EVALUATION OF QUIT-CALENDAR IN SMOKING CESSATION AT SAPASITHIPRASONG HOSPITAL, UBON RATCHATHANI

N Junnual[1], A Chaikoolvatana[2], P Suebsamran[1], W Thongnun[3] and C Sitthibutra[3]

[1]College of Medicine and Public Health, [2]Department of Pharmaceutical Science, Ubon Ratchathani University; [3]Sanpasithiprasong Hosptial, Ubon Ratchathani, Thailand

Abstract. This study aimed to investigate the demographics, smoking behavior, and benefits of the calendar for a group of participants involved in smoking cessation. The Quit-Calendar, containing 37 question items, was developed to promote smoking cessation. Its use was assessed by the implementation of a study involving 80 participants: 40 in a study group and 40 in a control group. The participants in the study group underwent a routine cessation counseling process with additional Quit-Calendars, whereas those in the control group received routine cessation counseling only. The effectiveness of the Quit-Calendar, duration of quit times (known as survival times), and attitudes to the Quit-Calendar and regular cessation counseling were evaluated via descriptive and analytical statistics. The study found that most participants were male, aged between 30 and 41, and had completed primary to senior high school education. The members of the control group had a significantly higher intention to quit smoking compared to those in the study group ($\overline{X}$ = 4.20 and 3.35, respectively; $p<0.001$). Survival times were measured at days 14 and 60. The results indicated that there were significant differences between the study and control groups on these specific days (p = 0.002 and 0.003, respectively).

Keywords: cigarettes, counseling, Quit-Calendar, smoking cessation

INTRODUCTION

Smoking is one of the world's most damaging factors regarding health, causing some serious diseases including chronic obstructive pulmonary disease (COPD), cardiovascular disease, and lung cancer (Khuenkaew, 2006). Worldwide, tobacco use causes more than 5 million deaths per year, and current trends show that it will cause more than 8 million deaths annually by 2030 (WHO, 2011). In 2006, the World Health Assembly (WHA) stated there were 1,100 million smokers and approximately five million deaths every year (WHO, 2005).

In Thailand, a 2011 annual report on the smoking behavior of the nation's population found that there were 11.5 million smokers under the age of 15 (National Statistical Office, 2011). These smokers were divided into current smokers (9.9 million) and non-regular smokers (1.6 million). This report also indicated that

Correspondence: A Chaikoolvatana, Department of Pharmaceutical Science, Ubon Ratchathani University, Warin Chamrap, Ubon Ratchathani 34190, Thailand.
Tel: +66 (0) 87 2586468; Fax: +66 (0) 45 353626
E-mail: kkjc5476@yahoo.com

46.6% of current smokers were men and 2.6% were women.

Currently, there are 380 health clinics in Thailand where seekers could possibly have access to smoking cessation services; only 68.8% have done so (Phumthong, 2008). A routine cessation counseling session, including face-to-face cessation counseling in the clinic, is normally provided; however, some smokers choose to go "cold turkey" (quit immediately). The success rate of going cold turkey during the first year of trying to stop smoking is 5%-7%. Taking smoking cessation counseling via health professionals can increase the quit success rate up to 10% during one year, and the quit success rate can be increased up to 20%-30% by a combination of behavioral change and psychosocial therapy (Wongwiwatthananukit *et al*, 2005). There have been a number of recently introduced strategies to enhance smoking cessation, such as counseling clinics, textbooks, public advertising, conferences, quit-lines, and web-communication (Smith and Tayler, 2006; Fiore *et al*, 2008). All of these strategies have shown promising improvements to cessation counseling services, including easy access, appropriate information, and enjoyable and time saving practices (Chaikoolvatana and Goodyer, 2003; Chaikoolvatana *et al*, 2004; Ruanta *et al*, 2007).

One of these strategies is a Quit-Calendar. A study in 2009 showed that a stop-smoking pocket calendar could encourage cancer patients to stop smoking. The volunteer patients agreed to follow the recommendations in the calendar, to review the calendar with their physicians during every visit, and to complete a questionnaire before and three months after using the calendar. The findings suggested that the average daily number of cigarettes smoked by the participants after three months decreased. The pocket calendar appeared to be a contributor to this smoking reduction (Nair *et al*, 2009).

Similar evidence has been provided by the stop smoking calendar, *Nichtraucher-kalende*® (AOK-Bundesverband, Berlin, Germany). It aims to encourage people to quit smoking. A monthly page displays graphic pictures of unhealthy lungs, followed by a series of monthly pictures of the progressive healthier lungs due to a person's quitting smoking. The pictures in the last month showed normal healthy lungs (Martz, 2012).

Smoking Cessation Clinics in Thailand generally use face-to-face cessation counseling as a routine service. Furthermore, neither the application of a Quit-Calendar for smoking cessation service nor the effectiveness of its functions has been reported among Thai health providers. Therefore, the authors aim to develop a Quit-Calendar to emphasize the importance of quitting smoking and to improve the cessation counseling service as an attempt to help people quit cigarettes. The study was conducted at Sapasithiprasong Hospital, Ubon Ratchathani Province. The evaluation of its efficacy and smoker satisfaction needs to be addressed.

MATERIALS AND METHODS

Study design

The study was of a quasi-experimental research design. The duration of study was a 60-day period.

Population and samples

A survey of patients who made regular visits seeking help from smoking cessation clinics, including Outpatient and Psychiatric Units, Sapasithiprasong Hospital, was conducted at the beginning of the study. At this hospital, similar cessation counseling

services were provided at both sites due to a large number of visitors. Additionally, both well-trained health teams from the units were qualified to undergo cessation counseling. Therefore, people seeking to quit cigarettes normally visit each unit.

Power analysis and exact probability test were implemented to calculate the sample size. Alpha value is equal to 0.05, power = 0.9, and quit rate = 0.37 (Bussaratid and Siripaiboonkij, 2012). As a result, 80 volunteers were enrolled into the program via purposive sampling. All volunteers satisfied the inclusion criteria that included being aged over 15, being either current or relapsed smokers, and agreeing to participate in the study. Two study sites were randomly chosen to be either study or control group. Forty participants were randomly selected into each group via simple random sampling. All were current smokers who visited the hospital for medical follow-up procedures, and completed consent forms for participation in the study.

Ethical considerations

The study protocol was reviewed and approved by Sapasithiprasong Hospital Council Policy Statement Ethical Conduct for Research Involving Humans (Ref Nº 029/2556; 2013 Oct 18). (A questionnaire form was filled out three different times, including, days 1, 14, and 60 following hospital policies). Before the commencement of the study, the authors obtained the approval of the Director of Sapasithiprasong Hospital.
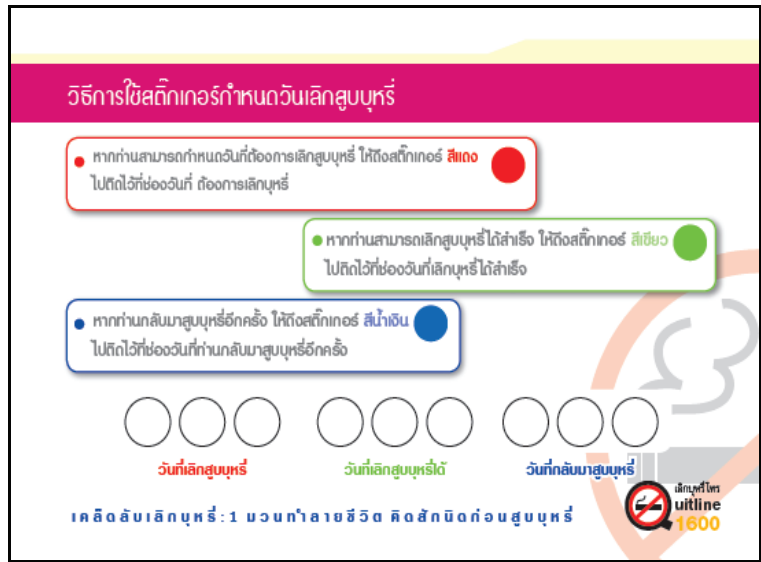

Fig 1–Examples of pages in the Quit-Calendar.

Research tools

There were two research tools, a Quit-Calendar (as shown in Fig 1) and a questionnaire.

The Quit-Calendar (Martz, 2012) contains various topics related to cigarette smoking and smoking cessation, including: 1) facts about the dangers of cigarettes, 2) facts about second-hand smoking, 3) facts about third-hand smoking, 4) withdrawal symptoms, 5) Fagerstrom Test for Nicotine Dependence, 6) how to quit smoking successfully, 7) behavioral modification, and 8) quit date with reminder stickers (Fig 1).

The questionnaire contained 37 question items in six sections: 1) demographic data (6 items), 2) smoking behaviors (7 items), 3) smoking cessation service access and intention to quit smoking (3 items), 4) effectiveness of Quit-Calendar (15 items), 5) attitudes towards Quit-Calendar related to smoking cessation (3 items), and 6) attitudes towards regular smoking cessation services (3 items). The participants in

the study group completed sections 1 to 5, and those in the control group completed sections 1 to 3, and 6.

The questionnaire paper was modified from a previous study (Srimorakot, 2006). Three clinical experts involved in smoking cessation services tested it for content validity. The validity index was equal to 0.90. Additionally, changes were made based on reviewer's recommendations. Reliability was assessed with 30 patients from Warin Chamrap Hospital to measure the Cronbach's alpha coefficient (α). The mean value of "α" was 0.820 (standard alpha ≥0.7).

Rating scales for intention to quit can be described from 1=low intention to 5=high intention. The evaluation attitudes towards Quit-Calendar used a four-point rating scale (Likert scale): 1=not good, 2=needs some changes, 3=fair, 4=good. A similar four-point scale was use for the effectiveness of Quit-Calendar and regular smoking cessation services: 1=no difference, 2=low, 3=intermediate, and 4=high.

Process and data collection

The counselors for both groups underwent a 3-day training course. Each participant came for smoking cessation counseling on the follow-up day (day-1). During the routine counseling process including, CO level measurement, 5-As Model for Smoking Cessation, pharmacological assistance, disease diagnosis, and clinical interventions, the study participants received additional information provided via Quit-Calendar as described in the 'research tools' section, above. The participants were given Quit-Calendars to remind them how to quit smoking properly. They were also required to specify their quit date using different stickers. For example, if they were ready to quit, they were asked to put a 'red' sticker on the nominated quit day of the calendar. If they were successful in quitting smoking, they were asked to put a 'green' sticker on the day, and if they re-commenced smoking after quitting, they were asked to place a 'blue' sticker on the calendar. The participants in the control group only received routine cessation counseling.

After the completion of counseling, both groups of participants were asked to complete the questionnaire paper in Sections 1 to 3. Later, during hospital visits on days 14 and 60, participants completed a follow-up in which they were asked to provide some additional information in sections 4 to 6, depending on their study or control group status.

Data analysis

Demographic data were analyzed via descriptive statistics including, percentages, frequencies, means, and standard deviations. Data of smoking behaviors and smoking cessation service access and intention to quit smoking were evaluated with analytical *t*-test. Attitudes towards Quit-Calendar were analyzed with descriptive analysis. The effectiveness of both Quit-Calendar and routine smoking cessation counseling were assessed at days 14 and 60 with survival analysis [Log Rank (Matel-Cox), Kaplan-Meier survival curve]. Satisfaction with the Quit-Calendar was investigated through percentages and frequencies.

RESULTS

The results indicated that most participants in both groups were males, aged between 30 and 40 years old, and had a wide range of education from primary to high school. The majority were private employees, had a medical history, and earned an average income ranging from

Table 1
Demographic data (*N*=80).

Variable	Study group	Control group	*p*-value[a]
	n (%)	*n* (%)	
Gender			0.494
Male	38 (95.0)	40 (100.0)	
Female	2 (5.0)	-	
Age (years)			0.025
≥35	25 (62.5)	15 (37.5)	
<35	15 (37.5)	25 (62.5)	
Mean	30.3	41.25	
SD	9.9	12.99	
Education level			0.446
No education	1 (2.5)	1 (2.5)	
Primary school	10 (25.0)	14 (35.0)	
Junior high school	11 (27.5)	7 (17.5)	
Senior high school/vocational certificate	8 (20.0)	8 (20.0)	
Diploma/high vocational certificate	3 (7.5)	7 (17.5)	
Undergraduate	7 (17.5)	3 (7.5)	
Occupation			0.062
No occupation	4 (10.0)	-	
Student	7 (17.5)	1 (2.5)	
Governmental officer	3 (7.5)	7 (17.5)	
Private employee	13 (32.5)	16 (40.0)	
Business owner	4 (10.0)	4 (10.0)	
Farmer	7 (17.5)	11 (27.5)	
Income (THB/month)			0.006
≥10,000	22 (75.9)	15 (41.7)	
<10,000	7 (24.1)	21 (58.3)	
Mean	6,075	11,357	
SD	5,673.31	13,109.46	
Medical History			0.793
Yes	30 75	31 (77.5)	
No	10 25	9 (22.5)	

[a]Fisher's exact test.

THB 6,000-11,000 per month. Only income and age variables were significantly different between groups (Table 1).

Participants in the control group had a longer duration of smoking than those in the study group did ($\overline{X}$=21.95 and 12.32, respectively). There was no difference in the starting ages of smoking between the control and study groups ($\overline{X}$=16.97 and 19.30, respectively). Participants in both groups smoked between 10 and 11 cigarettes per day. Thirty-eight and 35 of the control and study groups, respectively, were chronic patients, and the mean carbon monoxide levels were 5.66 and 5.58, respectively. The only significant difference between groups was the duration of smoking (Table 2).

Table 2
Smoking behavior (N=80).

Variable	Study group	Control group	p-value
	n (%)	n (%)	
Duration of smoking (years)			<0.001
≤10	24 (60.0)	7 (17.5)	
>10	16 (40.0)	33 (82.5)	
Mean	12.32	21.95	
SD	9.46	10.89	
Starting age			0.094
≤15	17 (45.5)	9 (22.5)	
>15	23 (57.5)	31 (77.5)	
Mean	16.97	19.3	
SD	4.24	5.57	
Numbers of cigarettes (per day)			0.974
<10	18 (45.0)	19 (47.5)	
10-20	20 (50.0)	19 (47.5)	
>20	2 (5.0)	2 (5.0)	
Mean	11.02	10.52	
SD	7.77	7.43	
Chronic conditions			0.432
Yes	38 (95.0)	35 (87.5)	
No	2 (5.0)	5 (12.5)	
Carbon monoxide (CO) levels (ppm)	18 (45.0)	25 (62.5)	0.82
Mean	5.66	5.84	
SD	1.81	2.8	

CO, carbon monoxide.

Table 3
Survival time (days) at days14 and 60 between groups.

Group	n	Mean survival time (days)	95%CI for mean survival time (days)	14-day survival (%)	p-value	60-day survival (%)	p-value
Study	40	24.63	16.72-32.54	42.5	0.002	32.5	0.003
Control	40	10.57	4.61-16.54	17.5		10	

Level of significance <0.05.

Additionally, investigation of access to smoking cessation services at day 60 suggested that most participants from both groups accessed smoking cessation clinics for their first time [n= 39 (97.5%), n=38 (95%)]. The main reason for quitting smoking at day 1, prior to a further investigation, was "doing it for myself," with significant differences between two groups (Study: 40 (97.5%), Control: 28
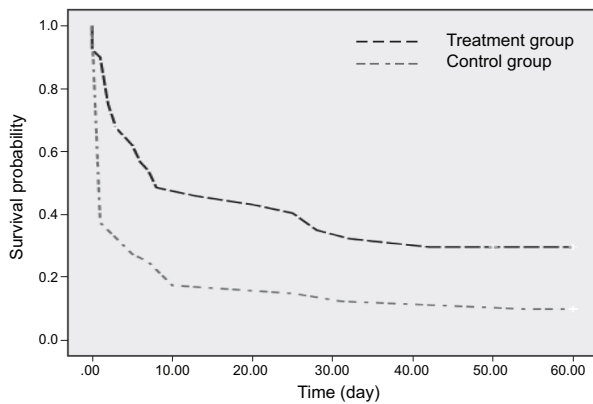
Fig 2–Kaplan-Meier survival curve.

(70%), *p*= 0.001). Members of the control group had a significantly higher intention to quit smoking than those in study group did at day 1 ($\overline{X}$=4.20 and 3.35, respectively; *p*< 0.001).

The effectiveness of the Quit-Calendar in quitting smoking was investigated. Results focused on 'survival time;' that is, the number of days that the participants quit smoking after entering a cessation counseling program. Findings showed that participants in the study group had longer durations of quitting smoking than those in the control group ($\overline{X}$=24.63 and 10.57 days, respectively). At 14 and 60 day survivals, there were significant differences of a number of survival days between study and control groups (*p*=0.002 and 0.003, respectively) (Table 3).

The Kaplan-Meier survival curve (Fig 2) shows the survival probability over 60 day periods. These values dropped over a period of time in both groups. Nevertheless, a sharp decline during the first 10 days of quitting smoking was found in the control group.

Participants in the study group were generally satisfied at days 14 and 60 with the quit smoking benefits, appearance,

expectations, and effectiveness of Quit-Calendar. Some examples of their opinions included statements referring to the combination of personal counseling and Quit-Calendar could help quitting cigarettes easier, the language and graphical pictures made the calendar more interesting, and that the Quit-Calendar would remind them to quit smoking.

DISCUSSION

Most of the participants in this study were male, in accordance with the findings of Garcia *et al* (2004) and other studies. It was also found that males made more attempts to stop smoking than females did (West *et al*, 1977; Targowski *et al*, 2004). However, other studies recognized no association between smoking and gender, (Targowski *et al*, 2004; Sherman *et al*, 2005; Turner *et al*, 2005; Abdullah *et al*, 2006; Hyland *et al,* 2006) and one study demonstrated that females have a greater probability of planning an attempt at smoking cessation (Clark *et al,* 1997; Toftgård *et al*, 2010). Additionally, the majority of younger smokers (in the study group) were more likely to be successful in quitting smoking than older participants (in the control group) were (Table 1).

This may be due to the fact that members of the study group had shorter durations of smoking, one of the factors that influenced smoking behavior and cessation (Table 2). As a result, it was easier for the study group participants to give up smoking than older smokers who had smoked for a longer time. However, some studies found there was no consistent association between age and stage of readiness to quit smoking, although the older group was most likely to succeed over the subsequent three months (Ma *et al*, 2003; Campbell *et al*, 2013). Some studies found

that the greater the age, the higher the probability of trying to stop smoking and the longer the attempt (Henderson *et al*, 2004; CDC, 2013). This may be explained by the higher rate of morbidity among older smokers, leading to a higher number of medical appointments and a greater likelihood of being frequently advised to stop smoking.

Participants in the study group had a higher income (Table 1) and higher mean survival time (Table 3) compared to those in the control group. The relationships of these factors were evident in previous studies, for example, Centers for Disease Control (CDC) Survey on tobacco use indicated people with higher income were generally less likely to start smoking and more likely to quit than those with lower incomes (CDC, 2014). The benefits of helping people with low incomes to quit cigarettes include a decrease in spending on cigarettes and increases in security, self-reliance, and prospects of a brighter future.

The levels of education of members of the study group were slightly higher than those in the control group (Table 1). Past studies have indicated that adults with education of high school level or below were more likely to smoke cigarettes than those who had college or graduate degrees were (Barnes *et al*, 2010).

There is a range of alternative methods of quitting smoking; some of which are promising, and the others are questionable. A review of hypnosis did not find evidence to support it as a workable method of quitting (CDC, nd). There is little evidence to support smoking deterrents, such as over-the-counter products that change the taste of tobacco, stop smoking diets that curb nicotine craving, and combinations of vitamins (Carim-Todd *et al*, 2013). Mind-body practice used yoga, mindfulness, and meditation to aid quitting smoking. Results were not completely in favor of these methods, but some suggested a lowering of craving and less smoking. Cognitive processing methods have also studied (Astin *et al*, 2003; Guichenez *et al*, 2007; Beddoe and Lee, 2008).

Regarding the implementation of a Quit-Calendar to improve the smoking cessation, this tool is a new strategy developed to promote smoking cessation alongside routine cessation counseling, which includes, the Five A's heuristic model, pharmacological assistance, disease diagnosis, and clinical interventions. This study found that those who used Quit-Calendar with routine cessation counseling had higher mean survival times at days 14 and 60 compared to those in the control group.

It could be explained by the fact that a Quit-Calendar contains warning graphics related to cigarette smoking, supportive messages, steps of quit smoking, and self-management for those seeking the appropriate approach to quit smoking. As a result, study participants appeared to follow the instruction comfortably and successfully. Interestingly, those using a Quit-Calendar were asked whether a calendar can help them to quit smoking, and positive answers were given. They also found that the determination of quit date using different stickers was interesting and easy to follow. The purposes behind this activity are to remind about quitting cigarettes, realize the dangers of tobacco products, and gradually see the progress of their cessation behaviors.

Previous evidence related to a Quit-Calendar was found. For example, the concept of Teachable Moments (TM)

(Flocke *et al*, 2012) with a Quit-Calendar was used in its counseling process. TM is the cueing of events during the treatment process, including diagnosis, discussion of treatment options, treatment visits, and attendance of family members. Clinicians and healthcare systems are well positioned to take advantage of these opportunities to build on patients' perceptions of personal vulnerability and emotions, such as fear or hope, and changes in self-concept to emphasize the importance of smoking cessation related to their medical conditions (Nair *et al*, 2009; Szklo and Coutinho, 2009).

The study group participants were counseled to quit smoking after they met with physicians for either diagnosis or treatment follow-up. The counselors took the opportunity to integrate a cueing event, such as disease diagnosis, severity of disease, disease stage, family members' concerns, work capability, and the use of Quit-Calendar to persuade the participants to stop smoking. Once the participants realized the importance of quitting smoking to improve their medical conditions, they were more likely to follow the advice to give up smoking. Then, the counselor went through the context of Quit-Calendar and let the participants set up their quit dates. The counselor also took the opportunity to promote smoking cessation of any relatives in attendance. Similar findings of TM concept to promote smoking cessation were also reported (Ostroff *et al*, 2001; Lawson and Flocke, 2009; Flocke *et al*, 2012).

Regarding the quit duration, the findings of the mean values of the survival time in the participants in the study group using Quit-Calendar were significantly higher than those of the members of the control group (Table3), but the research was unable to say with certainty that the Quit-Calendar played the most essential role in smoking cessation, as it was used as a supplementary tool combined with the routine counseling process. At this stage, the authors believe that the Quit-Calendar could motivate people to quit smoking.

Moreover, the Kaplan-Meier survival curve may indicate that during the first two weeks after quitting, smokers in both groups were expected to experience some withdrawal symptoms, such as anxiety, craving, sleeplessness, lost concentration, and weight gain. A possible explanation of this decline may be that smokers who went 'cold turkey' failed to cope with such factors as withdrawal symptoms and nicotine addiction levels, and as a result, resumed smoking. If smokers did not know how to cope with these symptoms, it was more likely they would give up the quitting process and resume smoking. Therefore, the survival probability value was dropped. Additionally, social-economic issues including, friends, stress might cause the resumption of cigarette smoking. Thus, it is important to advise a quitter to manage those factors reasonably and effectively.

The findings suggested that most of the participants in the study group were positively satisfied with Quit-Calendar as a supplementary tool for smoking cessation (Tables 4-5). Some stated that it could be used as a 'quit reminder' for those willing to stop smoking and those currently quitting cigarettes. The combination of routine cessation counseling (face-to-face; 5'A counseling) and Quit-Calendar was considered to be practical the members of the study group. Those who underwent regular face-to-face smoking cessation expressed positive opinions; therefore the promising benefits of relapse prevention from Quit-Calendar need further investigation.

Table 4
Attitudes towards Quit-Calendar.

Evaluation item(s)	Levels of attitudes (Study gr.)							
	Day 14				Day 60			
	4	3	2	1	4	3	2	1
1. Quit-Calendar can help you to specify your quit date.	22 (55)	18 (45)	-	-	23 (57.5)	16 (40)	1 (2.5)	-
2. Using Quit-Calendar can help you quitting cigarettes.	19 (47.5)	18 (45)	2 (5)	1 (2.5)	22 (55)	14 (35)	3 (7.5)	1 (2.5)
3. Quit-calendar can help you not to smoke cigarettes again.	-	-	-	-	22 (55)	13 (32.5)	2 (5)	3 (7.5)

1, no difference; 2, low; 3, intermediate; 4, high.

Table 5
Attitudes towards regular smoking cessation counseling (face-to-face).

Evaluation item(s)	Levels of attitudes (Control gr.)							
	Day 14				Day 60			
	4	3	2	1	4	3	2	1
1. Regular smoking cessation counseling can help you specify your quit date.	31 (77.5)	8 (20.5)	1 (2.5)	-	32 (80)	61 (15)	2 (2.5)	-
2. Using regular smoking cessation counseling can help you quitting cigarettes.	29 (72.5)	10 (25)	1 (2.5)		29 (72.5)	9 (22.5)	2 (2.5)	-
3. Regular smoking cessation counseling can help you not to smoke cigarettes again.	-	-	-		29 (72.5)	9 (22.5)	2 (5)	-

1, no difference; 2, low; 3, intermediate; 4, high.

The strategy represents an important contributor to stopping smoking in one particular hospital site. Further investigations, including the expansion of the evaluation of its effectiveness to other areas and longer survival time measurements involving Quit-Calendar and regular counseling are needed. Moreover, the intention to quit and carbon monoxide measurements throughout the cessation period, which were not recorded in this study, are required to see the co-operation and the effectiveness of cigarette cessation.

Regarding sociodemographic characteristics of participants in both groups, the results may not be clearly accurate so

as to draw a conclusion on effectiveness of a quit calendar, because the differences in the intervention and control groups. Further evaluation needs to focus on the similarity of the participant background, so the study outcomes will be more precise and reliable.

Additionally, this research could benefit from a repeated measure of the Analysis of Variance (ANOVA) test looking into the changes in attitudes. However, as the questionnaire items concerning attitudes towards the Quit-Calendar and regular counseling were different, it is not possible to see the changes in attitudes of both groups. A further adjustment is needed by revising the questionnaire items to be compatible for both groups. Pre- and post-test evaluations within- and between-groups are necessary to assess the changes in attitudes towards the smoking cessation services.

Noticeably, the monitoring periods of day 1, day 14 and day 60 are only used for this particular hospital. There is a need for follow-up using the standard criteria of the Thai Tobacco Control Organization including, day 1, month 3, month 6, consecutively. Also, more participants and multi-setting study areas are required to assess the overall picture of the possible benefits of this new and alternative tool.

The use of Quit-Calendar, coupled with routine cessation counseling such as face-to-face counseling, may enhance the prospects of quitting smoking. The Quit-Calendar was found to provide a useful reminder for smokers to specify their quit dates, learn some self-help guides, and receive pharmacological assistance presented on each calendar page. Its use among health providers should also be encouraged and further investigations of its benefits are required.

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