THE EFFECTIVENESS OF GROUP VIDEO-BASED SMOKING CESSATION STRATEGY (GRACIOUS) ON PATIENT'S MOTIVATION TO QUIT: A RANDOMISED STUDY AMONG HIGH CARDIOVASCULAR RISK SMOKERS

DR. NOOR EZZEAN EZZATI BINTI MOHD OTHMAN

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF MEDICINE
(FAMILY MEDICINE)

SCHOOL OF MEDICAL SCIENCES
UNIVERSITI SAINS MALAYSIA
2022

ACKNOWLEDGEMENT

First and foremost, praises and thanks to Allah SWT, the Almighty, for His showers of blessings throughout our research and its successful completion.

The researcher would like to express our deep and sincere gratitude to our supervisor and co-supervisors, Dr Nur Suhaila Idris, Dr Aida Maziha Zainudin, Dr Faridah Mohd Zin and Dr Rosnani Zakaria for providing invaluable supervision, support, and tutelage during the course of our research study. I would also like to thank all of them for their empathy, patient, and knowledge that they impart into me. It was a great privilege and honour to work and study under their guidance. Not to forget special thanks to Assoc. Prof Dr. Norhayati Mohd Noor for sharing her knowledge and technical expertise. Without her help, our research paper would not be possible.

My gratitude also extends to the content reviewers for our module, Prof. Madya Dr Mohd Ismail Ibrahim, Dr Imran Ahmad, Dr Nik Norashikin Nik Ab Rahman, and Dr Ahmad Abir Ab Ghani for their willingness to provide their wisdom and constructive suggestions. This really help us in improving our module for the better. I deeply appreciate the time you are willing to allocate despite your busy schedule.

Our thanks also go to the respondents who actively helped with their full cooperation which has made this study achieved its smooth completion. Last but not least, I thank my dearest family for their deep consideration and undying support throughout the making of the research study. With your constant encouragement and love. I had able to complete this study on time. Thank you all again.

TABLE OF CONTENTS

ABSTRAK

Pengenalan:

Merokok adalah faktor risiko bebas untuk penyakit kardiovaskular. Ia boleh mempercepatkan perkembangan dan melipatgandakan risiko penyakit kardiovaskular, terutamanya dalam kumpulan berisiko tinggi. Objektif kajian kami adalah untuk menentukan keberkesanan strategi berhenti merokok berasaskan video secara berkumpulan yang baru dibangunkan untuk perokok berisiko tinggi kardiovaskular, terhadap pengetahuan dan motivasi mereka untuk berhenti.

Metodologi:

Ini adalah kajian kawalan terkawal rawak dua cabang dan melibatkan seratus perokok berisiko tinggi kardiovaskular yang menghadiri Klinik Pesakit Luar, Hospital Universiti Sains Malaysia. Peserta diagihkan kepada dua kumpulan secara sama rata. Cabang intervensi menerima strategi berhenti merokok berasaskan video kumpulan melalui seminar dalam talian bersama-sama dengan penjagaan klinikal standard untuk berhenti merokok. Markah motivasi dan pengetahuan dinilai pada peringkat awal, 2 minggu, dan 8 minggu selepas intervensi.

Keputusan:

Terdapat interaksi masa kumpulan yang signifikan bagi skor pengetahuan min ($p<.001$, CI 95%) dan skor motivasi ($p<.001$, CI 95%) antara kumpulan intervensi dan kawalan. Akibatnya, terdapat perbezaan min skor pengetahuan yang signifikan antara ujian pra dengan ujian pasca 2 minggu dan ujian pra dengan ujian pasca 8 minggu ($p<0.05$, CI 95%) bagi kedua-dua kumpulan, tetapi perbezaan min yang lebih besar. diperhatikan dalam intervensi. Bagi motivasi, terdapat perbezaan min skor motivasi yang signifikan antara ujian pra dengan ujian pasca 2 minggu dan ujian pra dengan ujian pasca 8 minggu

(p<0.05, CI 95%) bagi kedua-dua kumpulan tetapi perbezaan min yang lebih tinggi. dalam kumpulan intervensi.

Kesimpulan:

Menggunakan strategi pemberhentian merokok berasaskan video kumpulan tambahan yang disesuaikan dengan perokok berisiko kardiovaskular tinggi di samping penjagaan standard meningkatkan dengan ketara pengetahuan dan motivasi pesakit untuk berhenti merokok.

ABSTRACT

Background:

Smoking is a major risk factor for cardiovascular disease, especially for high-risk individuals. This study aims to determine the effectiveness of a newly developed group video-based smoking cessation strategy tailored to high cardiovascular-risk smokers on their knowledge and motivation to quit.

Methods:

This was a two-armed, randomized control trial involving one hundred high cardiovascular-risk smokers attending the outpatient clinic Hospital Universiti Sains Malaysia. Participants were randomized into two equally divided groups. The intervention arm received a group video-based smoking cessation strategy via an online seminar and standard clinical care for smoking cessation. The motivation and knowledge scores were assessed at the baseline, 2 weeks, and 8 weeks post-intervention.

Results:

There was a significant group-time interaction of mean knowledge score ($p<.001$, CI 95%) and motivation score ($p<.001$, CI 95%) between the intervention and control groups. Consequently, there was a significant mean difference in knowledge score between the pre-test with post-test 2 weeks and pre-test with post-test 8 weeks ($p<0.05$, CI 95%) for both groups, but a greater mean difference was observed in intervention group. For motivation, there was a significant mean difference in motivation score between the pre-test with post-test 2 weeks and pre-test with post-test 8 weeks ($p<0.05$, CI 95%) for both groups but a higher mean difference in the intervention group.

Conclusion:

Using a supplemental group video-based smoking cessation strategy tailored to high cardiovascular-risk smokers in addition to standard care significantly improves the patient's mean knowledge and motivation to quit smoking.

Chapter 1

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1 Introduction

According to the World Health Organization – Non-Communicable Disease (NCD) Country Profiles 2018, cardiovascular disease (CVD) has been the leading cause of death in Malaysia for many years, accounting for 35% of total deaths (1). The prevalence of cardiovascular risk factors among adults in this country is also on the rise, with the most recent percentage being 50.1 % for overweight or obese, 38.1% for hypercholesterolemia, 30% for hypertension, 21.3% for smoking and 18.3% for diabetes (2). The smoking trend in our country has been static for the past few years; less than half of the current smokers attempted to quit smoking in the past 12 months. There are also minimal data currently available regarding the prevalence of smokers among high cardiovascular-risk patients, whether in Malaysia or globally.

Smoking is a known independent risk factor for CVD, particularly coronary heart disease (CHD) and stroke. It accelerates the development of the plague and may lead to plaque rupture, causing premature but preventable death (3). The risk is significantly increased even by exposure to low levels of cigarette smoke, such as exposure to second-hand smoke or smoking a few cigarettes per day (4). However, not many people know that smoking in patients with other risk factors, such as diabetes, will result in a higher risk of cardiovascular morbidity and mortality than in those without diabetes (5). Thus, promoting the cessation of smoking in high cardiovascular-risk patients is beneficial not only to them but also to the surrounding communities.

Currently, minimal smoking cessation interventional studies specifically target high cardiovascular-risk smokers, as most of the studies involved them in conjunction with the general population. In Malaysia, our smoking cessation approach is generally the same for all patients and is usually not tailored (6). Previous studies have shown evidence of the effectiveness of smoking cessation information tailored to the specific target population (7-9), but very limited intervention in high cardiovascular-risk patients remains. Motivating smokers by focusing on health concerns tailored to their condition can help promote smoking cessation (10). Motivation is a complex concept, and it is proven difficult to motivate behaviour change. Increasing one's awareness of potential risk or harm caused by unhealthy habits increases the motivation for behaviour change, as postulated by the Transtheoretical Model (TTM) of Health Behaviour Change. Additionally, following the most universally applied theoretical framework for health behaviour, The Health Belief Model (HBM), which consists of six concepts (11), has been shown to motivate patients to stop smoking and improve knowledge, attitudes and behaviour (12). Current brief interventions for smoking cessation primarily target the individual in the first three stages of the ‘stage of change’. According to TTM, the pre-contemplation stage is when the smoker does not intend to stop. A few reasons they are in this stage are due to lack of information, misinformation about the change of behaviour or demoralisation due to multiple failures. People in the contemplation stage are already aware of the benefits and are interested in change but still need to be motivated. Thus, by applying this theory, increasing people’s awareness and motivation is beneficial in promoting smoking cessation and predicting short-term and long-term cessation (13).

Besides the difference in the intervention's content, some trials use additional approaches along with the health care provider's brief standard clinical care, whether in group or individual counselling. There was a slight increase in cessation rates in combined interventions compared to the brief standard clinical care alone. Group counselling has also been better than self-help or other less intensive intervention to help people stop smoking (14). However, there needs to be more evidence to evaluate whether groups are more efficient or cost-effective than intensive individual counselling. Having said that, additional counselling can reduce the physician’s burden during follow-up, make counselling more likely, and significantly increase the cessation rate compared to the brief standard clinical care alone (15).

In addition to face-to-face counselling, various mediums such as educational pamphlets, booklets, letters, the telephone, and information technology (IT) have been used to deliver health education. The use of IT has been quite prevalent in recent years. Health promotion through either video-based education tools (16), short message services (SMS) (17) or computer-based intervention (18) has proven to be effective and facilitate changes in patient behaviour. Using a computerized medium, either in a video or text-based form, is effective in prolonged abstinence among smokers (19). This controlled trial compared the efficacy of video and text-based computerized mediums in smoking intervention, which both reported prolonged abstinence when compared to control, and more so in video intervention. A video-based educational strategy has been quite prevalent in promoting specific preventive health behaviours that have the potential to reduce morbidity and mortality associated with certain diseases. The use of videos can

minimize the burden on staff by providing needed skill training and role models for patients (15). Besides, adding video-based educational materials to standard brief interventions provides knowledge-based learning and an emotional incentive to change behaviour (20). Azmi et al. 2020 are doing one of the studies which used video-based smoking cessation education. In addition to standard brief advice, the study uses videos with fear-arousal messages in the form of personal testimonials for intervention in CVD patients. The result showed a significant improvement in the patient's motivation, behaviour and smoking status (8). However, the video in this study was developed specifically for hospitalized smokers with cardiac disease, which may only be applicable in some settings as a broader target population might be needed.

To ensure that smoking cessation intervention by health education is compelling, content should be tailored to the target group. In addition to brief standard clinical care, a supplementary strategy can be implemented to increase effectiveness. Considering the time and resource limitations in primary care settings, a group approach and video-based medium are beneficial to promote behaviour change, reduce the workforce burden and maintain sustainability.

In response to this concept, we developed a group video-based smoking cessation strategy using the HBM framework. It addresses health-specific content unique to patients with high cardiovascular risk to augment the brief standard clinical care. This study aims to increase their knowledge of the health risk of smoking and directly improve motivation to quit, which can subsequently promote behavioural change, that is, smoking cessation.

References

1. World Health Organization. Non-communicable disease country profiles. 2018.

2. National Institutes of Health. NCDs-Non - communicable disease: risk factors and other health problems. National Health and Morbidity Survey 2019. 2019;2.

3. NHAM A. Primary and secondary prevention of cardiovascular disease. Clinical Practice Guideline Malaysia. 2017;1st volume.

4. A report of the Surgeon General [electronic resource] : how tobacco smoke causes disease : what it means to you: [Washington, D.C.] : U.S. Dept of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2010; 2010.

5. Haffner S, Lehto S, Rönnemaa T, Pyörälä K, Laakso M. Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. The New England Journal of Medicine. 1998;339:229-34.

6. Public Health Department M. National Strategic Plan for Non-Communicable Disease (NSP-NCD) 2016-2025. 2016.

7. Aimer P, Stamp L, Stebbings S, Cameron V, Kirby S, Croft S, et al. Developing a tailored smoking cessation intervention for rheumatoid arthritis patients: developing a smoking cessation intervention in RA. Musculoskeletal Care. 2015;14.

8. Azmi J, Nurumal M, Mohamed M, Rahman N. A snapshot of pre- and post-intervention changes among cardiovascular disease patients participating in the new smoking cessation program. International Journal of Preventive Medicine. 2020;11:6.

9. Lennes I, Luberto C, Carr A, Hall D, Strauss N, Ponzani C, et al. Project reach: piloting a risk-tailored smoking cessation intervention for lung screening. Journal of Health Psychology. 2018:135910531875650.

10. Walsh RA, Sanson-Fisher RW. Encouraging People To Stop Smoking. World Health Organization Geneva. 2001.

11. DeBarr KA. A review of current health education theories. American Journal of Health Education 2004.

12. Renuka P, Pushpanjali K. Effectiveness of health belief model in motivating for tobacco cessation and to improving knowledge, attitude and behavior of tobacco users. Cancer and Oncology Research 2014.2(4):43-50.

13. Piñeiro B, Lopez-Duran A, Río E, Martínez U, Brandon T, Becona E. Motivation to quit as a predictor of smoking cessation and abstinence maintenance among treated Spanish smokers. Addictive Behaviors. 2016;53:40-5.

14. Stead LF, Carroll AJ, Lancaster T. Group behaviour therapy programmes for smoking cessation. Cochrane Database of Systematic Reviews. 2017(3).

15. Hollis JF, Lichtenstein E, Vogt TM, Stevens VJ, Biglan A. Nurse-assisted counseling for smokers in primary care. Ann Intern Med. 1993;118(7):521-5.

16. Wilson EAH, Park DC, Curtis LM, Cameron KA, Clayman ML, Makoul G, et al. Media and memory: the efficacy of video and print materials for promoting patient education about asthma. Patient Education and Counseling. 2010;80(3):393-8.

17. Head KJ, Noar SM, Iannarino NT, Harrington NG. Efficacy of text messaging-based interventions for health promotion: a meta-analysis. Social science & medicine (1982). 2013:41.

18. Portnoy DB, Scott-Sheldon LAJ, Johnson BT, Carey MP. Computer-delivered interventions for health promotion and behavioral risk reduction: a meta-analysis of 75 randomized controlled trials, 1988–2007. Preventive Medicine. 2008;47(1):3-16.

19. Stanczyk N, de Vries H, Candel M, Muris J, Bolman C. Effectiveness of video- versus text-based computer-tailored smoking cessation interventions among smokers after one year. Preventive Medicine. 2015;82.

20. Adam M, McMahon SA, Prober C, Bärnighausen T. Human-centered design of video-based health education: an iterative, collaborative, community-based approach. Journal of Medical Internet Research. 2019;21(1):e12128.

Chapter 2
OBJECTIVES OF THE STUDY

CHAPTER 2: OBJECTIVES

2.1 General objective

To assess the effectiveness of a group video-based smoking cessation strategy tailored to high cardiovascular risk smokers (GRACIOUS) in addition to standard care on their knowledge and motivation to quit among patients attending an outpatient clinic in Hospital USM.

2.2 Specific Objectives

a) To compare the change in mean knowledge scores between intervention and control groups at pre- and post-intervention in high cardiovascular risk patients attending an outpatient clinic in Hospital USM.

b) To compare the change in mean smoking cessation motivation scores between intervention and control groups at pre- and post-intervention in high cardiovascular risk patients attending an outpatient clinic in Hospital USM.

Chapter 3
MANUSCRIPT

CHAPTER 3: MANUSCRIPT

3.1 Title page

The Effectiveness of Group Video-based Smoking Cessation Strategy (GRACIOUS) on Patient's Motivation to Quit: A Randomised Study Among High Cardiovascular Risk Smokers

Noor Ezzean Ezzati Mohd Othman[1], Nur Suhaila Idris[1,*], Faridah Mohd Zin[2], Aida Maziha Zainudin[3], Rosnani Zakaria[1]

[1]Department of Family Medicine, Faculty of Medicine, Universiti Sains Malaysia, Kota Bharu, Malaysia

[2]MSU Medical Centre, University Drive, Shah Alam, Malaysia

[3]Department of Pharmacology, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, Kota Bharu, Malaysia

[*]Corresponding Author: Nur Suhaila Idris

Tel: +60-9-7676608, Fax: +60-9-7653370, E-mail: nursuhaila@usm.my

3.2 Abstract

Background

Smoking is a major risk factor for cardiovascular disease, especially for high-risk individuals. This study aims to determine the effectiveness of a newly developed group video-based smoking cessation strategy tailored to high cardiovascular-risk smokers on their knowledge and motivation to quit.

Methods

This was a two-armed, randomized control trial involving one hundred high cardiovascular-risk smokers attending the outpatient clinic Hospital Universiti Sains Malaysia. Participants were randomized into two equally divided groups. The intervention arm received a group video-based smoking cessation strategy via an online seminar and standard clinical care for smoking cessation. The motivation and knowledge scores were assessed at the baseline, 2 weeks, and 8 weeks post-intervention.

Results

There was a significant group-time interaction of mean knowledge score ($p<.001$, CI 95%) and motivation score ($p<.001$, CI 95%) between the intervention and control groups. Consequently, there was a significant mean difference in knowledge score between the pre-test with post-test 2 weeks and pre-test with post-test 8 weeks ($p<0.05$, CI 95%) for both groups, but a greater mean difference was observed in intervention group. For motivation, there was a significant mean difference in motivation score between the pre-test with post-test 2 weeks and pre-test with post-test 8 weeks ($p<0.05$, CI 95%) for both groups but a higher mean difference in the intervention group.

Conclusion

Using a supplemental group video-based smoking cessation strategy tailored to high cardiovascular-risk smokers in addition to standard care significantly improves the patient's mean knowledge and motivation to quit smoking.

Keywords: Cardiovascular Risk Factor; Brief Intervention; Smoking Cessation; Knowledge; Motivation to quit smoking.

3.3 Introduction

According to the World Health Organization – Non-Communicable Disease (NCD) Country Profiles 2018, cardiovascular disease (CVD) has been the leading cause of death in Malaysia for many years, accounting for 35% of total deaths [1]. The prevalence of cardiovascular risk factors among adults in this country is also on the rise, with the most recent percentage being 38.1% for hypercholesterolemia, 30% for hypertension, 18.3% for diabetes, 50.1 % for overweight or obese, and 21.3% for smoking [2]. The World Health Organization (WHO) Global Report showed that tobacco was responsible for 23% of all NCD deaths in Malaysia in 2004 [3].

Tobacco use is the single most preventable cause of death in the world, and WHO has shown that smoking is a risk factor contributing to six out of eight leading causes of death worldwide [4]. Smoking is a strong independent risk factor that contributes to CVD, particularly coronary heart disease (CHD) and stroke. It is well known that smoking accelerates the development of plaque and may lead to plaque rupture, causing premature but preventable death [5]. The risk of CVD in smokers is two to four times higher than in non-smokers [6]. Besides, smoking may also multiply the risk of CVD in the presence of other risk factors [7], indicating the importance of smoking cessation as a primary, secondary and tertiary prevention of CVD. However, not many people are currently aware that smoking in a high-risk population will result in a higher risk of cardiovascular morbidity and mortality [8].

For smoking cessation intervention, there are generally two types that have been practiced, which are brief and intensive intervention [9]. A brief intervention was given

to all smokers, irrespective of their condition. The commonly used approach in our clinical setting is either the '5 As' steps or the ABC approach, which is usually delivered individually [9]. Its main aim is to promote health education and motivate them to quit smoking, which can lead to desired behavioural changes [10]. A systematic review comparing brief and intensive smoking cessation interventions in the general population has shown that although there is a higher cessation rate in the intensive intervention [11], brief intervention is more widespread compared to the more specialized smoking clinic which was only accessed by fewer smokers [12]. Brief intervention for smoking cessation is mainly targeted at people in the first three stages of 'stages of change', which are pre-contemplation, contemplation, and preparation [10]. According to the theory postulated by the Transtheoretical Model (TTM) of Health Behaviour Change, increasing one's awareness of potential risks or harm caused by unhealthy habits could increase the motivation for behaviour change. Additionally, following the most universally applied theoretical framework for health behaviour; The Health Belief Model (HBM) which consists of six concepts [13], it has been shown to motivate patients to stop smoking, improve knowledge, attitudes and their behaviour [14].

In Malaysia, our approach of brief intervention is generally similar for all patients [9]. Previous studies have shown evidence of the effectiveness of smoking cessation information that has been tailored to the specific target population [15-17], however, presently there are limited brief smoking cessation interventions that specifically target patients with high cardiovascular risk.

Considering a steady increase in the cardiovascular risk trend in our population over the past few years [2], including the number of smokers, intervention for this specific group is extremely important in preventing complications, mostly premature death. In response to this issue, we were using the HBM to develop a group video-based smoking cessation strategy that addresses health-specific content unique to high cardiovascular-risk smokers in addition to brief standard clinical care. The objective is to compare the pre and post-test mean scores between the intervention and control groups in determining the efficacy of the intervention on participants' knowledge and motivation.

3.4 Methods

3.4.1 Study design

This randomized controlled trial was conducted among high cardiovascular-risk smokers attending an Outpatient clinic at Hospital Universiti Sains Malaysia (USM), Malaysia. It was run from September 2021 until July 2022, from recruitment until the last data collection. The inclusion criteria for this study were an adult age 18 and above, able to comprehend and understand Malay, a current tobacco smoker and in the high cardiovascular risk category calculated using the Framingham Risk Score FRS-CVD calculator. Patients receiving other interventions for smoking cessation, having documented underlying psychiatric illness or an illiterate, blind or deaf are excluded.

3.4.2 Sample size

The sample size was calculated for all objectives using Power and Sample Size calculation software for comparing two means between groups and paired-t for within group. The biggest sample size was taken as the study sample size. The largest sample

size for this study is the knowledge score. The calculation of sample size is as follows; $\alpha.= 0.05$, Power = 0.9, m = Ratio between intervention and control group = 1, δ Detectable difference in the mean knowledge score intervention and control group = 1, σ = Standard deviation of mean knowledge score for the intervention group in the post-test = 1.38 (Sejr and Osler, 2002). A detectable difference of one unit score was decided after considering the study's clinical importance and feasibility. The minimum required sample size was 41, and after considering the non-response rate of 20%, the sample size calculated for each group was 50.

3.4.3 Research tools

3.4.3(i) Socio-demographic data, smoking history, and Fagerstrom Test for Nicotine Dependence (FTND)

The questionnaire was constructed in Malay. It includes information regarding the socio-demographic background, including age, gender, marital status, working status, monthly income, educational level, and underlying comorbidity. Brief smoking history, such as the age started smoking, and duration of smoking also included. The FTND was used to evaluate the level of nicotine dependence of the subjects [9].

3.4.3(ii) Framingham Risk Score (FRS-CVD) 2008

The Framingham Risk Score FRS-CVD score was used to determine the eligibility of the participants in the study. The score was measured using an online validated calculator. The data required for risk stratification was taken from the patient’s case sheet. These include systolic blood pressure, total cholesterol (TC), high-density lipoprotein (HDL) cholesterol, hypertension status (with two categories- with or without treatment), diabetes

status, and smoking status. HDL and TC readings were taken from the available blood test result for the past 6 months. After the score was calculated, the percentage will determine the 10-year risk for patients to develop cardiovascular disease. Scores of more than 20% are defined as high-risk groups and thus qualified for this study.

3.4.3(iii) Group video-based smoking cessation strategy for high cardiovascular-risk smokers (GRACIOUS)

The Group Video-based Smoking Cessation Strategy for High Cardiovascular Risk Smoker (GRACIOUS) was developed in accordance with the Health Belief Model of health behaviour [18]. It was prepared in Malay and used video as a medium. The educational content is mostly adapted from the report of The Health Consequences of Smoking—50 Years of Progress [6] and specific to the high cardiovascular risk group. Before implementation, the content validity of the module was evaluated by four experts in the field. They comprised one health education expert, one public health specialist, and two family medicine specialists from the Ministry of Health and Hospital USM. Face validity was performed on five smokers; however, the internal structure of the module was not tested.

The video was divided into three main topics:

a. Smoking and health

   This was an animated video that delivered information regarding the effects of smoking on physical and psychosocial health specifically to those in a high cardiovascular-risk group, and barriers to smoking cessation.

b. Information and demonstration of Nicotine Replacement Therapy (NRT)

This video explains about choices of pharmacotherapy currently available in assisting smoking cessation and includes a demonstration of the use of NRT.

c. Experience sharing video

This was an experience-sharing interview with a high cardiovascular-risk patient who has successfully stopped smoking.

The content of the video was intended to improve their knowledge of tobacco effects and motivate them to stop smoking. The video was approximately 20 minutes long.

3.4.3(iv) Brief standard clinical care for smoking cessation

We provide a brief standard clinical care that has been widely used in our clinical setting to help all subjects with smoking cessation before randomization. The method to be used is known as the ABC approach. This approach consists of three steps: (1) asking people about their smoking status and documenting it; (2) providing brief advice to stop smoking to all people who smoke, irrespective of their desire or motivation to quit; (3) making an offer of and refer to or provide evidence-based cessation treatment [9]. It was delivered individually and took around 5 minutes to be completed.

3.4.3(v) Questionnaire to assess patient's knowledge of smoking health risk

A questionnaire to assess the knowledge of the health risks associated with smoking was developed based on the content of the group video-based smoking cessation strategy. It was prepared in Malay language and consisted of fourteen questions. It includes questions regarding the health effects of smoking in the general population, as well as the high cardiovascular-risk group, and pharmacotherapy for smoking cessation. Questions about the health effect of smoking was constructed following Global Adult Tobacco Survey

(GATS) questionnaire, while questions regarding health problems related to smoking were obtained by reviewing the literature on smoking-related illness, choosing conditions that have been used in other surveys [19, 20] as well as adding illnesses that are known to worsen with smoking (e.g., diabetes) [6]. Distracter items were also selected based on items used in other surveys and other medical conditions not known to be related to smoking (e.g., appendicitis, gallstones). Questions about NRT were constructed following the Malaysia clinical practice guideline and literature review on NRT knowledge [21]. In the questionnaire, the subject must choose between three options of an answer, either 'Yes,' 'Don't know' or 'No'. Three marks will be given for the correct answer, two for don't know, and one for the wrong answer. The mark will be totalled, and higher scores indicate a higher knowledge level. The content of the questionnaire was reviewed by four experts in the field before utilization. After that, face validity was done between ten adult smokers which is 10% of the sample size. Subsequently, a preliminary reliability test was carried out among 30 adult smokers with Cronbach's alpha value of 0.7.

3.4.3(vi) Smoking Cessation Motivation Questionnaire (Q-MAT)

Q-MAT was a validated scale that was widely used to measure patients' motivation for smoking cessation. It consists of four questions, the response modalities of which generated a score ranging from 0 (lack of motivation) to 20 (excellent motivation). Back translation for linguistic validity was carried out by language experts using Behling's and Law's (2000) technique to translate this questionnaire in Malay after permission from the original developer.

3.4.4 Data collection procedure

Patients were recruited on a voluntary basis. They were provided with flyers during the registration at the clinic. Those who wish to participate can approach the staff and they were evaluated for suitability according to inclusion and exclusion criteria. As consent was obtained, participants needed to respond to pre-test questionnaires comprised of socio-demographic data, FTND, knowledge of smoking and Q-MAT. Then, a simple computer-generated randomization was conducted using an Excel programme to divide participants equally between the control and intervention groups.

3.4.4(i) Control group

Participants received brief standard clinical care for smoking cessation following Kementerian Kesihatan Malaysia (KKM) guideline. After two and eight weeks, a similar set of questionnaires was administered to reassess the participants' knowledge and motivation to quit. Afterwards, they were given the option to receive the GRACIOUS module following the completion of the study.

3.4.4(ii) Intervention group

In addition to standard care, participants in the intervention group were arranged to attend an online seminar in a group of ten. They were shown the GRACIOUS module once. Few steps were taken to prevent the content of the intervention from being disclosed to the control group. The seminar was conducted live, and a link was provided to the participants scheduled to attend on the seminar day. Participants were strictly reminded before the seminar not to record it in any form. The researchers also ensured that participants from the two groups had no contact and were uninformed of one another. After the intervention,

they were given follow-ups at two and eight weeks to reassess their knowledge and motivation to quit.

Figure 1.

3.4.5 Data analysis

Collected data were entered and analysed using Statistical Package for Social Science (SPSS) version 26. Two-way repeated measures ANOVA was conducted to compare the mean of knowledge and motivation score between the intervention and control group at the time of pre-test, 2- and 8-weeks post-intervention.

3.4.6 Ethical Considerations

This study was approved by the Research and Ethical Committee, School of Medical Sciences, Universiti Sains Malaysia (USM/JEPeM/20050261).

3.5 Results

A total of 100 participants in this study were equally divided into control and intervention groups. All participants were male. Most of them are Malay, married, and employed. Table 1 shows the baseline characteristics of participants in the intervention and control groups. There was no significant difference in baseline knowledge and motivation score, age of start smoking and Fagerstrom test score between the intervention and control group. There was a significant difference in mean age (t90.724=-3.389,p=.001), and duration of smoking (t88.803=-3.153,p=.002) between this two groups however it was normally distributed based on Q-Q plot. For baseline co-morbidity, there was no significant difference between the intervention and control group aside from Diabetes Mellitus (DM) and Coronary Artery Disease (CAD) which was higher in intervention and

control group respectively. DM was the most prevalent chronic illness among them, followed by hyperlipidaemia (HPL) and hypertension (HTN).

Table 1.

A two-way repeated measure ANOVA was conducted to compare the effect of GRACIOUS on the mean of knowledge and motivation score between the intervention and control group at the time of pre-test, 2- and 8-weeks post-intervention. Table 2 show a group-time interaction of mean knowledge score change between the intervention and control groups ($p<0.001$). There was a significant change in the mean knowledge score between the intervention and control group over time with $p<0.05$ [Greenhouse-Geisser, $F (1.4, 133.5 = 287.46)$]. Post hoc analysis with Bonferroni correction done and based on the test of within-subject effects, there was a significant difference in mean knowledge score between the pre-test and post-test 2 weeks ($p<.001$ for both groups), and pre-test and post-test 8 weeks ($p<.001$ for both groups). However, there was no significant difference in mean knowledge score between the post-test 2 weeks and the post-test 8 weeks ($p=1.00$ intervention; $p=0.75$ control). The intervention group has overall higher mean differences compared to the control group.

Table 2.

Table 3 illustrates the group-time interaction of mean motivation score change between the intervention and control groups. There was a substantial change in the mean motivation score between the intervention and control groups over time $p<0.05$ [Huynh-Feldt, $F (1.9, 188.6 = 181.23)$]. Post hoc analysis with Bonferroni correction done and based on the test of within-subject effects, there was a significant difference in mean

knowledge score between the pre-test and post-test 2 weeks ($p<.001$ for both groups), and pre-test and post-test 8 weeks ($p<.001$ for intervention; $p=0.01$ for control). The difference in mean knowledge score between the post-test 2 weeks and the post-test 8 weeks in the control group was significant ($p=0.03$) but not in the intervention ($p=1.00$). Nevertheless, the intervention group has higher mean difference.

Table 3.

3.6 Discussion

The steady increase in the cardiovascular risk trend among our population over the past few years, including the number of smokers, justifies the importance of intervention for this specific group in preventing complications, mostly premature death. As this study also demonstrated, giving standard brief advice on smoking cessation to active smokers is known to increase their motivation to quit and enhance overall tobacco abstinence rates [22]. Additionally, using a group video-based smoking cessation strategy that addresses health-specific content unique to high cardiovascular-risk smokers substantially raises their knowledge and motivation to engage in health-promoting behaviour that can result in smoking cessation.

This research suggests that, in addition to standard care, one video-show session that is specifically produced for high cardiovascular-risk patients increases their knowledge and motivation to quit smoking. From the analysis, it showed that participants in the intervention group had greater improvement in mean knowledge (highest mean difference -6.74 between pre-test with post-test 8 weeks) and motivation score (highest mean difference -4.32 at pre-test with post-test 2 weeks) compared to the control group. These