

# The Effect of Android-Based Smoking Cessation Education to Improve the Level of Knowledge, Attitude, And Smoking Behavior Among Adolescents in Pamulang, South Tangerang Indonesia

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## ABSTRACT

Smoking has been shown to have a detrimental impact on various aspects of adolescent health, including physical, mental, and social health. Smoking increases the risk of developing health problems. Smoking rates among adolescents are very high, leading to various adverse health effects and social consequences. This study will use a cross-sectional research design, which is a type of observational research design. The design in this study is a non-equivalent control group design with pre-test and post-test. Due to the grouping of sample members in the experimental group and control group. This study divided the group into two, namely the first group was given android-based quit-smoking education, and the second group was not given the intervention. The research strategy used mixed research methods, with quantitative research as the main research design and qualitative research. The study showed that adolescents who participated in this education program had better knowledge about the dangers of smoking, as well as more positive attitudes towards smoking cessation. In addition, adolescents also showed changes in their smoking-related behaviors after participating in the education, so Android-based quit-smoking education can provide long-term benefits in reducing smoking prevalence among adolescents and promoting healthy lifestyles and awareness of the importance of lung health and prevention of smoking-related diseases. Along with the development of technology and the expansion of smartphone use among adolescents, the implementation of Android-based quit-smoking education not only provides benefits in adolescent health education but also has broader social implications.

**Keywords:** knowledge, attitude, behavior, smoking cessation, android-base

## Introduction

Smoking is a global health problem, with a significant number of cases worldwide. According to the World Health Organisation (WHO) in 2021, there are approximately 1.3 billion smokers worldwide, and the number is expected to increase to 1.6 billion by 2025 if current trends continue. This is a huge burden on public health, as smoking is a major cause of preventable disease and death. In terms of adolescent smoking, the Global Youth Tobacco Survey (GYTS) conducted by WHO and the Centers for Disease Control and Prevention (CDC) found that approximately 13% of adolescents aged 13-15 years are smokers worldwide. This highlights the urgent need for effective interventions to address the high prevalence of smoking among adolescents and reduce its negative impact on their health and well-being. (Health Organization, 2021)

According to World Health Organisation (WHO) 2022, Indonesia is one of the countries with the highest smoking rates among adolescents. Indonesia has one of the highest smoking prevalence rates among people aged 13-15 years. The high rate of smoking among Indonesian adolescents is concerning, as it has significant health implications and can lead to various diseases and disorders. Understanding the ranking of countries

with the highest smoking rates among adolescents helps highlight the urgent need for effective interventions and educational programmes to address this issue (Lucia et al.2022).

Today, smoking has become one of the most serious global problems. According to the World Health Organisation (WHO) 2021, smoking is the leading cause of death in the world and kills millions of people every year. Especially, adolescents are a vulnerable population to the dangers of smoking. Many efforts have been made to stop smoking in adolescents, including smoking cessation education. Smoking has been shown to have a detrimental impact on various aspects of adolescent health, including physical, mental, and social health.

Smoking knowledge, attitudes and cessation behaviour are important aspects to consider in the context of adolescent smoking prevention and education. Knowledge plays an important role in shaping attitudes towards smoking and can influence the decision to quit smoking. Lack of awareness about the health risks associated with smoking may hinder motivation to quit. On the other hand, having accurate knowledge about the harmful effects of smoking can have a positive impact on attitudes to quit smoking. Attitudes, in turn, can greatly influence one's resolve to quit smoking. Quitting behaviour requires determination, commitment and a series of actions to overcome the challenges of nicotine addiction. Adopting cessation strategies, seeking support from healthcare professionals or support groups, and implementing lifestyle changes are common behavioural components of smoking cessation. Therefore, understanding the relationship between smoking cessation knowledge, attitudes and behaviours is critical in designing effective educational interventions that can empower adolescents to quit smoking. (Megatsari, 2023)

Aplikasi smartphone ini telah menjadi lazim di kalangan orang dewasa muda, dengan bukti yang menunjukkan bahwa mereka adalah demografi usia yang paling mungkin mengunduh aplikasi dan merupakan pengguna yang paling intens. Aplikasi ponsel pintar tersedia sepanjang waktu dan dapat mengakomodasi fungsi-fungsi yang kompleks, termasuk audio dan video. Aplikasi ponsel cerdas telah secara konsisten didokumentasikan sebagai prediktor kuat untuk berhenti merokok.

## Research Methods

The design in this study was a non-equivalent control group design with pre-test and post-test. Because the grouping of sample members in the experimental and control groups was not done randomly or randomly. Pre-tests and post-tests were conducted to determine the increase in knowledge, attitudes, and behavior towards smoking cessation.

The research design employed in this study is a mixed-methods approach that combines both qualitative and quantitative methods. It allows for a comprehensive analysis of the impact of the android-based smoking cessation education program on adolescents' knowledge, attitude, and smoking behavior.

## Results

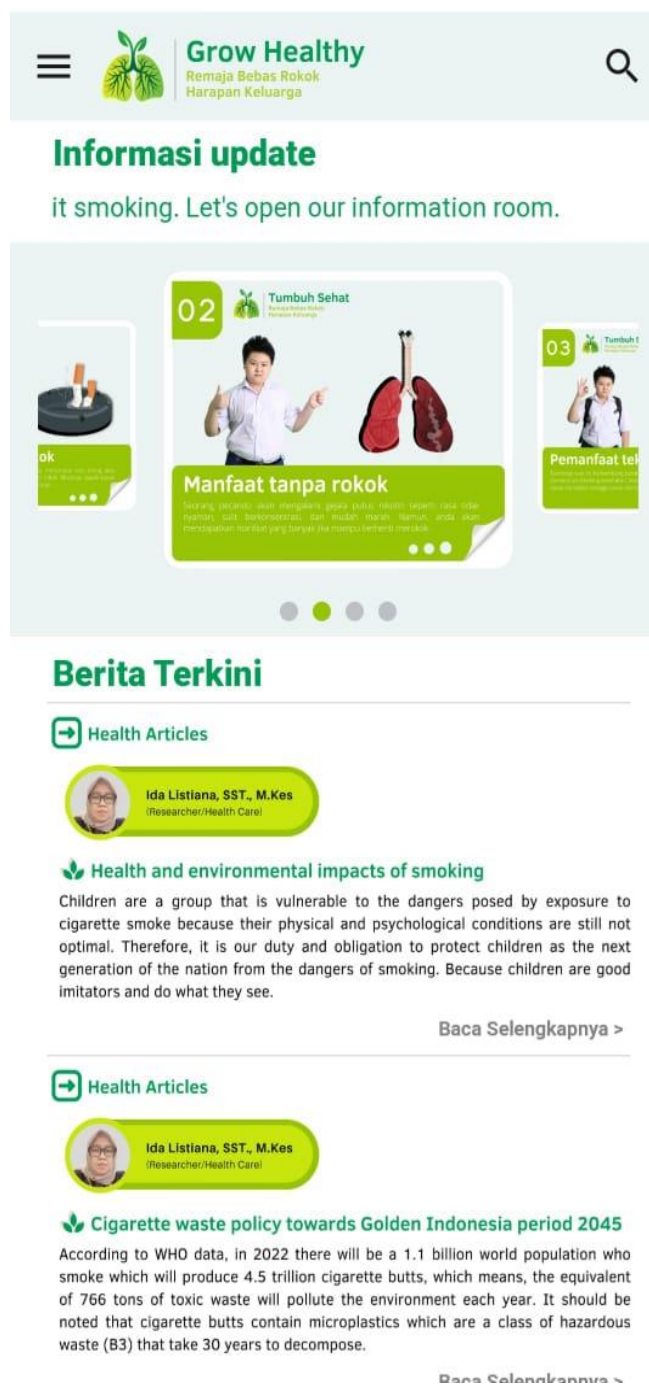
### 1. Analysed results of FGD

smoking is considered one of the correctable risk factors. This shows the importance of smoking reduction and cessation in disease prevention efforts. The statement also mentions the CERDIK movement that encourages the elimination of smoking from everyday life. This movement demonstrates efforts to create a smoking cessation app that can provide content and support for smoking cessation.

In addition, the statement highlights the importance of role models in educational content related to smoking cessation. Educational approaches through positive models and peer pressure were also recognised as an important part of shaping smoking cessation behaviour.

Overall, the informants' statements highlighted several important approaches to control and reduce tobacco consumption, including education, support through smoking cessation apps, and the role of positive role models and peer pressure in the quitting process.

### 2. Android Application Development for adolescent Smoking Cessation Education



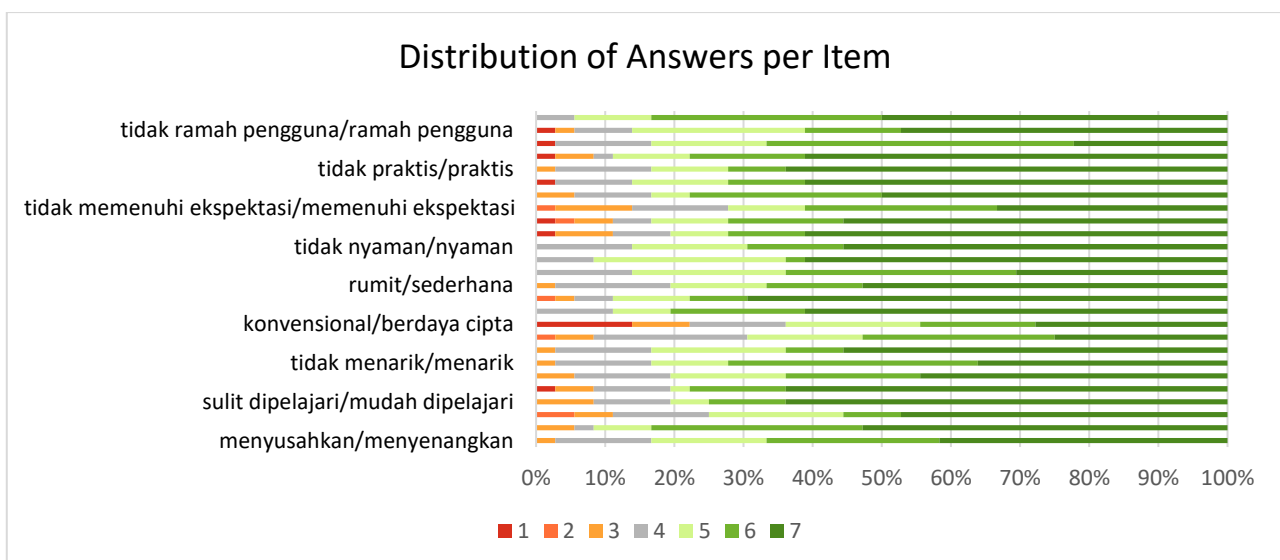
### 3. Testing/Pretesting to Assess Acceptability

After the stage of compiling the content and design of the application, a trial/pretesting was conducted to assess acceptability to 36 adolescents outside the research respondents. Assessment of User Experience in patients using the Application. Analysis of User Experience measurement results (UEQ Data Analysis Tool through Microsoft Office 365 excel).

Table 4.3 Overview of Patient Assessment on User Experience in Each Question Item

Item	Mean	Variance	Std. Dev.	No.	Left	Right	Scale
1	1,9	1,4	1,2	36	troublesome	pleasant	Attractiveness

2	2,2	1,2	1,1	36	incomprehensible	comprehensible	Clarity
3	1,6	2,5	1,6	36	monotonous	creative	Novelty
4	2,1	1,9	1,4	36	difficult to learn	easy to learn	Clarity
5	2,1	2,4	1,5	36	less useful	useful	Stimulation
6	1,8	1,7	1,3	36	boring	exciting	Stimulation
7	1,9	1,3	1,1	36	not interesting	interesting	Stimulation
8	2,0	1,6	1,3	36	unpredictable	predictable	Accuracy
9	1,4	1,9	1,4	36	slow	fast	Efficiency
10	0,9	4,1	2,0	36	conventional	inventiveness	Novelty
11	2,3	1,1	1,0	36	precludes in	favour of	precision
12	2,3	1,7	1,3	36	bad	good	Attractiveness
13	2,0	1,6	1,3	36	complicated	simple	Clarity
14	1,8	1,1	1,0	36	unfavourable	encouraging	Attractiveness
15	2,2	1,2	1,1	36	prevalent	leading edge	Novelty
16	2,1	1,3	1,1	36	uncomfortable	convenient	Attractiveness
17	2,0	2,5	1,6	36	not safe	safe	Accuracy
18	1,9	2,6	1,6	36	not motivating	motivating	Stimulation
19	1,5	2,3	1,5	36	does not fulfil expectations	fulfils expectations	Accuracy
20	2,1	1,5	1,2	36	not efficient	efficient	Efficiency
21	2,1	1,9	1,4	36	confusing	clear	Clarity
22	2,2	1,6	1,3	36	not practical	practical	Efficiency
23	2,1	2,1	1,4	36	messy	organised	Efficiency
24	1,6	1,6	1,2	36	not attractive	attractive	Attractiveness
25	1,8	2,0	1,4	36	not user-friendly	user-friendly	Attractiveness
26	2,3	0,8	0,9	36	conservative	innovative	Novelty



based on responses from 36 respondents. Each item in this table provides a snapshot of how users rate some aspect of the experience of using an app or service, such as clarity, novelty, stimulation, accuracy, efficiency, attractiveness, and user-friendliness. From these values, it can be seen how users rate various aspects of the experience of using a product or service.

### Benchmark Results with Other Studies

Table 4.4 Benchmark Results with Other Studies Recorded in the Data Analysis Tool (UEQ Data Analysis Tool through Microsoft Office 365 excel)

<i>Scale</i>	<i>Mean</i>	<i>Variances</i>	<i>Comparisson to benchmark</i>	<i>Interpretation</i>
<b>Attractiveness</b>	1,93	0,99	<i>Excellent</i>	<i>In the range of the 10% best results</i>
<b>Clarity</b>	2,10	1,18	<i>Excellent</i>	<i>In the range of the 10% best results</i>
<b>Efficiency</b>	1,93	1,19	<i>Excellent</i>	<i>In the range of the 10% best results</i>
<b>Accuracy</b>	1,94	1,31	<i>Excellent</i>	<i>In the range of the 10% best results</i>
<b>Stimulation</b>	1,93	1,41	<i>Excellent</i>	<i>In the range of the 10% best results</i>
<b>Novelty</b>	1,73	0,74	<i>Excellent</i>	<i>In the range of the 10% best results</i>

The table is the result of benchmarking compared to other studies recorded through the UEQ (User Experience Questionnaire) data analysis tool using Microsoft Office 365 Excel. Some of the parameters measured in the rating scale consist of Mean (average), Variances (variance), comparison with benchmarks, and interpretation of the results.

### Discussion

The following is the interpretation of the measured parameters:

1. Attractiveness: The average rating was 1.93 with a variance of 0.99. In comparison with the benchmark, the result is categorised as "Excellent" and falls within the range of the best 10% of results.
2. Clarity: The average rating was 2.10 with a variance of 1.18. In comparison with the benchmark, it is also categorised as "Excellent" and falls within the range of the 10% best results.
3. Efficiency: The average assessment was 1.93 with a variance of 1.19. Same as before, the result is categorised as "Excellent" and falls within the range of the 10% best results in comparison with the benchmark.
4. Accuracy: The average assessment was 1.94 with a variance of 1.31. As with the other parameters, the result is categorised as "Excellent" and falls within the range of the best 10% of results in comparison with the benchmark.
5. Stimulation: The average rating was 1.93 with a variance of 1.41. The result is also categorised as "Excellent" and falls within the range of the best 10% of results in comparison with the benchmark.
6. Novelty: The average rating was 1.73 with a variance of 0.74. Although slightly lower, the result is still categorised as "Excellent" and falls within the range of the best 10% of results in comparison with the benchmark.

Overall, the parameters measured in the table show excellent ratings and fall within the top 10% of results compared to other studies in terms of attractiveness, clarity, efficiency, accuracy, stimulation, and novelty of the user experience.

### Conclusion

When compared to other studies (Benchmark) the application is in an excellent position in all aspects of the assessment, shows 10% of the best results and the application is included in the excellent category in all aspects of the assessment. So the application is ready to be used on research respondents.

This study found that Android-based smoking cessation education is effective in improving knowledge, attitudes, and reducing adolescent smoking behaviour.

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