence of smoking in South Kalimantan Province in 2018 with a frequency of every day was in Kotabaru Regency at 27.37%, Hulu Sungai Tengah at 22.03%, and Banjar Regency at 20.88%. **Aims**: Explain and analyze the effect of pictorial health warnings on cigarette packaging on fear and intensity of smoking cessation in Kotabaru, Hulu Sungai Tengah, and Banjar districts. **Method**: The study used a cross sectional design. Accidental sampling was used with a sample of 164 Kotabaru districts, 112 Hulu Sungai Tengah samples, and 224 Banjar samples. The research instrument was a modified questionnaire from WHO STEPwise and previous research which were* then tested for validity and reliability. *Data analysis was univariate and bivariate analysis using linear regression analysis. **Results**: There was a relationship between pictorial health warnings on cigarette packaging with fear (p-value = 0.0001, r = 0.731) and smoking cessation intensity (p-value = 0.0001, r = 0.771). There is a positive influence between pictorial health warnings on cigarette packaging on fear by 53.4% and smoking cessation intensity by 59.4%. **Conclusion**: There is an influence between pictorial health warnings on cigarette packaging on fear and smoking cessation intensity in Kotabaru, Hulu Sungai Tengah, and Banjar districts.*

***Keywords**: Pictorial health warnings, Fear, Smoking cessation intensity*

INTRODUCTION

Based on the *World Health Organization report* (2020), the number of smokers aged 15 years and over in the world is 991 million people. The highest number of smokers in ASEAN is in Indonesia (46.16%) (Mutia, 2021). Prevalence of smoking at the age of more than 15 years in 2020 reached 28.69% then rose to 28.96% in 2021 and fell again in 28.26% (Badan Pusat Statistik Indonesia, 2020).

Survey results from General Adult Tobacco showed that Indonesians burn around 270 billion cigarettes a year, the average male smoker consumes 13 cigarettes per day, while female smokers consume 8 cigarettes per day, the rest are smoked by novice smokers. The WHO report states that Indonesia is the third largest country in the world with the highest number of smokers after China and India. (Nasir & Yulianto, 2023).

Based on the results of South Kalimantan Basic Health Research (2018), the prevalence of smoking in South Kalimantan is 20.55% (Riskesdas, 2019). Based on data from the Central Bureau of Statistics South Kalimantan, smoking

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problems have fluctuated from 2020-2022. The increase occurred from 23.83% in 2020 and then increased to 24.51% in 2021 and decreased again to 21.89% in 2022 (Hidayat & Agnesia, 2021).

The highest smoking prevalence in South Kalimantan Province in 2018 with a daily frequency is in Kotabaru Regency at 27.37%, other districts that also have a high prevalence are Hulu Sungai Tengah Regency at 22.03%, Banjar Regency is the district with the most population after Banjarmasin has a smoking prevalence of 20.88%. The prevalence in the 3 districts exceeds the prevalence of South Kalimantan Province by 20.55% (Riskesdas, 2019).

Pictorial health warnings are graphic displays typically placed on the packaging packets of tobacco products, such as cigarettes, cigars, and other tobacco products. The aim is to convey a clear and powerful health message about the negative health effects of smoking on health to consumers (Rico Satria, 2020) These displays include images depicting horrific health impacts, such as images of organs damaged by smoking or smoking-related health warnings. An overview of how pictorial health warnings can affect people is that the design and content they contain are always accompanied by concise and powerful messages, their size and placement which are usually in common spaces (Maulina, 2018).

The effectiveness of pictorial health warnings themselves has had an impact on reducing tobacco use through regulations from the Regulation of the Minister of Health Number 28 of 2013 which has regulated the use of images used with a ratio of 7: 5 and other formats that have been regulated as many as 19 articles (Kementerian Kesehatan, 2013). Based on previous research, pictorial health warnings have been shown to be effective for smoking cessation, with 25% in Singapore, 92% in Thailand and 44% in Canada (Kemenkes RI, 2013). The implementation of health warnings is well perceived by most active smokers and has a positive impact on people's smoking behaviour. Pictorial health warnings provide information about the specific health consequences of smoking, warnings motivate smokers to quit and warnings discourage potential smokers from starting. In addition, the importance of warning health messages through text and images on cigarette product packaging can increase public awareness of the negative health effects, increase knowledge related to the dangers of smoking, prevent a person from starting smoking and can increase a person's intention to quit smoking *(Ngo et al.*, 2018).

Graphic warnings evoke emotions of fear, dislike or anxiety, which have a positive impact on quitting, attempting to quit or reducing smoking. Warnings in the form of bold or scary images can evoke fear in smokers, with the emergence of fear can mediate Pictorial Health Warning on smokers' intention to quit smoking (Gallopel-Morvan et al., 2013). Previous research shown that there is a correlation between health warning images and fear (p-value = 0.0001, r = 0.698) and smoking cessation intensity (*p-value = 0.0001, r = 0.569)* (Putri Andriani et al., 2023). Based on the above problems, researchers are interested in researching the "Effect of Pictorial Health Warnings on Fear and Intensity of Smoking Cessation".

METHODS

This research is observational analytics using *Cross Sectional* studies, namely analytical research to determine the relationship between variables identified at one time. The location of this research was carried out in the residential areas of Kotabaru, Hulu Sungai Tengah, and Banjar regencies. The subjects of this study were 500 people who were active smokers divided into 3 districts using the *Accidental Sampling* technique. The results of proportional sample calculations based on smoking prevalence in each district obtained a minimum sample of 164 samples for Kotabaru Regency in the Districts of Pulau Laut Mediterranean, Pulau Laut Utara, and Pulau Laut Sigam, 112 samples for Hulu Sungai Tengah Districts in Barabai, Batu Benawa and Pandawan Districts, and as many as 224 samples for Banjar Regency in Aluh-Aluh District, Gambut, and Martapura.

The research instrument used was a modified questionnaire from the WHO STEPwise instrument related to tobacco use and from previous studies and theories related to fear and intensity of smoking which were then tested for

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validity and reliability of the questionnaire. Data collection is carried out by filling out questionnaires. Data analysis in this study in the form of univariate and bivariate analysis used linear regression to see the effect of pictorial health warnings on fear and intensity of quitting smoking. Based on the certificate of feasibility of research ethics No.343/KEPK-FK ULM/EC/X/2023, this research proposal has been reviewed by the Health Research Ethics Commission, Faculty of Medicine, Lambung Mangkurat University on October 12, 2023.

RESULTS AND DISCUSSION

Table 1. Characteristics of Respondents in Kotabaru, Hulu Sungai Tengah, and Banjar Regency

Characteristics	(n)	(%)
Gender		
Man	488	97,6
Woman	12	2,4
Age Category		
Early Adolescence (12-16 years old)	2	0,4
Late Adolescence (17-25 years old)	136	27,2
Early Adult (26-35 years)	83	16,6
Late Adult (36-45 years old)	85	17
Early Elderly (46-55 years)	111	22,2
Late Elderly (56-65 years old)	60	12
Elderly (> 65 years old)	23	4,6
Education		
No School	2	0,4
Not complete Elementary School or equivalent	12	2,4
Elementary School	100	20
Junior High School or equivalent	107	21,4
Senior High School or equivalent	236	47,2
College	43	8,6
Employment Status		
Unemployed	28	5,6
Employed	472	94,4
Average Number of Cigarettes		
Heavy smokers (>20 cigarettes/day)	230	46
Moderate smokers (10-20 cigarettes/day)	147	29,4
Light smokers (<10 cigarettes/day)	123	24,6

Based on table 1, it is known that out of 500 respondents, it was found that most of the respondents were male totaling 488 people (97.6%) and 12 people (2.4%) were female. Based on the age category, the most respondents were found in the late adolescent category of 136 people (27.2%) followed by the early elderly age category of 111 people (22.2%), late adults of 85 people (17%), early adults of 83 people (16.6%), late elderly of 60 people (12%) and early adolescents of 2 people (0.4%). Based on the level of education, it can be seen that the most respondents were found at the senior high school or equivalent of 236 people (47.2%), followed by the junior high school or equivalent of 107 people (21.4%), then the elementary level of 100 people (20%), the college level of 43 people (8.65), then not complete elementary school by 12 people (2.4%) and no school by 2 people (0.4%). Based on employment status, the most respondents were found in those who worked as many as 472 respondents (94.4%) and unemployed as many as 28 respondents (5.6%). Based on the results of the average number of cigarettes smoked every day, it can be seen that heavy smokers dominate from all respondents in this study by 230 people (46%).

Table 2. Research Variables

Variable	(n)	(%)
Pictorial Health Warning		
Very attentive	117	23,4
Attentive	320	64
Less Attentive	63	12,6
Fear		
High	129	25,8
Medium	182	36,4
Low	189	37,8
Smoking Cessation Intensity		
Quit attempt	141	28,2
Hesitant quit attempt	273	54,6
Unprepared quit attempt	86	17,2

Based on table 2, it can be seen that the majority of respondents to pictorial health warnings attentive to 320 people (64%), then very attentive to 117 people (23.4%) and less attentive to 63 people (12.6%). The majority of smokers regarding fear are low at 189 people (37.8%) then followed by medium at 182 people (36.4%) and high at 129 people (25.8%). The most common smoking cessation intensity was found in respondents who were hesitant quit attempt as 273 respondents (69%), then quit attempt as 141 respondents (28.2%), and unprepared quit attempt as 86 respondents (17.2%).

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Table 3. Effect of Pictorial Health Warnings on Cigarette Packaging on Fear

Variable	Coefficient Regression	Standard Error	t	*P-value*
Constant	-46.848	4.139	-11.318	0.0001
Pictorial Health Warnings	0.782	0.033	23.886	0.0001
Dependent Variable: Fear				
R Square: 0.534				
Adjusted R Square: 0.533				
rxy: 0.731				

Based on the calculation results, the results of the linear regression equation are obtained as follows: Y1 = -46.848 + 0.782X. This means that if the exposure to pictorial health warnings on cigarette packaging (X) equals zero or no change, then the consistent value of fear (Y1) is -46,848 while for every addition or increase of 1 exposure to pictorial health warnings (X), then fear will increase by 0.782 so it can be said that pictorial health warnings have a positive effect on fear. The degree of association between pictorial health warnings and fear was strong and unidirectional (r-count = 0.731). The R square value is 0.534 on the fear variable, meaning that the dependent variable Y in the model, namely fear, is explained by the independent variable, namely pictorial health warnings, by 53.4%, while the remaining 56.6% is explained by other variables outside the model.

Table 4. Effect of Pictorial Health Warnings on Cigarette Packaging on Intensity of Smoking

Variable	Coefficient Regression	Standard Error	t	*P-value*
Constant	-5.867	1.988	-2.952	0.003
Pictorial Health Warnings	0.425	0.016	27.017	0.0001
Dependent Variable: Smoking Cessation Intensity				
R Square: 0.594				
Adjusted R Square: 0.594				
rxy: 0.771				

Based on the calculation results, the results of the linear regression equation are obtained as follows: Y2 = -5.867 + 0.425X. This means that if the exposure to pictorial health warnings on cigarette packaging (X) is equal to zero or no change, then the consistent value of smoking cessation intensity (Y2) is -5.867 while every addition or increase of 1 exposure to pictorial health warnings (X), then the intensity of smoking cessation will increase by 0.425 so that it can be said that pictorial health warnings have a positive effect on the intensity of smoking cessation. The degree of association of pictorial health warnings with smoking cessation intensity was very strong and unidirectional (r-count = 0.771). The R square value is 0.594 on the smoking cessation intensity variable, meaning that the dependent variable Y in the model, namely smoking cessation intensity, is explained by the independent variable, namely pictorial health warnings, by 59.4% while the remaining 50.6% is explained by other variables outside the model.

The effect of pictorial health warnings on fear

Pictorial Health Warning (PHW) or pictorial health warning is an image contained on cigarette packaging with a picture of a terrible disease or dangerous disease and a very low recovery rate also accompanied by a loud and firm connotation aimed at preventing people from consuming or quitting smoking. Pictorial health warnings on cigarette packaging have been implemented by foreign countries in the world. Warnings about the dangers of cigarettes are always repeated every time someone smokes or at least 20 times a day. The size of the Pictorial Health Warning (PHW) or health warning images in Indonesia has been set at 40% of the total area of cigarette packs and if it does not include then the company will be subject to sanctions in the form of criminal penalties for five years and a fine of Rp. 500,000,000.00.

The results of this study showed that there was a significant relationship between the effect of health warning images on cigarette packaging on fear by 53.4%. From the results of this study, the higher the attention to health warning images on cigarette packaging, the higher the fear. The theory of fear persuasion is generally described using the fear appeal approach has two aspects. The first aspect is threatening, which is how much the information or message threatens or scares someone. The threat has two

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dimensions. The first dimension is the magnitude of the threat, whether the persuasion message contains a high or low threat (Putri Andriani *et al*., 2023).

Based on previous research, it is known that the relationship between attitudes towards health warning images on cigarette packaging by conducting in-depth interviews shows that most informants feel fear and disgust towards health warning images on cigarette packaging and want to reduce cigarette consumption after seeing health warning images on cigarette packaging (Mariyamah et al., 2020) According to Andriani P et al (2023), it is known that the results of this study most respondents pay attention to health warning images on cigarette packaging (51.38%) and state that the images on cigarette packaging are disgusting. The more active smokers see advertising images warning of the dangers of smoking on cigarette packs every day will become ordinary and do not cause fear effects, maybe at first they will feel afraid of the display of cigarette danger advertising images on the cigarette pack. Images that are viewed repeatedly and in fact do not cause what is depicted in active smokers make them immune to the information and no longer care about the warning images of cigarettes on cigarette packs (Putri Andriani *et al*., 2023).

The pictorial health warning images of throat cancer can trigger fear because they depict the very dire and vivid consequences of smoking. Based on previous research, warnings that can pose a threat are pictorial warnings of oral cancer, throat cancer and blackened lungs due to cancer. With highly graphic and gruesome images showing severe damage to the throat and oral cavity, individuals who see them quickly realize the serious repercussions they may experience if they continue smoking. Throat cancer is an often deadly condition, and the image creates strong feelings of discomfort, worry, and panic. This powerful emotional effect makes individuals feel scared and potentially encourages them to quit smoking or prevents them from starting smoking, making throat cancer images a very effective tool in anti-smoking campaigns (Baiquni & Widyatama, 2016).

The oral cancer is considered the most frightening and disgusting pictorial warning. The pictorial warning is most frightening because if exposed to the disease indicated by the warning (oral cancer) will be immediately visible to others. The warning is considered the most disgusting warning because it shows severity. Meanwhile, oral cancer images are often highly graphic and gruesome (N. C. Dewi & Damayanti, 2008) They describe the direct impact of smoking on the oral cavity and throat, including open wounds, broken teeth, and severe swelling. This image has a strong visual impact and is easily understood by many people without depending on a particular language. With these vivid and horrific images, individuals feel threatened and fear the serious consequences they may experience if they continue smoking. This strong visual and emotional influence makes images of lung and mouth cancer the most effective images in inducing fear and raising awareness about the risks of smoking. By looking at the real and dire consequences of smoking, individuals are more likely to be motivated to quit smoking or not start smoking, making such images a highly effective tool in anti-smoking campaigns (Baiquni & Widyatama, 2016).

Meanwhile, lung cancer is one of the deadliest smoking-related diseases. The lung cancer warning poses the highest threat because it is also considered the most frightening image. The warning is considered the most frightening because it shows the severity of smoking. Images of lung cancer depict life-threatening tumors in a vital organ of vital importance. This condition is often difficult to treat and has a low survival rate. When individuals see pictures of lung cancer, they quickly realize the potential fatal consequences of smoking. This creates a strong fear of continued smoking (Baiquni & Widyatama, 2016).

The effect of pictorial health warnings on smoking cessation intensity

Pictorial Health Warning (PHW) is a very effective vehicle used to communicate health risks. In the results of this study, pictorial health warnings had a very positive relationship to smoking cessation intensity. From the results of statistical analysis, it was found that pictorial health warnings had a significant value of 0.0001< 0.005, which means pictorial health warnings had a significant relationship with the intensity

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of smoking cessation in respondents. Respondents in this study had a positive perception of pictorial health warnings on cigarette packaging by 59.4%. When respondents rated the pictorial health warnings in cigarette packaging as realistic, objective and attractive, respondents would be influenced and choose to quit smoking. This is in line with research conducted by Trisnowati Heni *et al* (2018) which states that there is a meaningful relationship between pictorial health warnings such as smoking causing oral cancer, throat cancer, lung cancer to the intensity of smoking cessation (Trisnowati *et al*., 2018).

The dangers of cigarettes for health prompted WHO to form a policy, namely the *Framework Convention on Tobacco Control* (FCTC), an international level agreement that aims to protect young people and future generations from the impact of tobacco consumption and exposure to cigarette smoke that can damage various aspects such as health, social, economic and environmental through graphic design. Since the treaty was signed, various countries have provided health information about the dangers of smoking. Canada and Brazil are the pioneers in providing health labels in the form of pictures and writing on cigarette packaging, the results of the warning proved effective in reducing the number of active smokers in the country (Samosir *et al*., 2019).

Indonesia in protecting its people from the dangers of cigarettes, issued Government Regulation Number 109 of 2012 concerning the safeguarding of substances containing addictive substances in the form of tobacco products for health, namely by being obliged to include Nicotine and Tar levels on cigarette packs, prohibiting selling or giving to children under the age of 18 years or pregnant women and must provide health warnings in the form of pictures and writing printed in one package (Cibro & Siregar, 2022). Through this regulation, the Minister of Health of the Republic of Indonesia issued a policy through Regulation of the Minister of Health of the Republic of Indonesia Number 28 of 2013 concerning the inclusion of health warnings and health information in tobacco product packaging. Highlights in the regulation on the front and back cigarette packaging will always be displayed messages in the form of scary pictures and provocative writing about the dangers of smoking for health (Kementerian Kesehatan, 2013).

In accordance with Regulation of the Minister of Health of the Republic of Indonesia Number 28 of 2013 that every cigarette manufacturer is required to include *a pictorial health warning on every cigarette packaging produced and sold* (Kementerian Kesehatan, 2013). Cigarette consumption in the community is one of the health problems that develops very quickly then the impact caused is very complex and detrimental both in the health sector, the economy and the environment. The majority of causes of death in the world are caused by smoking, through this WHO intensifies *pictorial health warnings* to reduce death rates due to smoking, reduce the number of smokers to quit smoking and educate nonsmokers not to smoke (I. M. Dewi & Rumita, 2015) The prevalence of smokers in Indonesia ranks third in the world, and ranks first in Southeast Asia. Through this, the Indonesian government is working hard to reduce the number of people who smoke to quit smoking (Rudi *et al*., 2017).

Pictorial health warning will provide graphic information on the negative impact of smoking to quit smoking through cognitive responses (Baiquni et al., 2016). The results of this study are in line with the results of research conducted by Andriani et al (2023), that the intensity of quitting smoking is influenced by the image of the disease on the cigarette pack, thus giving the impression of fear and disgust, thus encouraging respondents to increase their intention to stop smoking (Putri Andriani et al., 2023). But in contrast to the results of research conducted by Stephani (2015) states the picture of oral cancer as a pictorial warning of health that has a positive effect on quitting smoking (Hamdan, 2019).

Quitting smoking is a behavior that arises on the basis of an individual's intention or intensity to no longer use tobacco products. According to Stephen P. Robbins, intensity is a determination to do a certain activity or produce a certain state in the future. The intensity of quitting smoking is a strong desire of the individual to stop smoking behavior. The intensity of quitting smoking occurs

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because of the relationship with the communication media obtained. This is in line with the results of research that the intensity of smoking cessation has a significant relationship with *pictorial health warning*. Images and messages conveyed through pictorial health warnings are factors triggering the intensity of smoking cessation (Akmal *et al*., 2017).

CONCLUSION

There was an association between pictorial health warnings on cigarette packaging and fear (p-value = 0.0001, r = 0.731*) and smoking cessation intensity (p-value = 0.0001, r = 0.771*). There was a positive influence between pictorial health warnings on cigarette packaging on fear by 53.4% and smoking cessation intensity by 59.4%. The size of pictorial health warnings on cigarette packs needs to be revised to 75-85% and efforts to warn children and adolescents about the effects of smoking need to be intensified.

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Carbon Monoxide (Co) Level in Exhaled Breath of Smoker High School Students

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ABSTRACT

***Background**: Smoking behavior is one of the health behavior problems throughout the ages among young generations in Indonesia. Hence, smoking or tobacco use remains a global epidemic as it is devastating global health and economic costs.* ***Aims**: This study aims to find the relationship between smoking and CO Levels in exhale breath among high school students and to describe the proportion of smoking and other behavior risk factors.* ***Method**: This is a cross-sectional study with 438 respondents from 5 high schools in Sawangan Primary Health Care working area who are available to participate in this study and to be tested by the smoke analyzer.* ***Result**: The result of this study shows that from 297 (67,8%) smokers, 56 (12,8%) students were daily smokers, 177 (40,4%) students were periodic smokers, and 64 (14,6%) students ever tried smoking even just once in a lifetime. This study also describes that the CO level in exhaled Breath was 2,64 ppm on average with a maximum level of 34 ppm. Using the Kruskal Wallis test, this study found a significant relationship between smoking behavior and CO level in exhaled breath. Besides that, the chi-square test in this study shows that there were different proportions between sex, type of smoke, having a smoker in a family member, and willingness to quit smoking with smoking behavior.* ***Conclusion**: it can be concluded that smoking behavior impacts the level of Carbon Monoxide inside the body and smoking behavior can be differentiated and impacted by multiple factors.*

***Keywords**: CO Level, High School Students, Smoke Analyzer, Smoking Behavior*

INTRODUCTION

Smoking behavior is one of health behavior problems throughout the ages among young generations in Indonesia as it is widespread among adults and teenagers. This refers to an article states the use of tobacco among youth (girls and/or boys) has increased in 63 of 135 countries surveyed, and now over 50 million 13 to 15-year-olds smoke cigarettes or use smokeless tobacco products (Strategies, 2022).

Smoking or tobacco use remains a global epidemic as it is devastating global health and economic costs. It has been released that tobacco use caused more than 8.67 million deaths worldwide (6.53 million men, 2.14 million women) and approximately US $2 trillion in economic damage in 2019 alone, although most deaths were attributable to smoking, 1.3 million died from second-hand smoke exposure (Strategies, 2022).

In Indonesia, the conditions at this time indicate that tobacco consumption remains steadily high. There are 60,8 million adult men and 3,7 million adult women who are smokers (Martini *et al*., 2022). The Global Adult Tobacco Survey stated that the prevalence of tobacco use among Indonesia's adult populations has experienced insignificant changes as it only marginally decreased from 36.1% in 2011 to 34.5% in 2021 (Swarnata *et al*., 2024). Furthermore, the data also show an increasing trend of tobacco use among children and adolescents. The prevalence of smoking in the 10 –19 years age group has increased from 7,2% in 2013 to 9,1% in 2018 or almost 20% higher than the prevalence in the previous five years (Martini *et al*., 2022).

Indonesia specifically Depok City

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already has regulations controlling tobacco such as tobacco advertising, promotion, and sponsorship ban, illustrated health warnings on tobacco packaging and labelling, including applicating the Smoke Free Area in order to prevent and overcome the adverse effects of cigarette smoke. Ironically, smoking behavior in Indonesia being culturized by society even though many smokers agree and admit that smoking could lead to various diseases such as cancer (Husein & Menga, 2019). Hence, smoking is still a problem in Indonesia with a huge number of consumers (Martini *et al.*, 2022).

Many young age generations initiate smoking every year making the smoking epidemic worse and start consuming cigarette at a young age endures prominent danger for the future. Therefore, purpose of this study was to present the relationship between smoking behavior and CO Level in exhaled breath among high school students and to describe the proportion of smoking behavior risk factors.

METHODS

This is a cross-sectional study to find the relationship between smoking and CO Levels in exhale breath among high school students and to describe the proportion of smoking and other behavior risk factors.

Population and Sample

Population in this study was the high school students aged 12 to 18 years old who enrolled in state junior and senior high school in Sawangan Primary Health Care Area, Depok City, West Java Province. Sample of this study was students in the population who meet the inclusive criteria which include the students aged 12 – 18 years old who enrolled in the selected schools and willing to join this study and willing to be tested by smoke analyzer. Total sample size was 438 students which was calculated by using Slovin Sample Size.

Sampling Selection

List of schools were schools located in the working area of Sawangan Primary Health Care. The list consisted of total 25 schools with total population 6007 students. 5 schools were selected to meet the required sample size. The schools were selected randomly by simple random sampling technique.

Variables

Variables in this study were student age, sex, smoking behavior, type of smoke, age start smoking, reason to smoke, cigarette amount per day, cigarette amount per week, duration of smoking in month and year, way to get cigarette, willing to quit smoking, reason to quit smoking, knowledge about smoking impact, smoking behavior in family, smoking behavior in relatives, and CO level in exhaled breath as the result of smoke analyser testing.

Data Collection

The data was collected by using questionnaire conducted by Health Ministry of Indonesia named smoking behavior screening questionnaire for age school children. Variables collected with questionnaire in this study were sex, age, smoking behavior, duration of smoking per month, the amount of cigarette consumed per week, type of smoke consumed, reason to smoke, and willing to quit smoking. Meanwhile, the CO level of respondents in this study were measured by using Micro^{+TM} Smokerlyzer Bedfont SN: CM916471 5019.

Interview Based Survey

Students from 5 schools were interviewed with questions from the questionnaire and being asked their willingness before being tested by using smoke analyser to find the CO level in exhaled breath. The students answered the questions and the enumerator fill the answer sheets. In average, it took 15 – 20 minutes per students to complete all the questions and being tested with smoke analyzer.

Data Analyis

The data was analysed using SPSS 26, while Microsoft Excel was used for data entry. This study descriptively described the proportion of sex, age, smoking behavior, duration of smoking per month, the amount of cigarette consumed per week, type of smoke consumed, reason to smoke, willing to quit smoking, and the result of CO test. Furthermore, this study used Kruskal Wallis test to statistical analysis the relationship between smoking behavior and the result of CO test. Then, this study used chi square test to statistical analysis the proportion between sex of respondent, smoking behavior, reason to smoke, and willing to quit smoking with

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smoking behavior. Normality test also being conducted in this study for CO level variable with result of Kolmogorov-smirnov test of normality was 0,000 significance value or it can be concluded that the CO level data is not normal.

RESULTS AND DISCUSSION

Descriptive

Smoking is the act of inhaling and exhaling the fumes of burning plant material which the act is most commonly associated with tobacco as smoked in cigarette, cigar, or pipe and it contains nicotine that is addictive and can have both stimulating and tranquilizing psychoactive effect (Sweanor, David T.; Roses, Christine; Field, 2024). The result of this study showed that from 438 respondents, 141 (32,2%) students were not a smoker, while 297 (67,8%) others were smoker or ever tried smoking once in a lifetime, with details of the result 56 (12,8%) students were daily smoker, 177 (40,4%) students were periodic smoker, and 64 (14,6%) students were ever tried smoking even just one smoke.

Smoking is associated with numerous adverse diseases and it is proofed by a study that reported the association between the percentage of smokers and the prevalence of smoking-attributable morbidity showed significant results with p value <0,005 on the variables of diabetes mellitus (p = 0,000), hypertension (p = 0,000), and lung tuberculosis (p = 0,008) (Martini et al., 2022).

A young age teenager or adolescent begins smoking differs by gender and the exact age of beginning smoking also varies and different in all populations, which the risk of initiation in smoking can be higher due to family and social causes for participating easily in social groups or even due to social beliefs that promotes smoking (Grapatsas *et al*., 2017). Table 1 describes the numeric variables in this study and shows that the mean score of respondent's age in this study were 15,78 (16) years old with the youngest were 12 years old and the oldest were 18 years old. This study also reveals that the respondents were evenly start smoking at 13,78 (14) years old with the youngest age was 7 years old and the oldest age at 17 years old.

For the amount of smoking per week, this study shows that the average of smoke consumed per week was 17 smokes with the lowest amount was 1 smoke per week and the highest amount was 112 smokes per week. The smoking duration found in this study was 25,42 times per month with the lowest duration was 1 time per month and 132 times per month. This study also describes the CO level in exhaled breath was 2,64 ppm in average with minimum level was 0 ppm and maximum level was 34 ppm.

Table 1. Descriptive of Numeric Variables

No.	Variables	Mean	Min.	Max	Sd
1.	Age	15,78	12	18	1,156
2.	Age of start smoking	13,78	7	17	2,081
3.	The amount of smoke per week	17	1	112	16,143
4.	Duration of smoking per month	25,42	1	132	21,657
5.	CO test result	2,64	0	34	2,635

Analytic

Chemical substances such as nicotine that contain in cigarettes are harmful (Taufiq, 2023). According to a study, CO level >11 parts per million (ppm) found in 94 (25.5%) smokers was associated with a significant increase in death and in overall population, CO > 11 ppm but not smoking was associated with an increased rate of all-cause death (Dillinger *et al*., 2024). The objective of this study is to measure the relation between smoking behavior and CO level in exhaled breath among high school students. By using Kruskal Wallis test as being showed in table 2, there was a significant relationship between smoking behavior and CO level in exhaled breath with pvalue score was 0,000 (pvalue<0,05). The result of this study align with a study by Amaliah, et al that indicated a relationship between smoking status and CO levels among high school student in Banda Aceh City (Amalliah *et al*., 2023). Another study held by Pan et al also found that smokers had higher concentration of baseline exhaled CO than non-smokers (Pan *et al*., 2021).

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Table 2. Kruskal Wallis Test Result of Smoking Behavior and CO Level

No	Variables	Smoking Behavior	N	Mean Rank	Pvalue
1	CO Level in Exhaled Breath	Daily Smoker	56	238,76	0,000
2		Periodic Smoker	177	260,62	
3		Ever tried smoker even just one smoke	64	185,44	
4		Non-Smoker (Never Smoke)	141	157,82	

This study also reveals the different proportion between smoking behavior risk factors as illustrates in table 3 that there were significant different proportion between sex (pvalue=0,000), type of smoke (pvalue=0,007), willing to quit smoking (pvalue=0,000), and having smoking family members (pvalue=0,037) with smoking behavior. Moreover, this study also found that the proportion of male smoker still higher than female smoker and most of them were periodic smoker.

Hence, the result of study is in accordance with Zyambo, et al study that illustrates the factors statistically associated with smoking status among school-going adolescents in Zambia were age, grade, friends' cigarette smoking status, parents smoking status, being taught at school about the dangers of smoking, and having a discussion at school about smoking and health (Zyambo *et al.*, 2022). Besides that, other study also presented that there was a higher percentage of males among smokers which higher percentage of males were in the heavy smokers' group than light smokers (95.0% vs. 71.4%, p-value = 0.039) (Pan *et al.*, 2021). As also reported in a study conducted by Ozgunay *et al.* which found the significant intergroup difference between male and female (pvalue=0.099) (Ozgunay *et al.*, 2018).

Conventional smoke such as cigarette was still being favored by high school students with 45 (80,4%) of daily smokers, 145 (81,9%) of periodic smokers, and 54 (84,4%) of ever tried smoker were using conventional smoke. Hence, only 10 (17,9%) of daily smokers and 19 (10,7%) of periodic smokers were using both of conventional and electrical smoke. Consimilar with this study, a study held by Arisona *et al.* also demonstrated that majority of students prefer to use conventional cigarettes (91.7%) compared to e-cigarettes (6.8%) or shisha cigarettes (1.5%) due to Indonesians far earlier know conventional cigarettes (Arisona *et al.*, 2020).

Most of high school smokers still have an eagerness to quit smoking which 38 (67,9%) of daily smoker, 166 (93,8%) of periodic smokers, and 63 (98,4%) of ever tried smoking students stated that they want to stop smoking. This result is consistent with Albayrak *et al.* study which reported 80% of students who smoked declared that they want to quit smoking and among the smokers, 55,2% of them tried to quit smoking even just able to stop smoking for a period between one day and one month at maximum (Albayrak & Ergun, 2015).

Although only few smokers having smoking family members, this study reveals that there was a significant different proportion between having smoker in family members with smoking behavior which 12 (21,4%) of dailysmokers, 38 (21,5%) of periodic smokers, 24 (37,5%) of ever tried smoking smokers, and 44 (31,2%) of non-smokers were having smoker in their family members. The result of this study was in line with Azzahra and Andriyani study which revealed that there was a relationship between the influence of parents on teenager and smoking behavior (pvalue of 0,043) (Azzahra, 2022). A study conducted by Nurhasana, *et al* also shows that

Even though this study found that there was no significant different proportion between reason to smoke variable with smoking behavior, friends could become the greatest influence of high school student smoking behavior followed by curiosity, filling the leisure time, and having smoker in their family member. From 56 daily smokers, 30 (53,6%) of them were smoking by following their friends while 20 (35,7%) of them were smoking in order to fulfil their curiosity and 3 (5,4%) of them were smoking during their leisure time. Azzahra and Andriyani on their study found that there was a relationship between peers-influence with smoking behavior (pvalue

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of 0,000) (Azzahra, 2022). Moreover, the result of Mahathir study showed a significant correlation between peer conformity and smoking behavior among male adolescents (pvalue=0,000) (Mahathir *et al*., 2020).

Table 3. Chi Square Test Result of Smoking Behavior Risk Factors

Independent Variables	Smoking Behavior								PValue
	Daily Smoker		Periodic Smoker		Ever tried smoker even just one smoke		Non-Smoker		
	n	%	n	%	n	%	n	%	
Sex									
Female	1	1,8	2	1,1	2	3,1	34	24,1	0,000
Male	55	98,2%	175	98,9%	62	96,9%	107	75,9%	
Type of Smoke									
Conventional Smoke (Cigarrete)	45	80,4%	145	81,9%	54	84,4%	-	-	0,007
Electronic Smoke (Vape)	1	1,8%	13	7,3%	9	14,1%	-	-	
Both Conventional and Electric Smoke	10	17,9%	19	10,7%	1	1,6%	-	-	
Willing to Quit Smoking									
Yes	38	67,9%	166	93,8%	63	98,4%	-	-	0,000
No	18	32,1%	11	6,2%	1	1,6%	-	-	
Smoking Family Members									
No	44	78,6%	139	78,5%	40	62,5%	97	68,8%	0,037
Yes	12	21,4%	38	21,5%	24	37,5%	44	31,2%	
Reason to Smoke									
Following Friends	30	53,6%	97	54,8%	42	65,6%	-	-	0,662
Family Influence	3	5,4%	5	2,8%	1	1,6%	-	-	
Curiosity	20	35,7%	62	35%	20	31,3%	-	-	
Leisure time	3	5,4%	12	6,8%	1	1,6%	-	-	
Releasing Stress	0	0%	1	0,6%	0	0%	-	-	
Total	56	100%	177	100%	64	100%	141	100%	

CONCLUSION

From this study, it can be concluded that smoking behavior impact the level of Carbon Monoxide inside body and smoking behavior can be differentiated and impacted by multiple factors. The amount of male smoker still higher than female smoker, conventional smoke such as cigarette was still being preferred, most of high school smokers still have an urge to quit smoking, only few smokers having smoking family members, and although there was no significant different proportion between reason to smoke with smoking behavior, friends could become the greatest influence of high school student smoking behavior followed by curiosity.

Therefore, we should start to consider the usage and the implementation of a good and sustained health school curriculum as well as take into account the relationships among parents, teachers, friends, and tobacco regulatory laws for bringing a behavior change and substantially reduce the rate of smoking among high school students. Besides that, the practiced tobacco control regulations such as Smoke Free Area should be evaluated as it will have an impact on people health status within the area and will lightly prevent the curiosity of young generation. Moreover, quit smoking services in every primary health care need to be optimized and strengthened as well as enhancing the number of smoking behavior detection/survey among teenagers then establishing a non-smoker pear campaign as a role model among adolescents.

This study has potential limitation. First, the interview session must be quick as possible due to participants are only available during a certain period. Second, variable of willing to quit smoking could be biased as the participant interviewed by health worker and other working

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partners as well as conducted in a public space of school. In consequence, the participant might have internal pressure to answer the question with proper answer. Even though interviewer never failed to explain that their answers were confidentially guaranteed.

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Media and Old Age: Health Information-Seeking among Elderly Slum Dwellers in Kenya

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ABSTRACT

***Background**: Investigating health information-seeking behavior among elderly slum dwellers empowers them with vital knowledge, enabling informed decisions and timely healthcare access. Understanding their unique information-seeking patterns aids in tailoring public communication campaigns, ultimately enhancing a healthier and more resilient community. In the Kibera slum, the elderly face a dearth of health information owing to their low socioeconomic status. Limited access to resources, including accessibility to various health information sources, exacerbates their informational gap. This hinders their ability to make informed decisions, potentially leading to delayed or inadequate healthcare, further compromising their well-being. The study presents findings on patterns of media use and health information seeking among the elderly in one of Africa's biggest slums, Kibera. Patterns of media usage for health information among elderly slum dwellers based on age group, income, education level, and geographical location were investigated. **Aims**: This study's primary objective was to assess media use patterns for health information among elderly slum dwellers. **Method**: Interviews, focus group discussions, and key informant interviews targeting the elderly living in the Kibera slum were conducted. Qualitative findings identified Radio, Phone calls, WhatsApp, SMS, Email, Video calls, Television, Online Radio, Online Television, Facebook, Twitter, and Websites as health information sources across different demographic backgrounds. **Results**: These channels empowered elderly slum dwellers with knowledge, promoting positive lifestyle changes such as healthy eating. **Conclusion**: Recommendations to enhance these media channels include tailoring radio broadcasts to address the specific health concerns of older adults, innovative interpersonal communication approaches, and user-centered online media design which enhances accessibility. **Conclusion**: These results provide significant findings on media usage patterns for health information among elderly slum dwellers from different demographic backgrounds. The study identifies media usage patterns for health information, the types of health information sought from these channels, the behaviors promoted by these sources, and provides recommendations on how to improve these media channels.*

***Keywords**: elderly slum dwellers, Health, information-seeking behavior, Kenya, Sustainable Development Goals*

INTRODUCTION

Most studies have investigated how communities seek health information related to chronic conditions such as cancer (Dean *et al.*, 2017; Ramasamy *et al.*, 2016; Zare-Farashbandi *et al.*, 2016). Both online health information users and nonusers regularly seek health information offline from health experts (Hall *et al.*, 2015). Health information seeking among elderly slum dwellers is influenced by social determinants as outlined in the Sustainable Development Goals (SDGs). SDGs 1 (No Poverty) and 10 (Reduced Inequality) emphasize the challenges posed by poverty, social exclusion, economic constraints, and low literacy. Digital technology, supported by SDG 9 (Industry, Innovation, and Infrastructure), can improve health information access through mobile phones, internet centers, and digital literacy training. Community-based approaches are crucial, as highlighted by SDG 11 (Sustainable Cities and Communities), with community health workers providing tailored health information, education, and assistance in navigating healthcare services, thereby

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enhancing communication and utilization of health information to curb deviant health behaviors (United Nations, 2020).

Additionally, studies have highlighted the significance of seeking health information through media among the elderly (Chaudhuri *et al.*, 2013; Feltwell & Rees, 2004). For example, Chaudhuri *et al.* (2013) argues that formulation of good health policies can be enhanced by information on the elderly's health information seeking behavior. Feltwel and Rees (2004) additionally asserted that seeking health information through media lowers the degree of precariousness. Furthermore, health information seeking through media enhances health care seeking among communities (Shi *et al.*, 2004). The population of the elderly is projected to be increasing up to 2.8% compared to the entire population (0.7%) per year by 2025-2030 (United Nations, 2013). The pattern is replicated in urban areas of undeveloped regions such as Kenya's urban informal settlements. For example, in 2005, the difference between the elderly inhabiting urban areas globally (51.5%) and their counterparts in developed countries (25%) is estimated to be around 25% (United Nations, 2013). In Kenya, the number of individuals aged 60 and above, has grown from 385,000 in 1950, (Haub & Kent, 2009) to about 1,396,125 (National Bureau of Statistics. Economic survey, 2010). By 2030, looking at the 2.6% population growth rate per year, there will be 3,473,000 elderly persons (United Nations, 2013).

In the past decade, new Information Communication Technologies have revolutionized health information seeking behavior among the elderly in slums. Online media has been utilized by the elderly for apprehending medical indicators, navigating health concerns, and doctor consultations (Chi *et al.*, 2020). Online media is rarely used by the elderly to seek health information despite their higher susceptibility to chronic diseases because they do not trust these channels (Sheng & Simpson, 2015). However, there has been continuous research assessing online health information seeking among the elderly in slums (Zhao *et al.*, 2022).

Social media enables elderly and communities to share health information using text, voice, and images (Haris et al., 2015). It enhances mental well-being by boosting social interaction and health information exchange in online communities.

Traditionally in Sub Saharan Africa, the elderly been appreciated for their wisdom and responsibilities as family heads. However, in contemporary times, societal changes especially in regard to rural-urban migration have weakened social ties thereby reducing interpersonal sources of health communication that existed in conventional communities. In Kenya, the elderly have been left out in numerous country's policies and programmes although there is significant change recently (Kyobutungi *et al.*, 2008). Kenyan government has purposed to publicize the significance of quality life amongst the elderly (Olum, 2003). However, the elderly living in urban informal settlements such as Kibera slum, experience poorer health and thus lower quality of life compared to older population in rural areas (Kyobutungi, Egondi, Ezeh, 2010; Chepngeno & Ezeh, 2007). The significance of acquiring data regarding health information seeking behavior of the elderly inhabiting informal settlements will have a great impact in filling the evidence gap. In this paper, we focus on assessing patterns of media use for health information among elderly slum dwellers, and provide recommendations on how to improve these channels.

METHODS

Qualitative research helped center attention towards patterns of health information seeking behavior among the old in Kibera slum. The main aim of the approach was to formulate a description of media use for health information among elderly slum dwellers in Kenya. Basically, the old with first-hand knowledge on seeking health information through media were selected through purposive sampling and interviewed. The data was then interpreted and analyzed thematically. Through this process the study was able to construct a universal conceptualization of media used for health information seeking among elderly slum dwellers.

This study used purposive sampling to pick a sample of 30 old persons from all the five wards in Kibera slum, identified

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through the Sub County ward administrator. Two public health centers and two level 4 healthcare facilities were purposively selected. The choice of these health facilities was based on the fact that they are most frequented by the old with low incomes in the slum. However, a variety health facilities, individuals and groups were significant in this study.

The 30 old persons comprised of 6 old persons of equal gender representation in each of the 5 wards. Personal interviews were conducted for all the 30 old persons. In addition, the sample included 6 Key Informants and 3 Focus Group Discussions. The Key informants comprised of a doctor, pharmacist, social health worker, an official from the ministry of health, dietician, and a communications expert working on a health project related to the old in Kibera slum. Each Focus Group Discussion comprised of 4 males and 4 females. Respondents were identified through the Sub County ward administrator.

Data gathering is crucial in research, as the data is meant to contribute to a better understanding of a theoretical framework. It then becomes imperious that selecting the manner of obtaining data and from whom the data will be acquired be done with sound judgment, especially since no amount of analysis can make up for improperly collected data. The purposive sampling technique, also called judgment sampling, is the deliberate choice of a participant due to the qualities the participant possesses. It is a nonrandom technique that does not need underlying theories or a set number of participants. Simply put, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the information by virtue of knowledge or experience. It is typically used in qualitative research to identify and select the information-rich cases for the most proper utilization of available resources.

Data was collected through interviews, focus group discussion (FGD) and key informant interviews (KIIs). 3 focus group discussions were conducted. Each focus group discussion comprised of 6 elderly persons (Male and Female) per ward, representing each information seeker typology.

In keeping with the qualitative research design of this study, data analysis was conducted using thematic analysis. Manual thematic analysis was used to analyze the data from the focus group discussions. The data was coded inductively and presented in form of narrative notes that clearly showed patterns of media use for health information among elderly slum dwellers. The research was carried out in accordance to ethical guidelines of research. The identities of the respondents were kept anonymous. For good and fair research, letters from the University's research office and National Commission of Science and Technology were obtained before embarking on the study. Furthermore, consent forms were provided to the study participants to allow them make the critical decision to participate in the study. Other ethical aspects that were considered for this study were language, participant consent, recording, and accessibility of the venues that was used for the FGDs.

RESULTS AND DISCUSSION

Patterns of media usage for health information among elderly slum dwellers based on age group

Online Media, Phone calls and Radio

Elderly aged 60-64 used these channels for updated health information, aiding emotional management and promoting healthy eating.

L03, a 60-year-old respondent noted stated:

> *"Facebook (health talk) and Twitter (Institute for global health and infectious disease) aided in coping with emotions related to Arthritis and Diabetes. Phone calls with children and the radio show Afya Bora (Good health) on Radio Pamoja further support emotional management."*

L06, a 63-year-old stated:

> *"World Health Organization website provides information on nutritious foods through phone calls with my children."*

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Radio, Television, WhatsApp video calls, and WhatsApp messages

These channels provided visual and auditory learning for 65–70-year-olds. WhatsApp video calls were used for content verification and communication with friends and nurses improving healthy eating habits.

S08, 68 -years -old respondent stated that:

> *"...NTV's (A leading Television Station) "Health Diary" programme that airs every Sunday at 6:30 pm and hosted by Gladys Gachanja provides tips on meal planning and preparation. WhatsApp video calls with friends and WhatsApp messages with nurses have help verify health information."*

Radio, Television, Phone calls and Email

Radio and television provided elderly aged 70 to 74 years updated information on chronic diseases and nutrition through phone calls with children. Email consultations with doctors ensure reliable guidance, promoting healthy eating for chronic disease management.

LO1 a 70-year-old respondent stated that:

> *"…Bora Afya (Good health) radio program hosted by Solomon Zully that airs on Radio Kaya on Wednesday from 10pm to midnight provides nutritional tips for managing hypertension. Hospice workers emails also provide nutritional tips. Additionally, 'My doctor' that airs ever Tuesday at 8:00 pm on Ebru TV hosted by Dr. George Kapiyo provides chronic disease management information through phone calls with my children who frequently view this program."*

L02, a 74- years- old respondent indicated that:

> *"…Phone calls with my children who source quality health information from an online radio station known as Doctor explain FM, provides nutritional tips for managing hypertension."*

Television, Phone calls, and Online media

These sources were favored by ages 75-79, offering multimodal learning.This boosted information accessibility and promoted healthy habits like eating and handwashing.

LS02, a 76-year-old participant stated that:

> *"NTV's Health Diary show, which airs every Sunday at 6:30 pm, hosted by Gladys Gachanja provides nutritional guidelines for managing low blood pressure. Additionally, Phone calls with my children help me access online media for health information."*

L04, a 77-year-old respondent noted that:

> *"…Facebook (health talk) and twitter (Institute for global health and infectious disease) help me remember to always wash my hands before taking meals. Through phone calls with my children, I have learnt how to access these social media channels."*

Phone calls, SMS, Emails, WhatsApp, Radio and Television

These interactive media offered real-time health updates and immediate responses for health information among elderly aged 80 years and above They encouraged healthy eating, physical exercise, stress management, and taking vaccinations.

LS04, an 80-year-old respondent stated that:

> *"Phone calls with children and SMS with neighbors guide on nutrition and diabetes management. Emails with doctors advise on nutrition and exercise to reduce anxiety. WhatsApp messages with social health workers provide vaccination information. TV programs, like Health Diary on NTV every Sunday at 6:30 pm, address anxiety, stress, depression, and mood disorders."*

KM03, an 81-year-old respondent stated that:

> *"Radio Citizen (A leading radio station) Jambo Kenya programme that airs daily from 7am to 8 am, hosted by Vincent Ateya and Melody Sinzore*

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provides me with information on managing diabetes and hypertension through healthy eating."

A doctor who was a key informant emphasized on a mixed media approach for health information to elderly slum dwellers, combining traditional methods and technology to bridge gaps and ensure widespread understanding and access.

Diverse age-related media preferences underscored the necessity for tailored health communication. Understanding these patterns informs targeted interventions for specific age groups.

Patterns of media usage for health information among elderly slum dwellers based on gender

Elderly slum dwellers' media preferences varied by gender. Women favored radio, WhatsApp, calls, and television for personalized health communication. Men preferred vernacular radio and email due to language and trust. These channels promote healthy eating, proper medicine storage and stress management.

LO1 a female respondent stated that:

"Bora Afya program on Radio Kaya hosted by Solomon Zully every Wednesday from 10pm and WhatsApp messages with health workers aid diabetes management and diet. "My Doctor" on Ebru television hosted by Dr. George Kapiyo, shared through phone calls by children, provides valuable health information."

M06, a male respondent noted that:

"Arahuka (Wake up) show on Kameme FM hosted by Muthee Kiengei and Gatonye wa Mbugua imparts knowledge on medicine storage and stress management. Emails with local doctors complement information from radio."

LS02, female respondent stated that:

"NTV's Health Diary show, hosted by Gladys Gachanja every Sunday at 6:30 pm, aids in managing low blood pressure through nutrition tips. Phone calls with children also provide access to the Ministry of Health website."

Gender influenced media preferences among elderly slum dwellers. Women valued personal connections, opting for phone calls and face-to-face interactions. Men prefered radio and emails for convenience.

Patterns of media usage for health information among elderly slum dwellers based on income

Income influenced media use. Affluent elderly accessed diverse channels including online media, while those with limited means favored cost-effective options like vernacular radio. These sources encouraged doctor consultations, taking immunizations, proper medication storage, and physical exercise.

S02, who was a retiree stated that:

"Emails from doctors in nearby hospitals offer medical advice for arthritis and diabetes. Radio, television, and online media complement this information. Programs like NTVs Health Diary hosted by Gladys Gachanja every Wednesday from 1-2 pm and Radio maria's Health show every Wednesday from 1-2 pm provide additional guidance. The Kenyatta National Hospital website offers details on immunizations and vaccines."

KS03, a vegetable vendor at Woodley ward stated that:

"Emails with doctors, WhatsApp messages with nurses, and SMS with neighbors are my covered various aspects of health including medicine storage and exercise."

S02, unemployed respondent stated that:

"Inooro Rucini (morning show), through "Ugima wa Mwiri" (Healthy body) program hosted by Wambui Wa Muturi offers tips on heart health and body exercises such as walking."

Tailoring health communication for income-based media preferences ensured accessibility and effectiveness for all

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elderly slum dwellers, promoting inclusivity.

Patterns of media usage for health information among elderly slum dwellers based on education level

WhatsApp messages, radio and phone calls

Local language used in these sources aided accessibility and relatability for uneducated elderly. They encourage vaccinations, doctor consultations, and proper medicine storage.

M02 stated that:

> *"WhatsApp messages with nurses and Community Health Volunteers (CHVs) offer crucial vaccination information. Phone calls from children serve as reminders for vaccinations."*

M03 stated that:

> *"Radio Citizen's (A leading radio station) "Jambo Kenya" (Hallo Kenya) program, hosted by Vincent Ateya and Melody Sinzore, urges regular clinic visits for monitoring chronic conditions."*

M06 stated that:

> *"Arahuka (Wake up) show on Kameme FM hosted by Muthee Kiengei and Gatonye wa Mbugua educates me on proper medicine storage and cognitive fitness."*

Television, online media and phone calls

These channels were preferred by secondary school dropouts because of real-time health updates, ensuring timely information dissemination. They encouraged medication adherence and healthy eating.

LS06 stated that:

> *"Ebru TV's (A local television station) program 'My Doctor' and Doctor Explain FM online radio remind me on medication adherence. Kenyatta National Hospital website, aided by my children's calls, guides me on nutritious foods."*

Radio, Online media and Television

These channels provided diploma and degree-holders varied health content formats like videos and interviews, supporting diverse learning styles. They encouraged healthy eating and vaccinations.

LS05 who was a degree graduate stated that:

> *"Radio Ramogi's (A leading vernacular station) 'Women's Voice' program aired every Saturday from 9am to 11 am educates on leafy greens for cognitive health. WHO online platforms remind me about balanced diets. NTV's 'Health Diary' offers meal planning tips."*

L04 who was a diploma graduate stated that:

> *"…Facebook (health talk) and twitter (Institute for global health and infectious disease) provide vaccination tips"*

SKI03, a Communication Expert, highlighted accessibility as a key hurdle for elderly slum dwellers in using online media, and emphasized on the need of user-friendly interfaces.

Customizing health communication is vital to engage all elderly slum dwellers, regardless of education level to ensure accessibility and comprehension.

Patterns of media usage for health information among elderly slum dwellers based on marital status

Radio, online media and phone calls

These channels were used by married older individuals because they trusted specific health experts and children. These sources promoted safety measures like handwashing and mask-wearing.

L04 stated that:

> *"Facebook (health talk) and Twitter (Institute for global health and infectious disease) provide guidance on safe water and disease prevention. Phone calls remind with my children remind me to wash hands to prevent Covid-19 infection."*

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L05 stated that:

> *"Doctor explain FM, WHO website, and Facebook (Health groups program) through phone calls with children provide health information. Calls remind me to wear masks to prevent Covid-19 infection."*

Radio and television

These sources provided private and anonymous sources for health info among single elderly encouraging healthy eating for chronic disease management.

L01 noted that:

> *"Radio Kaya's (Leading vernacular radio) 'Bora Afya' program hosted by Solomon Zully every Wednesday from 10pm till midnight offers meal planning tips. Ebru TV's 'My Doctor' with Dr. George Kapiyo every Tuesday 8.00 pm aids diabetes management."*

Radio, SMS, phone calls, and online media

These media channels were used by the divorced elderly because they provided personalized, interactive experiences. They encouraged balanced diet consumption, offering real-time interaction and immediate clarification.

LS01 stated that:

> *"Radio Maria's (Christian station) 'Health Show' aired every Wednesday from 1pm to 2 pm and SMS with friends aid in preparing special diets for diabetes. Phone calls and digital patient podcast offered balanced diet updates."*

WhatsApp and SMS

These direct communication channels were preferred by separated elderly promoting medication adherence and healthy eating without face-to-face interaction.

R05 stated that:

> *"WhatsApp messages with volunteer health workers, SMS with neighbors, and WhatsApp video calls with friends remind to adhere to medication and eat healthily."*

Emails, phone calls, WhatsApp, and online media

These sources were trusted by widowed elderly, improving bedtime routines and promoted vaccination without requiring physical mobility.

MO1 stated that:

> *"Emails with social health workers advise on bedtime routines for better sleep. Phone calls with children help navigate websites, while WhatsApp video calls offer physical exercise tips from friends."*

M02 from Makina ward, stated that:

> *"WhatsApp messages with nurses and Community Health Volunteers (CHVs) provide updates on vaccinations."*

MOHKI01, key informant from the ministry of health noted that the Ministry of Health always emphasizes on understanding media preferences based on age among elderly slum dwellers to tailor effective health communication strategies for improved outreach and accessibility.

Tailoring health communication based marital status aids engagement among elderly slum dwellers, promoting accessibility and relatability.

Patterns of media usage for health information among elderly slum dwellers based on geographical location

Emails and Radio

These sources were favored by Makina ward elders acting as an alternative to hospital visits, encouraging bedtime routines and healthy eating.

M01 stated that:

> *"Emails from social health workers offer emotional support and advice on managing terminal illness and sleep patterns."*

M03 stated that:

> *"Radio Citizen's "Jambo Kenya" program, hosted by Vincent Ateya and*

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Melody Sinzore daily from 7am to 8 am, gives guidelines for managing hypertension through healthy eating."

These channels were also primary sources of health information among the old in Woodley ward.

W01 stated that:

"Doctors' emails offer diabetes management tips through healthy eating. Mulembe FM's (leading vernacular radio) 'Bukha Bushiere' (Wake up in the morning) with Omar Bakuli provides daily disease management news."

Radio and online media

These sources provided privacy among Woodley ward elderly without requiring face-to-face interaction with doctors. They encouraged healthy eating.

LS01 stated that:

"Radio Maria's health show offers special diet tips for diabetes and heart disease management."

Phone calls and radio

These familiar media sources brought comfort to Lindi Ward elderly, promoting healthy eating habits.

L02 indicated that:

"Children's phone calls with health information from Doctor Explain FM help manage asthma and diabetes through balanced diets."

LKI02, a pharmacist, highlighted online media's role in the health industry, while cautioning against misinformation spread. This view was supported by MK104, a dietician who noted that online media plays a significant role in providing dietary guidelines, but it is crucial to avoid misleading information and promote accurate nutritional advice for better health outcomes. Additionally, a communication expert who was a key informant noted that online media offers significant health information to the elderly on various topics, but its major drawback is the prevalence of misinformation.

WhatsApp and Phone calls

These sources used local language and provided real-time interaction improving understanding and clarifications. They also promoted healthy eating and proper wound care.

S01, noted that:

""WhatsApp messages from nurses give tips on low blood pressure management with whole grains."

S04 indicated that:

"WhatsApp messages with health experts from Kenyatta National Hospital help manage recurring wounds because am diabetic."

Across focus groups, it was noted that phone calls with children broaden access to reliable, quality health info on chronic disease diets.

Tailoring communication for location-based media preferences aids in engaging elderly slum dwellers in diverse settings.

Patterns of media usage for health information among elderly slum dwellers based on ethnicity

Radio

Ramogi radio, preferred by Luo elders, bridged language gaps for better health comprehension. It promoted healthy eating and physical activities.

LS05 stated that:

"Radio Ramogi's 'Women's Voice' program advises on brain-boosting foods."

Kiswahili health programs on radio were favored by elderly Nubians for information.

M03 stated that:

"Radio Citizen's "Jambo Kenya" program with Vincent Ateya and Melody Sinzore educates on portion control to prevent overeating."

Musyi FM was used by elderly from Kamba community as depicted by S05 who stated that:

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"Musyi FM's (A leading vernacular station) "Thome wa Mukamba" (Kamba session) program hosted by Wavinya Mwiitu wa Muthiani emphasizes physical activity for chronic disease management."

Radio and WhatsApp

Radio offered affordable health tips, WhatsApp gave instant local health advice, promoting elderly's physical exercises and medicine adherence.

S02 from Kikuyu community stated that:

"Inooro Rucini's (Morning show) 'Ugima wa Mwiri' (Healthy body) hosted by Wambui wa Muturi imparts heart health tips and body exercises. Nurse's WhatsApp messages from nurses aid hypertension medication."

Radio and emails

Vernacular radio and doctor emails provided health information among elderly from the Luhya community, promoting healthy eating and taking vaccinations.

M06 stated that:

"Mulembe FM's (A leading vernacular station in Kenya) 'Bukha Bushiere' (Wake up in the morning) with Omar Bakuli from Monday to Friday, 6-10 am imparts vital nutrition tips. Doctor emails update me on vaccinations."

M07 stated that:

"Ingo FM's (A leading vernacular station in Kenya) 'Obulamu bwefwe' with Branice Abwalaba imparts vital daily nutrition insights, except on Tuesdays."

LSBK101, a social worker, noted that recognizing and understanding media preferences based on ethnicity is crucial for effective health information dissemination among underserved elderly slum dwellers, promoting inclusivity and accessibility.

Understanding ethnic media preferences in communication guides effective health outreach to diverse elderly slum residents.

Patterns of media usage for health information among elderly slum dwellers based on age group

Negative health worker attitudes and language barriers deter elderly from seeking health information (Efe, 2020). In this study, vernacular radio and television broadcasts eased language barriers in accessing health information. Elderly rely on face-to-face interactions for valuable health information (Walker *et al.*, 2017). Family and friends (FF) act as online media search surrogates. Only 7% of elderly normally ask FF for help while seeking health information, while 54% of FF seek for them. In this study, children, grandchildren, and friends used phone calls and WhatsApp for sharing online health information with elders.

Elderly aged 65–69 are more likely to use online media for health information compared to those aged 80 and older (Anderson & Perrin, 2017). Similarly, elderly slum dwellers aged 60-70, educated with higher socio-economic status, preferred online media. Those above 75 and less educated, used traditional channels like radio. Young, educated women are most active in using social media for health info (Pálsdóttir, 2014)

Assistive tech eases online health information access among the elderly, overcoming unfamiliarity. (Fischer *et al.*, 2014). In this study, elderly made numerous phone calls with their children to source online health information (Turner *et al.*, 2018). Chinese elderly also use online media to address medical concerns (Xiong *et al.*, 2021). Customizing health apps for elderly slum dwellers enhances its usability (Isaković *et al.*, 2016). Elderly slum dwellers using health apps respond well to public health campaigns (Guo *et al.*, 2023). In contrast, elderly slum dwellers did not use health apps but mostly relied on WhatsApp and SMS.

Patterns of media usage for health information among elderly slum dwellers based on gender

Men's greater online health information use boosts mHealth adoption intentions (Zhang *et al.*, 2014) Gender differences also affect media usage

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(Kimbrough *et al.*, 2013). Elderly slum dwellers used vernacular radio programs for health information.

Online media was frequently used by postmenopausal women aged 65 years and above registered in a Women's Health Initiative (WHI) (Sedrak *et al.*, 2020) Online media is less likely to be used for health information among women although recent cancer diagnosis increases reliance on this channel (Mattsson *et al.*, 2017). In Kibera slum, Radio, television and phone calls were preferred channels among women, while men preferred radio and emails. Generally, men and women seek online media for disease prevention, but women in poorer health turn to it frequently (Nikoloudakis *et al.*, 2018).

Media use among Finnish elderly women led to less alcohol consumption promoting healthy eating (Eriksson-Backa et al., 2018). Similarly, media use in Kibera slum promoted positive lifestyle among the elderly such as healthy eating, medical adherence and physical exercises. Previous research has indicated that women are active health information seekers (Enwald *et al.*, 2016; Pálsdóttir, 2014). Similarly, online health information was frequently used by elderly Serbian men promoting healthy habits (Gazibara *et al.*, 2016)

Patterns of media usage for health information among elderly slum dwellers based on income level

Elderly in Ghana with low incomes seek health info from various sources including health experts, family, mass media, and friends promoting healthy eating and medication adherence. (Agyemang-Duah *et al.*, 2020). Similarly, in this study elderly slum dwellers used family, friends and mass media to get information on healthy eating, physical exercise, stress management, and taking vaccinations. Ongoing efforts are crucial for ensuring easy online health information access, especially for diverse populations like elderly slumdwellers (Finney Rutten *et al.*, 2019)

In most developed countries, online health information is now easily accessible (Prestin *et al.*, 2015) and elderly, caregivers often seek health information online (Cutrona *et al.*, 2015). Online health information access is increasingly becoming vital for effective health management (Finney Rutten *et al.*, 2019). However, online health search experiences vary by sociodemographic characteristics (Prestin *et al.*, 2015; McCloud *et al.*, 2016; Nguyen *et al.*, 2017) For example, elderly and slum dwellers struggle finding health info online due to low social economic statuses and lack of digital literacy skills (Nguyen *et al.*, 2017). However, some elderly slum dwellers with low incomes are slowly acquiring smart phones which enable them to receive and share online health information especially on WhatsApp, SMS and email.

In middle- and high-income countries, about 44% in Malaysia and 45% in Singapore seek health information through mobile phones. Singaporeans show higher receptiveness to online media use compared to their Malaysian counterparts (Lee *et al.*, 2020). M-health has the capacity to enhance elderly slum dwellers' health information access, simplifying health care and cutting costs. (Quaosar *et al.*, 2018)

Patterns of media usage for health information among elderly slum dwellers based on education level

Higher education and online media familiarity impacted health information seeking in Chinese elderly (Nguyen *et al.*, 2017). In this study phone calls with children who had digital literacy skills, and formal education, aided online media use. Smartphone use for health information was predicted by younger age, higher education and health literacy among Korean elderly (Oh *et al.*, 2018).

Sociodemographic factors influenced SMS health information interest in rural Bangladesh. Men, educated, younger, higher social economic status individuals were more likely to access it through their mobile phones, compared to women, elderly people or people with no education (Rahman *et al.*, 2017; Tran *et al.*, 2015) and other low-middle income countries (Free *et al.*, 2013; Zurovac et al., 2013). mHealth aids hypertension management, offering accessible info, promoting healthy habits, and aiding medication adherence for elderly slum dwellers in low-middle income countries, notably effective in China and Brazil (Li *et al.*, 2020; Debon *et al.*, 2020; Debon *et al.*, 2019). In this study SMS with neighbors

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was commonly used for health information on nutrition. Elderly slum dwellers also used vernacular radio stations to get vital health information.

Patterns of media usage for health information among elderly slum dwellers based on marital status

Online health information use is not linked to Marital status, age, and gender among Chronic Obstructive Pulmonary Disease patients' (Stellefson *et al*., 2018). In contrast, this study showed that marital status influenced the choice of media for health information. Phone calls, WhatsApp, SMS and Email were most sought for health information among married old individuals, because of the larger social support network, including their spouses, children, grandchildren, neighbors, and health experts. Radio, SMS, phone calls, and online media are most preferred channels by the divorced old individuals because of the personalized and accessible nature of these media, providing a sense of companionship and trust.

Women probably look up health topics online not only for themselves, but also for their husbands, (Nölke *et al*., 2015). Married elderly slum dwellers often used phone calls while navigating social media, while single elderly slum dwellers prefer radio and television due to accessibility.

Patterns of media usage for health information among elderly slum dwellers based on geographical location

Geographical location shapes media usage patterns for health info among elderly slum dwellers due to access disparities. Online media is slightly used less in rural areas compared to urban among elderly in the United States. (Hadi Mousavi, 2020). In this study, phone calls with children helped the elderly slum dwellers to access online media such as online radio, websites and social media.

Numerous media such as radio, phone calls, television, SMS, WhatsApp among others were used to get health information in different geographical locations in Kibera slum. Low-income African American elderly in Kansas City face challenges in using online media for health information due to perceived difficulty, despite recognizing its usefulness. This skepticism hinders technology adoption for health-seeking (Seo *et al*., 2017). In Hong Kong, elderly prefer radio, while chronic diseases drive television health information seeking (Wang *et al*., 2013)

Study on European Union health info seeking found demographics affect online and offline searches. Women, young, educated, employed, urban, and those with chronic conditions seek more. Surprisingly, even those with good health seek information. This implies that expanding online health information could deepen offline disparities (Zhao *et al*., 2022)

Patterns of media usage for health information among elderly slum dwellers based on ethnicity

Traditional media and health experts use for health information was common among the elderly with low internet skills and from Hispanic ethnicity (Jacobs *et al*., 2017). Similarly, elderly slum dwellers from various ethnic backgrounds such as Luo, Kikuyu, Luhya, and Nubians used vernacular radio stations because they disseminated health information in a language that listeners could easily understand.

Elderly Blacks and Hispanics, use online health information less compared to whites, based on demographic, education, and health factors. They are also less likely to engage in phone calls, health management sites, web searches, and health-related brain games (Mitchell *et al*., 2019). Americans seek health information more compared to Chinese relying more on mediated communication, while Chinese preferred interpersonal sources (Lu *et al*., 2020).

Minority status with low socioeconomic status, such as elderly slum dwellers, reduces online media use (Yoon *et al*., 2020). Social support like family and friends are crucial for disseminating health information among Korean Americans, emphasizing the role of social networks in providing health information to immigrants (Kim *et al*., 2015).

CONCLUSION

These results provide significant findings on patterns of media usage for health information among elderly slum dwellers from different demographic

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backgrounds. These media channels include Radio, Television, Phone calls, WhatsApp, SMS, Email, and websites. The channels promoted positive lifestyles such as healthy eating, physical exercises and medication adherence. Recommendations such as tailoring radio content, fostering digital literacy and partnering with reputable health care organizations were also identified. Understanding media usage patterns for health information among elderly slum dwellers enhances health communication strategies. It enables targeted interventions, promotes informed choices, and improves overall well-being, addressing unique health challenges effectively through media. This study identifies the patterns of media usage for health information, type of health information sought from these channels, behaviors promoted by these sources, and provides recommendations on how to enhance these media channels. Understanding media usage habits aids tailored health communication, promoting well-being and accessibility for elderly slum dwellers in underserved communities.

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Does Parental Marital Status Matter in Male Adolescent's Smoking Behaviors?

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ABSTRACT

***Background**: Globally, approximately 940 million male adolescents and 193 million female adolescents were classified as smokers in 2019. The global prevalence of smoking has continued to decline over the years, but the number of smokers remains high due to population growth. Consistently, reports from the Indonesia Demographic Health Survey (IDHS) and Indonesia Fundamental Health Research have shown an increase in the number of adolescent smokers in Indonesia. **Objective**: This study aimed to investigate the relationships between parental marital status, age of male adolescents, socioeconomic family status, and educational level of male adolescents with tobacco smoking behavior. **Method**: The research design employed was a secondary data analysis using the IDHS 2017 data with n = 5,863 male adolescent respondents. **Results**: Most respondents did not smoke, had married parents, were between 15-17 years old, came from low to very low socioeconomic backgrounds, and had an educational level of junior high school or lower. All variables (parental marital status, age, socioeconomic status, and educational level) were found to be associated with smoking behavior among male adolescents aged 15-19 years. **Conclusion**: Adolescents with divorced parents were at a significantly higher risk, approximately 1.3 times greater, for smoking tobacco compared to those from non-divorced families. Intrinsic factors (age and educational level) emerged as dominant factors in the tobacco smoking behavior of male adolescents.*

***Keywords**: IDHS 2017, Indonesia, Male adolescent smoker, Parent marital status, Tobacco smoking*

INTRODUCTION

The global prevalence of smoking has experienced a decline from 2007 to 2021 with a prevalence rate of 22.7% in 2007 and 17% in 2021. This is attributed to many countries having achieved the global target for tobacco control. However, the absolute number of tobacco smokers worldwide remains high due to population growth. Globally, approximately 940 million males adolescent and 193 million females adolescent were classified as tobacco smokers in 2019. Notably, more than 75% of male smokers reside in countries with medium or high Human Development Index (HDI) scores, whereas over 53% of female smokers are found in countries with very high HDI scores (WHO, 2023).

Tobacco smoking is one of the most significant global health concerns, affecting millions of people worldwide. Annually, 8 million lives are lost due to smoking, with 7 million deaths attributed to active smoking and 1.3 million deaths resulting from passive smoking (Ritchie & Roser, 2023). Nicotine dependence can have both short- and long-term impacts on health. According to the WHO (2018), the effects of smoking on adolescent health include increased risk of cardiovascular disease and stroke, impaired physical health, elevated resting heart rate, enhanced risk of lung cancer, respiratory problems, emotional and psychological distress, and a propensity for engaging in risky behaviors such as alcohol consumption, illicit drug use, violence, and unsafe sexual practices. Apart from its health implications, smoking can also affect an individual's economic well-being, as every dollar spent on cigarettes reduces household

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expenditure, thereby compromising food security, education, and healthcare (Ginting & Maulana, 2020). In addition to the direct costs of purchasing cigarettes, smokers must also bear the financial burden of treating smoking-related illnesses. Smoking-induced diseases can result in substantial economic losses, including lost productive days due to illness and premature mortality during productive years (Agustin, 2019).

Globally, the average prevalence of smoking among young people aged 15-24 years has declined from 20% in 2000 to 13% in 2022 and is projected to reach 12% by 2030. The number of smokers aged 15 years and above in Southeast Asia decreased from 488 million in 2000 to 411 million in 2022 (WHO, 2024). Based on the IDHS report, the percentage of unmarried males aged 15-19 years who started smoking before the age of 15 increased from 56% in 2012 to 57% in 2017 (BPS, BKKBN & Kemenkes, 2017). Meanwhile, data from the 2018 Indonesian Basic Health Research showed that the prevalence of smoking among adolescents aged 10-18 years increased from 7.20% in 2013 to 9.10% in 2018. These results are far from the target set by the 2019-2024 Indonesian Mid-Term Development Plan (RPJMN), which aims to reduce the prevalence of smoking among adolescents aged 10-18 years to 8.7% (Fauzi *et al*., 2019).

Several studies have demonstrated that adolescents from divorced families are at a higher risk of smoking. A study conducted by Doku *et al*. (2019) found that parental divorce increases the risk of smoking behavior among adolescents. The adolescent period is also a susceptible age, as they are more likely to be influenced by others, such as smoking behaviors among their peers (Salsabila *et al*., 2022). Low levels of education are more likely to be associated with smoking behavior. Education can provide individuals with knowledge about the risks and dangers of smoking, which may deter those with higher levels of education from engaging in smoking behavior (Juliansyah & Rizal, 2018). Smoking behavior is also influenced by an individual's socioeconomic status, with those from lower socioeconomic backgrounds being at a higher risk of smoking (Mahdaviazad *et al*., 2022).

Given the preceding background, this study aims to investigate the relationship between parental marital status, age of male adolescents, family socioeconomic status, and educational level of male adolescents with smoking behavior. Moreover, the results of this study are expected to provide a more comprehensive addition to the existing profile of adolescent smokers population in Indonesia.

METHODS

The research design employed was a secondary data analysis using the IDHS 2017 data obtained from The Demographic and Health Surveys (DHS) Program. The IDHS 2017 data collection took place between July 24th and September 30th, 2017 (BPS, BKKBN & Kemenkes, 2017). The datasets utilized for analysis were the IDPQ7AFL and IDML7AFL datasets, with inclusion criteria consisting of male adolescents aged 15-19 years who had a parental relationship as children of married or divorced heads of households.

The variables examined included: parental marital status, adolescent age, educational level, family socioeconomic status (as independent variables), and smoking status as the dependent variable. Data interpretation employed descriptive analysis and contingency coefficient testing through chi-square tests (with α value 0.05) accompanied by risk calculation. A final sample size of 5,863 male adolescent respondents was obtained from the dataset. The sampling selection process can be seen in Figure 1 below.

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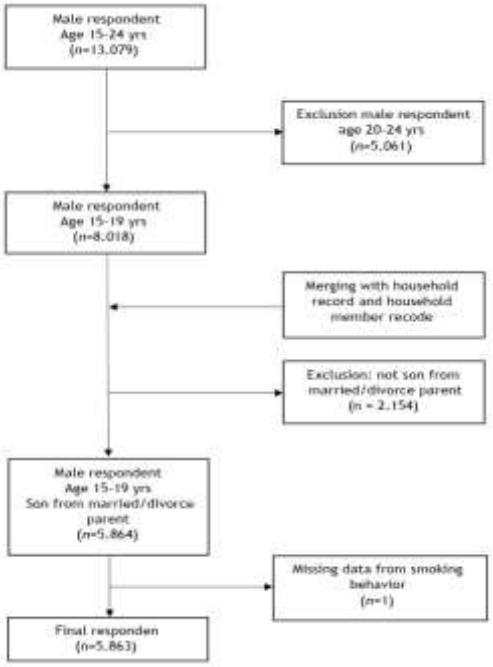

Figure 1. Data selection process

RESULTS AND DISCUSSION

Male adolescent respondents were categorized as smokers if they: 1) occasionally smoked or 2) smoked every day. Conversely, respondents were classified as non-smokers if they: 1) had quit smoking or 2) only tried smoking once or never smoked regularly at the time of the survey. As shown in Table 1, a total of 2,553 male adolescent respondents (43.54%) reported smoking behavior, whereas 3,310 respondents (56.46%) claimed to be non-smokers.

Only 165 parents of male adolescent respondents (2.81%) were divorced. Most respondents, comprising 3,974 individuals (67.78%) were within the age range of 15-17 years, while 1,889 respondents (32.22%) were within the age range of 18-19 years. Most respondents came from low and very low socioeconomic backgrounds, with details as follows: 1,412 respondents (24.08%) had a very low socioeconomic status, 1,150 respondents (19.62%) had a low socioeconomic status, while the remainder had a middle to high socioeconomic status.

Table 1. Parental marital status and 15-19 years male adolescent characteristics in Indonesia, IDHS 2017

Variables	Total (n)	%
Tobacco smoking behavior		
Yes	2,553	43.54
No	3,310	56.46
Total	**5,863**	**100.00**
Parent marital status		
Divorce	165	2.81
Married	5,698	97.19
Total	**5,863**	**100.00**
Age		
15-17	3,974	67.78
18-19	1,889	32.22
Total	**5,863**	**100.00**
Socio-economic status		
Lowest	1,412	24.08
Low	1,150	19.62
Middle	1,095	18.68
High	1,072	18.28
Highest	1,134	19.34
Total	**5,863**	**100.00**
Education level		
No education	251	4.28
Primary	941	16.05
Junior	3,434	58.57
Secondary/higher	1,237	21.10
Total	**5,863**	**100**

In general, most respondents' educational levels were junior high school or below. As shown in Table 1, 3,434 respondents (58.57%) had a junior level education, whereas 1,237 respondents (21.10%) had a secondary/higher level education. A total of 251 respondents (4.28%) had never attended school or did not complete elementary school.

A greater proportion of male adolescent smokers came from divorced families compared to those who came from non-divorced families. Most non-smoking male adolescents originated from non-divorced families. As shown in Table 2, there is a significant association between parental marital status and smoking behavior among 15-19-year-old male adolescents in Indonesia, with those having divorced parents being approximately 1.3 times more likely to smoke compared to those from non-divorced families.

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Table 2. Relationship of parental marital status and 15-19 yrs male adolescents characteristics with smoking behavior in Indonesia, IDHS 2017

Variables	Tobacco smoking behavior				Sig. (Coeff C.)	OR (95% CI)
	Yes (n)		No			
	n	%	n	%		
Parent marital status						
Divorce	98	59.4	67	40.6	<0,001*	1.379(1.211-1.569)*
Married	2,455	43.1	3,243	56.9	(0.054)	1
Age						
15-17	1,491	37.5	2,483	62.5	<0,001*	0.667(0.631-0.706)*
18-19	1,062	56.2	827	43.8	(0.174)	1
Socio-economic status						
Lowest	705	49.9	707	50.1	<0,001*	1
Low	537	46.7	613	53.3	(0.143)	0.879(0.752-1.027)
Middle	520	47.5	575	52.5		0.907(0.774-1.062)
High	453	42.3	619	57.7		0.734(0.625-0.861)*
Highest	338	29.8	796	70.2		0.426(0.361-0.502)*
Education level						
No education	176	70.1	75	29.9	<0,001*	1
Primary	412	43.8	529	56.2	(0.127)	0.332(0.246-0.448)*
Junior	1,378	40.1	2,056	59.9		0.286(0.216-0.377)*
Secondary/higher	587	47.5	650	52.5		0.385(0.287-0.516)*

Note: *Sig ≤ α (0.05)

Adolescents with divorced parents have a higher likelihood of smoking. Parental conflict can trigger stress in children and create an unpleasant home environment, thereby increasing the risk of smoking. Psychological pressures, such as feelings of suppression and high rebelliousness, can also lead to nicotine addiction. Moreover, smoking may become a means for adolescents to seek attention from their parents when the bond between parent and child weakens (Jabbour *et al*., 2020). The smoking behavior of children can originate from unhappy family environments where parents neglect their children, in contrast to those from happy families. If a child has complete parental support, their knowledge and awareness will likely improve (Sekeronej *et al*., 2020).

The majority of male adolescent smokers fall within the 18-19 yrs age range, based on statistical analysis, which reveals a significant association between age and smoking behavior. Male adolescents aged 15-17 years have a one-third lower risk ratio compared to those aged 18-19 years. The adolescent period is a vulnerable stage for initiating smoking, as individuals at this stage are seeking self-identity by trying new experiences and are easily influenced by others. Adolescents require special attention because those who start smoking often do not comprehend the risks and hazards of tobacco, particularly its addictive effects. Furthermore, it can have an impact on others, especially family members, due to the financial burden of cigarette purchases (Salsabila *et al*., 2022). The desire to try new things among adolescents can be attributed to peer influence. Peers play a significant role in shaping adolescent behavior during this stage, as they begin to separate from their parents and affiliate with same-age groups (Almaidah *et al*., 2021).

Nearly half of the male adolescent respondents came from families with a middle to low socioeconomic status. As shown in Table 2, there is an inverse relationship between family socioeconomic status and the prevalence of smoking among male adolescents, with the most significant decline observed in families with very high socioeconomic status. Adolescents from low socioeconomic backgrounds are more likely to engage in smoking behavior compared to those from higher socioeconomic backgrounds. This is because lower socioeconomic status tends to focus on daily basic needs such as food and drink, thereby diverting attention away from children's socialization needs. Unrestricted social interaction provides a platform for adolescents to express themselves and interact with people from diverse backgrounds. Adolescents feel more liberated and freer when they are among their peers, which can easily influence their behavior, including smoking (Ponimin *et al*., 2023). Research by Timban *et al*. (2019), has shown that

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low socioeconomic status is associated with a higher prevalence of smoking compared to high socioeconomic status. This is attributed to the relatively affordable price of cigarettes in Indonesia and the permissive sales policies, which allow cigarettes to be sold individually, making them easily accessible to anyone.

The majority of male adolescent smokers (70.1%) came from those who did not attend school or did not complete elementary school. In terms of numbers, male adolescent smokers were dominated by those in junior high school (1,378 male adolescents respondents), with the number of junior high school smokers nearly three times higher compared to those in elementary school or senior high school and above. A risk comparison of smoking behavior among male adolescents based on educational level reveals that those who received formal education had a three times lower risk of smoking compared to those who never attended school or did not complete elementary school. Educational level is associated with smoking behavior, as an individual's knowledge can influence their behavior. The high prevalence of smoking at low educational levels occurs due to the lack of knowledge regarding the impacts and dangers of smoking. Low educational attainment tends to be less likely to make an effort to quit smoking, but instead will increase nicotine dependence (Salsabila et al., 2022). This study aligns with previous research by Juliansyah & Rizal (2018), which suggests that education plays a crucial role in an individual's decision to adopt healthy behaviors, particularly those related to smoking. Individuals with higher educational attainment are more likely to adapt to the potential consequences of smoking.

Generally, smoking behavior among male adolescents is more strongly influenced by individual factors than parental marital status. This is evident from the relatively small contingency coefficient for parental marital status, which is roughly half the magnitude of the coefficients for age, socioeconomic status, and education. The analysis results show that the factors associated with adolescent smoking behavior, in order of strongest to weakest influence, are: age, socioeconomic status, educational level, and finally, parental marital status.

CONCLUSION

Most respondents who did not smoke had married parents, were between 15-17 years old, predominantly came from low and very low socioeconomic backgrounds, and had an educational level of junior high school or lower. All variables (parental marital status, age, socioeconomic status, and education level) were associated with smoking behavior among male adolescents aged 15-19 years. Adolescents with divorced parents were approximately three times more likely to smoke compared to those from non-divorced families. Intrinsic factors (age and education level) emerged as dominant factors in the smoking behavior of male adolescents.

Divorced parents with adolescent children should be a priority target in the Family Guidance Program for Adolescents (BKR – Bina Keluarga Remaja), aimed at reducing one of the negative consequences of divorce, specifically smoking behavior. Formal educational participation needs to be continuously promoted, as analysis results show that male adolescents who attended school had a significantly lower risk of smoking behavior compared to those who did not attend school or did not complete elementary school.

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Innovative Strategies to Prevent Childhood Smoking Epidemic: Systematic Review

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ABSTRACT

***Background**: The phenomenon of smoking in children is a serious problem. There are still many minors who smoke and traders who still sell cigarettes to them. Although regulation regarding this issue has been established, legal attention to this problem is still fairly minimal; this shows the need for law enforcement and further protection for children. The rate of e-cigarette use among children aged 13-15 years is higher than adults across WHO regions. **Aims**: This research aimed to determine how efforts have been made to reduce smoking prevalence in children. **Method**: This literature study used a Systematic Literature Review (SLR). PubMed, Science Direct, ResearchGate, and Google Scholar were used for the literature search. The keywords used were "Child Smoking," or "Child Cigarettes" and "Smoking Policy" or "Child Smoker". **Results**: Several efforts were made to reduce the prevalence of smoking in children, including legal protection efforts related to cigarette advertising regulations, restriction on cigarette dealers, prevention on selling cigarettes to children, expanding the implementation of KTR, providing smoking cessation services for children, mass campaigns and education for children, improving fiscal policy, and making innovation such as "Smoking Prevention in School Children in Hospitals" program and an idea called cigarette vending machine. **Conclusion**: Regulations related to cigarette use must continue to be pursued and implemented according to standards following local government policies by paying attention to the principles and guidelines provided. Families also play a role in helping to prevent the initiation of smoking in children.*

***Keywords**: Children, Cigarettes, Government Regulations, Health Policy, Smokers*

INTRODUCTION

The incidence of underage smoking in Indonesia remains notably high. Data from the Basic Health Research (Riskesdas) indicates that the proportion of smokers among individuals aged 10 to 18 years rose from 7.2% in 2013 to 9.1% in 2018, subsequently declining to 7.4% by 2023 (Kementerian Kesehatan Republik Indonesia, 2018). These statistics reveal that the prevalence of underage smoking has met the target outlined in the National Medium-Term Development Planning (RPJMN), which aimed to reduce the prevalence of underage smokers from 9.1% in 2018 to 8.7% by 2024. However, there are still many children who smoke as research conducted by Sari found that around 50% of male students in elementary schools have smoked, this can be seen when they come home from school to gather with their friends. Although it is clear that school regulations prohibit students from smoking, students do not care about these rules. The influence of peers is a major factor in the increasing number of underage smokers in the Camba sub-district. Based on preliminary observations, it was found that children who smoked were elementary students in grades 3-6 aged 7-12 years (G. S. I. Sari and Awaru 2021). Therefore, efforts to reduce the prevalence of smoking in children must continue to be attempted. Smoking is a behavior that can be detrimental to the health of smokers and those around them. Individuals who smoke face a heightened risk, ranging from 2 to 4 times, of developing coronary heart disease and are also at an elevated risk of experiencing sudden death. Smoking constitutes a primary risk factor for numerous non-communicable ailments, including hypertension, coronary heart disease,

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respiratory infections, stroke, and complications during pregnancy, impotence, and various types of cancer. Moreover, smoking ranks as the second most significant contributor to mortality globally, following hypertension, with statistics indicating that smoking has resulted in the demise of 1 out of every 10 adults worldwide (Kemenkes RI, 2017). The price of cigarettes in Indonesia is rather cheap and affordable for children, and sold retail. The affordability of cigarettes by children threatens the quality of life of Indonesia's next generation (Nurhasana *et al*. 2022).

Article 28B Paragraph (2) of the 1945 Constitution claims that the state must guarantee the right of every child to live, grow and develop (Republik Indonesia, 2016). In addition, according to Law Number 35 of 2014, children are individuals who have not reached the age of 18 years, including those who are still in conceive (Presiden Republik Indonesia 2014). As stipulated in the Republic of Indonesia Law Number 23 of 2002, it is mandated that both the Government and other state bodies are obligated and accountable to offer tailored safeguarding to children during crises, including those who fall victim to substance abuse—such as narcotics, alcohol, psychotropics, and other addictive substances (commonly referred to as drugs)—as outlined in Article 59. This will be achieved through vigilant oversight, preventive measures, treatment, and rehabilitation programs facilitated by governmental and societal entities. Therefore, everyone is prohibited from conciously placing, allowing, involving, ordering to involve children in the abuse, production and distribution of drugs (Presiden Republik Indonesia 2002). In fact, smoking habits prevent children from growing and developing optimally. Therefore, governments should address smoking among children through policies based on empirical evidence involving various groups of people.

The Center for Behavior and Health Promotion, Faculty of Medicine, Public Health, and Nursing (FK-KMK), asserts that smoking represents a type of harm inflicted upon children, as it detrimentally impacts their health. Consequently, children who engage in smoking are regarded as recipients of this harm. Indonesia has ratified the Convention on the Rights of the Children (CRC), which states that every child is entitled to the highest standard of health. Therefore, parents are responsible for maintaining the health of their children, including preventing them from smoking and helping children who already smoke to quit (Fakultas Kedokteran, Kesehatan Masyarakat, UGM 2023). The Ministry of Health of the Republic of Indonesia reported that the number of smokers in Indonesia showed an increase from 2013 to 2019, especially among children and adolescents. During this five-year period, the number of smokers in the child and adolescent age group increased by about 2% more. Around one in ten children aged 10-18 years in Indonesia are smokers, showing one of the highest smoking rates among adolescents in the world. The number of these young smokers continues to increase. Despite a ban on tobacco sales for those under the age of 18, more than 40 percent of Indonesian students aged 13-15 have used tobacco products, according to the 2019 Global Youth Tobacco Survey (N. R. Sari 2023).

Young individuals who initiate smoking at an early age exhibit an elevated occurrence of tobacco-related cancers as they reach a particular age, primarily attributable to their premature exposure to detrimental toxins found in cigarettes. Additionally, adolescent smokers often encounter a greater frequency of both short- and long-term respiratory symptoms compared to their non-smoking peers. Moreover, smoking can impede lung development in children and adolescents while also heightening the susceptibility to asthma among youth without a prior medical history of the condition (Scholes, Mindell, and Neave 2016).

The increasing number of minors who smoke and their easy access to cigarettes, despite existing regulations, highlights the urgency for immediate action in health promotion and behavioral science. This involves implementing evidence-based strategies aimed at safeguarding children from the harms of tobacco use. Regarding health promotion, the study stresses the importance of legal safeguards, especially in regulating cigarette advertising and sales to minors. It observes that although regulations are in place, their enforcement needs to be improved, revealing a gap between policy

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and practice. This gap presents an opportunity for health promotion professionals to advocate for stricter enforcement and innovative programs aimed at reducing smoking rates among children. These efforts are essential for creating a supportive environment that promotes healthy behaviors and upholds children's rights to health.

Behavioral science plays a crucial role in comprehending and addressing the factors influencing childhood smoking. The study identifies peer influence and the affordability of cigarettes as significant drivers of underage smoking. Interventions grounded in behavioral science can target these factors through initiatives such as peer education programs and advocating for fiscal policies that increase the cost of cigarettes for children. By applying behavioral change theories, these interventions can effectively curb the initiation and prevalence of smoking among children, contributing to broader public health goals of fostering a healthier, smoke-free generation. Based on these issues, it is important to analyze the efforts made to reduce the prevalence of smoking in children to better understand which approaches are most effective and how to improve strategies to protect children's health from the dangers of smoking. This will help create a healthier and more supportive environment for future generations.

METHODS

The method used in this study was Systematic Literature Review (SLR). The research was meticulously conducted, adhering to established protocols in the literature review process to mitigate any potential subjective biases. Data utilized in the study was sourced from diverse scientific publication databases, encompassing national and international sources. Articles were sourced from databases including Google Scholar, PubMed, ResearchGate, and Science Direct, employing keywords such as "Child Smoking," or "Child Cigarettes," and "Smoking Policy" or "Child Smoker."

The literature search was limited by the inclusion criteria:

1. The research was conducted between 2014 and 2024,
2. Research results published on Journal with ISSN, and
3. The results of the research specifically discuss about the efforts to reduce the prevalence of smoking in children.

The article journal search scheme is as follows:

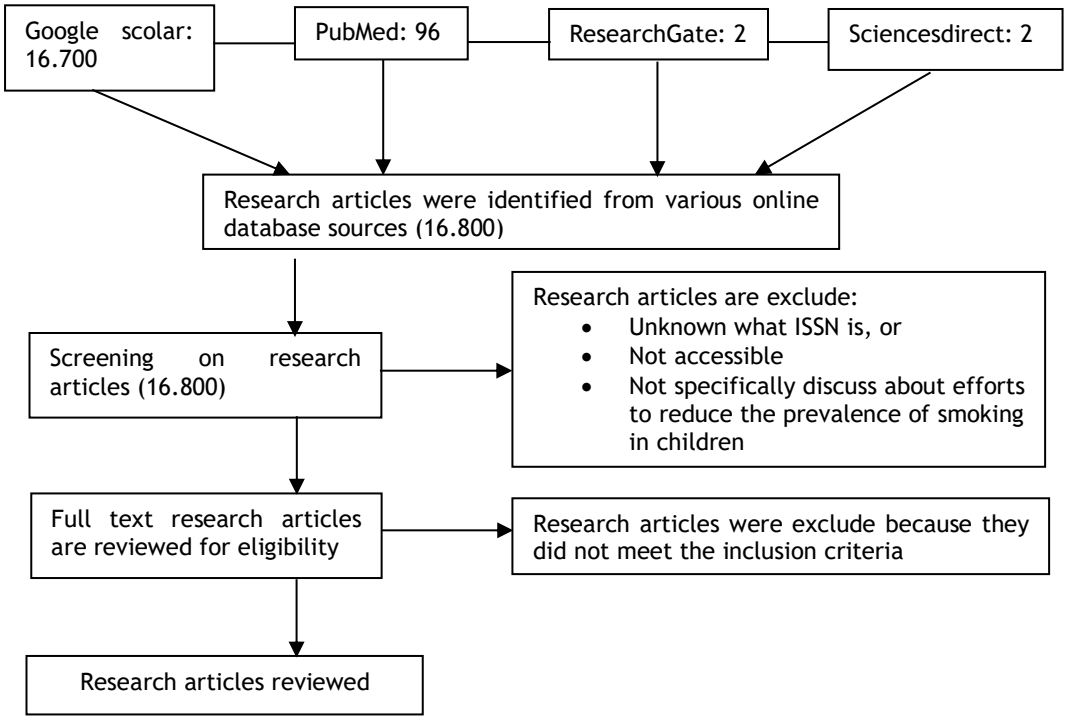

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Figure 1. Literature Search Scheme

RESULTS AND DISCUSSION

Search results through online databases found 16,700 articles on Google Scholar, 96 articles on PubMed, 2 ResearchGate articles, and 2 ScienceDirect articles. Next, articles were selected based on title, year published, and full text. Finally, 9 articles were selected based on inclusion and exclusion criteria. Based on a literature review, 9 articles discussing about various efforts made to reduce the prevalence of smoking in children. Figure 1 is the result of journal identification using systematic review. Some articles were excluded because they were not eligible for review. Requirements that were not met include: journals that do not have ISSN, articles that cannot be accessed, and articles that are not specific to efforts to reduce the prevalence of smoking in children. In addition, the nine articles discussed have texts that are complete, appropriate, and relevant to this study. Table 1 is the result of the literature review that shows the characteristics of articles that are proper of systematic review. Efforts in the form of law, family efforts, increasing child detention, and various other attempts are the focus of research in 2014-2024.

Table 1. Summary of finding from 9 studies

No	Title	Researcher and Year of Publication	Source	Study Design	Results
1.	Consumer Protection of Cigarette Product Advertising as an Effort Reducing the Prevalence of Child Smoking	Tiara Nabila, Muthia Sakti (2023)	Jurnal Interpretasi Hukum	Normative juridical method	Legal protection for child smokers as consumers as an effort to reduce the prevalence of child smokers has been stated in various regulations that regulate regarding the control of cigarette product advertising which can be said to be preventive legal protection, but this is considered unable to reduce the prevalence of child smokers in Indonesia.
2.	Analysis of Non-Smoking Area Regulatory Compliance in UPTD Kampung Anak Negeri Foster Children	Mike Danis Mutika Wati, Mochammad Bagus Qomaruddin (2020)	Jurnal Promkes: The Indonesian Journal of Health Promotion and Health Education	Observational using a cross-sectional approach.	All variables, including personal responsibility and support among fellow foster children have a relationship with compliance with non-smoking area. it's just that the closeness of the relationship between each variable is different. It is better to form peer educators in foster children and increase bonding with mentors and coaches.

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3.	Prohibition of Cigarette Sales to Children in Tambaksari District, Surabaya City	Rani Triana Simatupang, Emmilia Rusdiana (2016)	Novum: Jurnal Hukum	Sociological Juridical	There needs to be more enforcement regarding the prohibition outlined in Government Regulation on Safeguarding Tobacco Products for Health article 25 paragraph (b), which prohibits the sale of cigarettes to individuals under the age of 18 years in the Tambaksari District of Surabaya City. Several factors contribute to this regulation's weak enforcement, including law enforcement and community-related aspects. A significant portion of the population needs to be made aware of this regulation due to inadequate dissemination efforts by authorities. Moreover, there is a notable absence of surveillance and enforcement actions taken by law enforcement agencies against violators of this regulation.
4.	Cigarette Vending Machine and Cicard "Alternative Solutions to Reduce the Number of Underage Active Smokers	Latifa Fajri Ramdhani, Fitrianur Laili, Zahrotul Mahmudati (2014)	Jurnal Ilmiah Mahasiswa	Notion	A new idea in the form of cigarette vending machines and cicards (cigarette cards) that can limit the age of cigarette consumers.
5.	Prosecution of Traders and Businessmen who Sell Cigarettes to Children in Batam City, Indonesia	Rika Permatasari, Winsherly Tan (2021)	Conference on Management, Business, Innovation, Education and Social Science	Sociological or empirical, where empirical legal research is a legal research method that attempts to see law in a real sense or real observations, examine how law works in society.	The government has conducted socialization regarding regulations prohibiting selling cigarettes to children, to traders and entrepreneurs, and education on the dangers of smoking for children. The government is trying to continuously socializing and

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					educating during this pandemic, by conducting webinars, electronic books about the dangers of smoking, and developed Quit-Line via telephone for children who want to quit smoking can consult and get tips and info on the website of the Ministry of Health of the Republic of Indonesia.
6.	Preventing Smoking in Children and Adolescents: Recommendations for Practice and Policy	Johanne Harvey, Nicholas Chadi (2016)	Canadian Paediatric Society	Literature review	The most effective measures to reduce adolescent smoking rates are already in place in Canada: • High tax rates • Labelling disincentive • Marketing and sales restrictions No smoking in public places.
7.	Smoking Prevention in Children and Adolescents: A Systematic Review of Individualized Interventions	Lindsay R. Duncana, Erin S. Pearsonb , Ralph Maddison (2017)	Elsevier	A systematic review	Preventing the onset of smoking among adolescents aged 7 to 18 years entails implementing interventions within primary healthcare facilities employing interpersonal communication and support tactics. Ultimately, the most effective approach to deter adolescent smoking is likely to integrate traditional intervention methods with individual-level interventions that educate adolescents on cognitive-behavioral principles, such as effectively managing their behavior concerning cigarette use.
8.	Family-Based Programmes for Preventing Smoking by Children and Adolescents	Thomas RE, Baker PRA, Thomas BC, Lorenzetti DL (2015)	The Cochrane Library ScienceDirect	RCT's	There is compelling evidence indicating that interventions focused on families can yield favorable

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					outcomes in deterring children and adolescents from initiating smoking.
9.	Smoking prevention intervention with school classes in university hospital by thoracic surgeon und pulmonologist. The Zurich prevention project	K. Furrer a, M.M. Schuurmans b, M. Hebeisen c, S. Schulte a, D. Schneiter a, W. Weder a, I. Opitz a, S. Hillinger (2022)	Elsevier	Cohort	The "Hospital-based Prevention Program for Schoolchildren Smoking" is an initiative designed to offer students interactive educational sessions regarding the health implications of smoking and its ramifications.

Of the 9 articles selected and presented in table 1, the most discussed effort was legal protection efforts with a total of 4 articles. 1 article discussed legal remedies carried out in Canada. Another article mentioned several recommendations for efforts that should be made by the government in reducing the prevalence of child smokers. The rests discussed cigarette advertising regulations, regulatory revisions, No Smoking Area regulations, strict supervision by the government, and legal affirmation.

Several other efforts followed, namely: the formation of peer education or support from peers as many as 1 article, social support as many as 2 articles, conducting socialization or coaching and education related to cigarettes as many as 4 articles, conducting interpersonal communication with children as many as 2 articles, diverting children's attention with positive activities as much as 1 article, parental supervision as many as 2 articles, innovate a program as many as 2 articles.

Based on a literature review of 9 selected articles, there were several efforts made to reduce the prevalence of smoking in children. One of the most discussed efforts was to socialize, foster and educate children contained in 4 articles. The government, through the Education Office, can hold campaigns or socialization in schools with the aim of educating children about the negative effects of smoking on health (Nabila and Sakti 2023). In order for a regulation to be known by the community, one way that must be done is socialization. However, in Tambaksari sub-district, residents, including cigarette sellers, the elderly, and children who smoke, said they had never attended a socialization event about cigarettes (Simatupang and Rusdiana 2016). The government strives to continue to carry out socialization and education through various means, such as holding webinars, providing electronic books about the dangers of smoking, and providing Quit-Line services via telephone. Children who want to quit smoking can consult, get tips, and access information on the website of the Ministry of Health of the Republic of Indonesia (Permatasari and Tan 2021). Based on interventions conducted by Furrer *et al.*, (2022) socialization sessions showed a significant increase in knowledge about the effects of smoking. This was shown by an increase in the number of correct answers from 40% to 81%.

There are four articles that discuss various legal efforts made to prevent the prevalence of smoking in children. Legal protection to prevent disputes for cigarette consumers is contained in Article 4 of the Law regarding Consumer Protection that must be fulfilled, regarding the protection of cigarette advertisements in an effort to reduce the prevalence of child smokers can be seen in several positive laws in Indonesia that regulate the control and restriction of cigarette product advertisements in various platforms, such as in the Law of Customer Protection, Broadcasting Law, Health Law, and Government Regulation No. 109/2012.

As mandated by laws and regulations, the Indonesian Food and Drug Authority (BPOM) also oversees the legal aspects of cigarette advertisements. BPOM monitors advertisements for various cigarette products and evaluates their

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compliance with government regulations. Additionally, preventive legal measures are implemented by restricting access for individuals under 18 to purchase cigarettes, as stipulated in Article 21 Letter a of Regulation of The President of the Republic of Indonesia Number 109/2012. However, in that Presidential Regulation, it is considered that there is a void in legal provisions, namely that the regulation has not been regulated regarding criminal sanctions for parties who violate regulations related to cigarette advertising and has not been regulated also related to electronic cigarettes that have appeared since 2012 in Indonesia. In addition, there has been no regulation regarding the prohibition of cigarette purchases so that minors exposed to cigarette advertisements can easily buy cigarettes at stalls (Nabila and Sakti 2023).

One of the factors that make a regulation effective is the citizens of the community. The awareness of citizens to comply with laws and regulations is still poor. If the community obeys and is aware of the law, the laws/rules that are valid will run according to their functions. Law enforcement of the ban on the sale of cigarettes to children requires coordination between law enforcement officials, the community, and the children themself. All communities must begin to realize that cigarettes are harmful and cause many negative effects. With good coordination between parties, the rule can run properly and will reduce adolescent smokers (Simatupang and Rusdiana 2016). In addition, efforts to train children's responsibility in complying with regulations related to smoking can be added by becoming a peer educator for fellow children. Support provided by peers can lead to positive or negative things. Therefore, there is a need for peer educators who can be a positive role model for children to learn in order to understand the negative effects of smoking (Wati 2020).

There are several regulations governing the prohibition of the sale of cigarettes to children. Not only selling but giving. Giving is also prohibited according to existing rules and has different sanctions also in each law, based on Government Regulations and Batam City Regional Regulations (Permatasari and Tan 2021). Regulations governing the prohibition of selling cigarettes to children are:

1. Government Regulation Number 109 of 2012 concerning Safeguarding Substances Containing Addictive Substances in the Form of Tobacco Products for Health
2. Law Number 35 of 2014 concerning Amendments to Law Number 23 of 2002 concerning Child Protection
3. Law Number 8 of 1999 concerning Consumer Protection
4. Batam City Regional Regulation Number 1 of 2016 concerning Non-Smoking Areas

The legal action for traders who sell cigarettes to children is that socialization will first be carried out to traders or entrepreneurs by community police office (bhabikantibmas) explaining the rules that prohibit selling cigarettes to children. If they violate it, they will get sanctions, fines to revoke business licenses.

In Canada, the Tobacco Act, passed in 1997, and its amendment, Bill C-32, passed in 2009, became the basis for federal tobacco regulation. Several measures considered most effective for reducing adolescent smoking rates have been mandated in Canada (Johanne Harvey and Chadi 2016) Among them are:

1. High tax rates: Making tobacco products less affordable by raising taxes on tobacco products.
2. Labeling disincentives: The use of explicit photos and smoking-related health warnings on all tobacco products, their packaging and labeling.
3. Marketing and sales restrictions: Prohibit point-of-sale displays, advertising to minors, and sponsorship of public events by tobacco companies.
4. Non-smoking spaces: Smoking is prohibited in public places such as schools, daycare centers, workplaces, hospitals, restaurants, hotels and parks, as well as on public transport and cars transporting minors.

All levels of government should:

1. Continue to adopt and enforce laws and regulations restricting tobacco access for minors, including e-cigarettes and alternative tobacco products.
2. Passed a universal ban on smoking in cars whose passengers are teenagers under the age of 18.

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3. Continue to regulate tobacco advertising and packaging, and specifically control new tobacco products aimed at minors.
4. Apply strict penalties to any company or individual that sells contraband cigarettes.
5. Make all tobacco products less affordable by imposing very expensive taxes.
6. Provide confidential access and coverage for smoking cessation therapy, including treatment based on provincial/territorial health plans
7. Fund and encourage research on the impact of tobacco use in young people and successful smoking prevention and cessation interventions.

In an effort to help prevent initiation of smoking in children. Families should communicate to children, adolescents and other family members about tobacco use and exposure and provide age-appropriate information and counseling to prevent initiation as part of routine health services (Johanne Harvey and Chadi 2016). There is evidence of moderate quality indicating that interventions focused on families can effectively prevent children and adolescents from initiating smoking. Intensive programs may yield greater success compared to less intensive ones. Additionally, incorporating a family-based element into school interventions has shown promise in preventing smoking initiation. Because the interventions and situations in these reviews are so different, it is important for family-based programs to be continually evaluated (Thomas *et al.*, 2015). Based on research conducted by Septiono dan Meyrowitsch (2014) it was found that parental control and parental consent to tobacco use were associated with smoking among children, and active interventions that encourage these factors could potentially also influence the likelihood of smoking among children.

Parental control can be done through monitoring social activities and setting boundaries to avoid negative influences. This will reduce the socio-environmental impact of tobacco use as it is also intended to prevent the influence on smoking. However, parents' disapproval of smoking habits in the home can lead to the perception that smoking is a negative act. In addition, the status of fathers, mothers, and siblings who smoke is also a strong predictor of children will smoke.

Preventing adolescents aged 7 to 18 years from initiating smoking requires interventions implemented in primary healthcare settings, along with interpersonal communication and support strategies. Nevertheless, research consistently highlights that children are susceptible to influence and may alter their smoking behavior over time. This underscores the importance of continuous and regular interventions involving interpersonal communication with influential individuals, commencing from a young age (e.g., consistently practicing strategies to refuse offers of cigarettes). Further research is required to determine the most effective setting, dosage, and combination of intervention components necessary to sustain nonsmoking behavior in this impressionable demographic (Duncan, Pearson, and Maddison 2018).

Thoracic and pulmonary surgeons at the University Hospital Zurich, Switzerland, also contributed to endeavors aimed at decreasing the prevalence of smoking among children. They achieved this by arranging student visits to the University Hospital Zurich, where they directly interacted with physicians and patients. Throughout these sessions, students were educated about the health consequences of smoking and were shown surgical videos depicting the contrasting conditions of lungs in smokers and non-smokers. After the intervention, there was a significant increase in the number of correct answers to questionnaires on smoking knowledge. This session was followed by discussions and questions made by students *(Furrer et al.*, 2022).

Furthermore, Ramdhani *et al.* (2014) introduced an innovation known as the cigarette vending machine and cicard (cigarette card) to restrict cigarette purchases to individuals of legal age. This system permits only consumers aged 18 years and above to utilize the cigarette vending machine and cicard. The operation of this cigarette vending machine mirrors that of a standard vending machine, with the distinction that payment is facilitated through the cicard, which can be replenished via partnered banks and minimarkets. The implementation of cigarette vending

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machines and cicards serves to curtail the unrestricted accessibility of cigarettes to individuals under the age of 18.

CONCLUSION

The results of this literature review can be the basis for determining appropriate interventions to prevent the incidence of smoking in children, so as to reduce the prevalence of smoking in children. Some efforts made to reduce the prevalence of smoking in children are conducting socialization and education to increase children's understanding of cigarettes, strengthening legal protection regarding criminal sanctions for parties who violate regulations related to cigarette advertising, and making regulations related to electronic cigarettes. In addition, it is necessary to regulate the prohibition of cigarette purchases in a moderate manner. Families also play a role in helping to prevent initiation of smoking in children, families should communicate to children, adolescents, and families about tobacco use and exposure and provide age-appropriate information and counseling to prevent initiation as part of routine health services. To train children's responsibility in complying with regulations related to smoking can be added by becoming a peer educator for fellow children. There are several innovations or ideas as a form of effort to reduce the prevalence of smokers, namely the intervention program "Smoking Prevention in School Children in Hospitals" and an idea called cigarette vending machine and cicard (cigarette card).

To effectively reduce the prevalence of smoking in children, comprehensive school-based programs are essential. These should combine educational curricula that address the risks associated with tobacco use and equip students with skills to resist peer pressure. Additionally, implementing policies that enforce smoke-free environments and restrict minors' access to tobacco products can reinforce the educational messages. Community involvement is also vital, ensuring a consistent anti-smoking message is communicated across various platforms. For sustained success, regular monitoring and evaluation of these interventions are necessary to assess their impact. Engaging key stakeholders—parents, teachers, and policymakers—in ongoing discussions can improve strategy.

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Social Media Exposure towards Asian Youth Smoking Behaviour: A Scoping Review

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ABSTRACT

***Background**: Smoking habits among teenagers have a significant impact on public health. Smoking in adolescence is a global health problem that requires serious attention because it can have long-term impacts on public health, including an increased risk of chronic diseases in later life. **Aims**: This review aims to identify the influence and impact of cigarette promotion on social media on adolescent smoking behavior in Asia. **Method**: This research uses a scoping review method to explore and understand the level of cigarette consumption among teenagers in various Asian countries. Search using Pubmed, Google Scholar, and Springer Link databases. Search for articles using the main keywords Asian youth cigarette consumption, influence and impact. This review was conducted on 200 articles that were screened and a total of 10 articles were analyzed. The selected articles are in English and Indonesian, with a period of five years between 2019 and 2024. Types of articles cover the fields of medicine, health, health care, environmental science, and social science. The types of documents used are journals and articles with full text and free. The articles come from Germany, England, the United States, Malaysia, China, Taiwan, and Indonesia. **Results**: The results of this study indicate that cigarette promotion on social media can have a significant influence on smoking behavior among youth in Asia. **Conclusion**: We have identified that cigarette promotion on social media influences adolescent smoking behavior due to low self-efficacy, peers, ineffective promotional advertising, and family habits.*

***Keywords**: Asia, Promotion, Social-Media, Teenage cigarette consumption*

INTRODUCTION

Smoking among teenagers in Asia is a problem that requires serious attention, considering its negative effects on the health and development of the younger generation. Due to diverse geography and culture, it is difficult to understand the factors that influence smoking behaviour among adolescents in Asia *(Nainggolan et al*., 2020).

Cigarette promotion on social media has a significant impact on adolescent smoking behaviour. With wide penetration and great influence among teenagers, social media has become the main platform through which cigarette promotion can reach a wider and more vulnerable audience (Marchel, 2019). Through attractive content and targeted marketing campaigns, cigarette promotion can strengthen positive perceptions of smoking among teenagers, depicting a modern and mature lifestyle. This can change social norms in adolescents, encourage smoking experimentation, and even increase nicotine addiction rates (Fadhila *et al*., 2022). Apart from that, social media also facilitates the exchange of information and experiences between teenagers and strengthens the smoking culture among teenagers. Therefore, efforts to control cigarette promotion on social media are important in efforts to prevent smoking among teenagers.

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Thus, in order to find a solution, it is necessary to study how cigarette ads on social media affect young smoking habits in Asian nations. The impact of cigarette advertising on smoking habits among Asian youth is the focus of this study. Smoking habits among teenagers have a significant impact on public health and are a global health problem that requires serious attention. With its cultural and demographic diversity, the Asian Region offers an extraordinary context for understanding cigarette consumption patterns among adolescents.

Understanding cigarette consumption levels in Asia can help design more efficient public health interventions. Adolescent smoking increases the likelihood of developing chronic diseases in later years and has other far-reaching effects on public health (Muslim *et al.*, 2023).

This research is a continuation of previous research which used the Scoping review method by comparing factors that influence cigarette consumption in Asian adolescents. In the context of globalization, comparative objectives can provide more comprehensive insights into smoking trends among

Asian adolescents. The formation of this research title was based on the need to identify the impact of cigarette promotion on social media on cigarette consumption among teenagers, which is a big problem in Asia. This research is expected to be able to identify the impact of cigarette promotion on teenagers. The establishment of more efficient prevention and intervention initiatives can provide benefits in preventing the younger generation from the negative impacts of smoking behaviour. This research is relevant because it increases understanding of this pressing public health problem worldwide.

METHODS

This research uses a scoping review design. National international journals are the subject of this research, and the research sample consists of 20 research articles from national and international journals which discuss the influence of cigarette promotion on social media on adolescent smoking behaviour in Asia. These articles were taken from Google Scholar, Pubmed, and Springer databases.

Table 1. Database and keywords

Database	Keyword
Pubmed, Google Scholar	Keywords: (“Cigarette Consumption” [Mesh]) , (“Effect of Cigarrete Promotion”[Mesh]) Filter: Adult), (“Cigarrete Behaviour”[Mesh]) Filter: Adult), and (“Asian Adolescents”[Mesh]) Filter: Adult).
Springer Link	Keywords: (Effect of CIgarrete Promotion on Cigarrete Behaviour in Social Media), Filter: Discipline: Asian Adolescents Subdiscipline: Health

Selected articles were selected based on publications released between 2019 and 2024 (5 years) and written in Indonesian and English. The exclusion criteria are articles that require full text in a language other than English or Indonesian, articles published before 2019, articles with unclear publication sources, research results that are not related to health impacts, and articles that require ISSN or ISBN. The eligibility criteria for this study were based on the PICOS criteria (population, intervention/exposure, outcome, study):

- The population in this study consisted of non-cigarette consumers.
- The exposure in this study was not smoking behaviour.
- The results evaluated in this study are not the effect of cigarette promotion on social media on smoking behaviour in Asian adolescents.
- This research is not an observational study.

RESULTS AND DISCUSSION

Google Scholar returns 199 articles, Springer Link 181, and PubMed 22 when searching for papers using the aforementioned keywords. Reviewing the abstract is the next stage. In the next phase, a full-text review, 160 articles were included after 188 articles were removed from consideration due to their lack of relevance to the topic at hand (the Influence of Social Media Promotion

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on Teenage Smoking Behavior in Asia). Articles that did not fulfill the criteria were eliminated from a full text search of 160 chosen articles. For this study, eleven papers were chosen (Figure 1).

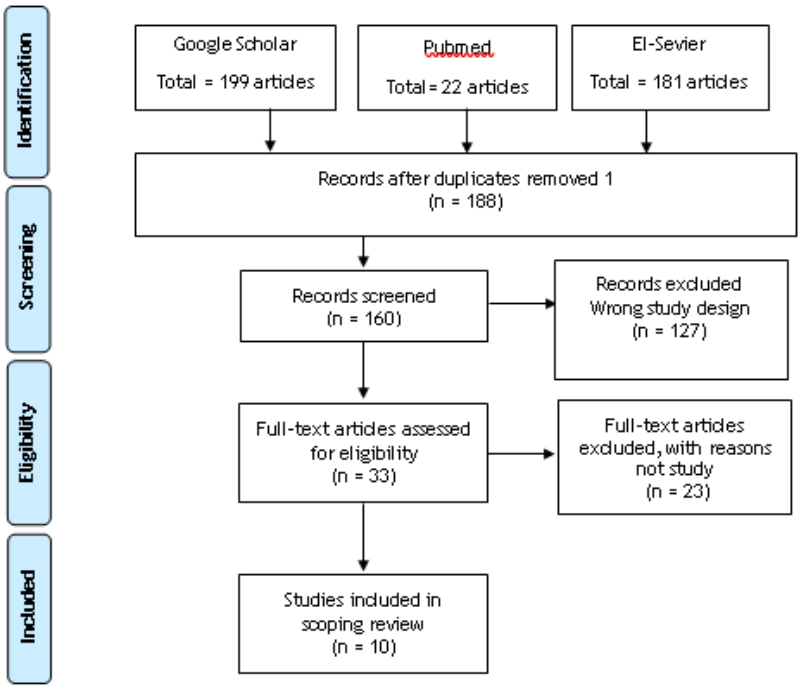

Figure 1. Framework diagram based on PRISMA guidelines

Table 1. Summary of selected data

Authors	Journal Title	Results
(Oktavilantika *et al.*, 2023)	Literature Review: Promosi Kesehatan dan Model Teori Perubahan Perilaku Kesehatan	Several theories may be used in health promotion to influence people's health-related behaviors. These theories include Theories of Affect, Learning Theory, Social Cognitive Theory, and Stage of Change Theory. To promote and change health behavior, this study used a literature review approach covering the years 2012–2022. The theories covered here address the steps, outcomes, and methodologies involved.
(Satpathy *et al.*, 2022)	Literature Review: Cigarette Promotion Strategies Versus Anti-Smoking Health Promotion Strategies	It is critical that we address the issue of adolescent smoking as soon as possible. As a result of advancements in media consumption enabled by ICT, anti-smoking health promotion initiatives are modern. Nevertheless, its widespread adoption is still in its early stages, and the effectiveness of health promotion messaging is heavily dependent on its attractiveness and relevance to the target audience.
(Vassey *et al.*, 2022)	Frequency of social media use and exposure to tobacco or nicotine-related content in association with E-cigarette use among youth: A cross-sectional and longitudinal survey analysis	Online surveys were administered to 2,036 high school students from varied ethnic and socioeconomic backgrounds in Los Angeles, California, between January and May of 2021 and 2022. The data was analyzed using both cross-sectional and longitudinal methods. Adolescents who used TikTok several times daily were more likely to use e-cigarettes ever (adjusted odds ratio [AOR] = 2.16; CI: 1.20;3.90) and are using them now (AOR = 3.11; CI: 1.64;5.89), as comparison to those who used

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		TikTok less often or not at all. Adolescents who used TikTok more often or daily were also more likely to start using electronic cigarettes (AOR = 2.97; CI: 1.53;5.77) than those who used it less often or never. Viewing tobacco or nicotine postings, including e-cigarettes, on TikTok at least weekly increased the likelihood of e-cigarette ever-use (AOR = 2.60; CI: 2.02;3.35) and current usage (AOR = 3.11; CI: 1.64;5.89) among adolescents. The risk of e-cigarette use and initiation is higher among teenagers who use TikTok often and who are exposed to tobacco material on the app frequently.
(Pokhrel *et al.*, 2021)	Social media's influence on e-cigarette use onset and escalation among young adults: What beliefs mediate the effects?	Twenty-three hundred and thirty-seven college students (mean age=21.2; standard deviation=2.1; 54% female) had their self-report data taken at three intervals between 2017 and 2019. The mediational models were tested using structural equation modeling. greater affect regulation expectations, such as the perception that e-cigarette usage alleviates boredom and stress, moderated the relationship between greater baseline social media e-cigarette exposure and the commencement of e-cigarette use one year later among baseline never e-cigarette users. Among those who had used electronic cigarettes for at least a year, the effects of increasing social media exposure at baseline on increased current e-cigarette usage were moderated by higher positive sensory, pleasant "smoking" experience, and affect regulation expectation beliefs. Ads for electronic cigarettes on social media may entice young individuals to give them a try by making them seem like a stress reliever and a source of happiness.
(Donaldson *et al.*, 2022)	The impact of e-cigarette product placement in music videos on susceptibility to use e-cigarettes among young adults: An experimental investigation	Final Product When comparing the treatment group to the control group, those who had never used electronic cigarettes before were more likely to say they planned to use them in the future (OR = 1.94, 95% CI [1.08, 3.54]). When comparing the treatment group to the control group, individuals in the former were more likely to report being influenced by their peers to use e-cigarettes (OR = 1.97, 95% CI [1.19, 3.32]). The treatment group did not show a correlation with the composite measure of e-cigarette use susceptibility, while these subitems did. In summary, Seeing e-cigarettes advertised in music videos could make young individuals more open to trying them out.
(Dai *et al.*, 2022)	Vaping Media Literacy, Harm Perception, and Susceptibility of E-Cigarette Use Among Youth	Disparities in vape media literacy were shown to be statistically significant among middle school students (p=0.03), male students (p=0.003), and students from racial and ethnic minority groups (Blacks, Hispanics, others vs Whites, p=0.0009), along with gender. An AOR of 1.2 (95% CI=1.1, 1.2; p<0.0001) was shown to be substantially linked with an elevated perception of the harmfulness of E-cigarette usage, when vaping media literacy was higher. Perceived danger from electronic cigarettes was likewise linked to all subscales. Higher vaping media literacy was associated with a reduced likelihood of first-time E-cigarette use among non-users

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		(AOR=0.90; 95% CI=0.83, 0.97; p=0.005). Exposure to vaping was inversely related to the vaping Messages and Meanings subscale and the vaping Representation and Reality subscale.
(Klein *et al.*, 2022)	Testing potential disclosures for e-cigarette sponsorship on social media	We summarized the main topics connected to the hashtags by qualitative content analysis, and we compared commercial content recognition by condition using logistic regression analyses. Final Product When comparing the #sponsored and #ad conditions, the probabilities of commercial recognition were 1.98 (OR: 1.14-3.38). The probability of commercial awareness rose by 22% for every second that the hashtag was given attention to (OR:1.22, CI: 1.00-1.33).
(Tantri *et al.*, 2018)	The Relationship Between Perceptions of Warnings about the Dangers of Smoking on Cigarette Packaging and Smoking Behaviour among Adolescent Boys in Palembang City	Perceived vulnerability, perceived severity, perceived advantages, perceived obstacles, and signals to actio were all shown to be connected with smoking behavior in statistical tests, however self-efficacy was found to be unrelated (p=0.734). According to multivariate research, the duration of perceived vulnerability was the most influential variable on smoking behavior.
(McKelvey *et al.*, 2015)	Determinants of cigarette smoking initiation in Jordanian schoolchildren: longitudinal analysis.	On average, the participants were 12.6 years old when they started. By the end of the tenth grade, 29.8% of the 1,454 pupils had started smoking cigarettes, with men's rates being 37.2% and girls' at 23.7%. Smoking was first started by 47.2% of males and 37.2% of girls in eighth grade, out of 498 who started. A history of waterpipe use, poor cigarette rejection self-efficacy, a desire to start smoking, and the presence of smoking peers were all factors in the decision to start smoking cigarettes. Girls were also more likely to start smoking if they had a smoking parent or sibling.
(Ling *et al.*, 2019)	Cigarette smoking among secondary school-going male adolescents in Malaysia: Findings from the National Health and Morbidity Survey 2017	a cross-sectional research with 27,497 participants that aimed to represent Malaysian school-aged teenagers using a 2-stage stratified cluster sampling method. The purpose of this study was to investigate potential risk variables for current cigarette smoking among Malaysian male teenagers by using multiple logistic regression analysis. Teenage boys between the ages of 16 and 17 were more likely to be current smokers if they were: current users of illicit drugs (AOR = 8.14; 95% CI = 6.37-10.41), current users of alcohol (AOR = 1.92; 95% CI = 1.65-2.23), students from rural schools (AOR = 1.60; 95% CI = 1.46-1.76), children of parents who were widowed, divorced, or separated (AOR = 1.37; 95% CI = 1.21-1.55), and children of parents or guardians who used tobacco products (AOR = 3.47; 95% CI = 2.33-5.16). Adolescents at risk and parents should both be targets of tobacco control initiatives targeted at helping their children quit smoking.

According to research conducted by Oktavilantika *et al.* (2023), there are several approaches that can explain that the role of health promotion can help reduce smoking behaviour in society. The Learning Theory approach has an influence in providing behavioural changes to individuals. This theory may help patients care for themselves and live a healthy oral lifestyle, especially by reducing the negative effects of smoking, which include thickening of saliva and dryness of the throat, which causes bad breath. Apart from that, this theory can also increase people's awareness of paying attention to their throat health so they

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can avoid disease. Then, according to the Social Cognitive Theory approach, it states that oral health promotion on social media can have an influence on smoking behaviour in individuals. This theory can increase individual self-efficacy regarding handling oral health problems and improving oral health through productive and healthy activities. Then the Stage of Change Theory approach can have an influence on individual awareness of readiness and awareness of biological health, especially oral health. And finally, the Theory of Affect theory approach can have an influence on increasing health promotion which can have an impact on the desire to quit and avoid smoking behaviour in individuals as well as being able to provide awareness of the dangers of smoking and the benefits of avoiding smoking behaviour.

According to Research conducted by Satpathy *et al*. (2022) stated that health promotion that develops today's technology can influence reducing smoking behaviour among young people in Asia. This is due to the problem of smoking. The problem of smoking in teenagers is a crucial point that must be a priority to prevent, which is caused by the negative impacts of smoking behaviour such as hypertension, lung cancer and heart attacks. Therefore, appropriate health promotion strategies are needed that can be packaged in an attractive way to increase awareness among young people in Asia about the dangers of smoking behaviour.

According to Research conducted by Vassey *et al*. (2022) stated that cigarette promotion on the Tiktok platform could have an influence on increasing smoking behaviour among teenagers. The results of this research have a ratio value [AOR] = 2.16; CI: 1.20;3.90 in cigarette users and increased in the last 30 days with value (AOR = 3.11; CI: 1.64;5.89). This shows that teenagers who have a high frequency of using TikTok have a higher tendency for smoking behaviour than teenagers who have a low frequency of using TikTok. The data shows that young people who use and watch tobacco content on TikTok are more likely to start using e-cigarettes, and that there needs to be stricter regulation and enforcement of existing rules due to the prevalence of tobacco-related content on popular youth social media platforms like TikTok. Stronger stances on tobacco content restriction on their platforms.

According to Research conducted by Pokhrel *et al.*, (2021) stated that cigarette promotion on social media can influence individual beliefs regarding smoking behaviour. The results of this research indicate that the individual's confidence in e-cigarette users can increase because it is influenced by the individual's expectations of the consequences of existing regulations. The idea that vaping makes you feel better, less stressed, and bored may be at the root of this phenomenon, mitigating the effect of increased exposure to e-cigarettes on social media on starting to vape. Then, cigarette ads on social media can suggest to young people that smoking is a great way to relax and unwind, which might lead them to start smoking themselves. Cigarette ads on social media often portray smokes as a greener option, which helps to normalize the product and attract new smokers.

According to Research conducted by Donaldson *et al*. (2022) said that advertising cigarettes would make young people want to light up someday. Ads on social media and from friends may have a big impact on teens' urge to smoke, according to one research. Therefore, it is hoped that the local tobacco control body will consider promotional strategies to reduce the placement of cigarette products, one of which is promotion in the form of music videos.

According to Research conducted by Dai *et al*. (2022), Advertising cigarettes on social media platforms has a major impact on adolescent cigarette knowledge. The findings of this study suggest that heightened knowledge of the risks associated with smoking may be achieved via increased literacy. The odds ratio (AOR=0.90; 95% CI =0.83, 0.97; p=0.005) for first-time e-cigarette users among non-user teenagers was lower for pupils with more vaping media literacy compared to those with less literacy.

According to Research conducted by Klein *et al*. (2022) claim that there is a correlation between the prevalence of cigarette ads on social media and a rise in adolescent smoking in Asia. Disclosure advertisements are eye-catching and help young social media users recognize commercial sponsorships much better.

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One potential way to help people understand the impact of paid social media is to label commercially sponsored material on social media. The value of boosting prospects for commercial awareness by 22% (OR:1.22, CI: 1.00-1.33) and the ratio of sponsored advertising (OR = 1.98, CI: 1.14-3.38) provide proof of this.

According to Research conducted by Tantri *et a*l. (2018) found that males in Palembang City exhibited a correlation between their perceptions of their own vulnerability and their smoking habits, with a p-value of less than 0.000. Teens' lack of heightened understanding of the risks of smoking is a direct result of the many warnings printed on cigarette packs. Aside from that, the ads' content doesn't do a good job of warning teens about the risks of smoking.

According to Research conducted by McKelvey *et al*. (2015) participants' average age at baseline was 12.6 years. In the tenth grade, 29.8% of 1,454 pupils (37.2% of males and 23.7% of girls) began smoking. In eighth grade, 47.2% of males and 37.2% of females began smoking. The total number of smokers was 498. The factors that contributed to the smoking habits seen in this research among boys were their frequent exposure to social media advertisements for cigarettes, their lack of confidence in their ability to resist smoking, and the impact of their smoking-heavy peer group. Then smoking behaviour in women is caused by the smoking habit of their parents or closest family, which is a form of identification and prediction that smoking behaviour is a daily and commonplace behaviour in their family.

According to Research conducted by Ling *et al*. (2019) found that among male adolescents between the ages of 16 and 17, there was an increased likelihood of being an active smoker if they were: drug users, current alcohol users, those attending rural schools, those whose parents were widowed, divorced, or separated, and those whose parents or guardians used tobacco products. Teens in Malaysia are more likely to light up after seeing ads for cigarette products.

CONCLUSION

Based on the results of the coping review of the 10 articles above, cigarette promotion on social media has a significant influence on increasing smoking behaviour among teenagers in Asia. This is due to the low level of adolescent self-efficacy in rejecting smoking behaviour so that adolescents feel less motivated to understand the dangers of smoking. Apart from that, invitations to smoke from peers also influence adolescent smoking behaviour. Then the lack of effectiveness in the distribution of advertising and the low level of literacy regarding the dangers of smoking also causes low awareness of teenagers regarding the dangers of smoking. Family factors also have a significant impact on increasing smoking behaviour among teenagers in Asia.

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Review of Tobacco Taxes Advocacy in Indonesia: A Health Promotion Strategies

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ABSTRACT

***Background**: The global smoking prevalence from 2007 to 2021 decreased from 22.7% to 17%. However, in some countries, the prevalence has not changed or even increased. Indonesia is the third largest country in cigarette consumption. Data shows about 58 million male smokers and 3.5 million female smokers smoke every day. Many tobacco control efforts have been made, including efforts to increase cigarette excise taxes. In the process, there are advocacy efforts included in the health promotion strategy according to WHO in the Ottawa Charter. However, a complete review of the process and results of advocacy is still lacking, even though it can be used to evaluate the implementation of advocacy for future excise tax increases. **Aims**: This research aims to review the process and results of advocacy as a health promotion strategy in tobacco control. **Methods**: This research involves CISDI (Center for Indonesia's Strategic Development Initiatives). The method used was Focus Group Discussion with CISDI and secondary data from political mapping in assessing advocacy results. **Results**: Advocacy of the excise tax increase policy carried out by CISDI received support from officials or the public amounting to 70.2% and only 23.6% disagreed. **Conclusion**: Health promotion strategies through advocacy can increase awareness and support from policy makers quite effectively. Tobacco control through increasing tobacco taxes can be carried out if all parties encourage the government to make policies. However, in reality, an increase in tobacco taxes alone cannot reduce cigarette consumption in the community.*

***Keywords**: advocacy, health promotion, tobacco control, tobacco taxes*

INTRODUCTION

One of the biggest concerns to public health in the globe today is the tobacco pandemic. According to data, tobacco use kills around 8 million people annually, including 1.3 million nonsmoking passive smokers (WHO, 2023). Approximately 80% of the 1.3 billion tobacco smokers worldwide are in low- and middle-income nations (WHO, 2021). Cigarette smoke from tobacco contains more than 7000 toxic chemicals and 70 carcinogenic substances that can damage the body's organ systems. The average life expectancy of a lifetime smoker is reduced by around 10 years and a quarter of those of their productive age can suffer from tobacco-related disabilities. The risks identified in the impact of COVID-19 are increased hospitalization, potential death, increased risk of periodontal disease and gastroesophageal reflux disease (Tobacco Atlas, 2022a). Additionally, smoking was found to nearly double the probability of developing a severe COVID-19 infection (Zhao *et al.*, 2020).

The 2021 Global Adult Tobacco Survey (GATS) states that the average price of 12 kretek cigarettes is IDR 14,867 and the monthly price reaches IDR 382,091. Tobacco and electronic cigarette use is 34.5% overall (70.2 million adults), 65.5% of men, and 3.3% of women currently used tobacco (smoking, smokeless, or heated tobacco products) (GATS, 2021). Even healthcare professionals' smoking habits may result from work-related stress and outdated cultural standards that once accepted smoking as a habit and linked it to a particular status symbol, making it more difficult to offer patients cessation advice (Juranić *et al.*, 2017).

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According to the Global Youth Tobacco Survey (GYTS), 19.2% of students aged 13-15 years, 25.6% of boys and 3.5% of girls consume tobacco products. Access to buying cigarettes is still very free in shops, kiosks, street vendors and even 76.6% of students are not prevented from buying (GYTS, 2019).

There is a practical initiative from the FCTC (Framework Convention on Tobacco Control) called MPOWER. MPOWER's steps are as follows: 1) Monitor tobacco use and prevention policies, 2) Protect people from tobacco use 3) Offer help to quit tobacco use, 4) Warn about the dangers of tobacco, 5) Enforce bans on tobacco advertising, promotion and sponsorship, 6) Raise taxes on tobacco (WHO, 2023), are the most effective but least implemented tobacco control intervention. A sizable tax increase would raise the price of tobacco products—making them less affordable—thereby discouraging initiation, encouraging people to quit smoking, and decreasing consumption (Tobacco Atlas, 2022b). In light of this on-site circumstance, advocacy initiatives might be used to carry out a health promotion strategy.

To encourage better policies, advocacy efforts are needed for policy makers. This is in accordance with the implementation of health promotion strategies based on the Ottawa Charter (1984) which consists of Advocacy, Mediation and Enabling. Advocacy is an activity to convince policy makers that the proposed health program is important and requires policy support and decisions from these officials. Advocacy activities can be formal or informal. Formal advocacy can be carried out through presentations or seminars about proposed programs which are expected to receive support from relevant officials. Meanwhile, informal advocacy activities can include visiting officials relevant to the proposed program to request policy support and/or other facilities (Nurmala, 2018). One of the advocacy efforts regarding tobacco control is carried out by the Center for Indonesia"s Strategic Development Initiatives or CISDI.

CISDI was strategically placed on the committee for APACT 12 in 2018, hosted by Indonesia, its first international tobacco control conference. The theme of the 12th APACT is "Tobacco Control for Sustainable Development: Ensuring a Healthy Generation", which will be a positive momentum to utilize this effort to reflect Indonesia's concern and seriousness in achieving the SDGs by 2030 and protecting its young generation. This supports CISDI's involvement in the tobacco control movement as a small part of a larger goal to help drive the regulatory and institutional framework within the central government to mainstream the SDGs in Indonesia's National Long Term Plan. Improving the atmosphere of correctional facilities to promote health has an influence on community and social welfare in addition to more efficient incarceration *(Satria et al.*, 2024).

The CISDI Tobacco Control Division has a political mapping program which is a demonstration of argumentation mapping through mass media in the form of news within a certain period of time. The mapping results are discussed with other organizations and then used to formulate advocacy strategies regarding increases in tobacco taxes and/or simplification of tobacco taxes (Murtiningtyas, 2021).

METHODS

This research involves CISDI. This research involves CISDI (Center for Indonesia’s Strategic Development Initiatives) in 2021. The method used is qualitative methods with Focus Group Discussion techniques to explore information about CISDI's advocacy efforts to policy makers regarding tobacco control through increasing tobacco taxes. The FGD involved the CISDI tobacco control division and a team of students from the Faculty of Public Health, Airlangga University. The advocacy process and results are assessed through secondary political mapping data which contains official or public approval regarding the policy of increasing tobacco taxes.

RESULTS AND DISCUSSION

The advocacy process by CISDI starts from mapping the process of what activities need to be carried out to create a policy to increase tobacco taxes every month. Apart from that, CISDI also determines the main actors who have an influence on the implementation of these

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activities. In May - August 2020, the activities carried out were the preparation of the APBN so that the national budget draft activities for next year were formed and expenditure plans and income targets for all ministries, with the main actor playing a role in budget planning being the Ministry of Finance (Ministry of Finance/MoF), Coordinating Minister of the Economy (CMoE) and consulted with legislative institutions and Bappenas. Then in August - September 2020, the activity carried out was to determine the amount of excise rates required with details to determine the excise revenue targets to increase state revenues as expected, with the main actor playing a role in budget planning being the Ministry of Finance (Ministry of Finance/ MoF), Coordinating Minister of the Economy (CMoE) and Ministry of Industry (Minister of Industry/MoI).

The amount of tobacco taxes has been determined, then the next activity is a hearing meeting which will be held internally by the Ministry of Finance, the Ministry of Finance with Industrial Players, the Ministry of Finance with other affected Ministries and the RDP with Commission IX of the DPR. In October – December 2020, the process of issuing a Minister of Finance Regulation regarding tobacco taxes policy which will be brought to a limited Cabinet Meeting with the president.

The advocacy strategy carried out by CISDI from May 2020 is by lobbying. Lobbying is a process, method, act of contacting or approaching (a government official or political leader) to influence a decision or issue that can benefit a number of people; an attempt to influence another party in deciding a case or issue, usually by negotiating informally or privately (KBBI, 2023). In May, the advocacy strategy carried out was to approach BKF to push for direction on excise policy to encourage consumption reduction in KEM-PPKF, champion at Commission

In August approaches were made to the affected Ministries (Ministry of Health, KemenPP-PA, Ministry of Social Affairs, Ministry of Agriculture, Ministry of Manpower) who will be involved in inter-ministerial meetings. In September an approach was made to DJBC to obtain an update on the process of determining excise rates. In October 2020, he attended the Commission XI RDP on excise.

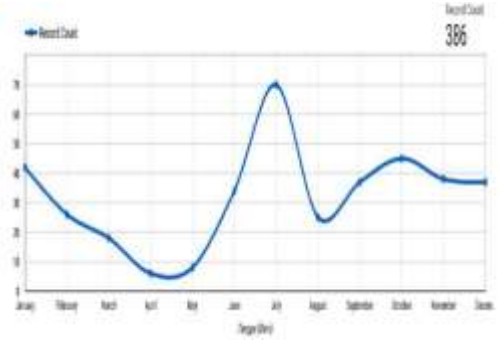

Figure 1. Political Mapping Data

It can be seen that the data obtained from January - December 2020 was 386 pieces of data consisting of news regarding tobacco taxes policy in Indonesia. Overall, the data obtained experienced increases and decreases. The highest data was obtained in July, which was the month approaching the APBN meeting which would be held by the ministry. The highest argumentation statements were found in July, namely 70 data, and the lowest were found in April, namely 6 data.

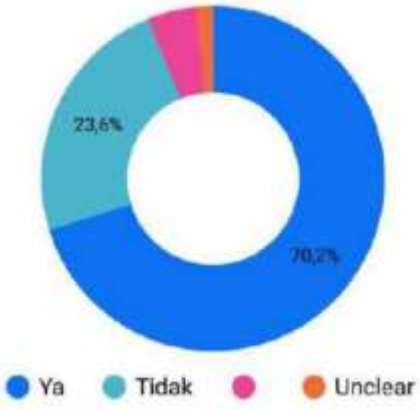

Figure 2. Political Mapping Result

From the total of 386 data, it can be seen that there are more arguments from officials or the public who agree with an increase in tobacco taxes. 70.2% agreed to increase tobacco taxes compared to arguments that did not agree if tobacco taxes was increased, namely 23.6% and 6.3% were arguments that could not be clearly concluded (unclear and null). From the previous data presentation, the results of the political mapping carried out for the policy of

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increasing tobacco taxes were widely approved by officials and the public with the results obtained being that 70.2% expressed their agreement and the institution with the most voices in agreement was the Ministry of Finance and only 23.6% does not agree with an increase in tobacco taxes and most of the institutions that speak out are the APTI organization (Murtiningtyas, 2021).

Advocacy can increase awareness of the executive and legislative branches. This also applies to advocacy to strengthen smoke-free regulations (Widati et al., 2022). Research shows that strong community support from advocacy results can encourage policy makers to accommodate these interests (Sugiyo & Henshall, 2020). The younger generation also needs to understand the value of advocacy. Getting youth involved in tobacco advocacy can help lay the groundwork for upcoming initiatives aimed at tobacco reduction. Since policy changes take time, it could be beneficial to keep an eye on youth development over the coming years, as well as community involvement and, eventually, tobacco policy changes (Ickes *et al.*, 2020). By including the community at every level of the policy change process—from data collecting to health equality advocacy campaigns—policy makers may be persuaded to pay attention and alter their policies to improve people's health (Folkerth *et al.*, 2020).

Increases in excise taxes have a major impact on both the number of smoking-related deaths that are prevented and the prevalence of smoking. High taxation measures would mostly affect countries with middle- and upper-middle-class incomes (Ho *et al.*, 2018). In the Asia-Pacific area, low- and middle-income nations have significantly raised since the WHO Framework Convention (FCTC) was signed. Nonetheless, tobacco rates have persisted to be less than the FCTC declared WHO Best-practice tax rate of more than 75% of retail price (Ho *et al.*, 2018).

The problems that occur in tobacco control can be clearly seen. The Ministry of Finance consistently increases tobacco excise until in 2021 tobacco taxes increases by an average of 12.5%, but there is still an increase in cigarette production. In 2020 Indonesia produced IDR 298.4 billion cigarettes and in 2021 cigarette production increased to IDR 320.1 billion cigarettes(CISDI, 2023a). The price elasticity of the possibility of quitting smoking in Indonesia is still low. When the price of a certain brand of cigarette increases due to excise taxes, smokers tend to switch to other brands of cigarettes with cheaper prices, even illegal cigarettes. Research shows that a 10% price increase increases the probability of quitting smoking by 0.15% to 0.17%. However, the government should consider increasing the excise tax on cigarettes at higher prices because price increases over the last two decades have not shown a decline in cigarette consumption (CISDI, 2023b).

CONCLUSION

Health promotion strategies through advocacy can increase awareness and support from the executive and legislative branches. Tobacco control through increasing tobacco taxes can be carried out if all parties encourage the government to make policies. However, in reality, an increase in tobacco taxes alone cannot reduce cigarette consumption in the community. Therefore, comprehensive tobacco control efforts called MPOWER are needed and at the same time address the presence of illegal cigarettes in circulation.

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