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Conveying The Negative Health Consequences of Smoking for The Development of School-Based Social Marketing Programs: An Experimental Study

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Abstract: Cigarette products certainly have a negative impact on health, especially for teenagers. Although there is a growing body of literature on the positive social influence of peers as a preventative measure, it is unclear how they react when convinced of the truth of its negative impact on health. This experimental study aims to examine the impact of negative health consequences on adolescents' emotions and behavior. Through an online invitation and randomization process, 78 high school students from South Sumatra Province, Indonesia were participated in the online experimental study. We compared two groups (experimental vs. control) to examine the impact of negative health consequences on their emotions (empathy) and behavior (prosocial behavior). Our findings show that, as compared to adolescents in the non-convincing health message condition (n=40), adolescents in the convincing negative health message condition (n=38) had higher empathy (sign=0.005) and prosocial behavior (sign=0.028) to assist their smoking peers. Our findings provide a valuable information to sustainability development in the future through reducing underage smokers. We suggest that the use of convincing method to develop a school-based social marketing program for handling adolescent smoking problem.

Keywords: Negative Health Consequence; Social Marketing; Adolescent Smoking; Positive Peer Influence; Prosocial Behavior.

Introduction

Adolescent smoking is still reported as a global threat (Immurana et al., 2021), and becoming more popular in developing countries (Liu et al., 2016). Cigarette products have also proven to be an economic burden throughout the world (Farhangmehr et al., 2015). Despite major advances in reducing smoking prevalence (Gendall et al., 2018), the rate of tobacco use remains high in many countries (Ngoc Bich et al., 2019). Most adult smokers

start their first cigarette at age fourteen (60 percent), with 90 percent of them having started by the end of their teen years (Yang and Schaninger, 2010). Furthermore, cigarette smoking during childhood and adolescent causes substantial health problems such as respiratory infections, lower physical fitness, and probable retardation in the rate of lung expansion (Greene and Banerjee, 2008). The increasing number of underage smokers (teenage smokers) could pose a significant threat to our sustainable growth in the future. Despite the availability of numerous health programs and anti-smoking campaigns aimed at teen unhealthy behaviors (Bigsby et al., 2017), research has shown that adolescents tend to question the validity of health warnings, which they regard as less compelling than their own observations (Gendall et al., 2018; Gray et al., 2016; Hoek et al., 2013). Therefore, preventing smoking among adolescents presents a significant problem (Aura et al., 2016).

Adolescents and their peers are inextricably linked in their developmental process. Peer impact is a significant component in affecting adolescent development (Lakon et al., 2015). Peers are persons who are the same age, have the same social standing, or have the same abilities as other people in a group (Cambridge Dictionary, n.d.). There is a growing body of literature demonstrating that peers have a positive influence on prosocial behavior (Barry and Wentzel, 2006; Berger and Rodkin, 2012; Logis et al., 2013). Peers can influence adolescent behavior in a variety of ways, including negative (i.e., deviant behavior) or positive (i.e., helping, sharing, and comforting). Prior study on peer and prosocial behavior suggests that friends or acquaintances can either directly or indirectly promote prosocial behavior (van Hoorn et al., 2016).

Social marketing is one of the marketing disciplines that is concerned with adolescent smoking. Health-related issues prompted the development of social marketing. Non-profit organizations also carry out the successful use of the marketing concept in the commercial field. They use marketing principles to achieve social goals such as behavior change. Social marketing campaigns were initially known as "start and stop campaigns," which were popular from 1990 to 2000s (Kassirer et al., 2019). Using the marketing mix for social issues is becoming more frequent, and it is a fundamental component of social marketing that provides one of the differentiating factors in bringing about social and behavior change, such as for healthy behavior modification interventions (Luca and Suggs, 2010). Regarding health topics, cigarettes and smoking cessation are important issues discussed in social marketing. Regarding smoking habits, the health risks of a smoker are higher. The increase in disease also has a negative impact because it will affect individual productivity in the future.

This recent study aims to examine the impact of negative health consequence on adolescent emotions and behavior. Due to most of an adolescent has questioned the validity of the health consequences, we investigate what if they were exposed by the truth on their empathy (ability to imagine someone in need) and prosocial behavior (giving voluntary help to their peers). In accordance with the research objectives and problems, we formulated the research question in this study "Is convincing the truth about the negative impact of smoking on health important to arouse adolescent emotions and behavior?"

Literature Review

The emotional reaction of people can be influenced by portraying someone who has an unfavorable health outcome. The relationship between emotional expressiveness and

unfavorable health outcomes has been extensively studied in the literature (Biener et al., 2004; Brennan et al., 2018; Luong and Moyer-Gusé, 2021). For instance, Biener et al (2004) has found that advertisements featuring messages about serious health consequences were more likely to be recalled and were perceived as more effective by youth participants than the humor messages advertisements. Other example is scary pictures on packages of cigarettes constitute a fear appeals, by arousing negative emotional reactions (Kok et al., 2018). Most emotional reactions to portraying the health effects of smoking produce negative emotions, such as sadness, fear or anger (Kim and Niederdeppe, 2014). In context of regulation, graphic antismoking ads can elicit strong emotional responses from smokers and influence them to quit (Kim et al., 2017). Recent research suggests emotional reactions to pictorial health warning messages produce greater activation in emotion-encoding areas of the brain thereby reducing the urge to smoke (Durkin et al., 2018). The association between emotional reaction and behavior, especially for health literature has widely discussed (Durkin et al., 2018; Kim and Niederdeppe, 2014; Kok et al., 2018).

By employing the Empathy-Altruism Hypothesis (EAH Theory) as a theoretical lens, the emotion-behavior phenomenon is try to explained. Empathy-Altruism hypothesis asserts that the pro-social motivation elicited by empathy is ultimately aimed at enhancing the well-being of the individual requiring assistance (Batson 1987, Batson 1991). Empathy refers to ability to imagine the self in another's shoes or understand the feelings of another (Batson 2011). While prosocial behavior includes all the acts aiming at promoting others' well-being, such as assistance, comfort, cooperation (Drummond et al., 2015). The relationship between empathy and prosocial behavior has been traditionally studied both in the cognitive development and moral thinking literature (Belacchi and Farina, 2012). There is substantial empirical support for this assertion (Cavallini et al., 2021; McCamant, 2006).

Empathy-altruism hypothesis testing must satisfy the need situation as a basic assumption. Specifically, empathic concern is the response of an empathic emotion to a need situation (someone who is suffering or in a difficult circumstance). It is crucial to comprehend the factors that elicit empathic emotions due to the substantial motivational effects that have been demonstrated by research (Lishner et al., 2011). Seeing someone suffer from smoking is a type of need situation. We considered using the empathy-altruism hypothesis to see if a need situation could assist an adolescent become more aware of the harms of smoking. Being exposed to someone who is suffering can inspire an adolescent to aid their peers before experiencing the bad consequences of smoking. For hypothetical testing, we stated the hypothesis as follows.

H1: Participants who convinced with negative health consequences felt more empathy for their fellow smokers than participants in the control condition.

H2: Participants who convinced with negative health consequences exhibited greater prosocial behavior toward their smoking peers than participants in the control condition.

Methods

Research Context

The current study was conducted in Palembang City, the capital of South Sumatra Province, Indonesia. Based on Statistics Indonesia in 2022, Palembang has 117 high

schools with 49,691 students. Moreover, approximately 8.92 percent, or 4.443 of them are active smokers (Statistics Indonesia, 2018). The context of this study is adolescent smoking in the school setting. We employ a high school kid for a specific reason. First, this is a vital age for deciding whether to stop or continue smoking. Second, the majority of the information distribution procedure with tobacco products occurs during the high school phase. Finally, in comparison to junior high school students, they are comparatively quick and easy to understand the study protocols.

Participants and Recruitment Process

We recruited participants using convenience and snowball sampling methods. The recruitment process took place in April and May of 2023. All participants were recruited via the WhatsApp application, which is one of the most popular communication channels in Indonesia. Participants can only take part in this study once. We enable the collecting email option to ensure that they only send one response. The participant was screened in accordance with the inclusion criteria. Our research criteria are: (1) male or female, (2) 15-17 years old, and (3) registered as a high school student. Our exclusion criteria required a person to be at least 18 years old. Before taking part in this study, participants had to fill out a consent form. This section allows participants to choose whether or not to participate. They are able to abandon the process at any point if they do not choose to participate. This study has received ethical approval from Universitas Gadjah Mada Ethics Committee *(Approval number ref. KE/UGM/037/EC/2022)*. Finally, we asked the participants to recommend anyone else who fitted the inclusion criteria.

Procedures

The enumerators used the snowball method to spread the invitation, resulting in 114 participants responding and agreeing to join. The use of snowball sampling allowed participants to be randomly selected to participate in this study. Following that, we randomized (distributed participants in each group at random) into two groups. There are 57 participants in each group (see **Figure 1**). Following that, we send a study link based on their group (experimental group or control group). Following the data sorter, we obtained 78 valid responses, 38 for the experimental group (19 participants were dropped) and 40 for the control group (17 participants were dropped). Ineligible participants were those who (1) did not match the three research criteria, (2) provided incomplete data, and (3) were given no further answer. The datasets containing qualified participants are then created and readied for further processing. Each participant receives research manipulation based on their membership in the group. The experimental group is given a passage (text-based communications) including information about the negative health consequences of smoking. Participants in the experimental group were given a passage containing facts about adolescent smoking as well as a brief testimonial from a teen who was suffering health problems as a result of smoking. Participants in the control condition were merely instructed to envision the health consequences of smoking on the back of a cigarette pack.

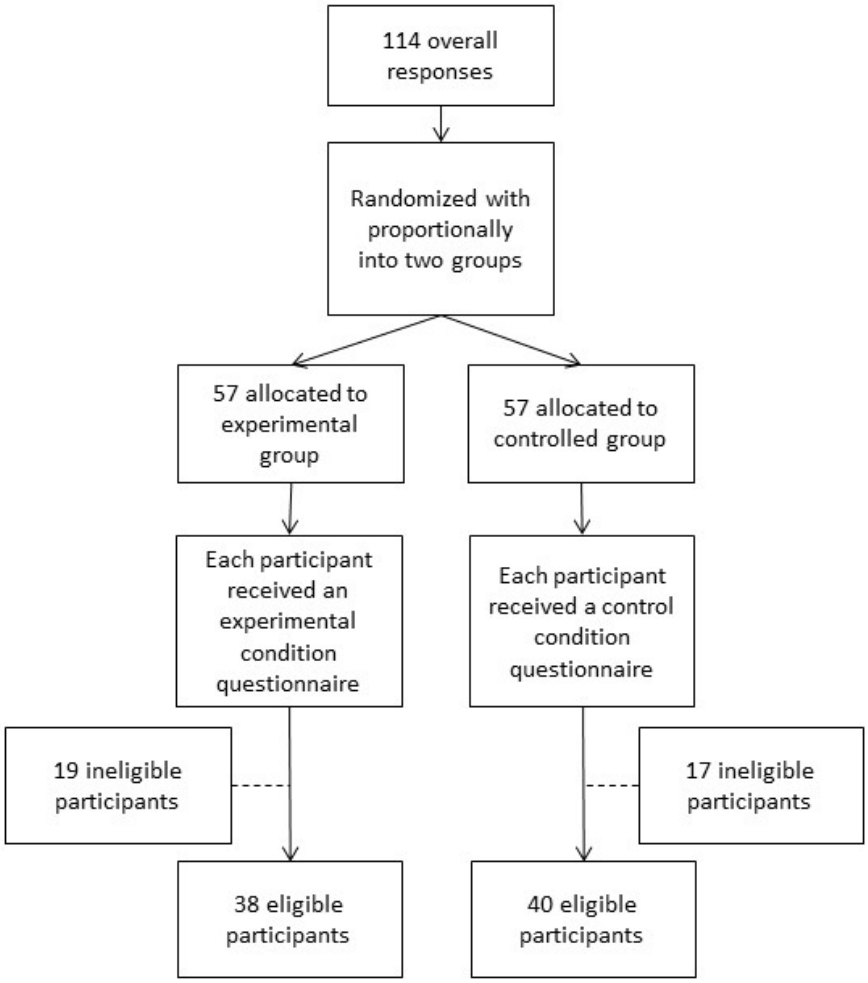
Measures

In this study, we use two main variables: criterion and independent variable. The criterion variable is the variable being predicted, and the independent variable is the variable that is not influenced by any other variables in the study. Empathy and prosocial behavior are

criterion variables, while negative health consequences are independent variables. Empathy refers to other-oriented emotional responses elicited by and congruent with the perceived welfare of a person in need (Batson et al., 2007). On the otherside, prosocial behavior is defined as voluntary behaviour meant to benefit others (Eisenberg and Sadovsky, 2004). Slattery et al. (2019) distinguish two major categories of prosocial behavior: philanthropy (e.g., providing financial contributions to prosocial causes) and volunteering (spending time in solving a prosocial problem).

Previously, in order to build a more realistic manipulation, we gathered relevant information and held a focus group discussion with one of Yogyakarta's Lung Hospitals (RS Paru Respira, Bantul, DIY), Indonesia, in the middle of 2022. We inquire about teenage patients who are experiencing health problems as a result of smoking and collect information on such cases. To ensure anonymity, the informants' personal identities are not made public. The study incorporates manipulation, specifically a text-based intervention based on prior knowledge. Participants are then invited to respond to questions about criteria variables with their reactions (see **Table 3**). For each criterion variable (empathy and prosocial behavior), there are four questions. We utilize a Likert Five-point scale (1-5 scale) to assess their reaction. Research instrument also through preliminary test before distributed to the participants. Finally, after receiving their responses, the questionnaire was sent and processed further. ANOVA was used to compare the efficiency of various manipulations. For transparency of the study report and replication, we also provide the raw data (the dataset and outputs). Other researchers can access the files at: https://data.mendeley.com/datasets/vgsv8mkj4g/1

Figure 1. **Flow Diagram of Participant Progress**



Findings

Participant's Charactheristics

Table 1 shows the characteristics of the participants. This section has five behavioral questions and three profile questions. We compare two groups, the **experimental group (EG)** and the **control group (CG)**, side by side. On the first question. "Are you an active smoker?", both groups dominated with the answer "No" (CG = 70 percent, and EG = 94.7 percent), the rest answered "Yes" (CG = 30 percent, and EG = 5.3 percent) . In the second question, "Do you have experience with smoking?", in the control group, the answers "Yes" and "No" were distributed evenly (50 percent). However, in the experimental condition, most participants had no smoking experience (73.7 percent), and only 26.3 percent had smoking experience. Furthermore, on the third question, "Did you know that one of your classmates is an active smoker?", both groups dominated with the answer "Yes" (CG = 77.5 percent, and EG = 65.8 percent), the rest answered "No" (CG = 22.5 percent , and EG=34.2 percent).

Table 1. **Participant's Characteristics**

		Group	
		Control group (n=40)	**Experimental group (n=38)**
Are you an active smoker?	No	28 (70.0)	36 (94.7)
	Yes	12 (30.0)	2 (5.3)
Do you have experience with smoking?	No	20 (50.0)	28 (73.7)
	Yes	20 (50.0)	10 (26.3)
Did you know that one of your classmates is an active smoker?	No	9 (22.5)	13 (34.2)
	Yes	31 (77.5)	25 (65.8)
Have you ever warned a smoking friend about the dangers of smoking?	No	17 (42.5)	17 (44.7)
	Yes	23 (57.5)	21 (55.3)
If your school had a smoking prevention program, would you be willing to participate?	No	11 (27.5)	10 (26.3)
	Yes	29 (72.5)	28 (73.7)
Sex	Male	30 (75.0)	10 (26.3)
	Female	10 (25.0)	28 (73.7)
Age	15 y.o.	8 (20.0)	0 (0.0)
	16 y.o.	3 (7.5)	12 (31.6)
	17 y.o.	29 (72.5)	26 (68.4)
Grade	X	11 (27.5)	0 (0.0)
	XI	0 (0.0)	19 (50.0)
	XII	29 (72.5)	19 (50.0)

Note: Data from 114 eligible participants and processed from 78 valid response.

In the fourth question, "Have you ever warned a smoking friend about the dangers of smoking?", both groups also dominated with the answer "Yes" (CG = 57.5 percent, and EG = 55.3 percent), the rest answered "No" (CG= 42.5 percent, and EG=44.7 percent). On the last question, "If your school had a smoking prevention program, would you be willing to participate?", both groups dominated with the answer "Yes" (CG = 72.5 percent, and EG = 73.7 percent), the rest answered "No" (CG=27.5 percent, and EG=26.3 percent).

Next, in the profile question there are three questions: gender, age, and class. The first question relates to the gender of the participants, most of the participants in the control condition were male (75 percent) and the rest were female (25 percent). In contrast, most of the participants in the experimental condition were female (73.7 percent) and the rest were male (26.3 percent). The second profile is age. Both the experimental and control conditions were dominated by students aged 17 years (CG=72.5 percent; EG=68.4). The final question related to the participant profile is value. Most of the participants in these two groups came from class XII students (CG = 72.5 percent, EG = 50 percent).

Table 2. **Descriptive Statistics**

	Response	Group	
		Control group (n=40)	**Experimental group (n=38)**
Do you think the health effects of smoking are real?	No, I am not sure	1 (2.5)	2 (5.3)
	Yes, I am sure	39 (97.5)	36 (94.7)
Do you believe that one day one of your classmates might suffer from smoking?	No, I am not sure	2 (5.0)	0 (0.0)
	Yes, I am sure	38 (95.5)	38 (100.0)
Without exposure to health consequences, would you believe it actually happened? (There is an adolescent who suffers from smoking)	No, I am not sure	24 (60.0)	13 (34.2)
	Yes, I am sure	16 (40.0)	25 (65.8)
If a teenager smoked at least one cigarette a day, which of the two statements below would you be more confident about?	I believe they will have health consequences in the near future or a few years from now	16 (40.0)	12 (31.6)
	I believe they will have health consequences far into the future or years from now	24 (60.0)	26 (68.4)

Note: Data from 114 eligible participants and processed from 78 valid response

Descriptive Statistics

Table 2 shows descriptive statistics of the four questions regarding participants' responses to negative health consequences. We also provide a side-by-side comparison between the two groups (experimental vs. control conditions). In the first question, "Do you think the health effects of smoking are real?", both participants in the control and experimental conditions answered "Yes, I'm sure" (CG=97.5 percent, EG=94.7 percent), and the rest answered "No, I'm not sure" (CG=2.5 percent, EG=5.3 percent). In the second question, "Do you believe that one day one of your classmates might suffer from smoking?", all participants in the experimental condition answered "Yes, I am sure". In contrast, 95.5 percent of participants in the control condition gave the same answer, and only 5 percent answered "No, I'm not sure."

An interesting result emerged from the third question, "Without exposure to health consequences, would you believe it actually happened? (There is an adolescent who suffers from smoking)." In the control condition, most participants answered "No, I'm not sure" (60 percent), and 40 percent answered "Yes, I'm sure." In contrast, 65.8 percent of experimental group participants answered "Yes, I'm sure," and only 34.2 percent answered "No, I'm not sure." In the final question, "If a teenager smoked at least one cigarette a day, which of the two statements below would you be more confident about?", the most participants in both the control and experimental groups answered "I believe they will have health consequences far into the future or years from now" (CG=60 percent, EG=68.4 percent). In contrast, others answered "I believe they will have health consequences in the near future or a few years from now" (CG=40 percent, EG=31.6 percent).

Table 3. **Descriptive Report of Criterion Variables**

Criterion variables	Items	Group (mean, SD)	
		Control group (n=40)	Experimental group (n=38)
Empathy	I feel sad (empathy1)	2,65 (0,834)	3,24 (0,943)
	I feel unconfortable (empathy2)	3,00 (1,086)	3,58 (0,919)
	I feel disturbed (empathy3)	3,03 (1,050)	3,50 (1,007)
	I feel afraid he/she get health consequence in the future (empathy4)	3,20 (0,992)	3,79 (1,094)
		2,97	*3,53*
Prosocial behavior	Thinking to persuade him/her to stay away from smoking related activity (prosoc1)	3,10 (0,928)	3,42 (1,056)
	Intended to make my friend stay away from cigarette products (prosoc2)	3,20 (1,018)	3,47 (0,951)
	Open to discussion whether he/she willing to stay away from cigarette products (prosoc3)	3,08 (0,859)	3,61 (0,946)
	Showing a negative attitude toward cigarette product to my friend (prosoc4)	2,98 (0,974)	3,53 (0,979)
		3,09	*3,51*

Note: Measure with 5-point Likert scale, n=78 valid responses

Main Analysis

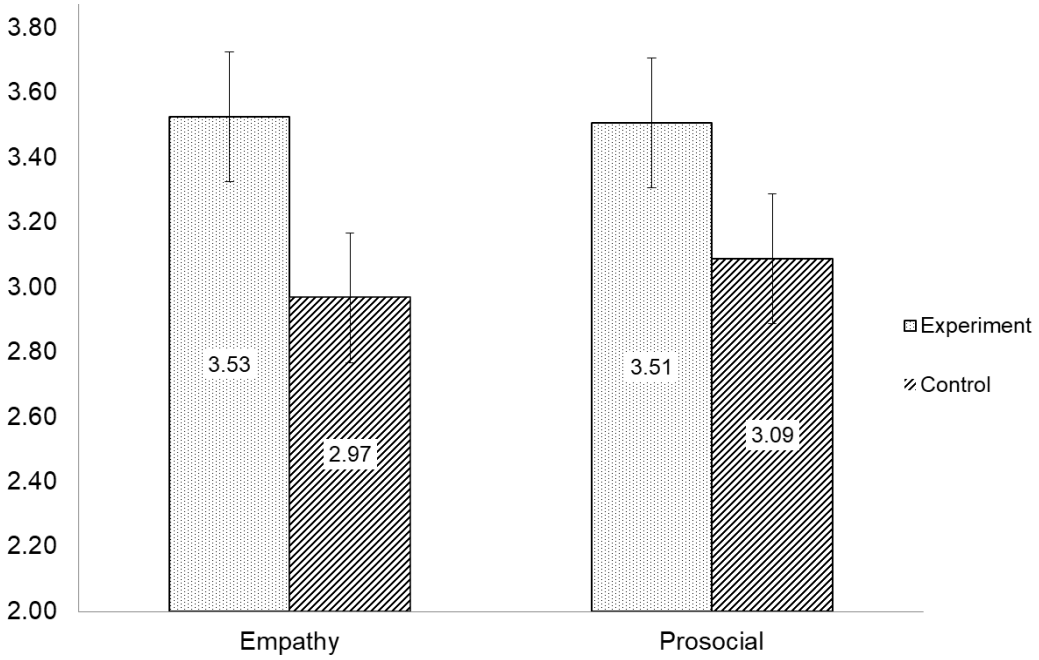
This study is empirical research to examine the impact of negative health consequences on adolescent emotions and behavior. Descriptive report of criterion variable as reported in **Table 3.** Based on previous literature, we hypothesized that (1) negative health consequences may increase empathy, and (2) negative health consequences may increase prosocial behavior. Based on **Table 4**, there is a significant effect of using reassuring messages on empathy and prosocial behavior compared to the control condition. The results of the first hypothesis show that the effect of manipulation is significant between the two groups (Mean CG=2.97 and EG=3.53, sign 0.005). The same thing also happens to the use of reassuring messages in prosocial behavior (hypothesis 2). We found that participants who were exposed to the study treatment (negative health consequences) had a more prosocial desire to help their peers than those who did not receive the study treatment (mean CG=3.09, EG=3.51, sign 0.026). To see criterion variables comparison between two conditions (control vs experimental group) in graph visualization, see **Figure 2.**

Table 4. **ANOVA test Between Group**

Variable	Group	N	Mean	Std. Deviation	Levene statistics	ANOVA	
						F	Sign
Empathy	Control group	40	2.97	0.860	0.826	8.168	0.005
	Experimental group	38	3.53	0.861			
Prosocial behavior	Control group	40	3.09	0.829	0.969	5.125	0.026
	Experimental group	38	3.51	0.804			

Note: measure with 5-point Likert scale

Figure 2. **Comparing Empathy and Prosocial Behavior in Experiment vs. Control Condition**



Findings reveal that participants in the experimental condition (getting reassuring text-based messages concerning negative health consequences) exhibit higher levels of empathy and prosocial behavior than participants in the control condition. This entails informing youth about the negative health effects of smoking (for example, severe coughing) can affect an adolescent to provide help for their smoking peers (to assist them stay away from cigarette products. Inline with our prediction, emotions and prosocial factors will affected by social marketing intervention. This also shown that, our findings can be used to create effective smoking prevention programs in schools by employed the role of positive peer influence.

There are various school-based preventive programs that have been studied and thoroughly documented around the world. In the United States, there is TATU, or Teens Against Tobacco Use (Wiener et al., 2016), and ASPIRE, or A Smoking Prevention Interactive Experience (Khalil and Prokhorov, 2021). Another school-based preventative scheme comes from Finland and Russia. They discovered that encouraging people (parents, school personnel) to participate in more effective teamwork and take shared responsibility for a non-smoking lifestyle (Aura et al., 2016) was beneficial. Finally, research from South Korea suggests that the government should seek to implement a more comprehensive method for supporting smoking cessation inside young adults' living quarters, as well as promote smoking cessation programs, in order to prevent smokers from becoming seriously addicted (Lee and Lee, 2019).

Similar with previously, In Indonesian context there is also limited work has reported the effectiveness of school-based smoking cessation program. The smoking cessation program in Indonesia is still not widely known by the public and health workers themselves (Lorensia et al., 2021). First example is implementation of school-based smoking cessation program at Islamic Boarding School (or *pesantren*) in Aceh Province (Ismail et al., 2022). Still from Aceh Province, an effective prevention program is determined by adolescent

perspective on peer pressure, parents' smoking status, curiosity, and masculinity (Fithria et al., 2021). Moreover, other works from Suarjana et al. (2020) has reported that Indonesian smoke-free law enforcement has indirect effect to support the program, such as in Bali Province.

Furthermore, in social marketing perspective, the implementation of the regulation is making school environment are more friendly to children or adolescent (freely from cigarette smoke). Although some measures has been implemented, but implementation of the social marketing program is challenging. For instance, in *pesantren* (or Islamic Boarding School) teaching staff (or also called *teuku*) the one who plays the role model is also smokers (Ismail et al. 2022), or adolescent believe that smoking could eliminate someones negative feelings (Fithria et al., 2021). In addition, this findings also contribute to social marketing development program for using convincing method to increase the adolescent believe toward validity of health messages. Based on our findings, social marketing practicioners can use text-based intervention with health consequence fact to influence adolescent and drive their behavior at least reminding other peers to stay away from cigarette products. We also suggest school-based social marketing program must be adopted and formalized as a regular school program. Designed intervention that embedded at school-based program can increase the ecological validity.

Limitation and Future Study

This present study has several limitations. First, the scope of this study only focused on adolescents and their peers' context (classmates setting) or smoking activity related to individuals under 18 years old. We do not generalize this study in an adult context whether they will react in the same way or not. The smoking context in adolescents and adults period may totally different (i.e. adolescents smoking activity is prohibited by law, and cigarette product only sold to 18+ buyers). Second, the participant's reaction on negative health consequences that investigated in this study only focused to empathy and prosocial behavior. Future study must consider the wide range of individual's emotion and behavior when they stimulated with need situation (i.e. someone that experienced bad situation). Last, we do not specified the effect of gender on empathy and prosocial behavior. Previous literature has found that there is indicated that female react more emotional and prosocially than male (Graaff et al., 2018; Kamas et al., 2020; Rueckert et al., 2011). We suggest future research on social marketing consider to examine the effect of gender when developed school-based intervention.

Conclusion

This study aims to examine the impact of negative health consequences on adolescents' emotions and behavior. Based on our findings, we conclude that convincing adolescents about the dangers of smoking will increase their empathy (ability to understanding and feelings someone in need) and prosocial behavior (giving voluntary help) to their peers. This study also contributes to the Empathy-Altruism Hypothesis theory by examining the use of emotional messages in influencing individual empathic concern and prosocial behavior. Our findings could become significant information for improving the marketing environment by reducing young smokers (adolescent smokers) in order to preserve sustainable development in the future. The availability of healthy human resources (e.g., those who have no health problems as a result of smoking) may become a future

competitive advantage for a country. Furthermore, the application of a positive peer influence perspective can aid in the construction of a stronger social marketing program. A social marketer can create school-based health education programs and interventions that take emotion into account when studying social aspects associated to smoking behavior (Aura et al., 2016).

Ethics Statement
Ethical approval was obtained from the Universitas Gadjah Mada Ethics Committee (Approval number ref. KE/UGM/037/EC/2022).

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Supplemental files are available at: https://data.mendeley.com/datasets/vgsv8mkj4g/1

Conflict of Interest
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Conceptualization: MEF, BSD, BMP. Data curation: BMP. Formal analysis: MEF, BMP. Methodology: MEF, BMP. Project administration: MEF. Visualization: MEF. Writing – original draft: MEF. Writing – review & editing: MEF, BSD, BMP.

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