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Effects of the "Cut-Down Smoking" Program to Promote Smoking Cessation Behavior among Postman Smoker from the Central Portion of Thailand

Phannathat Tanthanapanyakorn[1], Aree Sanguanchue[1], Tassanapan Weschasat[2]
[1]Faculty of Public Health, Valaya Alongkorn Rajabhat University under the Royal Patronage, Pathum Thani, Thailand, 13180
[2]Faculty of Science and Technology, Suratthani Rajabhat University, Suratthani, Thailand, 84100
Email address: phannathat.tan @ vru.ac.th, areenueng06 @ gmail.com, narutong_tp @ hotmail.com

***Abstract*—** *Smoking is harm nearly every organ of the body, causes many diseases, and reduces the health of smokers in general. Smoking Cessation can promote lowers risk for smoking-related diseases. The objective of this study was to determine the before and after the intervention program of postman Smoker from the central portion in Thailand. The samples were separated into 2 groups by using the purposive random sampling. A total of 90 participants had 5 dropouts from intervention group and 10 dropouts from control group during a 1-month intervention program. So, there were 72 participants in the total who were finished the after measurements in this study. The postman smoker who were evaluated the Fagerstrom Test for Nicotine Dependence score, and the quit smoking behavior at the baseline and after a 1-month intervention program. The inferential statistics was used to compare the differences between and within the group (independent t-test and paired sample t-test, respectively). The results revealed that the Fagerstrom scores in the intervention group was decreased significantly more than the control group ($p<0.001$) and the quit smoking behavior were increased significantly in the intervention group more than the control group ($p<0.001$) after a 1-months intervention program. Finally, the Cut-Down smoking program can promote the smoking cessation behavior and prevent its effects from smoking in the future.*

***Keywords*—** *Smoking Cessation, Postman, Intervention.*

I. INTRODUCTION

Smoking is associated with the development of cancers, cardiovascular diseases, chronic obstructive pulmonary disease, and other diseases [1]. Smoking is a learned behavior that evolves through several stages, including preparation, initiation, experimentation, regular smoking and nicotine addiction [2]. The multitude of factors can influence the smoking in adult's population and their subsequent success in quitting includes; sex, age and developmental stage, socioeconomic status, sexual orientation, education level, ethnicity, cultural background, history of tobacco use, risk-taking behavior and psychological aspects, personal acceptability of tobacco use and commitment to cessation, tobacco use among peers and family, external support for cessation, time availability, knowledge, attitudes, and beliefs about cigarette, self-esteem and self-perception, sense of control and behavioral. Although adult people experiment with or begin regular use of tobacco for a variety of reasons [3].

Nicotine dependence is established rapidly [4]. On average, it takes 2-3 years to become a regular smoker and addicted to nicotine. As adult person was become increasingly dependent on nicotine over time, it proves to be difficult to quit smoking [5].

Tobacco use are remaining the leading cause of preventable death in the world today [6]. World Health Organization reported that Smokers who smoke approximately 16 cigarettes per day lose about 11 min of their lifetime per cigarette smoked [7]. Tobacco use is kills more than 8 million people each year. More than 7 million of those deaths are the result of direct tobacco use while around 1.2 million are the result of non-smokers being exposed to second-hand smoke. Over 80% of the world's 1.3 billion tobacco users live in low- and middle-income countries [8]. Furthermore, WHO reported that over 1.1 billion people aged 15 years old and older were smoked tobacco in 2016. The global average of smoking proportion was 21.9%. In Thailand, the tobacco use proportion was 20.4% in 2016 which nearly to the global an average. Moreover, WHO reported that in Thailand, it was increased of tobacco use in every year. The prevalence of current tobacco use was 15.0 in the year 2015 and increasing to be 20.7 and 23.3 in the year 2017 and 2019, respectively [9].

The workplace has been a popular environment for promoting cigarette cessation. Many employers have integrated cigarette cessation into their workplace wellness program, motivated by increasing worker productivity and decreasing medical costs [10]. Post office wellness are a promising setting for scaling interventions because employers have the financial resources to sustain the program over time, and offer a way to access some hard-to-reach groups. Thus, workplace wellness program increasingly uses monetary incentives to encourage employees to quit smoking. Most of the widely used smoking cessation programs include several hours of skills training in cognitive and behavioral techniques designed to help the smoker cope not only with the cravings to smoke but also with negative mood states frequently associated with quitting and known to promote relapse to smoking [11].

Dependence on cigarettes is a deeply entrenched behavior that has been learned, on the one hand, by the association between the effects of nicotine on brain reward circuitry and the behavior of smoking. Behavioral support program was focused on two key objectives: maintaining or enhancing to be quit smoking and avoiding or minimizing to smoke. The

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incentives smoking cessation program might spur program participation for promoting the cigarette cessation. This program was approached on the behavioral change by applying the Stage of Change Model [12] to establish the "Cut Down Smoking" program. Moreover, this intervention program was instigated the herbal for reducing to demand smoking. The postman is high prevalence group to use tobacco. Form the pilot study and in-depth interview of the postman smoker, the finding showed that over 80% of regular postman smokers beginning tobacco use before the age of 18. So, as smoking cessation can help to reduce individual health risks and long-term, systemic health-care costs, there is a need for evidence-informed interventions to help quit smoking. In this study, the research has realized the problem of cigarette use among postman employee in the central portion of Thailand. This main of outcomes were considered on the Fagerstrom score which indicated to the nicotine dependence and the quit smoking behavior at the baseline and a 1-month intervention program. The postman had the specific of work characteristics and its difficult to get the participation from them. So, this program was developed to suitable with the workplace by conducting at the work office on every Saturday morning before start working.

II. METHOD

This study was a Quasi-experimental study to determine the Fagerstrom scores and quit smoking behavior before and after a 1-month intervention program. This study was designed to use a single-blinded. The program was carried out in the central of postal transport with comprises high proportion of employees and most of them who were currently smoked. It was separated into 2 groups: the intervention group who were obtained the "Cut-Down smoking" program and the control group who were suffered the self-health education by using the manual handbook. The study duration was taken place between Septembers to December 2020. This program was designed to 4-weeks intervention program and used a 1-month to follow-up the outcome and repeated to measure all of the outcome.

A. Participants

The postman was recruited age aged range from 25-44 and 45-59 years old with the high rate of smoking, accounting for 21.9 and 21.1, respectively [14]. The samples were measured the Fagerstrom measurement who had the score more than 3 points and registered at the post office from central portion of Thailand at least 6 months to recruit into the study. The participants were participated in this study with the consent from and singed the name. The purposive sampling random was used to select the respondents as per the inclusion and exclusion criteria into the experiment and the control group. The exclusion criteria consisted of the postman were registered to treatment the chronic diseases especially the lung cancer or respiratory tract diseases.

The sample size of this study was calculated by the G-power program which using the confidence interval was 95% study, allowable error was 5% and effect size was 0.5 [15]. After calculation the sample size by the G-power program, total sample size was used 90 participants. At starting the total 90 of participants from both groups were recruited to this study by voluntary. After the baseline measurement, total 83 participants who met the criteria were selected to this study (intervention group; n=40 and control group; n=43). After 1-month intervention program, 38 participants from the intervention group who were finished Cut-Down smoking program. Thus, the total 72 participants were performed post-test measurement (intervention group; n=35 and control group; n=37).

B. Material and Procedure

The postman smoker from the central portion in Thailand was selected to the sample in this study. They were recruited by the inclusion criteria consisted of 1.) The samples who were evaluated the Fagerstrom Test for Nicotine Dependence more than 4 point 2.) The postman smoker who had aged range between 25-59 years old and voluntary to join with this study. This program was established by using the Stage of Change Model [12] and the Cognitive Behavior Therapy by Corey [13] and integrated the local herbal for promotion the smoking cessation behavior. This program was appropriated for the postman smoker who were had the specific characteristics and suitable to implement with their work conditions. This experimental program was architected to 4-weeks and scheduled to perform the knowledge, quiz smoking behavior on every Saturdays between 7.00 a.m. to 8.30 a.m. by the researcher and the motivation expert staff. In addition, the program was applied the social media for providing the knowledge on smoking by using line@ application. The program was considered by social distancing to protect COVID-19 distribution. The trained co-researchers were measured, recorded and collected all tool for assessing the parameters at the baseline and a 1-month intervention program.

The "Cut-Down Smoking" program was scheduled on 4-weeks intervention program. The detail of the intervention as follows; Week I: "Effect of smoking"; this process was aimed to improve the knowledge on smoking, nicotine dependence and its effects by using the VDO media, and slide presentation. The participants can ask the question and discussion with the expert person. Moreover, the role model was invited to taking with the postman smoker for raising awareness about the smoking cessation behavior. This step was assigned to the participants can identify their behavior and receive their level of nicotine dependence. Week II: "Pro and Con Discussion on Smoking"; this process was designed to raise the quiz smoking behavior of postman smoker by using the group discussion method. The participant was identified the Pro and Con of smoking to recognize about their behavior and making to change their behavior for quitting smoking behavior. Week III: "Cigarette smoke puzzle"; this process was designed to classify the media propaganda purposes by integrating the VDO advertising about smoking. The participants were divided 3-4 groups to analyze the aim of alcohol advertising media after that chosen the representative form each group to present the results and shared the idea and fact from their recognition. Week IV: "Stop smoking by herbal"; this process was reinforced the herbal to promote the

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smoking cessation behavior in postman smoker. Indian gooseberry can help to reduce the crave smoking. Cutting a small lemon then chew for 5 minutes before rinse their mouth and brush their teeth every morning can promote the smoking cessation behavior. Moreover, Indian gooseberry roasted or dried can bring it to make tea, the result can reduce the crave smoking.

C. Instruments

The data collection was used the structural-interview by considering on social distancing for prevention the risk from COVID-19. The instrument consisted of 3 parts as follows;

Part I: The baseline characteristic questionnaire: This part was to record the data such as gender, age, monthly income, and living arrangement.

Part II: The Quit smoking behavior assessment form; the total of this part was to 14 question. Each question has 5 answers choice. The aim of this tool was used to access the quit smoking behavior before ana after who's joined the program by interview. The score ranged from 14-70 points. The low total scores indicated that the participants the high level of quit smoking behavior.

Part III: The Fagerstrom Test for Nicotine Dependence; [16] this part is a standard instrument for assessing the intensity of physical addiction to nicotine. The test was outlined to supply an ordinal degree of nicotine reliance related to cigarette smoking. It contains six things that assess the amount of cigarette utilization, the compulsion to utilize, and reliance. The score of the Fagerstrom Test for Nicotine Dependence, yes/no items are scored from 0 to 1 and multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0-10. The higher the overall Fagerstrom score, the more seriously is the patient's physical reliance on nicotine.

D. Ethical Consideration

The Ethical approval was granted to review by the ethic committee. The researcher and co-researchers were told the participants about the study protocol and risk of the program before they were signed a consent form.

E. Statistical analysis

All results with $p<0.05$ was considered statistically significant. The Shapiro Wilk Test was used to measure the normality. The finding showed that there was the normal distribution in all variables. The Chi-square test and the Pearson's correlation coefficients were used to explore the baseline characteristics between groups. The Independent t-test was used to compare before and after a 1-month intervention program between the group and the paired sample t-test was used to compare before and after a 1-month intervention program within the group.

III. Result

A total of 72 participants (intervention group; n=35 and control group; n=37) in the total who participated in this study and who were finished the post measurement. The general characteristics variables were similar between both groups. The results revealed that the total of the postman smoker was 45.45±8.2 years old. The samples were insufficient of family status and they mostly had income more than 10,000 Baths or 328.54 USD (72.2%). Most of them were came from the central region of Thailand (45.8%) and who were drank alcohol drinking (90.3%). The majority of the samples who were had dyslipidemia, followed by hypertension and diabetes (29.1%, 19.4% and 16.7%, respectively). Moreover, the result found that 34.7% of them haven't co-morbidity.

TABLE 1 The general characteristics and outcome variable at the baseline between intervention group and control group, p-value=0.05.

Variables	Total	Intervention group (n=35)	Control group (n=37)	*p*-value
Age (Years)				
Mean± SD.	45.45±8.2	43.21±10.1	47.01±6.7	0.534
Income				
<10,000 Baths	20 (63.1%)	8 (22.9%)	12 (32.4%)	0.542
>10,000 Baths or equal	52 (72.2%)	27 (77.1%)	25 (67.6%)	
Family Status				
Insufficiency	44 (61.1%)	23 (65.7%)	21 (56.8%)	0.222
Sufficiency	28 (38.9%)	12 (34.3%)	16 (43.2%)	
Alcohol Drinking				
Yes	65 (90.3%)	32 (91.4%)	33 (89.2%)	0.110
No	7 (9.7%)	3 (8.6%)	4 (10.8%)	
Domicile				
Northern	5 (6.9%)	2 (5.7%)	3 (8.1%)	0.780
Southern	22 (30.6%)	10 (28.6%)	12 (32.4%)	
Central	33 (45.8%)	18 (51.4%)	15 (40.5%)	
Northeast	12 (16.7%)	5 (14.3%)	7 (19.0%)	
Co-morbidity				
No	25 (34.7%)	10 (28.6%)	15 (40.5%)	0.532
Diabetes	12 (16.7%)	5 (14.3%)	7 (18.9%)	
Hypertension	14 (19.4%)	8 (22.9%)	6 (16.2%)	
Dyslipidemia	21 (29.1%)	12 (34.3%)	9 (24.3%)	

REMARK: Data were analyzed with Chi-square test and independent t-test.
*Statistically significant level at the 0.05 level ($p<0.05$).

At the baseline, the mean change of the Fagerstrom score and quit smoking behavior (Mean± SD.) between the intervention group and control group were not difference significantly ($p>0.05$). The mean different of all the parameters (Mean± SD.) within group and between groups after a 1-month intervention program were compared. The results revelated that the Fagerstrom score between intervention group and control group was decreased significantly ($p<0.001$) and the quit smoking behavior was increased significantly ($p<0.001$).

TABLE 2. Mean difference of the outcomes between intervention group and control group.

Variable	Baseline (Mean± SD.)	1-month Intervention Mean± SD.)	p-value (a)
Fagerstrom Score			
Intervention group	6.25± 1.12	3.08± 1.58	**<0.001***
Control group	5.72± 1.59	4.70± 1.56	**<0.001***
p-value (b)	0.110	**<0.001***	
Quit Smoking Behavior			
Intervention group	39.94± 9.56	60.28 ± 5.31	**<0.001***
Control group	39.45± 10.46	46.78± 6.47	**<0.001***
p-value (b)	0.839	**<0.001***	

REMARK: Data were analyzed with paired sample t-test within group (p-value (a)) and independent t-test between group (p-value (b))
*Statistically significant at the 0.05 level p-value<0.05.

The comparison of the parameters within the experiment group at the baseline and 1-month intervention program found that the Fagerstrom score was at 6.25±1.12 and decreased significantly to 3.08±1.58 ($p<0.001$). The quiz smoking behavior

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was at 39.94±9.56 and decreased significantly to 60.28±5.31 ($p<0.001$). In the contract, the mean change of the parameters within the control group at the baseline and 1-month intervention program found that the quit smoking behavior was at 39.45±10.46 and increased significantly to 24.96±1.91 ($p=0.002$). The body fat percentage was at 33.79±5.83 and decreased significantly to 46.78±6.47 ($p<0.001$).

IV. Discussion

The study design was to examine the effect of the "Cut Down Smoking" program by separating into the experimental and controlled. The baseline measured of all variable was no difference between 2 groups. The finding indicated that the intervention groups was decreased significantly of the Fagerstrom score between 2 groups compared at the baseline and 1-month intervention program ($p<0.001$) and the quit smoking behavior was increased significantly between 2 groups after 1-months intervention program ($p<0.001$). The result is consistent with the study of Wei Xia, et al [17] whose study effectiveness of a video-based smoking cessation intervention focusing on maternal and child health in promoting quitting among expectant fathers in China. The finding revealed that the video and text groups had higher levels of readiness to quit smoking than the control group at 6 months ($p = 0.002$). Similarly, A. Coşkun Beyan, Y. Varol. [11] whose study the effectiveness of smoking cessation program in a workplace with high risk. The results found that the participants in the experiment group was statistically significant differences with an average FNDT score ($p< 0.001$). Moreover, the results consisted with C.M. Cantera, et al. [18] whose study the effectiveness of multicomponent interventions in primary health care settings to promote continuous smoking cessation in adults. The finding indicated decrease in the prevalence of smoking of 4% for post-intervention and in the number of cigarettes per day from 17.4 (pre-intervention) to 16.4 (post-intervention).

This finding might explain that; firstly, after the participants were participated with the "Cut Down smoking" program, they mostly had the high score of knowledge about smoking. This may cause to promote the quit smoking cessation and decreased the Fagerstrom Test for Nicotine Dependence scores [16]. Secondly, the intervention detail was integrated the behavioral change theories, the activity was designed to train with the process of changing their thought and setting behavioral conditions to reduce tobacco use. The postman smoker addicts can practice to think about their smoking condition and behavioral training with the belief-based concept of rational therapy. This may affect to them can set the ideation to stop smoking. This behavior change is consisted with the Corey theory [13]. Thirdly, this intervention was developed by using the Stage of Change Model or TTM [12]. The concept of TTM was divided into individuals classified according to the level of behavior change and organized by activities using appropriate change processes at each stage. As a result, the sample groups were ready to change their behavior. Weighing the advantages (Pros) with the disadvantages (Con) can lead to change their target behavior. When the postman smokers were seen on the negative effects of quitting and can lead to balance of decision for quitting smoking. Moreover, the "Cut Down smoking" program was applied the herbal to reduce the tobacco use. Amla is high in vitamin C and tannins, because the amla has a sour and astringent taste, so it has the effect of altering the taste of the cigarette and not wanting to smoke. Eating herbs that are high in vitamin C will help keep the body fresh, and the smoker should drink plenty of fluids at the same time.

V. Limitation and Recommendations

The limitation in this study consisted of the intervention program were designed on 4-weeks of program sessions by using the Stage of Change Model and used 1-month to follow the outcomes. This study had short of the program design; the future study should realize this program to longer follow-up time after finishing the program to determine suitable of behavior change. Moreover, the public health personnel should adapt the "Cut Down Smoking "program to reduce smoking for the general population to interpolate activities in the smoking cessation clinic and instigate to the routine care in order to be more effective. Besides, smell is important for mood, the future study could develop the products to obtain the condition for stimulating the smelling by conducting the activity related to reduce smoking. Furthermore, next research should add the outcome about the self-efficacy to quit smoking and the number of cigarettes smoked per day for the outcome parameters.

VI. Conclusion

The "Cut Down smoking" program was designed with the motivation program and simply to perform this program at the with the dynamic worship characteristic. The results showed the experiment group had an average of the Fagerstrom score with 6.25 scores at the beginning and decreasing to be 3.08. Score after 1-month intervention program. The "Cut-Down Smoking program" can promote the smoking cessation behavior and reduce the score of Nicotine dependence. For the program implementation can be used for integrating with the health promotion planning of the organization for improve the good health status of the postman and preventing the effect from heavy smoking. Therefore, the health care department and administrative organization should make the heath policy by applying the "Cut Down smoking" program for the postman smoker. The future study should add other method especially the individual motivation and community motivation to design the program for promoting the smoking cessation behavior. The social media support should conduct to promote the smoking cessation behaviour.

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