

The Role of Education in Preventing E-Smoking Behavior is to Increase Student Knowledge and Attitudes

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KEYWORDS

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ABSTRACT

Introduction: Aim this research to determine the differences in levels of knowledge, Attitude about e-smoking prevention before and after education between experimental and the control group the Samarinda City Central Statistics Agency in 2017 (3). The number of teenage smokers in the city of Samarinda reached 29.69%. While there is a significant level of access to advertisements for cigarettes on television and the internet, 15.7% of people access the internet, and 41.5% of people access electronic cigarettes with their peers.

Methods: The experimental design of this study consisted of a two-group experimental design with a pre-test and a post-test plus a control, with the purpose of determining the impact of educational intervention through the use of web-based preventive education for measure differences knowledge and attitude

Results: The Different Tests Within Experiment Group Of Knowledge, Attitudes From One Month After Intervention, knowledge P-Value 0.000, Attitudes P-Value 0,00. The Different Tests Within Control Group Of Knowledge, Attitudes From One Month After Intervention, Knowledge P-Value 0,97 and attitudes P-Value 0,135.

Conclusion: After the education was carried out, the results demonstrated that there were differences in the experimental group's knowledge and attitudes before and after the education was carried out. The control group did not exhibit any differences in knowledge or attitudes during either of the two measures that were conducted. It was found that there were variations in knowledge and attitudes between the experimental group and the control group after one month of post-education was delivered.

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INTRODUCTION

There are currently 193 countries that have signed the commitment to accomplish the Sustainable Development Goals (SDGs), which have been ratified through the efforts of sixty Indonesians. Indonesia is making its way into this group of countries. One of the Sustainable Development Goals (SDG) is to achieve a reduction of one-third in the number of premature deaths caused by non-communicable diseases by the year 2030. This target is intended to be achieved through the implementation of prevention and treatment indicators. Additionally, the goal is to enhance mental health and well-being by lowering the percentage of people aged 10 to 18 who smoke. Another objective is to enhance the implementation of the WHO Framework Convention on Tobacco Control in every country as a suitable measure, with the objective of reducing the percentage of individuals who smoke among the population aged 15 years or older (1).

Since Riskesdas 2007 (34.2%), Riskesdas 2010 (34.7%), and Riskesdas 2013 (36.3%), the percentage of the population aged 10 years that consumes tobacco has increased. Despite this, smoking rates continue to be high, and the number of people who smoke has climbed. It was the highest number of smokers in other domains, with the age of smokers being between 20 and 24 years old, amounting to 24.79%, according to the data from Susenas (Survey National Social and Economic), which was conducted by the Samarinda City Central Statistics Agency in 2017 (2). The number of teenage smokers in the city of Samarinda reached 29.69%. While there is a significant level of access to advertisements for cigarettes on television and the internet, 15.7% of people access the internet, and 41.5% of people access electronic cigarettes with their peers (3). The results of the 2021 GATS survey showed that there was an increase in smoking by 8.8 million people, namely from 60.3 million in 2011 to 69.1 million smokers in 2021(4). Currently, the number of cigarettes smoked by teenagers in Samarinda is 17.60%, with the average number of cigarettes smoked being 86.08% (5). Currently, various types of interventions are provided to overcome e-smoking behavior. Quit Smoking behavior is one of the most important steps you can take to improve your health. This is true no matter how old you are or how long you have smoked, The Indonesian Ministry of Health has a smoking cessation program but this program is currently available, however, there are not a lot of kids who participate in it. This is due to the fact that the program is focused on quitting smoking, which means that its target audience is those who are already smokers. Additionally, the program is broad in nature, and there is no prevention of the e-smoking habit (6).

Based on the findings of the preliminary study survey, it has been observed that the number of individuals who use cigarettes, particularly e-cigarettes, is growing on campus. It is true that there are some forms of media that are already present in the campus environment; nevertheless, students do not have access to the posters and movies that are available on campus because these forms of media are not located everywhere. Students also have a difficult time gaining access to the media. Therefore, control necessitates the provision of easily accessible online education regarding the prevention of e-smoking behavior. This is done to ensure that students have a positive attitude and a greater understanding of the risks associated with e-cigarettes. It is intended that this will discourage students from engaging in the behavior of using e-cigarettes.

METHOD

The experimental design of this study consisted of a two-group experimental design with a pre-test and a post-test plus a control, with the purpose of determining the impact of educational intervention through the use of web-based preventive education. Within the scope of this investigation, the experimental group was provided with an educational intervention through the utilization of web-based preventive education, whereas the control group did not get any form of intervention. In order to determine the level of knowledge, attitudes preventative e-smoking behavior, a pre-test was initially administered to each of the groups before the intervention was administered. The post-test is designed to assess the level of knowledge, attitude, and the prevention of vaping behavior. In the control group, no intervention was given. Using the same instrument for both the pre-test and the post-test. This research

was conducted at the Faculty of Public Health, Muhammadiyah University, East Kalimantan from December 2022 to July 2023. The sample size calculation is based on the Lemeshow Formula (7). To anticipate missing samples, 10% of 281 is added, namely 28, so that the total sample is 310. The sample for the experimental group was 155 and the control group was 155. Simple random sampling is the method that is utilized for the sampling process.

The instrument must also be valid and reliable in order to produce accurate and trustworthy results (8). The instrument in quantitative research contains knowledge and attitudes about e-cigarettes using previous research. In the knowledge and attitude questionnaire, previous research used research from Hanan Aghar et.al (9). For the questionnaire on knowledge, attitudes r, a validity test was carried out, namely a validity test carried out with expert validity, namely a validity test carried out by asking health promotion experts to provide input on the questionnaire (10). Intervention in the form of education using the web about preventing e-smoking behavior, all respondents had to complete a pre-test. Then after the pre-test you can open it for education. After attending education for 1(first) month, post test 1 is carried out. As a result, the data was determined to be non-normally distributed. It is a non-parametric statistical test that is utilized when dealing with data that does not follow a normal distribution. The Cochran's Q test is the statistical test that is utilized in non-parametric statistical tests (11). This test is used because it is measured twice with categorical data. Respondents, after receiving an explanation of the research procedures, filled out their willingness to become respondents. This research received ethical approval from the Health Sector Research Ethics Commission (KEPK) Muhammadiyah University of Samarinda, East Kalimantan in accordance with the Certificate of Approval of Ethical Eligibility NO. 012/KEPK-UMKT/I/2022.

RESULTS

In this particular study, the evaluation of the participants' levels of knowledge was carried out two times, once for the experimental group and once for the control group. Prior to the implementation of web-based education on the prevention of e-smoking behaviour, the initial evaluation was carried out. After the education was completed, two additional assessments were conducted on the experimental group. Meanwhile, the groups that served as controls did not receive any form of educational intervention.

In Table 1, it can be explained that the total number of respondents in both the experimental group and the control group was the same, namely 155 respondents. Gender in the experimental group was 130 (83.9%) women and 25 (16.1%) men, while in the control group, the number of respondents with gender was 127 (81.9%) and 28 (18.9%). The average age of respondents in both the experimental group and the control group was 19 years.

Table 1. Level Of Knowledge in The Experimental

No	Characteristics	Experiment Group		Control Group	
		Frequency	%	Frequency	%
1	Sex				
	Female	130	83,9	127	81,9
	Male	25	16,1	28	18,1
2	Age				
	mean	19		19	
	Total	155	100	155	100

Table 2. In Table 1, it can be explained that in the experimental group, before the web-based intervention was carried out, a pre-test was carried out, and after the intervention in the form of web-based education was carried out, a post-test measurement was carried out on the knowledge variable about preventing e-smoking behavior. The results were measurements with a total of 155 respondents, namely

during the pre-test knowledge in the Less category 101 (65.2%) respondents and in the Good category 54 (34.8%). Meanwhile, after the educational intervention was carried out for one month, the results of measuring the knowledge variable were in the less category of 11 (7.1%) respondents and in the Good category of 144 (92.9%) respondents.

Table 2. Level Of Knowledge in The Experimental Group

No	Categori	Pre Test		Post Test (1 mont)	
		Frequency	%	Frequency	%
1	Less	101	65,2	11	7,1
2	Good	54	34,8	144	92,9
	Total	155	100	155	100

In the control group table 3, there were 155 individuals who filled out the questionnaire, and they were asked about their level of knowledge. In the group that served as the control, measurements were carried out three times to ensure that there was no educational intervention. During the preliminary examination, which was referred to as the pre-test, it was discovered that 99 persons out of a total of 63.9% had a low level of knowledge, while 56 individuals out of a total of 36.1% had a high level of knowledge. After getting the questionnaire once more, one month after the initial evaluation, individuals were evaluated for their level of knowledge without receiving any extra teaching. The findings revealed that 97 individuals, or 62.6% of the total, have a low level of knowledge, whereas 58 persons, or 37.4% of the total, possess a high degree of knowledge.

Table 3. Level Of Knowledge in The Control Group

No	Categori	Pre Test		Post Test (1 mont)	
		Frequency	%	Frequency	%
1	Less	99	63,9	97	62,6
2	Good	56	36,1	58	37,4
	Total	155	100	155	100

The experimental group in table 4, consisted of 155 individuals who were asked to fill out a questionnaire regarding their attitudes. These individuals were then subjected to measures of their attitudes. These actions were carried out on two separate occasions. Regarding attitudes, the questionnaire was filled out. In order to get a better understanding of the opinions of the respondents, a questionnaire was given to them before any guidance was given to them about how to avoid engaging in behaviours that are associated with electronic smoking. The pre-test (first) measurement revealed that there were 104 instances of negative attitudes, which accounted for 67.1% of the total, and 51 instances of positive attitudes, which accounted for 32.9% of the total. After that, education was carried out for a period of three months, beginning with the previous step. Following the education that was carried out, attitudes were evaluated during the first month (post-month) that followed the education. To be more specific, twenty (12.9%) of the participants held negative attitudes, whereas thirteen hundred and thirty-five (87.1%) of them held favourable views.

Table 4. Level Of Attitude in The Experiment Group

No	Categori	Pre Test		Post Test (1 mont)	
		Frequency	%	Frequency	%
1	Negative Attitude	104	67,1	20	12,9
2	Positive Attitude	51	32,9	135	87,1
	Total	155	100	155	100

Table 5 explain, the control group consisted of a total of 155 individuals who had previously responded to a questionnaire assessing their attitudes. These individuals' attitudes were then assessed in three different ways. Those who participated in the control group were given a questionnaire to fill out so that their perspectives could be taken into consideration. The group that served as the control did not receive any information addressing the prevention of behaviour related to electronic smoking. A total of 115 individuals had negative attitudes at the initial measurement, which was the pre-test. On the other hand, forty individuals exhibited positive attitudes during the preliminary test. A total of 113 (72.9%) of the participants had unfavourable attitudes within the first month (post 1 month) that followed the collection of attitude assessments, while 42 (27.1%) of the individuals had positive attitudes.

Table 5. Level Of Attitude in The Control Group

No	Categori	Pre Test		Post Test (1 mont)	
		Frequency	%	Frequency	%
1	Negative Attitude	115	74,2	113	72,9
2	Positive Attitude	40	25,8	42	27,1
	Total	155	100	155	100

The Different Tests within Experiment Group of Knowledge, Attitudes from One Month after Intervention in table 6. In order to identify whether or not web-based training is advantageous in lowering the behaviour of electronic smoking, a within-group difference test for knowledge was carried out. This was done in order to evaluate the effectiveness of the instruction. Given that knowledge data is nominal categorical data, the difference test is utilised in conjunction with Cochran's QTest. This is because the difference test is specific to knowledge data. There is a significant difference between the P-value of 0.000 and the significance level of 0.05. The fact that there is a difference in the level of information regarding the avoidance of smoking behaviour before and after getting education via the internet indicates that this is the case. With regard to the research, there were a number of different variables, and one of them was attitude. In addition, the measurement was carried out with a variety of tests carried out within the groups. According to the findings of the analysis using Cochran's Q Test, the P value was 0.000, which was lower than the threshold of 0.05.

Table 6. The Different Tests within Experiment Group of Knowledge, Attitudes from One Month after Intervention

	Knowledge	Attitude
N	155	155
Cochran's Q	177.680a	173.723a
df	2	2
Asymp.Sig	.000	.000

Additionally, evaluations of attitudes were carried out on the group that served as the experimental control. In order to study the differences in attitudes that existed between the groups, Cochran's Q test was applied. It is reasonable to draw the conclusion that there is no difference in views among the individuals who are in the control group since the P-value is 0.135, which is greater than 0.05. This is because the P-value is an indicator of statistical significance. One of the characteristics that was investigated was smoking behavior, which was also included in the control group. As a result of the outcomes of the numerous tests that were carried out on smoking behavior groups at the initial, one-month, and three-month measures using Cochran's Q Test, the P value was found to be 1,000. Due to the fact that this figure is higher than 0.05, it suggests that there has been no change in the manner in which people smoke. The P value is equal to 1, since the number of smokers has not decreased or remained the same at the time of the initial measurement in months 1. This is the reason why the P value is equal to 1.

Table 7. The Different Tests within Control Group of Knowledge, Attitudes from One Month after Intervention

	Knowledge	Attitude
N	155	155
Cochran's Q	4.667a	4.000a
df	2	2
Asymp.Sig	.097	.135

DISCUSSION

Interpretation of Key Findings

Attitude is an individual's inclination to act based on their understanding. Greater knowledge correlates with a more favourable attitude towards favourable aspects. Attitude is an individual's inclination to act in accordance with their acquired information. Greater understanding leads to a more favourable attitude towards favourable aspects. Conversely, those with limited understanding typically exhibit a negative attitude towards positive things. This can be useful for youngsters with limited understanding about smoking. Adolescents with limited understanding often harbour unfavourable views about cigarettes and are more susceptible to the temptation of smoking. Conversely, adolescents with greater awareness of the risks associated with smoking typically exhibit a more favourable outlook on health and are less susceptible to the temptation of smoking. It is crucial for youngsters to enhance their understanding of the hazards of smoking to have a favourable outlook on health and steer clear of the perils associated with smoking. Adolescents who have limited knowledge, unfavourable attitudes, and convenient access to cigarettes are more susceptible to smoking (12).

With a P-value of 0.00, there was an increase in the level of knowledge after the intervention of 58.1%. This shows that education is effective in increasing knowledge. Education that includes insight into health, the use of technology, and a general understanding of e-cigarettes will help respondents understand the contents of e-cigarettes, the dangers of e-cigarettes, and the prevention of e-cigarette use. This is in accordance with the research conducted by, the intervention was carried out twice over the course of one month, and after that, there were changes in both the knowledge and attitudes of the individuals engaged in the intervention. After implementing online educational modules, there were changes in both the knowledge and attitudes of the population (8). This usually involves the initiation of behaviour, such as avoiding smoking areas, distracting oneself by substituting cigarettes with snacks, coffee, or ice cubes, participating in positive activities like joining clubs, playing sports, sleeping, playing games, reading, and engaging in self-suggestion to alter mindset. Behavioural changes usually occur within one to three months (13).

Educational changes in knowledge are measured by comparing pre- and post-test scores. This transformation is influenced by several factors, including the presence of engaging sources of information such as the media, health workers, family experiences, and friends. Electronic educational media serves as an intermediary tool for transmitting messages from sources. Health education media is a tool used for communicating health messages. Health education media can take the form of print or electronic media, through which individuals acquire knowledge by adhering to the guidance given by health professionals. Experience is another source for acquiring knowledge. Knowledge is crucial for shaping an individual's behaviour. An action grounded in understanding tends to be enduring(14). Utilising online media for knowledge enhancement is advantageous due to its feasibility and acceptability. Feasibility refers to the practicality of health promotion activities in different environments, while acceptability pertains to the approval of educational objectives. Delivering health promotion using online platforms in many target regions can fulfil the feasibility requirement(15).

Research has shown that online education effectively enhances knowledge about smoking and encourages individuals to stop smoking. Multiple studies have confirmed that online learning modules and

e-courses are effective in improving understanding of tobacco, smoking cessation, and related subjects. A college student's involvement in an online learning module focused on smoking education and prevention led to significant knowledge improvement for both smokers and non-smokers. It also motivated smokers to contemplate quitting (16).

Comparison with Previous Studies

Health education can be a useful tool for altering smoking behaviour and promoting smoking cessation. Several studies have shown that health education can enhance individuals' understanding and attitudes towards smoking, as well as increase their motivation to quit smoking. Research conducted among university students in Indonesia suggests that health education utilising audiovisual mediums can increase students' readiness to quit smoking (17).

Previous research and programmes on e-cigarette usage have been conducted; however, this study offers unique therapeutic approaches. Smoking cessation access Quitline programmes and telemedicine provide smokers with opportunities to interact with counsellors and physicians to receive psychological assistance and encouragement. Smokers can access various instructional materials and inspiring films online. Health professionals can receive training on the WHO 5A model and the 4T approach model for smoking cessation, which involve components like asking, advising, assessing, helping, and managing, as well as asking, examining, helping, advising, and following up to support smoking cessation efforts. The programme is currently accessible; however, there is limited participation from children. The programme is designed for individuals who currently smoke, as it is centred on helping them quit smoking. Furthermore, the programme is comprehensive and does not address the prevention of e-smoking (6).

Prevention programmes emphasised the significance of comprehending flavoured e-cigarette products, discussed industry-focused marketing, integrated social learning activities to enhance refusal skills, were provided at no charge, accessible online, and explicitly mentioned their use of theory. Five preventative programmes and two cessation programmes have conducted empirical evaluations of their e-cigarette-related components. Programmes should enhance their digital accessibility and interactive features to stay current with the evolving technology and media that adolescents are exposed to (18). Digital education seems to be just as effective as traditional learning techniques in improving the knowledge and abilities of health professionals in providing smoking cessation therapy. Therefore, it may be concluded that digital education is a suitable approach. To instruct medical professionals on the proper administration of smoking cessation therapy and offer training sessions for them. The limitations of the evidence suggest that these results should be interpreted with caution. Blended education showed potential advantages over both digital education and traditional learning alone. Despite insufficient data to determine which parts of digital education are associated with the most significant increases in results (19). There needs to be a specific form of online health education so that online selection needs to be considered, and the language that is utilized is English.

Implications for Public Health

In this study, results were obtained that were beneficial for public health, especially for preventing e-smoking behavior. With a P-value of 0.00, there was an increase in the level of knowledge after the intervention of 58.1%. This shows that education is effective in increasing knowledge, the education provided also changed negative attitudes to positive ones by 1.3%. According to the results of this research, online health education can increase knowledge and attitudes so that it contributes to the prevention of smoking behaviour, which can be accessed more widely. According to the results of this research, online health education can increase knowledge and attitudes so that it contributes to the prevention of smoking behavior, which can be accessed more widely.

Limitations and Cautions

It is important to note that although the findings of this research are helpful in avoiding smoking behaviour in adolescents, there are some limitations to this research. The variables of knowledge and attitude were the only ones that were investigated in this study. Regarding smoking behaviour, there are a number of factors that come into play, such as the fact that there are specific laws concerning electronic cigarettes that have not been officially documented in government legislation. Ease of access is another element that contributes to the behaviour of electronic smoking. Shops that specialise in electronic cigarettes are quite easy to locate in today's culture, and there are no specific regulations that govern the purchase of these products. It is also necessary to conduct additional research on the engagement of schools, the community, and stakeholders because it plays a very significant role in the behaviour of electronic smoking among adolescents. Due to the fact that e-cigarettes offer an option for quitting smoking and the opinion that e-cigarettes are safe, there is a need for research on general education for the general public regarding e-cigarettes. With regulations governing the use of e-cigarettes and clear regulations, it will be possible to reduce the use of e-cigarettes.

Recommendations for Future Research

There is a need for studies on smoking behaviour in women as well as behavioural interventions for factors other than knowledge and attitudes. For instance, there is a need for interventions that focus on the ease of access, regulation, peer influence, and the environment that promotes smoking behaviour.

CONCLUSION

After the education was carried out, the results demonstrated that there were differences in the experimental group's knowledge and attitudes before and after the education was carried out. The control group did not exhibit any differences in knowledge or attitudes during either of the two measures that were conducted. It was found that there were variations in knowledge and attitudes between the experimental group and the control group after one month of post-education was delivered. So the importance of e-smoking prevention education is to prevent e-smoking behavior, and the use of online e-smoking behavior prevention can be widely used.

AUTHOR'S CONTRIBUTION STATEMENT

1,2 Arrange the concepts that have been offered. 1,3,4 Construct a theory and do the computations by themselves. Check that the analytical procedure is correct. 7 to study [certain aspects] and keep track of the results of this work through monitoring. Every author participated in the discussion of the findings and made contributions to the final publication.

CONFLICTS OF INTEREST

Declares that it has no affiliation or involvement in any organisation or entity with any financial or non-financial interests such as personal or professional relationships, affiliations, knowledge, or beliefs in the subject matter or materials discussed in this manuscript.

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