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Educating school students and gauging their perception about the harmful effects of smoking using a “Facial-Ageing App (mobile application):” An experience from Malaysia

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Abstract:

INTRODUCTION: Smoking is one of the leading factors of mortality in Malaysia. Most youngsters start at adolescence, fascinated by the concept of smoking. Interventions that harness the broad availability of mobile phones, as well as adolescents’ interest in their appearance, may be an innovative way to advance school-based prevention. This study aims to determine the perceptions of facial-aging apps among secondary school students.

METHODOLOGY: For this research, descriptive cross-sectional study using simple random sampling method was used. Population sampling was targeted toward three government schools. The total number of respondents is 383, with all of them aged between 13 and- 16 years of age. Legal considerations were taken to maintain the confidentiality of respondents. The specific objectives are: 1. To determine the level of change of intention on smoking, 2. To know the perceived reactions of the peer groups on the appearances of students as nonsmokers, 3. To determine whether the students learned new benefits of nonsmoking and, 4. To measure the impact of a facial-aging app among students.

RESULTS: The number of respondents who smoke was 40 (10.4%), while the number of respondents who do not smoke was 343 (89.6%). About 89% of the respondents agree that their three-dimensional selfie image motivates them not to smoke. In addition, 87.8% of respondents admit that the perceived reactions of their classmates make them think that they look better as nonsmokers. After learning the effects of smoking, about 86.4% of the respondents acknowledged that they would educate their peer groups. Furthermore, 85.9% of the respondents found this “Smokerface” app enjoyable.

CONCLUSION: The facial-aging intervention was effective in motivating Malaysian pupils to stay away from tobacco use. Thus, the analysis on the study of facial app usage in smoking prevention among youngsters concludes that most of the adolescents concur that the “Smokerface” app helps in the prevention of smoking among youths.

Keywords:

Aging apps, education, health promotion, smoking

Introduction

Tobacco is the only legal drug that kills many of its users when used exactly as intended

by manufacturers. The WHO has assessed that tobacco usage (both smoking and smokeless) is currently responsible for the death of around six million individuals over the world every

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year, with a significant number happening prematurely.^[1] Analysts examined information from studies of teenagers in 61 nations conducted from 2012 to 2015, which concluded that half of those countries had a smoking rate of somewhere around 15% for boys and not <8% for girls.^[2]

In Malaysia, statistics determined that smoking-related demise is the fifth leading cause of all deaths yearly and that over 15% of aggregate hospitalizations were from smoking-related diseases. The national well-being morbidity overview of 2015 showed that around 5 million or 22.8% of the Malaysian population aged 15 and above were smokers.^[3]

The earlier a person starts smoking, the higher the chance of becoming a regular smoker and developing associated diseases. As most smokers start smoking during their early adolescence years, it was necessary to develop tests and endorse tobacco control strategies that focus on this group through an age-appropriate and innovative approach. Therefore, most school health programs focused on educating students against tobacco use and increasing awareness of tobacco-induced diseases.^[4]

Significance of the study

Mobile devices have even greater potentials of being flexible and cost-effective means of delivering smoking cessation interventions, because of their ability to run apps tailored to users’ needs and be available when needed.^[1] According to a recent Cochrane analysis, adolescent smoking can be avoided by health educators in schools; however, no information for photoaging interventions or their usage in the school setting is accessible to date.^[2] The widespread accessibility of cellphones and teenagers’ concern for their appearance encourage app developers to create a free cellphone application, which requires the user to take a self-portrait. The photoaging software will then develop four pictures: consequences of smoking and not smoking, smoking one pack per day for a year, and smoking for 15 years.

Objectives of the study

General objective

- To determine the effectiveness of facial-aging app for smoking prevention among secondary school students in Malaysia.

Specific objectives

- To determine the level of change of intention on smoking among secondary students after the intervention
- To know the perceived reactions of the peer groups on the appearances of students as nonsmokers after the intervention
- To determine whether the secondary students learned new benefits of not smoking

- To measure the impact of facial-aging mobile app interventions among students.

Methodology

Site of the study

Three secondary schools from Muar were selected for this study, which were Muar High School, SMK Dato’ Sri Amar Diraja, and SMK (P) Sultan Abu Bakar in Muar, Johor state, Malaysia.

Survey method

A quantitative survey seeking to determine the perceptions of secondary school students on the facial-aging apps was used for this study.

Study design

Researchers used a descriptive cross-sectional study using simple random sampling on its target population for this study.

Population and sample

The total population of Muar is 357,148, whereas the population of secondary school students in Muar High School, SMK (P) Sultan Abu Bakar, and SMK Dato’ Sri Amar DiRaja is approximately 1400 students. The sample size was 248. The age of the respondents who participated in the study was between 13 and 16 years.

Data collection

The data were collected using a validated questionnaire, wherein the respondents were asked to answer questions about the level of change of intention on smoking. These questions also aimed to know the perceived reactions of the peer groups on the appearances of students as nonsmokers, to determine whether the secondary students learned new benefits of not smoking, and to measure the impact of facial-aging mobile app interventions among students and their sociodemographic data (age, gender, race, and religion). The respondents were also asked to assess whether the “Smoker face” application was favorable to them or not. The duration of the questionnaire section was about 5 min.

Questionnaire design

The medium used in the questionnaire were English and Malay. It was a 17-item questionnaire that concentrated on the respondents’ sociodemographic information, their awareness and perception on smoking after the mobile app intervention, smoking habits, and impact of the facial-aging mobile app intervention.

The content validity for the questionnaire was carried out to determine whether the content reflected a complete

range of the attributes under study and was assessed by five chosen experts in the areas of medicine for the research. According to the analysis of the experts, all of the questions were considered relevant. Each reviewer rated the relevance of each question to the conceptual framework using a 4-point Likert scale (1 = not relevant, 2 = somewhat relevant, 3 = relevant, 4 = very relevant). The content validity index was used to estimate the validity of the items presented and resulted in 98% validity. After the content validity of the questionnaire was assessed, the English language questionnaire was translated into Malay and was validated by a local university lecturer.

A pilot study was conducted among a random sample of 20 respondents aged between 13 and 16 years to evaluate the face validity of the questionnaire in terms of clarity of the wording, likelihood that the target audience would be able to answer the questions, layout, style, and whether the questions were hard or easy to answer. The respondents who were selected completed the face validity using a Likert scale of 1–5, which had the following ratings: 5 = strongly agree, 4 = somewhat agree, 3 = neither agree nor disagree, 2 = somewhat disagree, and 1 = strongly disagree. SPSS analysis was used to determine the reliability of the pilot study, using the Cronbach’s alpha method. The reliability result of the study was 0.853.

Survey instrument

The survey instrument consisted of 17 questions that are divided into 10 sections [Table 1].

Table 1: Sections and related questions

Section	Theme	Questions
Section 1	Sociodemographic information	A. Age B. Gender C. Race D. Religion
Section 2	Students’ smoking behavior	A. Do you smoke? B. If you answered “yes” to question number 1, how old were you when you first smoked a cigarette?
Section 3	Students’ knowledge about the “Smokerface” app	Have you heard about the “Smokerface” app before this?
Section 4	The effectiveness of the “Smokerface” app	A. Does the “Smokerface” app motivate you to quit smoking? B. Does your 3D selfie image motivate you not to smoke?
Section 5	The perception of the students about the “Smokerface” app	A. Based on your classmates’ reaction on your selfie image, would you be motivated not to smoke? B. Do your classmates think you look better as a nonsmoker?
Section 6	Likelihood of students to share their knowledge to others	After learning about the effects of smoking, would you educate your peer groups about it?
Section 7	Evaluating the awareness of the app	Does the “Smokerface” app make you aware of the harmful effects of smoking?
Section 8	Assessment of whether the students were entertained by the app	Do you find the “Smokerface” app enjoyable?
Section 9	Convenience of the app	Was this “Smokerface” app easy to handle?
Section 10	Advocacy of the “Smokerface” app	A. Would you try this app again in the future? B. Would you recommend this “Smokerface” app to your friends and relatives?

3D=Three-dimensional

Ethical considerations

Ethical aspects relevant to the participants were handled properly. Legal considerations were taken to ensure that the confidentiality of the participants is maintained at the highest level. The names and private details of the participant, such as e-mail and contact numbers, were obtained with informed consent from the parents of the participants, as well as from the school’s authorities, before conducting the interventional study. Ethical measures were approved by the Medical Research Ethical Committee, followed by the Faculty of Medicine of the Asia Metropolitan University. Registration was done under the National Malaysian Research Register.

Results

Our results revealed that the Malay race had the highest percentage of respondents at 46.2%, followed by Chinese at 30.8% and Indian at 19.9% whereas the “Others” category had the lowest percentage at 3.1%.

As seen in Table 2, the number of participants who smoke is 40, which is 10.4% of the total respondents. Meanwhile, 343 or 89.6% of the total respondents do not smoke.

Table 3 shows that 22 or 55% of the respondents who answered “yes” to question number 1 first experienced smoking at 14–15 years old, whereas the least number of respondents, at 3 (7.5%), had their first smoking experience at 10–11 years old.

Table 4 shows the awareness of respondents about the “Smokerface” app before the study. Surprisingly, none of them have heard about it.

The responses taken from questions 4–13 have been summarized. Based on the succeeding tables, it clearly shows that most of the participants agreed with all of the questions.

Table 5 shows that Smokerface app motivates them to quit smoking (87.7%) and three-dimensional (3D) selfie image motivates them not to smoke (89%).

Table 6 shows that their classmates’ reaction on their selfie image motivates them not to smoke (85.6%). In addition, 87.8% of the respondents admit that the perceived reactions of their classmates made them think that they look better as a nonsmoker.

After learning about the effects of smoking, about 86.4% of the respondents said that they would educate their peer groups as well and 85.9% of the

respondents make them aware of the harmful effects of smoking.

There are 85.9% of the respondents found this “Smokerface” app enjoyable and easy to handle (83.8%), would try this app again in the future (80.9%), and recommend this Smokerface app to their friends and relatives.

Discussion

The primary purpose of this research is to determine the perceptions of facial-aging apps among secondary school students. Control on tobacco use is a crucial component of the public health program in Malaysia and is one of the needs of the Ministry of Health^[5]. In recent times, tremendous breakthroughs are being made worldwide by different governments to enhance awareness on the health effects of smoking among the population.^[6] yet there are still ongoing debates on smoking awareness and its effects globally.

In a previous study, more than half had downloaded smoking cessation apps in the past, and of these, three-quarters had previously used similar apps and made attempts to quit, which lasted for at least 24 h. Respondents who had attempted to do so for at least three times in the previous year were more likely to have tried smoking cessation apps (odds ratio 3.3, 95% confidence interval 2.1–5.2).^[7] This study showed a similar outcome when compared to the study of these researchers, wherein the highest percentage of respondents at 87.7% agreed that the “Smokerface” app does motivate them to quit smoking, whereas only 0.8% of the respondents do not agree.

This outcome is the result of the respondents seeing their future facial appearances through the facial-aging app. Smokers will be presented with a graphic depiction of their future appearance if they continue to smoke, as compared to an image of their future self if they quit smoking. The current study suggests that by making future consequences of smoking vivid and salient to smokers, their intention to smoke will decrease.^[8] In contrast, many adolescents and young adult smokers

Table 2: Students’ smoking behavior

Do you smoke?	Frequency (%)
Yes	40 (10.4)
No	343 (89.6)
Total	383 (100.0)

Table 3: Students’ smoking behavior

If you answered “yes” to question number 1, how old were you when you first smoked a cigarette? (years old)	Frequency (%)
10 or 11	3 (7.5)
12 or 13	8 (20)
14 or 15	22 (55)
16	7 (17.5)
Total	40 (100)

Table 4: Students’ knowledge about the “Smokerface” app

Have you heard about the “Smokerface” app before this?	Percent
Yes	0
No	100

Table 5: The effectiveness of the “Smokerface” app

Questions	Agree (%)	Neutral (%)	Disagree (%)
Does the “Smokerface” app motivate you to quit smoking?	87.7	11.5	0.8
Does your 3D selfie image motivate you not to smoke?	89	9.9	1.1

3D=Three-dimensional

Table 6: The perception of the students about the “Smokerface” app

Questions	Agree (%)	Neutral (%)	Disagree (%)
Based on your classmates’ reaction on your selfie image, would you be motivated not to smoke?	85.6	13.6	0.8
Do your classmates think you look better as a nonsmoker?	87.8	10.4	1.8

want to stop smoking and report frequent attempts to quit. It has been recently reported that there is high interest in smoking cessation (67%) among young people who were habitual smokers, as well as those who frequently expressed the difficulty of not smoking despite repeated attempts to quit (;).^[9,10] This is comparable to these researchers’ studies, which showed that 0.8% of the respondents were not motivated to quit.

Regarding the perceived reactions of peer groups, 85.6% of the respondents concur that the reactions of their classmates prompt them not to smoke. Smoking causes skin wrinkling that could make smokers appear unattractive and prematurely old. Cigarette smoking has been shown to decrease capillary and arteriolar blood flow in the skin, damaging connective tissue components that are important in maintaining the integrity of the skin.^[3] Graphic images of smokers displayed in the app concern the young and the people around them.

Furthermore, according to Brinker *et al.*,^[11] students learned new benefits of not smoking through apps (300 out of 306 or 98.0%). This complements this researchers’ study, wherein 85.9% of the respondents agreed that through the app, they learned new information about the effects of smoking that can harm them. Moreover, 86.4% of the respondents acknowledged that after learning about the effects of smoking, they would educate their friends. In spite of this, about 1.3% of the respondents said that they did not learn any effects. Brinker *et al.*^[12] also have stated that only a minority of the students disagreed that they learned new benefits of not smoking (4 out of 306 or 1.3%). This is because teen smoking can be a form of rebellion or a way to fit in with a particular group of friends. Some teens begin smoking to control their weight, while others smoke to feel cool or independent.^[13]

In addition, the impact of the facial-aging mobile app intervention was found to be favorable in this study. 85.9% of the students found the app enjoyable, and about 83.8% found the app easy to handle. This coincides with the study conducted by Brinker *et al.*,^[12] which states that the majority of the students perceived the intervention as fun (77 out of 125 or 61.6%). Nevertheless, about 2.1% of the respondents did not find the intervention fascinating.

Conclusion

The facial-aging intervention was effective in motivating Malaysian pupils to stay away from tobacco use. Thus,

this knowledge can be used to promote the conveniences of using facial-aging apps to prevent or stop smoking among adolescents. About 89% of the respondents agreed that their 3D self-image motivates them not to smoke. In addition, 87.8% of the respondents admit that the perceived reactions of their classmates made them think that they look better as a nonsmoker. After learning about the effects of smoking, about 86.4% of the respondents said that they would educate their peer groups as well. Furthermore, 85.9% of the respondents found this “Smokerface” app enjoyable [Tables 7 and 8]. This study concludes that most of the adolescents concur that the “Smokerface” app facilitates the prevention of smoking among youths.

Recommendations

Schools are in a uniquely powerful position to play a major role in reducing the serious problem of smoking of young adults. It is a great platform to provide comprehensive and broad health intervention programs to confront health issues due to smoking. Each school is recommended to set up smoking cessation programs, such as smoking cessation workshops, where students can have hands-on learning about the harmful effects of smoking. Smoking should also be forbidden to students, staff, and visitors on all school grounds and at all school-sponsored events. Smoke-free policies that are clearly and consistently communicated, applied, and enforced should also be adapted to reduce smoking among students. They should also provide program-specific training for teachers to guide them in creating a smoking prevention curriculum. Mass media anti-smoking campaigns also acting as a promising tool for health promotion^[14,15]

Schools should also adopt a firm policy of not accepting any funding, curricula, or other materials from any cigarette company, as these companies produce and market incredibly harmful and addictive products and they rely on students or young adults to replace their adult customers who die or quit. The school’s smoke-free program should also be evaluated at regular intervals. Such evaluations are necessary for schools to determine which areas of their program need improvement and also to assess the positive effects of the program to students, parents, and the community, as well as to other schools who have not adopted any tobacco prevention programs.

By implementing these recommendations, schools can have an enormous positive impact on the current and future generations.

Table 7: Likelihood of students to share their knowledge to others

Questions	Agree (%)	Neutral (%)	Disagree (%)
After learning about the effects of smoking, would you educate your peer groups about it?	86.4	12.8	0.8
Does the “Smokerface” app make you aware of the harmful effects of smoking?	85.9	13.6	0.5

Table 8: Assessment of whether the students were entertained, feel convenient and advocated by the app

Questions	Agree (%)	Neutral (%)	Disagree (%)
Do you find the “Smokerface” app enjoyable?	85.9	12.3	1.8
Was this “Smokerface” app easy to handle?	83.8	15.9	0.3
Would you try this app again in the future?	80.9	17	2.1
Would you recommend this “Smokerface” app to your friends and relatives?	83.2	14.4	2.4

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Conflicts of interest

There are no conflicts of interest.

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