



Tobacco Harm Reduction Model Using SAST and ECM

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Cigarettes is related with culture and people's behavior. In almost all countries it has become a serious problem because of its negative impact on health, but the number of smokers increasing year by year. In fact, the community has considered it as a lifestyle, social intimacy (social behaviour), and some even have made it part of certain traditional ceremonies, So behavioral change is an important thing to stop smoking or reduce the danger of negative impact of smoking. The main problem is how to change community behavioral to reduce negative impact of cigaret? This research aimed to identify and analyze the factors that caused a person to be active smoker, and what is the most appropriate strategy to reduce the negative impacts of smoking according to the real condition. The method used was the combination of inductive and deductive approaches. Data collection via questionnaire and experts discussion. The analysis used were SAST and ECM . The analysis results showed there are three main factors to stop smoking : health, economic reasons, and family encouragement. While the best strategy to reduce negative impact of cigarette is government affirmative policy and building hexa helix collaboration involving business actors, academics, government, society, market and the media.

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1. BACKGROUND

Cigarettes have long been a culture for the people of Indonesia, and have also influenced people's behavior. The smoking habit is easily found in most people, both in urban and rural areas. In fact, the community has considered it as a lifestyle, social intimacy, and some even have made it part of certain traditional ceremonies. Based on religious perspective, there are still differences where some scholars forbid it yet others do not. From a social point of view, there are some people who smoke because of their family culture that is passed down from generation to generation; characteristics, they introduce cigarettes to their sons since childhood. Some of them smoke because of their association, in order to maintain friendship, thus that is why people smoke. In fact, smoking starts by trying (just-want-to-try), then getting used to it, and eventually becoming addicted.

Indonesia is the third largest number of smokers after China and India. The number of smokers in Indonesia is 65.19 million, or a quarter of Indonesia's population [1], and the number tends to increase from year to year. Out of these, 33.8% are those aged 15 to 25 years old, which means they are melinials ages or still in school/college age. Based on the 2019's survey results of the Statistics Indonesia [2], there are around 26% of active smokers in Jakarta who spend 72 cigarettes per week for ages 15 to 25 years old, which means 10.3 cigarettes per day, thus smoking contributes to poverty by an average of 11.38% in rural areas and 12.22% in urban areas. Based on the study results by experts, there are a lot of risks that will be caused by smoking include cancer, heart disease, cholesterol, diabetes complications, yellowing teeth, miscarriage, eye disorders, and others, [3-5].

The government has been attempting to stop smoking through the tobacco control policy; even in every pack of cigarettes, the dangers caused by smoking are also printed, including the prohibition of smoking in various places by pamphlets or others. Most local governments have also banned the circulation of cigarettes through local regulations but not effective. The trend of the number of smokers is increasing from year to year, which means that the impact of disease caused by smoking will also continue to increase. However, the fundamental question

is: Why the prohibition printed on cigarette packs—even in all pamphlets on a large scale—still ineffective. Research at James Cook University in Queensland, Australia, of 2,000 active smokers showed that health messages would be more effective if they were written on each cigarette, not on the pack. However, the messages' shock value is diminished, and becomes mundane over the years [6].

The negative impact of smoking on health will be a burden for the government. Assuming that of the 65.19 million smokers in Indonesia, and 10% suffer from smoking and should be treated, there will be 6.5 million people; and if the average person spends IDR 10 million, it will require more than IDR 65 trillion per year of funds to be borne by the state for the healthcare of smokers. To avoid the risks of smoking, it is most effective to quit smoking outright which is very difficult; out of 100 people on smoking cessation therapy, only 3 to 4% are successful, and the remaining 96 to 97% fail [7].

Based on these facts, it is not easy to reduce the risks of smoking by stopping totally, due to cultures, traditions, and lifestyles. Campaigns to prevent the risks of smoking through packs or pamphlets using scary narratives are ineffective. Therefore, it needs the right strategy according to the objective conditions of smokers. Based on the facts above, there are several factors to reduce cigarette consumption or stop smoking: (1) strong motivation, (2) storytelling, (3) target audience segmentation, and (4) influences through certain figures. So, this study focused on three problems, which were (a) the factors causing smokers to quit or reduce smoking, (b) the important and certain factors for smokers for switching to other medically-low-risk tobacco products, and (c) the appropriate tobacco communication strategies to reduce the risks of smoking with other safer tobacco products.

2. LITERATURE REVIEW

To ensure a healthy life for everyone, the government has made tobacco control regulations through the Government Regulation Number 19 of 2003 concerning Safeguarding Cigarettes for Health, particularly article 25, and the Law Number 36 of 2009 concerning Health, particularly article 115, which regulates the circulation of cigarettes includes: (1) smoking-free areas, among others: (a) health service

facilities, (b) places for teaching and learning process, (c) children playgrounds, (d) places of worship, (e) public transportation, (f) workplace, and (g) public places and other stipulated places.

The impact of smoking on human health is very serious. Based on the study results [8-9], cigarette smoke contains particles and gases. The particles include nicotine, TAR, benzopyrene, phenol, and cadmium; while the gas components consist of carbon monoxide, carbon dioxide, oxides of nitrogen, and hydrocarbon compounds. As much as 25% of harmful cigarette smoke will enter the human body, and the remaining 75% circulate in the air, which will be inhaled by passive smokers. The more frequent smoking, the more serious the health impact is [9]. The number of deaths due to smoking in Indonesia is averagely 225,700 each year [10], and one of the causes is heart attack [11]. The efforts to control the impact of smoking have been carried out, especially through the cigarette packs, yet the results are still ineffective, and even the smoking trend continues to increase [12]. The best way to avoid the effects of smoking is to stop smoking. However, it is not easy for smokers to quit smoking, despite the guidance of counseling and other treatments. The success rate is only 3 to 4%, meaning another 96 to 97% fail [13]. Based on this fact, controlling smoking can be done through a more precise strategy by reducing the risks of smoking itself through the development of low-risk products, such as HPTL (other tobacco processing products) or others. The use of HPTL such as e-cigarettes or heated tobacco, snus, and nicotine bags, carries a lower risk to health than conventional cigarettes [14-16]; education and socialization are important things to increase public awareness of reducing the dangers of smoking [17].

3. METHODOLOGY

This research used a combination of deductive and inductive approach. Deductive approach based on experts discussion, while inductive approach based on empirical data from the field. The deductive approach used SAST (Strategic Assumption Surfacing and Testing) and expert-based ECM (Exponential Comparison Method). SAST was used to identify important and definite factors in lowering the risks of smoking, while ECM was used to select the right cigarette harm reduction strategy based on social, economic, cultural, and health criteria. While the inductive approach based on statistical data from questionnaires given to respondents to see the

trend of smokers in several important aspects (health, economy, culture, etc.). The questionnaire was given to 1000 respondents of active smoker, who were randomly selected in several major cities in Indonesia such as Jakarta, Bogor, Tangerang, Bekasi, Depok, Bandung, Cirebon, Semarang, Surabaya, Yogyakarta, Makassar, Medan, and Denpasar.

4. RESULTS AND DISCUSSION

First, an inductive analysis was conducted to determine the profile and behavior of smokers based on the survey results. Of the 1000 questionnaires, there were 930 that feasible be analyzed; in general, the profile of respondents was as follows: in terms of age, most (53.01%) were 15 to 25 years old, followed by 36 to 45 years old (26.88%), and the rest was over 45 years old; in terms of smoking duration, 38.9% were between 6 to 10 years, 30.2% were less than five years, 10.18% had smoked for 11 to 16 years, 8.4% had smoked for 16 to 20 years, and the rest was more than 20 years. The results of the crosstab analysis showed that those who smoked less than five years were between the ages of 15 to 25 years old. This indicated that most of the youth group (millennial) were included in the category of new smokers, especially in the last five years; as shown in Table 1 below:

The main factors that caused a person to become a smoker were starting from trying (39.8%), encouraged by friends (25.16%), family culture from generation to generation (19.46%), the growth of self-confidence (10.22%), and others (5.48%). Both main reasons, *trying* (experimenting, just want to try it) and *encouraged by friends* (for the sake of friendship), were attractive because the two were actually somewhat similar, and this mean that the main cause of smoking is external impulse.

Based on educational background, most of the smokers were high school students (39%), then followed by undergraduate/bachelor's degree students (29%), and associate's degree students (24%). In terms of occupation, 49.7% were private employees, 26% were students, 5.8% were health workers, and others as in the following table:

The high number of smokers who were students indicated that the smoking ban at school or campus environment only applied when they were at school or campus due to the prohibiting

rules; while after leaving school or campus, the smoking behavior continued, especially for new smokers. This showed that quitting smoking was only for a moment because the rules were not based on awareness.

The average monthly income of most smokers was less than IDR 5 million (68.60%), IDR 6 to 10 million, as much as 22.6%; IDR 11 to 16 million at 4.09%; and the rest was above IDR 16 million. By looking at the occupational background and the average income of less than IDR 5 million, most of these smokers belonged to

the middle to lower class; and if seen from how much they have spent on cigarettes for most of the respondents, it was quite real for their income.

The analysis also showed that they spent 1 to 2 packs per day. If the price of cigarettes is Rp.25,000, it will cost Rp.750,000 to Rp.1,000,000 per month (or 15 to 20% of income; and this amount would definitely be very significant for the families. Therefore, after the health and family encouragement, the economic aspect became a factor for them to consider to quit smoking, as shown in the following figure.

Table 1. Profile of respondents based on age and duration of smoking

		Duration					Total	
		less than 5 year	6-10 year	11-15 year	16-20 year	21-25 year		more than 25 year
AGE	less than 15 year	4	1	1	0	0	0	6
	15-25 year	418	111	28	1	0	0	558
	26-35 year	83	95	24	7	3	2	214
	36-45 year	14	39	23	6	1	1	84
	46-55 year	8	12	10	7	4	7	48
	more than 55 year	8	1	7	0	2	2	20
Total		535	259	93	21	10	12	930

Table 2. Background of respondents' occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	students	242	26.0	26.0	26.0
	State employees	49	5.3	5.3	31.3
	Private Employees	462	49.7	49.7	81.0
	Businessman	88	9.5	9.5	90.4
	Farmers	10	1.1	1.1	91.5
	Housewife	25	2.7	2.7	94.2
	Health worker	54	5.8	5.8	100.0
	Total	930	100.0	100.0	

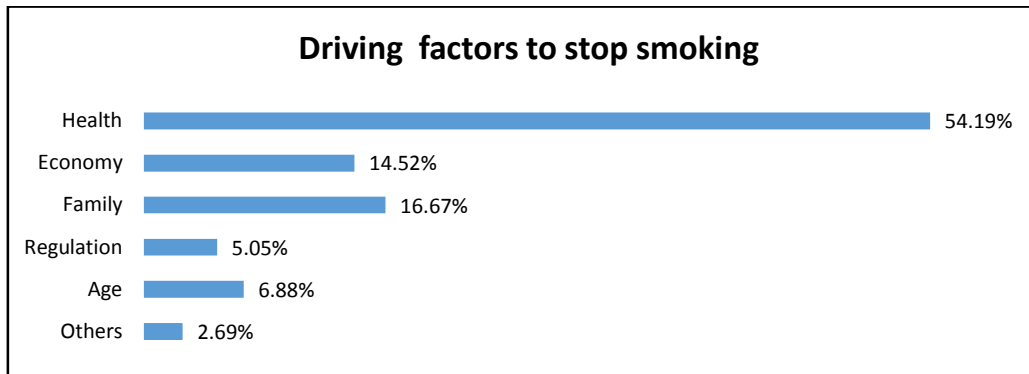


Fig. 1. Factors of consideration to stop smoking

The health aspect was a major consideration, especially for those who were over 40 years old yet they stated that quitting smoking was very difficult, therefore controlling the risks of smoking had to be pursued by other strategies, such as by introducing other low-risk tobacco products. However, most of the respondents (52.4%) stated that they did not know any other tobacco products existed, and the remaining 47.6% said they knew. Those several HPTL products they knew were vape (51%), liquid vape (20%), HPTL, e-cigarette (16%), and others (13%). Some of the other known forms included: Nicotine Patch, Nicotine Gum, and heated tobacco.

The next analysis is deductive approach by using SAST and ECM --both of which are expert-based-- which aimed to determine the strategic factors (important and definite) in lowering the risks of smoking. There were 17 strategic elements that played an important role in controlling cigarettes according to the discussion results by the experts, namely: Strategic elements related to attempts to lower the risks of smoking based on the results of discussions by the experts: (A) Correct public education about the risks of smoking, (B) Availability of other low-risk products, (C) Public risk awareness, (D) Cigarette excise tariffs / high cigarette prices, (E) Restriction of smoking areas, (F) Conformity with values held by the community, (G) Rational, emotional and spiritual linkages, (H) Development of online information systems about the risks of smoking, (I) Development of other low-risk tobacco products (HPTL), (J) Types other tobacco processing products, (K) Information on other tobacco products (HPTL), (L) Support and Participation of Business Actors, (M) Ease of Access to Other Tobacco Processing

Products, (N) Prices for Other Tobacco Processing Products, and (O) Support for Regulations and Government Policies.

The results of the SAST analysis showed that the most strategic factor with the highest level of important and certainty was the support of regulations and government policies (O), followed by correct public education about the risks of smoking (A), information on other tobacco products (HPTL) (K) and Support and Participation of Business Actors (L). Government policy support (alternative policy) occupied the most strategic elements/aspects (important and certainty). This shows that government policies will determine the success of efforts for tobacco harm reduction. Government agencies directly related to this issue include: Ministry of Health, BPOM (Food and Drug Monitoring Agency), Ministry of Industry, and Ministry of Finance/Customs. These five government institutions should synchronize and harmonize policies related to lower the risks of smoking. Restriction through regulation itself is ineffective without being properly educated by involving other elements. Likewise, increasing cigarette excise is also ineffective. Policy harmonization will be a leverage factor for society, academics and business actors to jointly carry out synergies for tobacco harm reduction. Another interesting results from this study was public risk awareness (C) that has a very high level of importance, but the level of certainty is low. This means that many people are still indifferent to tobacco harm, despite knowing the impact on health. While Restriction of smoking areas (E) and Rational, emotional and spiritual linkages (G) are important but uncertainty, as shown in the following figure:

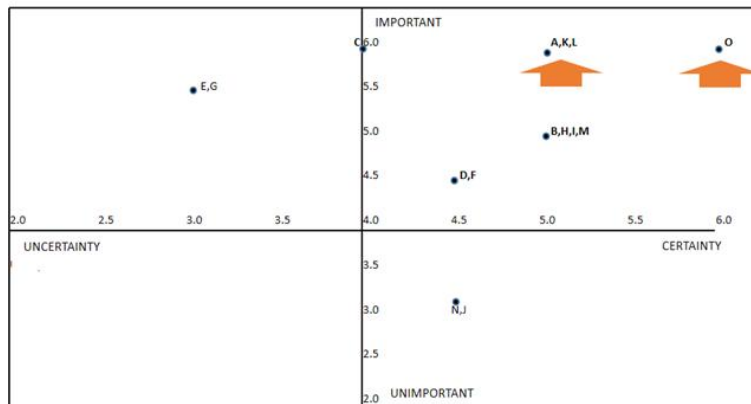


Fig. 2. Elements of interest and certainty in lowering the risks of smoking

The results of the ECM analysis based on experts discussions showed that there were three suitable priority strategies in the attempts to lower the risks of smoking, namely: Collaboration and synergy between government, business actors, and academics and society, to create a massive movement to lower the risks of smoking (11) with a total value of 4758. The government policy support for the efforts to lower the risks of smoking (10) with a value of 4641, and limiting the age of smoking through regulation and control by involving all elements of society (4) with a value of 3873, presented as table follows:

Based on the results of the inductive and deductive analysis above, it was shown that the profiles and behavior of smokers differed based on age, educational background, income, and

occupation. Therefore, the communication strategy used must be segmented (customized), and threat narratives could not be used as printed on cigarette packs. Seeing at the smokers' profile from the age group, the communication strategy could be divided into two: the millennial group (15 to 25 years old) and the millennial d group (over 25 years old) as shown below:

Efforts to lower the risks of smoking should have been carried out massively through collaboration and synergy of the Penta Helix, namely academics, business actors, government, society, media, and the market by using the support of information technology (social media). The roles of each based on the results of the analysis were as follows:

Table 3. The best strategy based on the results of the ECM analysis

Alternative strategies	Criticality	Economic Aspect	Social Aspect	Cultural Aspect	Environmental Aspect	Total	Rank
1	3	797	948	282	1019	3049	4
2	3	531	892	484	887	2797	6
3	3	755	548	389	1197	2892	5
4	3	625	874	1057	1314	3873	3
5	2	67	86	96	121	372	11
6	3	372	818	518	1080	2791	7
7	3	470	622	524	762	2381	8
8	3	818	561	277	608	2267	9
9	2	119	179	169	162	631	10
10	3	794	1314	1155	1375	4641	2
11	3	935	1314	1192	1314	4758	1

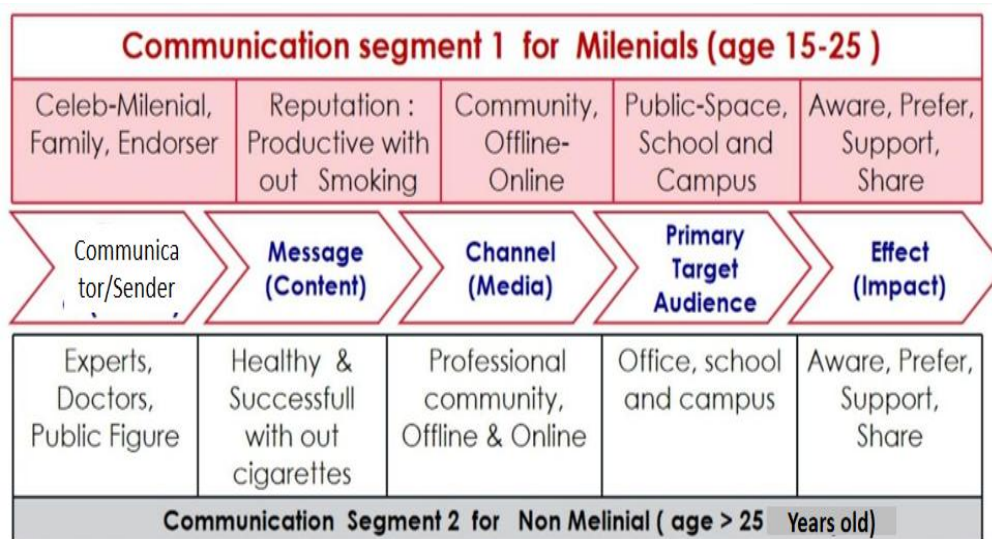


Fig. 3. Segmented communication strategy to lower the dangers of smoking

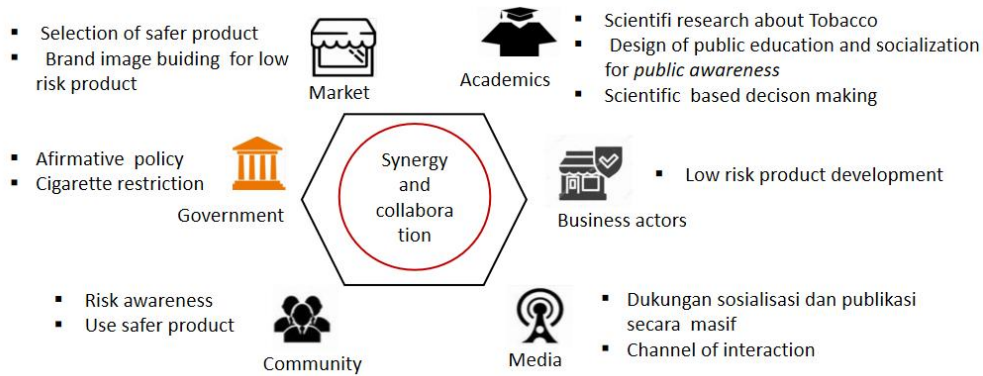


Fig. 4. Hexa Helix collaboration and synergy for lowering the risks of smoking

5. CONCLUSION

Based on the analysis results, there are three important conclusions: (1) there are two main factors that cause the increasing number of smokers, namely: *trying* and *peer influence or encouragement*; and three main reasons for quitting and reducing the risks of smoking : health, economy, and family encouragement. (2) Complete public education about the risks of smoking based on the research results is needed to build public awareness; general messages delivery through cigarette packs with scary narratives are less effective because the characteristics of smokers differ based on their addiction level of cigarette, cultural background, age, and education; and therefore, segmented communication is needed according to the characteristics of the background. (3) The most appropriate strategy for reducing the risks of smoking is government policy support to build collaboration and synergy of Penta Helix involving academics, business actors, government, society, media and the market. Thus, in order to carry out education and socialization, it can be done massively with the support of information technology, i.e., social media.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely

no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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