Education through WhatsApp Media in Changing of Smoking Behavior among Senior High School Students

by Yusriani .

Submission date: 01-Feb-2023 05:34PM (UTC-0800)
Submission ID: 2004445310
File name: 1.1_3270-13295-1-PB.pdf (294.35K)
Word count: 6517
Character count: 35361

Yusriani et al. Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal). 2020; 15 (3): 134-141
DOI: 10.21109/kesmas.v15i3.3270

Kesmas: Jurnal Kesehatan Masyarakat Nasional
(National Public Health Journal)

Education through WhatsApp Media in Changing of Smoking Behavior among Senior High School Students

Yusriani[1*], Joel R U Acob[2]

[1]Department of Public Health, Faculty of Public Health, Universitas Muslim Indonesia, Makassar, Indonesia
[2]Department of Nursing, Faculty of Nursing, Visayas State University, the Philippines

Abstract

Teenagers, who are considerably susceptible to smoking, must be educated to prevent smoking behavior that can cause health problems and even death. The aim of this study was to assess the effect of education through social media such as WhatsApp in the modification of smoking behaviors among senior high school students in Pangkep District, Indonesia. It employed a quasi-experimental, pretest-posttest-only control group design. The experimental group received education in the use of WhatsApp social media, while the control group was provided with leaflets. Data were collected through observation and interviews with a total of 180 students in both groups, with 90 students in each. Data analysis used a paired sample t-test and an independent sample t-test. The study suggested that disseminating health information through WhatsApp media about the dangers of teenage smoking was more effective than leaflets in changing student behavior.

Keywords: behavior, leaflets, smoking, students, WhatsApp

Introduction

The current teenage generation will determine the future fate of the nation. A quality character is absolutely necessary, despite the fact that social change and modern lifestyles tend to increase various problems in the lives of young people. This is due to teenagers experiencing a transition period where they always want to try the latest trends. They are easily affected and want to be accepted in their peer groups. Many of these behaviors can bring health risks such as smoking, drinking alcoholic beverages, using drugs, or premarital sexual behavior. Adolescents who are the next generation of nation-builders must be prepared as well as possible. In particular, during high school, they are extremely vulnerable to risky behaviors such as smoking and drinking. They must be equipped with the knowledge that will change their attitudes to prevent such risks and avoid negative impacts on their health and futures.[1] The high incidence of smoking among high school students is caused by a lack of knowledge about its dangers, so it is necessary to educate them. In this case, teenagers are more likely to be interested in learning from the WhatsApp multimedia platform, with its range of audiovisual features, than reading.

Study conducted on risky health behaviors among middle and high school students in Indonesia listed smoking, physical violence and alcohol consumption as the principal causes of health problems.[2] Findings from the Surakarta Vocational School stated that health education regarding the dangers of smoking was essential to increasing adolescent knowledge, reversing smoking trends, and avoiding the practice to begin with. Health education achieves its goals by encouraging changes in adolescent behavior.[3]

According to World Health Organization (WHO) data from 2016, smoker percentages of ASEAN countries are as follows: Indonesia (46.16%), Philippines (16.62%), Vietnam (14.11%), Myanmar (8.73%), Thailand (7.74%), Malaysia (2.9%), Cambodia (2.07%), Laos (1.23%), Singapore (0.39%), and Brunei (0.04%).[4] Smoking rates among men are generally higher than those of women. Indonesia shows a high male prevalence rate above 64%, while rates in Laos, Malaysia, Myanamar, Philippines, and Vietnam are nearly 50%. It is pointed out that, smoke consumption was a problem of increasing in Indonesia, Philippines, Vietnam, Myanmar, and Thailand.[4]

In Indonesia, smoking can be designated a community

***Correspondence**: Yusriani, Department of Public Health, Faculty of Public Health, Universitas Muslim Indonesia, Building O 2nd Floor, Kampus II UMI Makassar, Indonesia 90231, E-mail: yusriani.yusriani@umi.ac.id, Phone: +62-852-5599-7212*

Received : August 27, 2019
Accepted : May 28, 2020
Published : August 28, 2020

habit because the prevalence rate tends to remain high, especially for men. In this case, the government, including the Ministry of Health together with other relevant ministries, has sought to control the habit through various strategies. Tobacco control policy is outlined in Government Regulation No. 109 of 2013, which clearly governs advertisements, access to cigarettes by vulnerable groups, and nonsmoking areas. The Ministry of Health, in collaboration with related sectors, has implemented smoking prevention efforts through cessation programs and education on its health dangers as well as other approaches at the community level through public facilities, schools, workplaces, groups, and various populations.[5]

The Pangkajene Kepulauan or Pangkep District lies in South Sulawesi Province at the southern end of Sulawesi Island and includes several small islands off its coast. The population of Pangkep is 353,428, of whom 35% are aged 11–21 years, according to the data of 2017 from the Central Bureau of Statistics.[6] The capital is Pangkajene. Pangkep Regency initially comprised an area of 1112.29 km^2; after a joint analysis of *Badan Koordinasi Survei dan Pemetaan Nasional* (*Bakosurtanal*), or National Survey and Mapping Coordinating Board, is an Indonesian non-ministerial government agency tasked with carrying out governmental tasks in the field of geospatial information, the area was revised to 12,362.73 km^2, with a land area of 898.29 km^2 and a sea area of 11,464.44 km^2.

For this study's initial survey, questionnaires were distributed on January 2018 to 100 Grade-2 students aged 15-18 years at the Muhammadiyah Bungoro Senior High School and 100 more at Pangkajene DDI Senior High School in the Pangkep District South Sulawesi Province Indonesia. Both schools were private school located in the port of Biringkassi Harbor, Samalewa Village, Bungoro Subdistrict, Pangkep District. The respondents at Muhammadiyah Bungoro comprised 85 students with smoking habits. As many as 60 of them smoked one pack (12 sticks) per day, and 25 smoked six cigarettes a day. Fifty-seven usually smoked in school, and 28 smoked only outside school. At Pangkajene DDI, 93 students had smoking habits, of whom 53 smoked one pack per day and 40 smoked six cigarettes per day. A total of 60 students smoked in school, and 33 smoked outside.

Based on supporting data on period of June to August 2018 obtained from the Counseling Guidance teachers, 47 students committed school violations by smoking on campus. At Pangkajene DDI Senior High School, 43 students committed school violations by smoking within the school environs. Students smoke in the school environment because there are no strict rules from the school regarding smoking bans. They are also unaware of the dangers of smoking in the school environment and have never received education in school about the dangers of smoking.

Adolescent risk behaviors such as smoking generally occur in many senior high school environments, both public and private. Smoking behavior also occurs in private high schools such as Muhammadiyah Bungoro and Pangkajene DDI Senior High Schools because some of them never been educated about it, either at school or in their family environments. In addition, there are students who have received education both conducted in the school environment, for example by teachers, students, or other elements, or in the home environment for example by parents or relatives. While students, but this education is often not specifically explained the dangers of smoking and how to reduce or eliminate smoking consumption. This education is usually carried out unsustainably so that the majority of students, although already educated, continue to consume cigarettes because of encouragement from their peers. The researchers provided education for the Muhammadiyah Bungoro students with WhatsApp media and with leaflets for Pangkajene DDI students. Thus, the aim of the study was to assess the effects of education through WhatsApp media on senior high school student smoking behavior in Pangkep Regency.

Method

The type of study used was a quasi-experimental pretest-posttest-control group design which is a study that determines the treatment (intervention) in an experimental group by comparing it with a control group.[7,8] In the current study, the experimental group received education with WhatsApp social media, while the control group was educated with leaflet media. Before the intervention, the pretest was performed in both groups. After the intervention, the posttest was carried out. This study used questionnaires, a data-collection technique carried out by giving a set of written questions or statements to each respondent. The population in this study consisted of 330 Grade-2 students enrolled in the Muhammadiyah Bungoro and Pangkajen DDI Senior High Schools, both in Pangkep Regency. Data were collected through observation and interviews with 180 respondents. There were 90 respondents each in the control group and the intervention group.

Selection of respondents used a purposive sampling method based on the criteria of inclusion and exclusion. The inclusion criteria were standards set before the study that were used to determine whether the person was a good candidate. The inclusion criteria were class 2 male students who were registered and who actively participated in learning in the last three months at the Muhammadiyah Bungoro and DDI Pangkajene Senior

High Schools in Pangkep Regency; and students with mobile phones and WhatsApp and who were willing to answer questions in the questionnaire and complete the observation sheet. Inclusion and exclusion criteria were set before the study and used to determine whether or not to allow the candidate. Then data analysis paired the sample t-test and independent sample t-test because the data were normally distributed.

To simplify the study process, a series of activities were presented in the preparation phase. These included scheduling the study, choosing the study assistants, and preparing the material to be delivered. The material consisted of lessons on the hazardous substances and dangers posed by smoking, their effects on health and economics, and the potential impact of passive smoking. The implementation phase started with the opening greeting, followed by the introductory stage, and then the class with prayers led by the class leader. Attendance was taken, at which point the researcher explained the topic and described the material to be covered.

Steps for health education through the WhatsApp media include preparing material and supporting media. This material may be short messages, pictures, or videos containing invitations and appeals; it may provide the pretest, explain the purpose and topic of the meeting to respondents, or contain their contact information. It may help create a WhatsApp group named the respondents of Muhammadiyah Bungoro Senior High School and Pangkajene Darul Da'wah Wal Irsyad (DDI) Senior High School, or share health information in the form of narrative texts or audiovisual messages, posters, or pictures related to cigarette material. It could be performed for one week, on a regular day and night schedule. At the final stage, the same pretest questionnaire is distributed as a posttest, with the aim of assessing any changes in students' knowledge, attitudes, and behavior.

Educational steps through the leaflets are comprised of preparatory material and supporting media. They provide the pretest and explain the purpose and topic of the meeting to the respondent. With the help of research assistants, leaflets are distributed to each respondent. The assistants recite the contents of the leaflets and offer suggestions to the respondent, to listen and pay attention to the contents of the leaflet, be sure to understand them, and strive to improve their knowledge, attitudes, and behavior accordingly. The final stage is to perform the posttest by distributing the same questionnaire as the pretest, with the aim of assessing progress in the students' knowledge, attitudes, and behavior via the leaflets.

The final stage of the implementation is to evaluate the results by checking respondent answers, scoring and tabulating the data, and ascertaining the pre- and posttest levels of student knowledge, attitudes, and behavior through WhatsApp and leaflet media.

Knowledge, attitudes, and actions are obtained by distributing questionnaires and using questionnaire measurement tools. Knowledge is measured by participant responses to questions about risky behaviors, including understanding of cigarette- and alcohol-induced disease processes, the contents of harmful substances and the negative impacts of smoking behavior on individual, family, and social health, learning achievement, and the environment. While, compulsive smoking is an actual addiction. When someone takes a pack of cigarettes from his pocket and lights one, the activity is following a series of commands from the brain, caused by addiction to substances contained in the tobacco.[18]

Knowledge and action questions are allowed two answer criteria, namely "yes" or "no," using the Guttman scale, where yes scores 1, and no scores 0 (zero). Knowledge or action is said to be "good" if the respondent answers ≥ 50% of all questions correctly. The knowledge or action is said to be lacking if the respondent answers < 50% of all questions correctly.

Attitude variables are student responses to a Likert scale questionnaire about risk behavior with regard to smoking. They consist of four optional statements with varying scores: SS (Strongly Agree) = 1, S (Agree) = 2, TS (Disagree) = 3, and STS (Strongly Disagree) = 4. The sum of all statements is 10, so the number of possible scores is obtained if the respondent's answer score is > 62.5%. It is said to be negative if the score is < 62.5%.

To find out whether there is an increase or decrease in the students' knowledge, attitudes, and actions, the results of the knowledge score during the posttest are reduced by the scores from the pretest. A positive change means an increase; a negative change represents a decrease. If the results of the two knowledge scores do not exhibit positive or negative changes, or if the result is zero (0), then the students' knowledge, attitudes, and actions remain unchanged.

This study has been approved by the Health Research Ethics Commission of the Universitas Muslim Indonesia and the Ibnu Sina Hospital YW-UMI Makassar Number: 058/A.1/KEPK-UMI/V/2018.

Results

The preparation stages consisted of (1) determining and scheduling research; (2) choosing research assistants according to predetermined requirements, namely, those aware of the conditions of students and the school environment under study, such as one of the school teachers already employed there; (3) preparing material to be used; and (4) preparing leaflets about the dangers of smoking. This includes preparing material in the form of theories, pictures, and audiovisual content about smoking risks: definition of cigarettes, the harmful

content of cigarettes, and the dangers arising from smoking, both for health and economic aspects, and their impact on passive smokers.

Implementation phase: in the initial stages of the implementation, leaders opened first with greetings, then introduced the stage, opened the class with a prayer led by the class leader and marked the attendance or absence of invitees. The researchers then explained the purpose of the study and the goals, topics, and description of material to be brought.

Steps to Health Education through WhatsApp media consisted of the following:

1. Prepare material and supporting media
   Material given to respondents concerned cigarettes, namely, the content of hazardous ingredients, the dangers to health, the economy, the environment, and the people in it. This material was presented in the form of short messages, pictures, or videos containing the meaning of solicitation and appeal. Besides, through WhatsApp media the adolescents learning about the history of cigarettes, ingredients of cigarettes, psychologically addictive, the consequences to the body, the second-hand smoke, time the doctors realize they cause lung cancer, cigarette manufacturers respond, reason the governments care about disease caused by cigarettes, and the cost of these illnesses to the society and the government each year, etc.
2. Give a pretest
   Questionnaires were distributed to each respondent to determine their level of knowledge and their attitudes before offering them education through the WhatsApp media. Respondents were given 5–10 minutes to fill out questionnaires.
3. Explain the purpose and goals of the meeting to the respondents
   The purpose of this activity was to increase students' knowledge and attitudes toward risk behaviors such as smoking. Topics to be discussed at the meeting were about the definition of cigarettes, the hazardous substances they contain, and the dangers arising from them in terms of health, economic losses, and impacts on the social and physical environment.
4. Save the phone numbers of student respondents who comprise the sample.
5. Create a WhatsApp group named Muhammadiyah Bungoro Senior High School Respondents and Pangkajene DDI Senior High School Respondents.
6. Share health information related to cigarettes in the form of narrative texts, posters, pictures, and audiovisuals. This was performed every day for one week at regularly scheduled day and evening meetings;
7. Evaluation
   The final stage involved distributing the same questionnaire for the posttest as was given for the pretest. This determined any changes in student knowledge and attitudes consequent to the health education interventions through the WhatsApp media.

Educational steps via the leaflet consisted of the following:

1. Prepare material and supporting media
   Prepare leaflets containing material about cigarettes. The material described the hazardous ingredients and the dangers that can arise from smoking habits in terms of health like as nicotine which can cause addiction. Nicotine can increase blood pressure, blood gluco se, and heart rate. Aceteldehyde can cause irritation to the skin, eyes and respiratory tract. N-Nitrosamines are carcinogens or cause cancer. 1,3-Butadiene contains teratogens or substances that can cause defects in humans. In addition, this substance is carcinogenic to humans, can cause irritation to the eyes and ears, and upper respiratory tract. Benzene is also a carcinogen for human and animals. In fact, it can cause chromosome changes in the spinalcord and etc, smoking also can impact economic and social aspects.
2. Give a pretest
   Distribute questionnaires to each respondent to find out their level of knowledge and attitudes before receiving the educational program through the leaflet media. Respondents were asked to complete questionnaires for 5–10 minutes.
3. Explain the purpose and topic of the meeting to the respondents.
   The purpose of carrying out this activity is to increase students' knowledge of risk behaviors such as smoking. Topics to be discussed at the meeting concern the definition of cigarettes, the content of hazardous substances they contain, and the dangers arising from cigarettes, in terms of health, economic losses, and impacts on the social and physical environment.
4. Distribute leaflets to each respondent with the help of research assistants and ensure the leaflets are evenly distributed.
5. Read back the contents of the leaflet that has been distributed, and encourage respondents to listen and pay attention to the contents of the leaflet.
6. Encourage respondents to understand the contents of the leaflet, and hope for a change in knowledge and attitudes after reading the leaflet.
7. Encourage respondents to bring back the leaflets one week later at the time of the evaluation.
8. Evaluation
   The final stage consists of a posttest that is a repeat of the same questionnaire as the pretest, with the aim to discern any changes in the students' knowledge and attitudes resulting from the health education intervention through the leaflet media.

The final stage of the implementation is to evaluate the results of the respondents' answers, score them, tabulate the research data, and draw conclusions regarding the effect of the different health education programs of WhatsApp and the leaflet media. Did the adolescents learn from them; how did the level of knowledge and the students' attitudes change with each one; and how did the results of the two methods differ?.

Leaflet design is a traditional form of promotion and advertising. In subsequent advertisements although electronic media dominates, the use of leaflets as advertising media is still considered as relevant as before. The reason is the printed design is still needed in certain circumstances for example when a computer monitor screen cannot be turned on because it is damaged or there is no electricity, besides that in certain circumstances the use of electronic devices becomes impractical and cannot be brought to the audience who need it. Even if it can be taken, it will cost a lot of money. As a promotional media leaflets can be produced in such a way that the quality is on par with other forms of marketing media. Although the contents are purely intended for the purpose of communication or promotional messages, leaflets can be made in such a way as to be able to describe and show the image of the company, products or others. However, because leaflets are generally small in size, the information conveyed is also limited. It only contains the subject matter so it lacks depth of information. It can be said that the leaflet is only as a means of supporting the delivery of information and messages in other forms. Although generally small in size, it can be developed into A4 to A1 paper sizes and even billboards and can be the basis of internet site design.

WhatsApp media is one application that is popular among the public both from the upper middle class and lower middle class. The popularity of WhatsApp is because there is no cost to send messages to friends and family besides the internet data network that is already on the user's mobile phone. WhatsApp is an application for exchanging messages instantly, and allows us to exchange pictures, videos, photos, voice messages, document file and can also be used to create a chat group that allows to communicate with many people at one time, so that it can be used to share information and discussion in an education.

The results of the study were obtained through primary data using a questionnaire. Processing data used a computer statistic program and presented in Table 1, Table 2, and Table 3.

This study shows inputs/comments from participating students about the tobacco education content of WhatsApp and Leaflets. The comments range from enthusiastic to critical. There are positive and negative comments because the WhatsApp material is presented in both written and audiovisual form. Information contained in WhatsApp can be delivered to students more quickly. The ease of comprehension of the material contained in the video(s) is due to their presentation as a storyline, so that someone can viscerally comprehend the disease process he/she is risking. Students are able to empathize with the character's circumstances in WhatsApp media, making them more prone to absorbing the attitudes about smoking. Conversely, comments from students reading the education leaflet were few. Students simply read the information without responding because the leaflet information was more cerebral and less immediate.

Discussion

The intervention was health education using leaflets and WhatsApp. The material given to students pertained to cigarette smoking, including the harmful substances they contain and diseases, such as lung cancer, that they cause. Smoking is not only linked to disease but also impacts others' health, the economy, and the environment.

WhatsApp media was chosen because it is a cross-platform messaging application for smartphones that allows users to exchange messages and receive information via audio, visual, and audiovisual media.

Table 1. Distribution of High School Respondents Knowledge Levels, Attitudes, and Smoking Behaviors based on Pretest and Posttest Responses to Education through WhatsApp Media and Leaflets in Pangkep District

Variable	Category	WhatsApp (n = 90)				Leaflet (n = 90)			
		Pretest		Posttest		Pretest		Posttest	
		n	%	n	%	n	%	n	%
Knowledge	Good	42	46.67	88	97.78	41	45.56	77	85.55
	Less	48	53.33	2	2.22	48	54.44	13	14.45
Attitudes	Positive	30	33.33	79	87.78	32	35.56	76	84.44
	Negative	60	66.67	11	12.22	58	64.44	14	15.55
Behavior	Good	14	15.55	62	68.89	20	22.22	61	67.78
	Less	76	84.44	28	31.11	70	77.78	29	32.22

Leaflets, however, consist of pieces of paper containing writing in short, concise sentences. They are easy to understand and include simple and interesting pictures. Some are presented in folded sheets of paper. Leaflets only allow students to receive information visually.

Table 1 shows that before the intervention, 45.56% of the respondents in the leaflet group have good knowledge about cigarettes; afterwards, more than 77 students, or 85.55% show some improved knowledge. While, before the educational intervention with WhatsApp media, only 46.67% of respondents had 'good' knowledge about cigarettes. Afterwards, a total of 88 students, or 97.78%, had better knowledge of cigarettes. The results showed that the group of students that were educated through the media leaflets and WhatsApp experienced an increase in knowledge. Since the leaflet was printed in a piece of paper, the message was written clearly and could be read repeatedly by the students, while on WhatsApp, students preferred to only read messages once and only in video. Students would enjoy the storyline on the video but were less able to get some implicit messages in the video story.

The paired t-test results (Table 2) show that providing an education through WhatsApp or leaflets increases student's knowledge, attitudes, and actions about smoking. Knowledge of cigarettes had improved for 73 students, or by 81.1%, through WhatsApp. This was because WhatsApp messages delivered were clearly written, two-way, and could be read repeatedly. Moreover, they were equipped with sounds and images. In addition, the students were easier to access if needed because they could open WhatsApp any time; while, with the leaflet media, students preferred to only read the information once. Furthermore, the leaflet was usually quickly lost because the students cannot re-read and understand it more. Finally, the leaflets were one-way.

This study is in accordance with the study that stated that video media was more effective in increasing students' knowledge about the dangers of smoking compared to leaflets. The same study also concluded that health education positively influenced knowledge about the dangers of smoking in adolescents.[9-15] Some study results also concluded that health education through social media about the dangers of smoking led to reduced cigarette consumption in adolescents.[16-20]

The results of this study are not in line with study on the effectiveness of health promotion with leaflets and video media on adolescent knowledge indicating that adolescent knowledge is sufficient and promotes good attitudes after receiving counseling alone about smoking behavior.[10]

A study conducted at the Surakarta Vocational School,[3] on the effects of health education on cigarette smoking in adolescents revealed that to increase adolescent knowledge and attitudes about the dangers of smoking, health education is expected to stop smoking habits and avoid smoking to begin with. Health education can help achieve the goal of changing the adolescent behavior process.

Attitudes and behaviors describe a collection of beliefs or psychological tendencies in response to a stimulus or an object. They involve thoughts, feelings, attention, and other psychiatric symptoms.[21,22]

Changes that occur in respondents as a result of exposure to messages and information conveyed through health education, in the form of behavioral changes and attitudes, begin with changes in individuals' knowledge. The higher the knowledge, the more positive the attitude; the lower the knowledge, the more negative the attitudes and behavior of individuals.[23,24]

Table 2. Distribution of High School Respondents Knowledge Changes, Attitudes and Behaviors about Cigarettes before and after Intervention with Media Education WhatsApp Media and Leaflets in Pangkep District

Variable Changes about Smoking	Category	WhatsApp (n = 90)		Leaflet (n = 90)	
		n	%	n	%
Knowledge	Increase	73	81.1	59	65.6
	Decrease	9	10.0	18	20.0
	Remain	8	8.9	13	14.4
Attitude	Increase	74	82.2	72	80.0
	Decrease	14	15.6	14	15.6
	Remain	2	2.2	4	4.4
Behavior	Increase	74	82.2	68	75.6
	Decrease	13	14.4	18	20.0
	Remain	3	3.4	4	4.4

Table 3. Education through WhatsApp Media and Leaflets on Average Knowledge, Attitudes, and Behaviors about Cigarettes in High School Students in Pangkep District

Variable about Cigarette	Knowledge			Attitude			Behavior		
	Mean ± SD		p-value*	Mean ± SD		p-value*	Mean ± SD		p-value*
	Pretest	Posttest		Pretest	Posttest		Pretest	Posttest	
Leaflet	4.27 ± 1.29	6.51 ± 1.55	0.000	24.63 ± 6.35	31.61 ± 4.44	0.000	4.36 ± 1.46	6.47 ± 1.67	0.000
WhatsApp	4.33 ± 1.37	5.80 ± 0.87	0.000	24.38 ± 5.40	32.22 ± 3.38	0.000	4.82 ± 1.84	5.80 ± 0.87	0.000
p**	0.812	0.009		0.772	0.030		0.186	0.021	

Notes: *Paired t-test, **Independent sample t-test, SD: Standard Deviation

This study showed that before the intervention, many students held positive attitudes about smoking, 66.67% in the WhatsApp group and 64.4% in the leaflet group. After the educational intervention, more students expressed negative attitudes about smoking, 79 or 87.78% in the WhatsApp group and 76 or 84.44% in the leaflet group. Students who held negative attitudes about smoking increased through leaflet education to 68 people (75.6%), and 74 people (82.2%) in the WhatsApp program.

Attitude formation is influenced by several factors, such as psychology, experience, and social communication skills. A person's psychology will determine how a person behaves. Psychological factors can relate to age and health. Young people usually have freer and more courageous attitudes compared to their elders. People who are sick or in compromised conditions often have attitudes that depend on others. A person's attitude can be influenced by their direct experience of the object of their attitude. Factors of social communication can take the form of information from one person to another who will influence their attitude(s).[25,26]

The results also show that prior to the intervention, students with bad smoking behavior constituted 84.4% in the WhatsApp group and 77.8%in the leaflet group. After the educational intervention, more students had good behaviors about cigarettes: 62, or 68.89%, in the WhatsApp and 61, or 67.78%, in the leaflet group. Students with good behaviors about cigarettes increased by 74 people, or 82.2%, in the WhatsApp group and 68 people, or 75.6%, in the leaflet group.

Paired t-test (Table 3) results show that education through WhatsApp or leaflets will improve student attitudes about cigarettes (p-value < 0.05). Negative attitudes about cigarettes increased more with respondents who received educational intervention with WhatsApp compared to leaflets. This is due to the material contained in the videos via WhatsApp, which can be more quickly appreciated by students. The ease of appreciation of the material contained in the video is due to a presentation that contains a storyline that begins with someone who starts smoking when young and then follows them through the deadly diseases they ultimately suffer. The students are able to empathize with the circumstances of the character in the story. They are better able to observe the emotional changes in the character's attitude about smoking than the people reading only the leaflet. The leaflet information about cigarettes and their dangers is presented in a drier, more straightforward manner. The respondents can easily obtain additional information and improve their understanding.

The study on the mobile-based, video learning of smoking effect as an anti-smoking health education media program, found that the use of the "smoking effect learning" video method was quite effective. The media used could be easily and simultaneously accessed by various groups via mobile phones.[14] These teenagers will be more interested in learning more from social media that offer not only the sound but also the visual presentation.[27-31]

Conclusion

Education through social media (WhatsApp) is more effective than leaflet media in increasing the knowledge, attitudes, and behavior of high school students about cigarettes. It is advised to disseminate health information with WhatsApp, along with leaflets and other media about the dangers of smoking for teenagers, to reduce and stop smoking.

Abbreviations

WHO: World Health Organization; *Bakosurtanal: Badan Koordinasi Survei dan Pemetaan Nasional* (National Survey and Mapping Coordinating Board); DDI: Darul Da'wah Wal Irsyad.

Ethics Approval and Consent to Participate

This study has been approved by the Health Research Ethics Commission of the Universitas Muslim Indonesia and the Ibnu Sina Hospital YW-UMI Makassar Number: 058/A.1/KEPK-UMI/V/2018.

Competing Interest

Author declares that there are no significant competing financial, professional, or personal interests that might have affected the performance or presentation of the work described in this manuscript.

Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available owing to their containing information that could compromise research participant privacy and consent.

Authors' Contribution

All authors conceived of the presented idea in this manuscript. Yusriani devised the project, the main conceptual ideas, and proof outline and prepared and revised the manuscript. Joel R U Acob was involved in the design of the study and the data analysis. All authors read and approved the final manuscript.

Acknowledgment

Authors would like to thank all the respondents of this research in Pangkep District, especially the local government of Pangkep in supporting this research. The author(s) fully thank Universitas Muslim Indonesia for the financial support for the research, authorship, and/or publication of this article by the name of Internal Research Grant Funding by Resource Research and Development Institute yaitu LP2S (*Lembaga Penelitian dan Pengembangan Sumberdaya*).

References

1. Department of Child and Adolescent Health and Development. Orientation programme for adolescent health for health care providers: handout, new module; topics at glance. Switzerland: WHO; 2015.
2. Kusumawardani N, Suhardi S. Behavior health risk among adolescents: a school-based health survey with the focus on smoking in male adolescents aged 12-15 in Depok, West Java, Indonesia. Buletin Penelitian Sistem Kesehatan. 2011; 14 (4): 332–40.
3. Wantland DJ, Portillo CJ, Holzemer WL, Slaughter R, McGhee EM. The effectiveness of web-based vs. non-web-based interventions: a meta-analysis of behavioral change outcomes. Journal of Medical Internet Research. 2004; 6 (4): e40.
4. Infodatin. Situasi kesehatan reproduksi remaja. Jakarta Selatan: Pusat Data dan Informasi Kementerian Kesehatan Republik Indonesia; 2015 [Accessed in 2017].
5. Badan Penelitian dan Pengembangan Kesehatan Kemeneterian Kesehatan Republik Indonesia. Agency for health research and development on cigarettes and health; 2016.
6. Pemerintah Kabupaten Pangkajene & Kepulauan. Demografi; 2017.
7. Aril BSR. Quantitative research methodology. Mold I; 2017.
8. Sugiyono. Qualitative and quantitative research methodology in the field of health; 2013.
9. Ambarwati A, Umaroh AK, Kurniawati F, Kuswandari TD, Darojah S. Media leaflet, video dan pengetahuan siswa sekolah dasar tentang bahaya merokok (studi pada siswa SDN 78 Sabrang Lor Mojosongo Surakarta). Kesmas: Jurnal Kesehatan Masyarakat Nasional. 2014; 10 (1): 7–13.
10. Ristin E. Effectiveness of health promotion with leaflet and video media on adolescent knowledge; 2016.
11. Pholsena S, Asaad AM, Mao ZQ, Sio AR, Sokana O, Kishi Y, et al. Youth smoking prevention programs: influence of smoking prevention program among secondary school students in Paranaque City, Philippines. Journal of the National Institute of Public Health. 2011; 60 (1): 54-9.
12. Liem A. Influesces of mass media, family, and friends towards adolescents' smoking in Yogyakarta. Hubs-Asia. 2014; 18 (1): 41–52.
13. Zoni H, Syam S. Faktor-faktor yang berhubungan dengan perilaku merokok di rumah pada masyarakat di Jorong Gantiang Ateh Nagari Tantung Alam Kecamatan Tanjung Baru Kabupaten Tanah Datar tahun 2013. Jurnal Kesehatan Masyarakat STIKES Prima Nusantara Bukittinggi. 2013; 4 (2): 24-34.
14. Duke JC, Davis KC, Alexander RL, MacMonegle AJ, Fraze JL, Rodes RM, et al. Impact of a U.S. antismoking national media campaign on beliefs, cognitions and quit intentions. Health Education Research. 2015; 30 (3): 466–83.
15. Kaplan A, Haenlein M. Users of the world, unite! the challenges and opportunities of social media. Business Horizons. 2010; 53 (1): 59–68.
16. Woohyun Y, Doo-Hun C, Keeho P. The effects of SNS communication: How to express and accept MERS-preventive behavioral intentions in South Korea. Computers in Human Behavior. 2016; 62: 34–43.
17. Jae-Eun C. Antismoking campaign videos on YouTube and audience response: application of social media assessment metrics. Computers in Human Behavior. 2015; 51 (Pt A): 114–21.
18. Cunningham JA, Selby PL. Implications of the fallacy in young adult smokers aged 19–24 years. American Journal of Public Health. 2007; 97 (8): 1399–400.
19. de Viron S, Suggs LS, Brand A, Oyen VH. Communicating genetics and smoking through social media: are we there yet?. Journal of Medical Internet Research. 2013; 15 (9): e198.
20. Depue JB, Sothwell BG, Betzner AE, Walsh BM. Encoded exposure to tobacco use in social media predicts subsequent smoking behavior. American Journal of Health Promotion. 2015; 29 (4): 259–61.
21. Ajzen I. From intentions to actions: a theory of planned behavior. In: Kuhl J, Beckmann J. (eds) Action Control. SSSP Springer Series in Social Psychology. Heidelberg: Springer; 1985: pp. 11–39.
22. Ajzen I, Fisbein M. Understanding attitudes and predicting social behavior. Englewood Cliffs: Prentice Hall; 1980.
23. Bandura A. Social cognitive theory of mass communication. Media Psychology. 2009; 3 (3): 265-99.
24. Bernhard U, Dohle M, Vowe G. Do presumed online media effects have influence on online activities of politicians?. Policy & Internet. 2016; 8 (1): 72–90.
25. Yusriani, Alwi MK. Buku ajar promosi kesehatan dan pemberdayaan masyarakat; 2018.
26. Murphy-Hoefer R, Hyland A, Rivard C. The influence of tobacco countmarking ads on college students' knowledge, attitudes, and beliefs. Journal of American College Health. 2010; 58 (4): 373–81.
27. Paek HJ, Gunther AC, McLeod DM, Hove T. How adolescents' perceived media influence on peers affects smoking decisions. Journal of Consumer Affairs. 2011; 45 (1): 123–46.
28. Yusriani. Effective audio visual aids change the behavior of elementary school students in maintaining dental. Indian Journal of Public Health Research and Development. 2019; 10 (3): 584–8.
29. Shmueli D, Prochaska JJ, Glantz SA. Effect of smoking scenes in films on immediate smoking: a randomized controlled study. American Journal of Preventive Medicine. 2010; 38 (4): 351–8.
30. Phua J. Participating in health issue-specific social networking sites to quit smoking: how does online social interconnection influence smoking cessation self-efficacy?. Journal of Communication. 2013; 63 (5): 933–52.
31. Yusriani, Alwi MK, Nugroho HSW. The effect of training on efforts to reduce maternal mortality risk to behavior of community-based safe motherhood promoters (SMPs). Indian Journal of Public Health Research and Development. 2018; 9 (11): 339–45.

Education through WhatsApp Media in Changing of Smoking Behavior among Senior High School Students

ORIGINALITY REPORT

13%	12%	6%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	jurnal-lp2m.umnaw.ac.id Internet Source	2%
2	www.ssdjournal.org Internet Source	1%
3	Submitted to Universitas Diponegoro Student Paper	1%
4	www.ijphrd.com Internet Source	1%
5	jurnal.fkmumi.ac.id Internet Source	1%
6	repo.unand.ac.id Internet Source	1%
7	oamjms.eu Internet Source	1%
8	Submitted to Universitas Indonesia Student Paper	1%
9	www.researchgate.net Internet Source	1%

10	repository.binawan.ac.id Internet Source	1 %
11	Submitted to Universitas Muslim Indonesia Student Paper	<1 %
12	Submitted to University of Wollongong Student Paper	<1 %
13	publikasi.polije.ac.id Internet Source	<1 %
14	trialsjournal.biomedcentral.com Internet Source	<1 %
15	www.koreascience.or.kr Internet Source	<1 %
16	repositori.usu.ac.id Internet Source	<1 %
17	Submitted to Coventry University Student Paper	<1 %
18	academic.oup.com Internet Source	<1 %
19	pubs.sciepub.com Internet Source	<1 %
20	stars.library.ucf.edu Internet Source	<1 %
21	uwspace.uwaterloo.ca Internet Source	<1 %

22	www.ausaid.gov.au Internet Source	<1%
23	repository.lppm.unila.ac.id Internet Source	<1%
24	Ellen Rosawita Veronica Purba, Lely Lusmilasari, Janatin Hastuti. "SCHOOL HEALTH PROMOTION: A QUASI-EXPERIMENTAL STUDY ON CLEAN AND HEALTHY LIVING BEHAVIOR AMONG ELEMENTARY STUDENTS IN JAYAPURA, PAPUA, INDONESIA", Belitung Nursing Journal, 2020 Publication	<1%
25	core.ac.uk Internet Source	<1%
26	erepo.unud.ac.id Internet Source	<1%
27	es.scribd.com Internet Source	<1%
28	journal.managementinhealth.com Internet Source	<1%
29	Banchlay Addis, Workye Akele, Amare Minyihun. "Factors Influencing Willingness to Pay for Insecticidal Treated Bed Nets Among Rural Households of Bugina District North Wollo Zone, North-East Ethiopia",	<1%

ClinicoEconomics and Outcomes Research, 2022
Publication

30 Hamzah B. "Pengaruh Model Pembelajaran Inkuiri Terhadap Perubahan Pengetahuan dan Sikap Siswa Tentang Bahaya Merokok di SMAN 1 Kotamobagu", Pharmed: Journal of Pharmaceutical Science and Medical Research, 2020 <1%
Publication

31 Yusma Indah Jayadi, Widia Maharani, Nurdiyanah Nurdiyanah. "Health Education About Hypertension Using Leaflet Media Effective On People's Knowledge And Attitudes Of The Community In Tanete Labba Hamlet, Maros", Preventif : Jurnal Kesehatan Masyarakat, 2021 <1%
Publication

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		